

**CHAPTER**

**20**

**STANDARD  
PRACTICES -  
AIRFRAME**



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20-50-70	BUSHING PULLER	ST921B
20-50-71	BUSHING REMOVAL TOOL	ST921C
20-50-72	STAKING TOOL - BUSHING	ST922
20-50-73	STAKING TOOL - 3/8-INCH DIAMETER BUSHING	ST922A-6
20-50-74	STAKING TOOL - (X/16) BUSHING, BACB28B-X	ST922C
20-50-75	STAKING TOOL - 1/4 BUSHING, BACB28B-4-239P	ST922E
20-50-76	STAKING TOOL - 1/4 DIAMETER BUSHING	ST922F-4
20-50-77	ADAPTOR FOR 0.374 SHANK TO 0.750	ST923
20-50-78	POINT STAKING TOOL - BEARING RETENTION	ST925
20-50-79	STAKING TOOL - HINGE FLAP, FORWARD ENTRY DOOR	ST925A
20-50-80	ROLLER STAKING TOOL	ST926-1, -2, -3, -4, -5, -6
20-50-81	ROLLER STAKING TOOL	ST926A
20-50-82	ROLLER STAKING TOOL - PORTABLE, HAND OPERATED	ST926B
20-50-83	ROLLER STAKING TOOL	ST926C
20-50-84	STAKING TOOL - ROLLER BEARING	ST926D
20-50-85	ROLLER SWAGING TOOL - BEARING	ST926E
20-50-86	ROLLER SWAGE BEARING AND SLEEVE REPAIR KIT - BAC5435 PROCESS	ST926F-1, -34
20-50-87	STANDARD TOOL - BEARING REMOVE/INSTALL/SWAGE, BEARING WITH GROOVE 0.500 TO 1.250-INCH RACE SWAGE (TYPE III)	ST926G
20-50-88	BEARING REMOVAL TOOL	ST927
20-50-89	BUSHING REMOVAL TOOL FOR 69B13953	ST927A

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CHAPTER 20  
STANDARD PRACTICES - AIRFRAME

<u>SUBJECT</u>	<u>TITLE</u>	<u>PART NO.</u>
20-50-90	STANDARD TOOL - BACB10CN3 BEARING REMOVAL TOOL	ST927AA-1
20-50-91	STANDARD TOOL - BACB10AG4MC BEARING REMOVAL TOOL	ST927AA-2
20-50-92	BEARING REMOVAL TOOL	ST927B
20-50-93	STANDARD TOOL - BEARING REMOVAL TOOL	ST927C
20-50-94	STANDARD TOOL - HOLE SAW, BEARING REMOVAL	ST927J
20-50-95	STANDARD TOOL - ROLLER STAKING TOOL, ALUMINUM SLEEVE	ST928
20-50-96	STANDARD TOOL - ROLLER SWAGING, ALUMINUM SLEEVE 69-38919	ST928-A
20-50-97	ROLLER STAKING HAND TOOL - YD-134 BEARING	ST928A
20-50-98	ROLLER SWAGING TOOL - BEARING SLEEVE	ST928B
20-50-99	ROLLER SWAGING TOOL - BEARING SLEEVE	ST928C
20-51-01	ROLLER SWAGING TOOL FOR BACB10C94H	ST928D
20-51-02	ROLLER SWAGING TOOL - ALUMINUM SLEEVE, 69-38919-2	ST928E
20-51-03	ROLLER STAKING TOOL - ALUMINUM SLEEVE	ST928F
20-51-04	STANDARD TOOL - ROLLER SWAGING ACCESSORIES FOR ST928	ST928G
20-51-05	STANDARD TOOL - BEARING REMOVE/INSTALL/SWAGE, SLEEVE OUTSIDE DIAMETER 1.33 THRU 2.25-INCH SLEEVE TYPE	ST928H
20-51-06	BEARING ROLLER SWAGING TOOL	ST929-1
20-51-07	STANDARD TOOL - ROLLER SWAGING SLEEVE BEARING	ST929-1A
20-51-08	ROLLER SWAGING TOOL - ROD END	ST929-1B
20-51-09	BEARING SLEEVE STAKING TOOL - 3 POINT	ST929-2A
20-51-10	12 POINT STAKING TOOL	ST929-2B
20-51-11	STAKING TOOL - BEARING SLEEVE, 6 POINT	ST929-2C
20-51-12	STAKING TOOL - BEARING SLEEVE, 3 POINT	ST929-3A
20-51-13	LINE STAKING TOOL - BEARING	ST929-4
20-51-14	BUSHING STAKING TOOL	ST930
20-51-15	STAKING TOOL - PRESSURE	ST930B
20-51-16	STANDARD TOOL - ANVIL SWAGING TOOL	ST930C
20-51-17	LOAD TEST - BEARING BAC 5435	ST930-LT
20-51-18	BALL POINT MULTIPLE - BEARING STAKING TOOL	ST931
20-51-19	BEARING STAKING TOOL - ADJUSTABLE BALL POINT	ST931A
20-51-20	YODE BALL POINT - BEARING STAKING	ST931B

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CHAPTER 20  
STANDARD PRACTICES - AIRFRAME

<u>SUBJECT</u>	<u>TITLE</u>	<u>PART NO.</u>
20-51-21	BALL STAKING TOOL - BEARING	ST931D
20-51-22	SWAGING TOOL - THRUST LINK FITTING, FORWARD ENGINE MOUNT	ST931E-500-1000
20-51-23	ROLLER SWAGE TOOL HOUSING - BEARING RETENTION	ST932
20-51-24	PILOT - ROLLER SWAGING TOOL, BEARING RETENTION	ST932-P
20-51-25	SPINDLE - ROLLER SWAGE TOOL HOUSING, BEARING RETENTION	ST932-S
20-51-26	ROLLER - STAKING TOOL, BEARING RETENTION	ST932-R
20-51-27	ROLLER STAKING TOOL - BEARING RETENTION	ST932A-R
20-51-28	ROLLER SWAGING TOOL - HOUSING, BEARING	ST932B
20-51-29	ROLLER SWAGING TOOL FOR BACB10A-38 BEARING	ST932C
20-51-30	ROLLER SWAGING AUTOTHROTTLE, BRACKET ASSEMBLY	ST932E
20-51-31	SWAGING TOOL - HOUSING BEARING RING LOCK	ST933
20-51-32	SWAGING TOOL - SHAFT BEARING RING LOCK	ST933-100
20-51-33	BEARING ROLLER SWAGING TOOL	ST934
20-51-34	ROLLER SWAGE - BEARING RETAINING RING	2MIT65B02661
20-51-35	INSTALLATION AND REMOVAL TOOL - ROLLER SWAGED BEARING	2MIT65B02070
20-51-36	SWAGE TOOL - UPPER AND LOWER JURY STRUT, BODY LANDING GEAR	2MIT65B05370
20-51-37	TOOL - REMOVAL, 60B00180-302 BEARING	2MIT65B90361
20-51-38	DIE - BEARING STAKE, ROD END ASSEMBLY, 65B01521 AND 65B01537	4MIT65B01501
20-51-39	DIE - BEARING STAKE, ROD END ASSEMBLY 65B01513-1 AND -6	7MIT65B01500
20-51-40	STANDARD TOOL - ANVIL SWAGE NACELLE SUPPORT FITTINGS	ST937D-1
20-51-41	SOCKET SET - SPHERICAL BEARING	A20008-1

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**PART NUMBER: A20013-1**

**NAME:** WORK TABLE - PILOTS AISLE STAND

**AIRPLANE MAINTENANCE:** YES

**COMPONENT MAINTENANCE:** NO

**USAGE & DESCRIPTION:** The A20013-1 work table is used on 737-300 thru -900 airplanes configured with the wide aisle stand.

A20013 is a portable table for tool placement and to protect the P-8 panel (aft electronics panel) during flight deck maintenance.

Refer to the current A20013 tool drawing for complete usage instructions.

A20013-1 consists of:

A20013-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	TABLE ASSEMBLY	A20013-2
1	STORAGE BOX	

**WEIGHT:** 8 lbs (3.6 kg)

**DIMENSIONS:** 20 x 18 x 10 inches (510 x 460 x 254 mm)

**20-00-01**

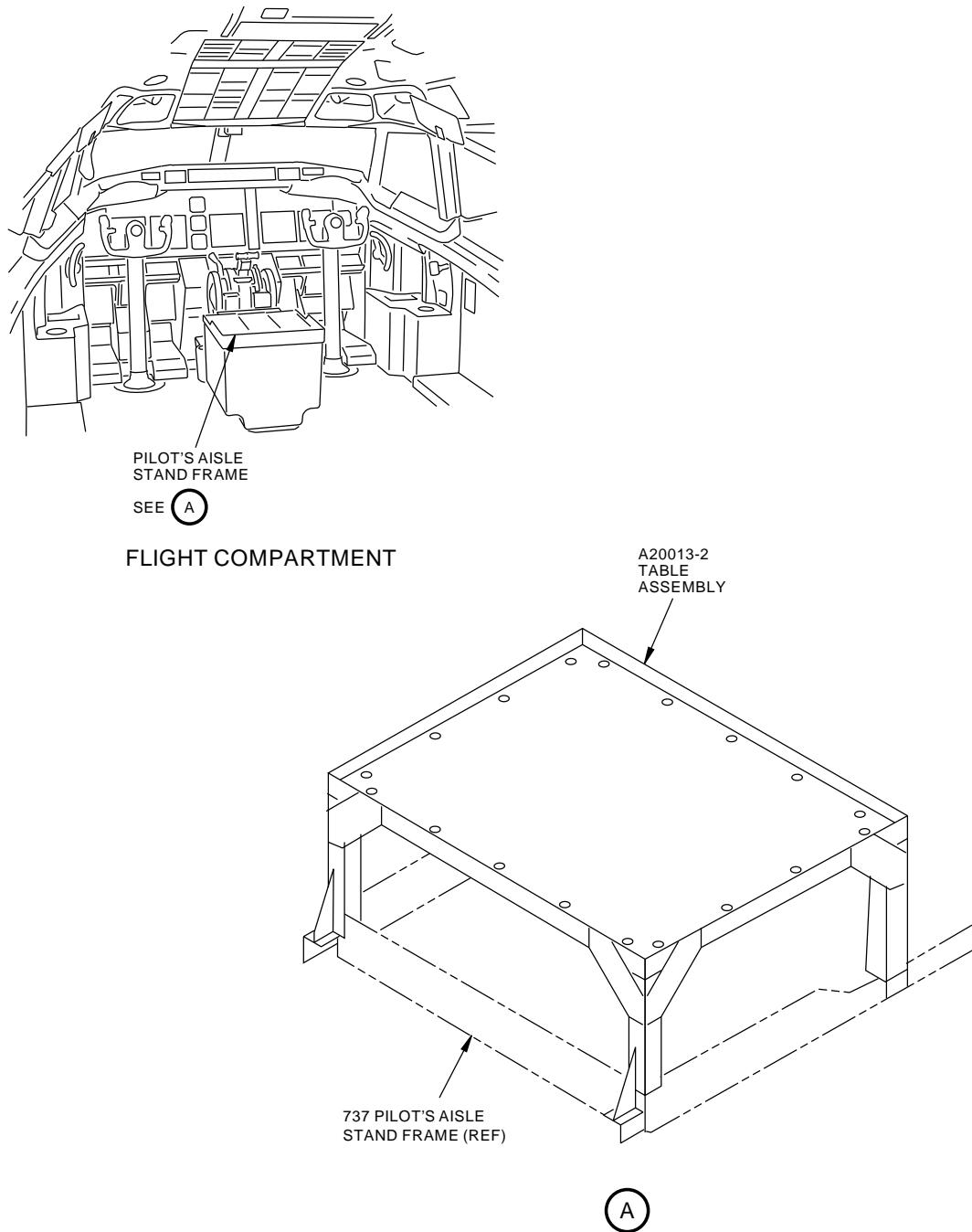
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H56522 S0006831386\_V2

Pilot's Aisle Stand Location  
Figure 1

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PART NUMBER: ST848R

NAME: REMOVAL TOOL - O-RING

AIRPLANE MAINTENANCE: YES

AMM 20-10-17

COMPONENT MAINTENANCE: NO

**USAGE & DESCRIPTION:** The ST848R O-ring removal tool is used on all 737 airplanes.

ST848R is used to remove various O-rings from internal and external grooves.

Refer to AMM 20-10-17 and the current ST848R drawing for complete usage instructions.

The ST848R O-ring removal tool consists of a 0.25 x 8 inch nylon rod with tapered ends.

**WEIGHT:** 0.0625 lb (0.03 kg)

**DIMENSIONS:** 0.25 x 8 inches (6.3 x 203.2 mm)

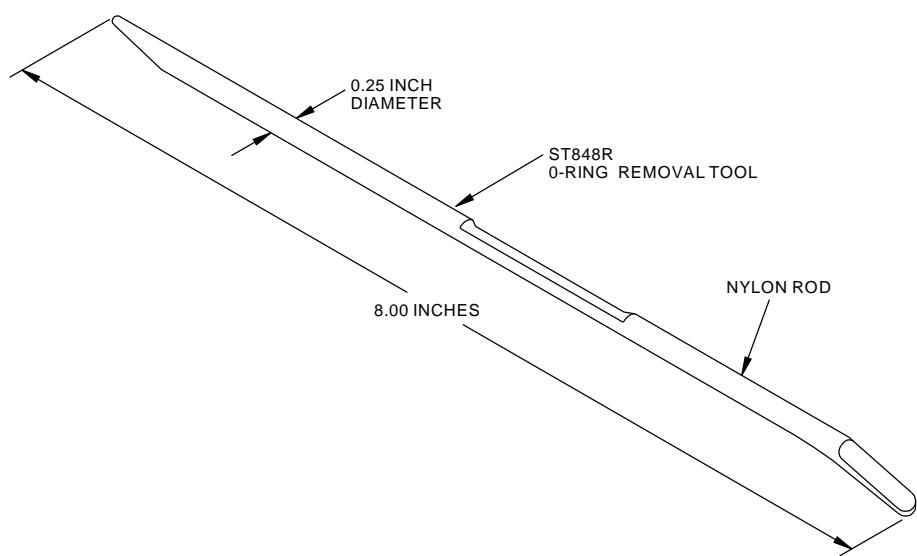
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M27036 S0006831388\_V3

**O-Ring Removal Tool**  
**Figure 1**

**20-00-02**



**737-600/700/800/900**  
**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER: ST895A-3**

**NAME:** PROBE - SURFACE RESISTIVITY MEASUREMENT

**AIRPLANE MAINTENANCE:** YES

**COMPONENT MAINTENANCE:** NO

**USAGE & DESCRIPTION:** The ST895A-3 probe is used on all 737 airplanes.

ST895A-3 is used in conjunction with a customer-furnished multimeter (Hewlett-Packard VTVM412A, Triplett 630 or Simpson 269-2) to measure the resistance of the electrical bond between the conductive coating on two different surfaces. ST895A-3 includes a sponge probe with two wire braid contacts. The ST895A-3 contacts are placed on two different faying surfaces to measure the resistivity between them. Electrical jacks on the probe attach to electrical leads from the customer-furnished multimeter. Refer to the current ST895A-3 drawing for complete usage instructions.

ST895A-3 probe assembly consists of a handle; sponge pad; two, braid contacts and two, electrical jacks, all contained in a storage box.

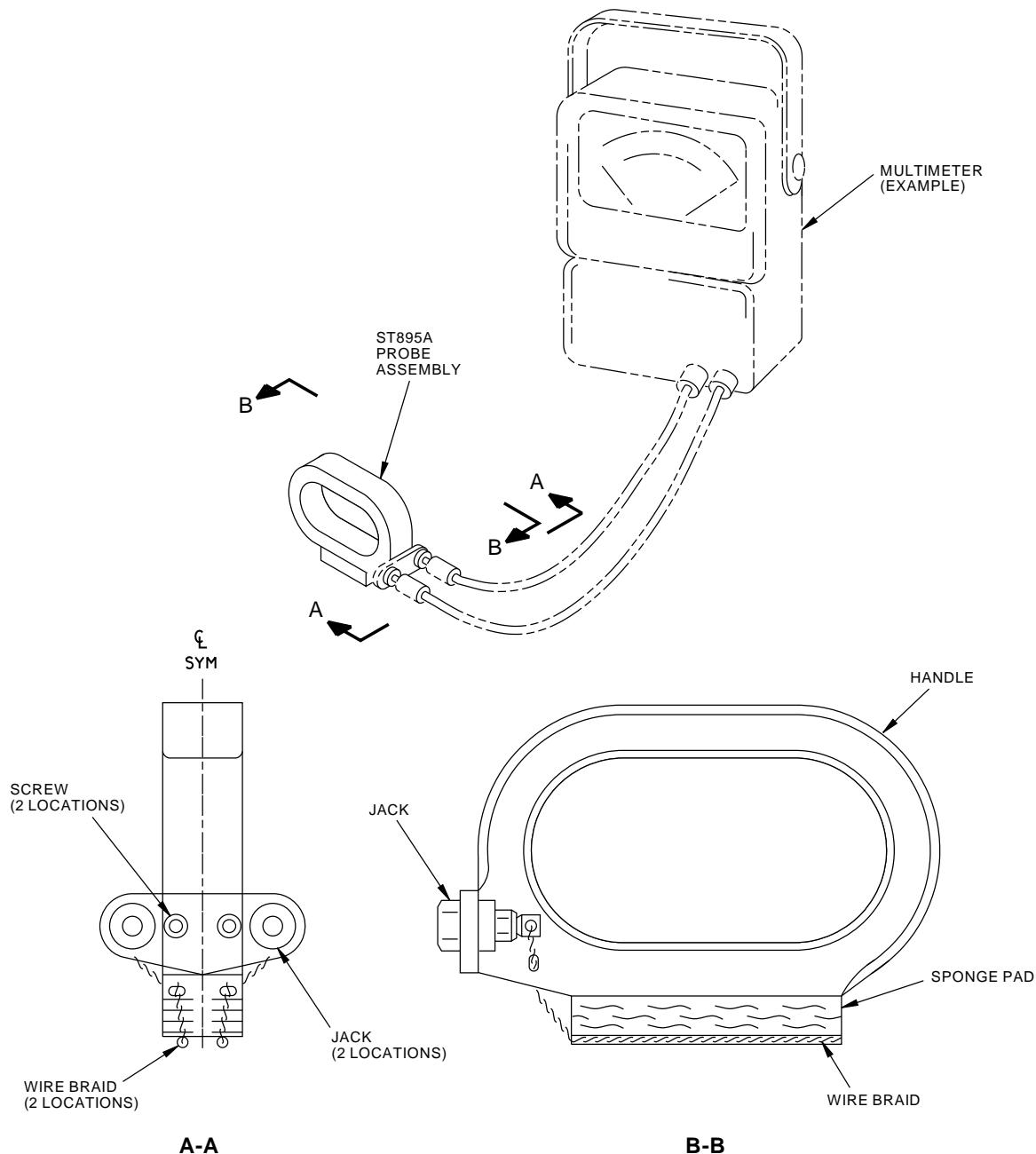
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1997211 S0000389667\_V1

Surface Resistivity Measurement Probe  
Figure 1

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ILLUSTRATED TOOL AND EQUIPMENT MANUAL

**PART NUMBER:** F70313-1, -2, -3, -4, -5, -6

**NAME:** STANDARD BOX - SUPPORT EQUIPMENT

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

F70313 Drawing

**USAGE & DESCRIPTION:** The F70313 standard box is used for most tools used on all 737 airplanes.

F70313 is used to protect tools during storage and transportation and to provide a method of accounting for individual parts of the tool. F70313-1 thru -4 and -6 are all boxes. F70313-5 is a standard bag.

F70313-1 is a small storage box for tools weighing 0 to 15 pounds (0 to 6.8 kg).

F70313-2 is a medium storage box for tools weighing 0 to 100 pounds (0 to 45.4 kg).

F70313-3 is a large storage box for tools weighing over 100 pounds (over 45.4 kg).

F70313-4 is a large storage box with fork lift guides for tools weighing over 100 pounds (45.4 kg).

F70313-5 is a standard bag, determined by the customer. There is no illustration for F70313-5.

F70313-6 is a large storage box with fork lift guides and hoist rings for tools weighing over 70 pounds (31.8 kg).

Refer to the F70313 drawing for complete information on the standard boxes and bag.

F70313 dimensions shall be determined by the tool manufacturer and will allow adequate interior space for a tool. F70313 will be constructed to allow reuse for transportation and storage. F70313 will contain adequate reusable restraints or dunnage to prevent damage to the tool.

**20-00-06**

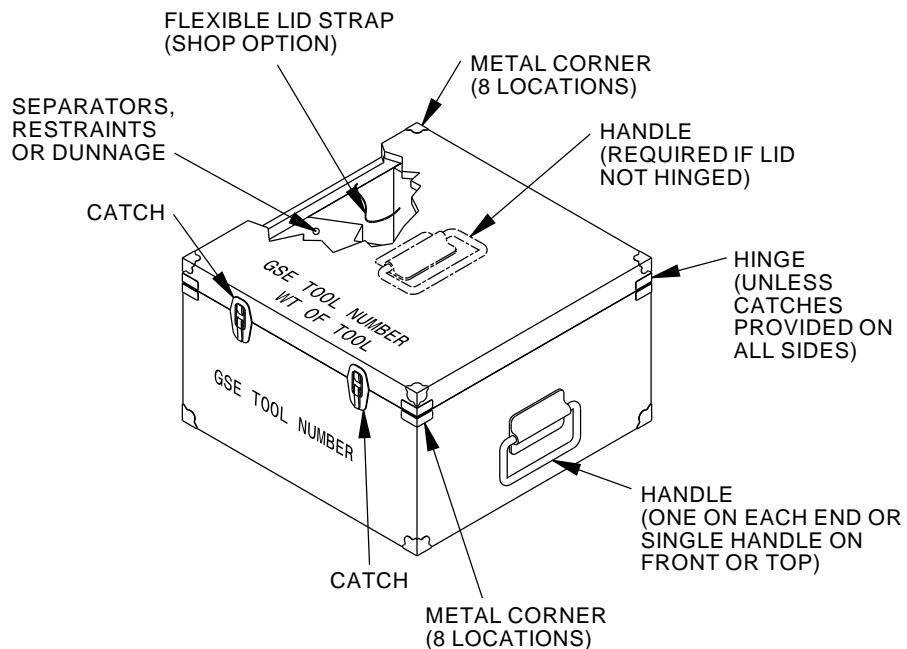
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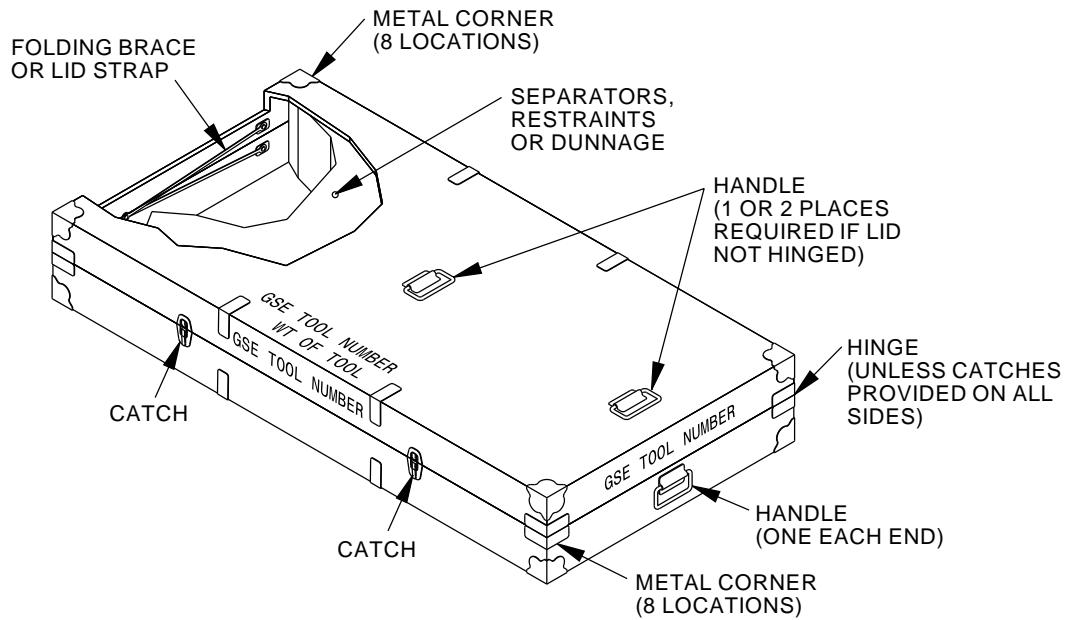
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**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**



**F70313-1**  
**SMALL STORAGE BOX (0-15 POUNDS 0-6.8 KG)**



**F70313-2**  
**MEDIUM STORAGE BOX (0-100 POUNDS 0-45.4 KG)**

2428428 S0000561734\_V1

**Support Equipment Standard Box**  
**Figure 1 (Sheet 1 of 3)**

**20-00-06**

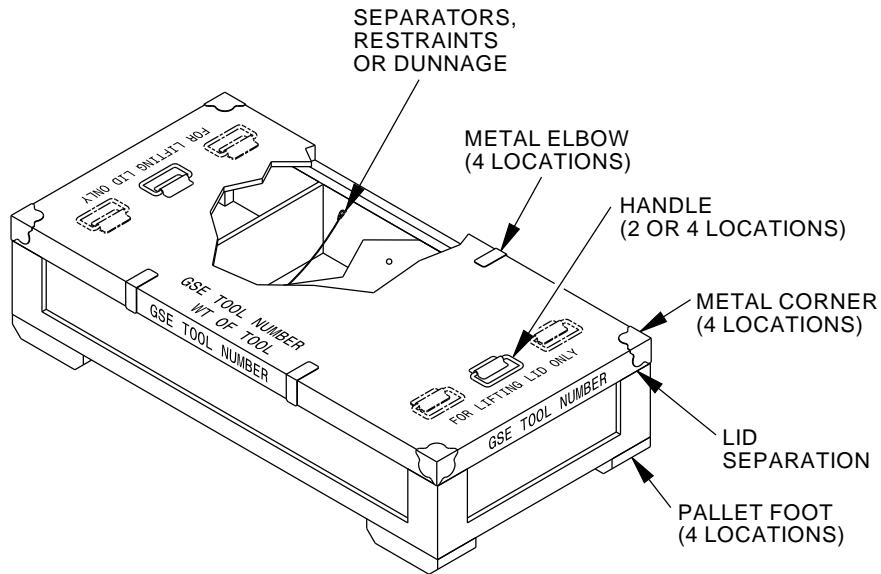
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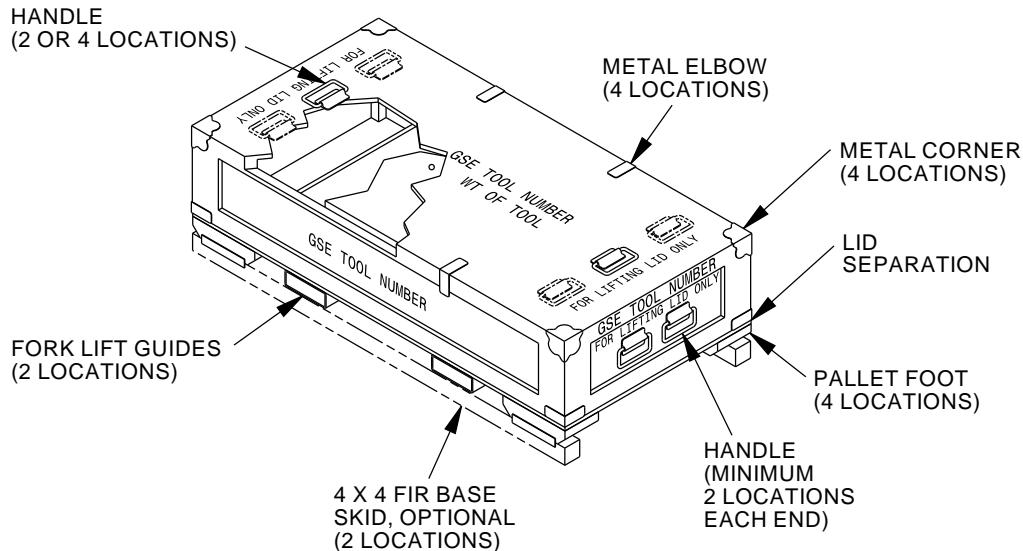
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**737-600/700/800/900**  
**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**



**F70313-3**  
**LARGE STORAGE BOX**  
**(OVER 100 POUNDS, 45.4 KG)**



**F70313-4**  
**LARGE STORAGE BOX WITH FORK LIFT GUIDES (OVER**  
**100 POUNDS, 45.4 KG)**

2428436 S0000561735\_V1

**Support Equipment Standard Box**  
**Figure 1 (Sheet 2 of 3)**

**20-00-06**

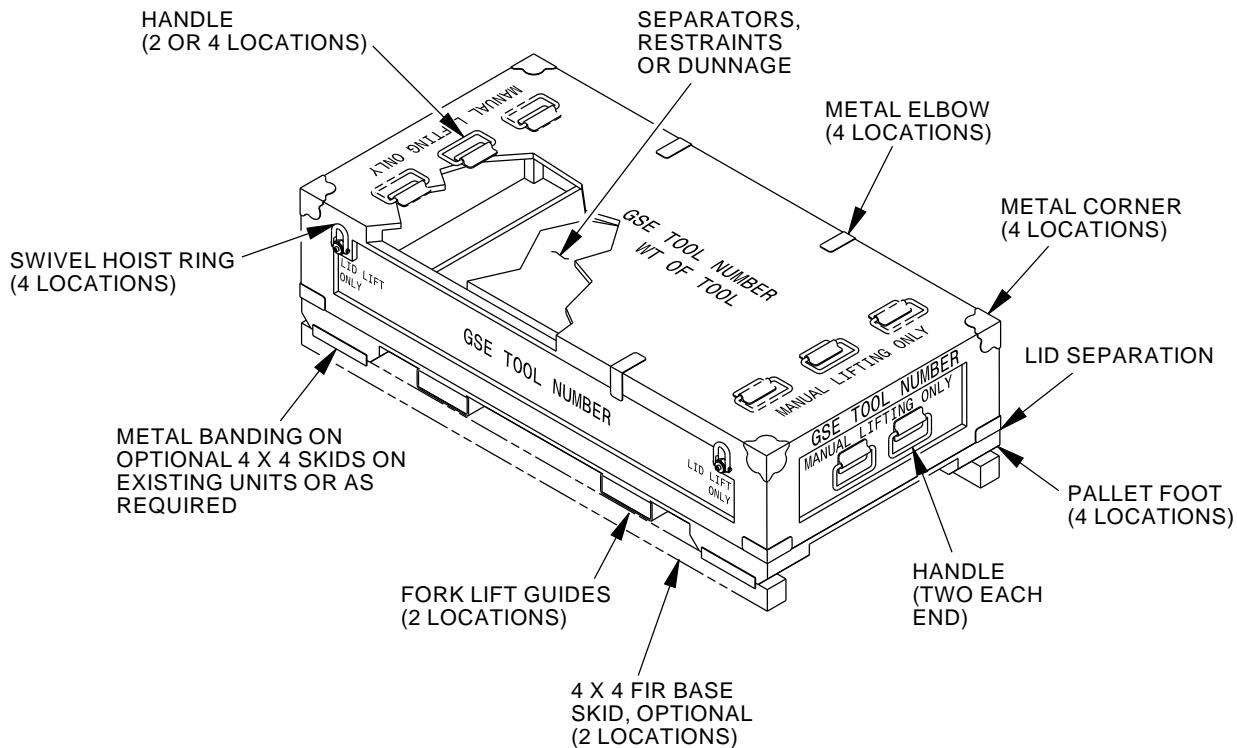
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F70313-6  
LARGE STORAGE BOX WITH HOIST RINGS  
AND FORKLIFT GUIDES

2428439 S0000561736\_V1

Support Equipment Standard Box  
Figure 1 (Sheet 3 of 3)

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737-600/700/800/900  
**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER: A00001**

**NAME:** WELDING SPECIFICATION, GROUND SUPPORT EQUIPMENT

**AIRPLANE MAINTENANCE:** YES

**COMPONENT MAINTENANCE:** YES

**USAGE & DESCRIPTION:** The A00001 welding specification has a limited applicability to only Boeing Commercial Airplane ground support equipment. A00001 is not a tool but an electronic specification document. The A00001 welding specification describes the requirements for fusion welding of steel, corrosion resistant steel and aluminum by shielded arc welding, gas tungsten arc welding, gas metal arc welding, oxyhydrogen welding and oxyacetylene welding.

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ILLUSTRATED TOOL AND EQUIPMENT MANUAL

**PART NUMBER:** B20004-21, -42

**NAME:** LEVERAGE ADAPTER EQUIPMENT - ACCESS PANEL

**AIRPLANE MAINTENANCE:** YES

AMM 55-33-11, AMM 55-33-31 and AMM 57-41-02

**COMPONENT MAINTENANCE:** NO

**USAGE & DESCRIPTION:** The B20004-21 or -42 (preferred) access panel leverage adapter tool is used on all 737 airplanes.

B20004 leverage adapter tool is used to remove damaged or hard-to-loosen access panel screws by maintaining screwdriver alignment at higher than design torque. B20004 is used in conjunction with a customer furnished ratchet wrench. B20004 consists of different sizes of threaded bolts and nuts. The appropriate sizes for use are as required.

Refer to the current B20004 drawing, AMM 55-33-11, AMM 55-33-31 and AMM 57-41-02 for complete usage instructions.

B20004-21 and -42 access panel leverage adapter consists of:

B20004-21		
QUANTITY	NOMENCLATURE	PART NUMBER
1	LEVERAGE ADAPTER	B20004-39
1	BOLT ASSEMBLY	B20004-22
1	BOLT ASSEMBLY	B20004-23
1	BOLT ASSEMBLY	B20004-24
1	BOLT ASSEMBLY	B20004-25
1	NUT	B20004-26
1	NUT	B20004-27
1	NUT	B20004-28
1	NUT	B20004-29
1	STORAGE BOX	

B20004-42		
QUANTITY	NOMENCLATURE	PART NUMBER
1	LEVERAGE ADAPTER	B20004-39
1	BOLT ASSEMBLY	B20004-43
1	BOLT ASSEMBLY	B20004-44
1	BOLT ASSEMBLY	B20004-24
1	BOLT ASSEMBLY	B20004-25
1	NUT	B20004-26
1	NUT	B20004-27
1	NUT	B20004-28

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ILLUSTRATED TOOL AND EQUIPMENT MANUAL

(Continued)

B20004-42		
QUANTITY	NOMENCLATURE	PART NUMBER
1	NUT	B20004-29
1	STORAGE BOX	

**WEIGHT:** B20004-21 or -42 - 8 lbs (3.6 kg)

**DIMENSIONS:** B20004-21 or -42 - 3 x 6 x 10 inches (76 x 152 x 254 mm)

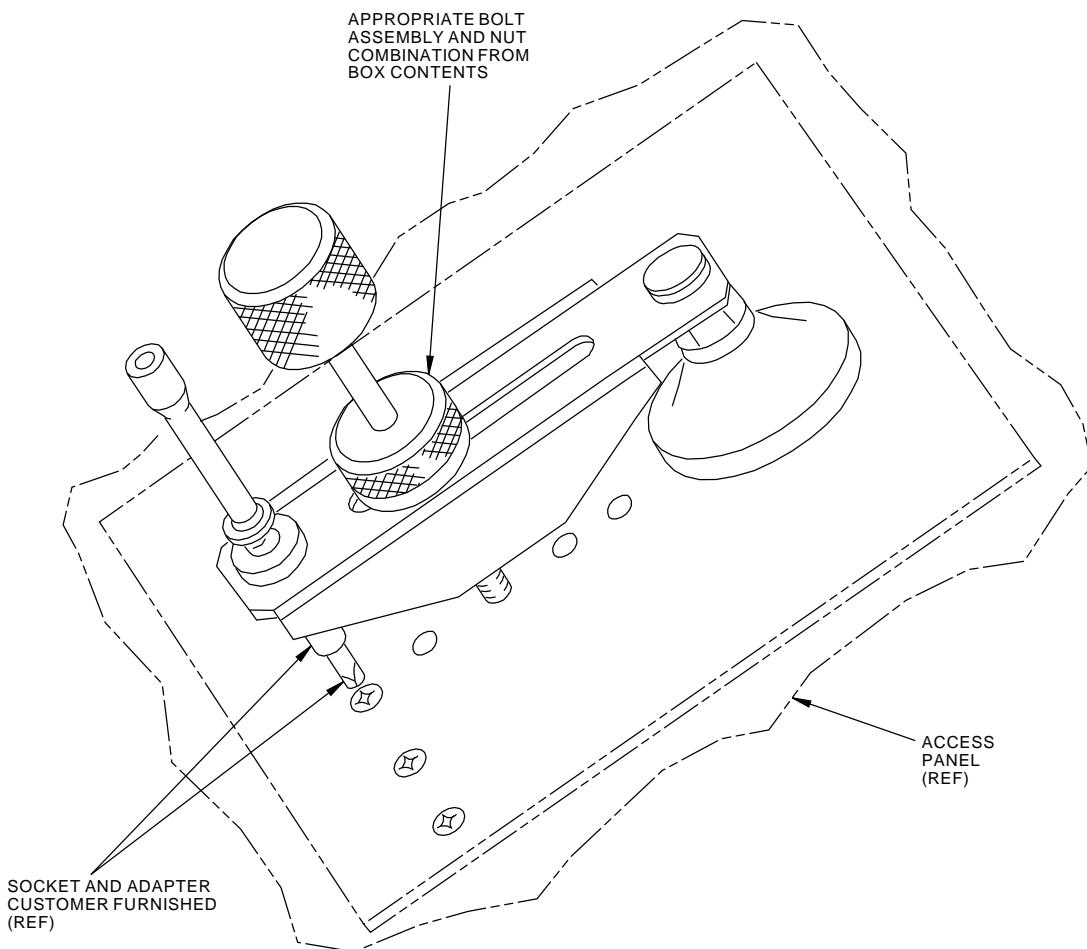
**NOTE:** B20004-21 supersedes B20004-16.

B20004-42 replaces B20004-21 for future procurement.

**20-10-01**



737-600/700/800/900  
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G79544 S0006831391\_V2

Access Panel Leverage Adapter  
Figure 1

**20-10-01**

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737-600/700/800/900  
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: ST732

**NAME:** STANDARD TOOL CUTTER - SCOTCHCAL MARKING MATERIAL

**AIRPLANE MAINTENANCE:** YES

AMM 20-10-11

**COMPONENT MAINTENANCE:** NO

**USAGE & DESCRIPTION:** The ST732-190, -250 and -312 Scotchcal Marking tool standard cutter tool is used on all 737 airplanes.

The ST732-190 is used on #10 size screws.

The ST732-250 on 1/4 inch screws.

The ST732-312 on 5/16 inch screws.

ST732 is used to cut plastic material (Scotchcal Marking) around the head of NAS flat head screws.

Refer to the current ST732 tool drawing and AMM 20-10-11 for complete usage instructions.

**WEIGHT:** 0.5 lbs (0.2 kg)

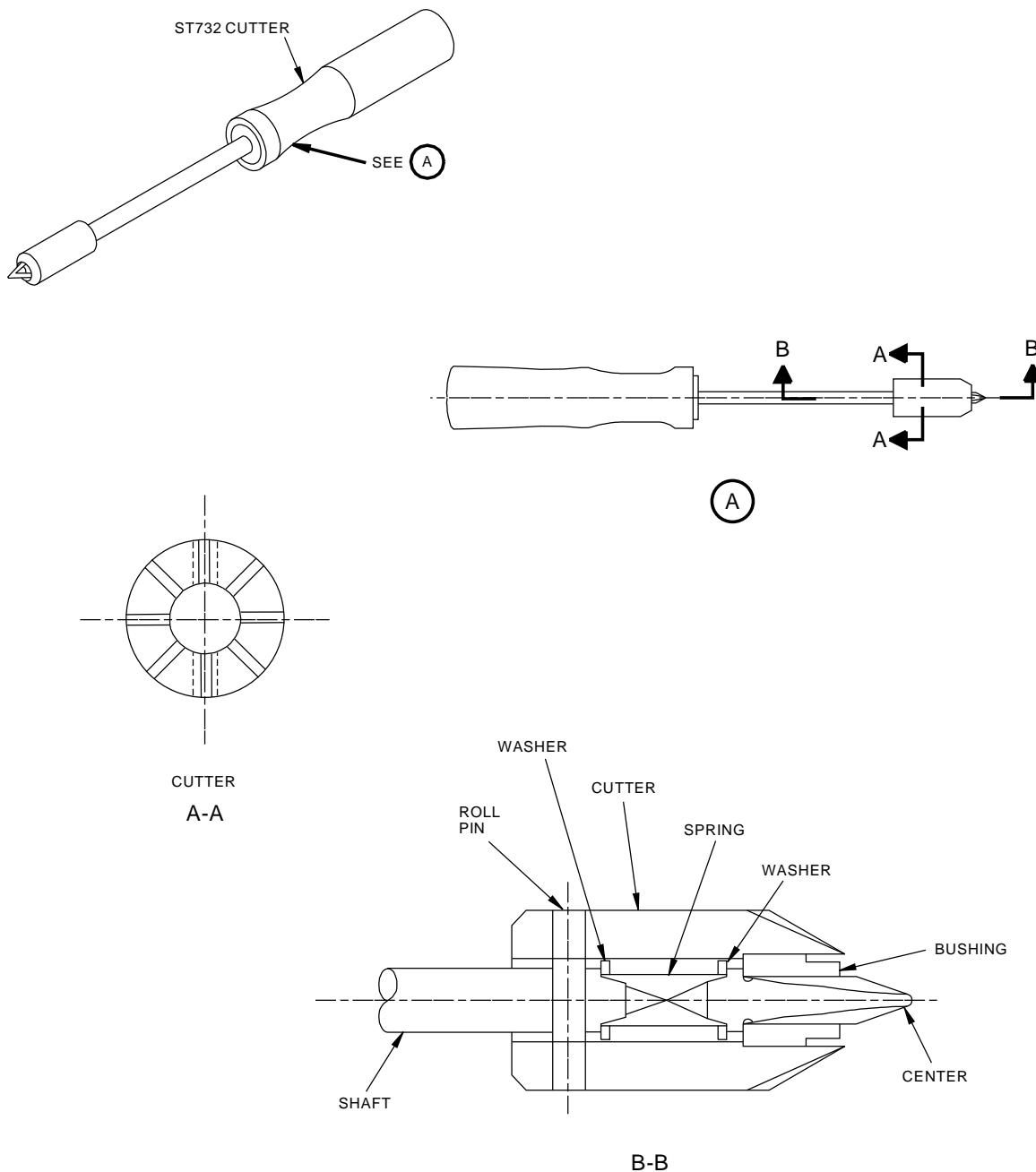
**DIMENSIONS:** 1 x 1 x 10 inches (25 x 25 x 254 mm)

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H36628 S0006831393\_V2

**Scotchcal Marking Material Cutter**  
**Figure 1**

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PART NUMBER: A20005-9

NAME: CLAMP - CONTROL CABLE

AIRPLANE MAINTENANCE: YES

AMM 20-10-09, AMM 20-10-91, AMM 27-31-61, AMM 27-41-81, AMM 27-41-82, AMM 27-61-31, AMM 32-41-21, AMM 32-41-81

COMPONENT MAINTENANCE: NO

USAGE & DESCRIPTION: The A20005-9 clamp is used on all 737 airplanes.

A20005 is used to clamp a cable at any point while installing or rigging cables.

Refer to AMM 20-10-09, AMM 20-10-91, AMM 27-31-61, AMM 27-41-81, AMM 27-41-82, AMM 27-61-31, AMM 32-41-21, AMM 32-41-81 and the current A20005 tool drawing for complete usage instructions.

A20005-9 consists of:

A20005-9		
QUANTITY	NOMENCLATURE	PART NUMBER
1	CLAMP ASSEMBLY	A20005-10
1	STORAGE BOX	

WEIGHT: 1 lb (0.45 kg)

DIMENSIONS: 6 x 4 x 4 inches (152 x 102 x 102 mm)

NOTE: A20005-9 supersedes A20005-5.

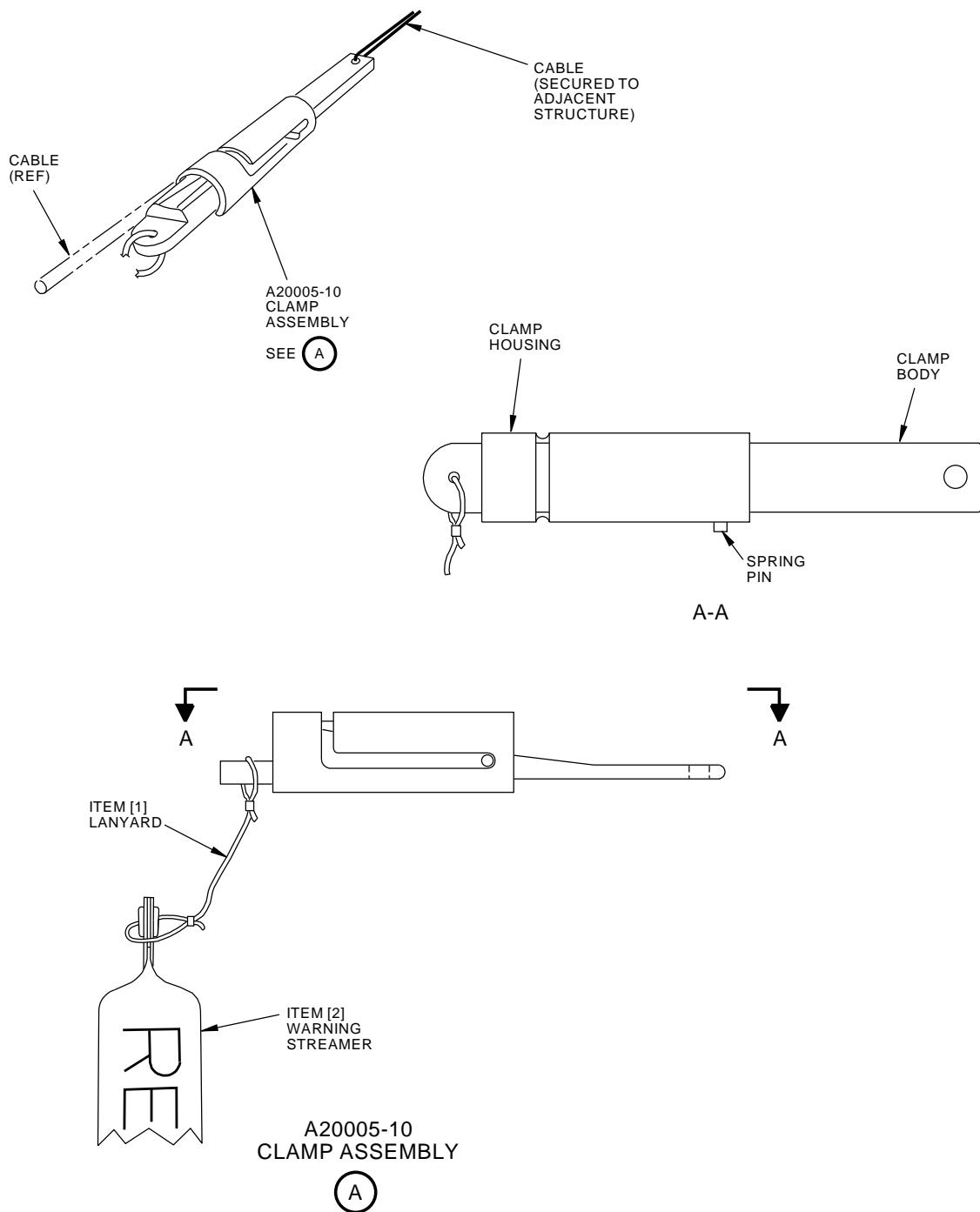
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H41925 S0006831395\_V2

**Control Cable Clamp Assembly**  
**Figure 1**

**20-10-03**

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REPAIRABLE/REPLACEABLE PARTS			
ITEM NO.	PART NO.	NOMENCLATURE	VENDOR CODE
[1]	CL-21-KA-10.0LR	LANYARD	99862
[2]	NAS1756-24	WARNING STREAMER	---

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PART NUMBER: A20006-32

NAME: GROMMET INSTALLATION SET

AIRPLANE MAINTENANCE: YES

AMM 20-10-41

COMPONENT MAINTENANCE: NO

USAGE & DESCRIPTION: The A20006-32 grommet installation set is used on all 737 airplanes.

A20006 is used to install NAS1368 plastic flip grommets. A20006 is functionally equivalent to ST1065C. A20006-32 usage includes:

A20006-32/GROMMET APPLICATIONS			
GROMMET	PUNCH	DIE	SCREW
NAS1368-3	A20006-4	A20006-18	A20006-46
NAS1368-4	A20006-5	A20006-19	A20006-45
NAS1368-6	A20006-6	A20006-20	A20006-47
NAS1368-8	A20006-7	A20006-21	A20006-47
NAS1368-10	A20006-8	A20006-33	A20006-48
NAS1368-12	A20006-9	A20006-34	A20006-48
NAS1368-14	A20006-10	A20006-35	A20006-48
NAS1368-16	A20006-11	A20006-36	A20006-48
NAS1368-18	A20006-12	A20006-37	A20006-48
NAS1368-20	A20006-13	A20006-38	A20006-48
NAS1368-22	A20006-14	A20006-39	A20006-48
NAS1368-24	A20006-15	A20006-40	A20006-48
NAS1368-28	A20006-16	A20006-41	A20006-48
NAS1368-32	A20006-17	A20006-42	A20006-48

Refer to the current A20006 tool drawing and AMM 20-10-41 for complete usage instructions.

A20006-32 consists of:

A20006-32		
QUANTITY	NOMENCLATURE	PART NUMBER
1	PUNCH	A20006-4
1	PUNCH	A20006-5
1	PUNCH	A20006-6
1	PUNCH	A20006-7
1	PUNCH	A20006-8
1	PUNCH	A20006-9
1	PUNCH	A20006-10
1	PUNCH	A20006-11

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A20006-32		
QUANTITY	NOMENCLATURE	PART NUMBER
1	PUNCH	A20006-12
1	PUNCH	A20006-13
1	PUNCH	A20006-14
1	PUNCH	A20006-15
1	PUNCH	A20006-16
1	PUNCH	A20006-17
1	DIE	A20006-18
1	DIE	A20006-19
1	DIE	A20006-20
1	DIE	A20006-21
1	DIE	A20006-33
1	DIE	A20006-34
1	DIE	A20006-35
1	DIE	A20006-36
1	DIE	A20006-37
1	DIE	A20006-38
1	DIE	A20006-39
1	DIE	A20006-40
1	DIE	A20006-41
1	DIE	A20006-42
1	SCREW	A20006-45 (NAS1801-04-24)
1	SCREW	A20006-46 (NAS1801-06-24)
1	SCREW	A20006-47 (NAS1801-4-24)
1	SCREW	A20006-48 (NAS1801-6-24)
1	STORAGE BOX	

**WEIGHT:** 6 lbs (2.7 kg)

**DIMENSIONS:** 12 x 5 x 3 inches (305 x 127 x 77 mm)

**NOTE:** A20006-32 supersedes A20006-1.

A20006 replaces ST1065C for future procurement.

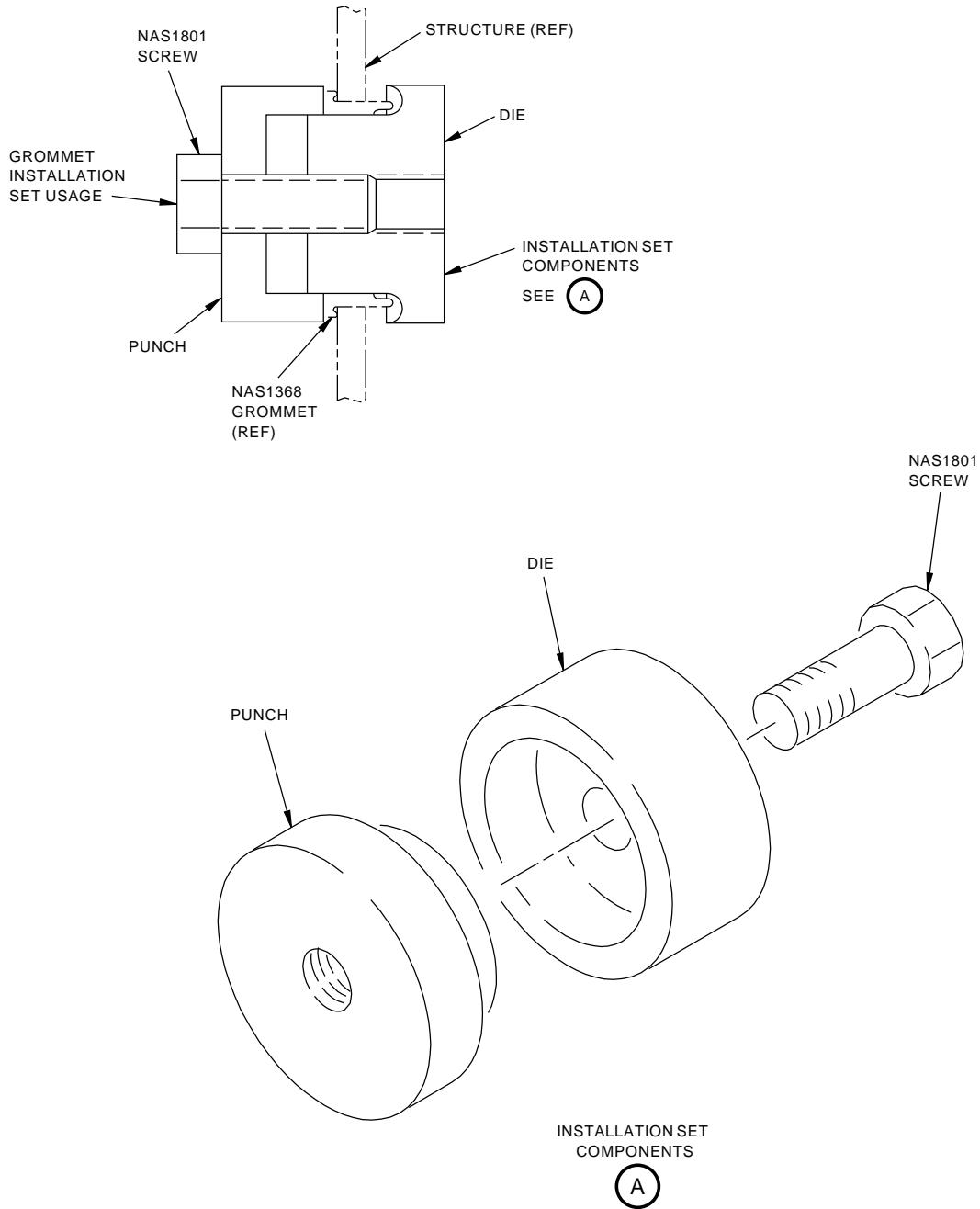
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K36382 S0006831397\_V2

**Grommet Installation Set Usage**  
**Figure 1**

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**PART NUMBER: ST1065C**

**NAME:** STANDARD TOOL - INSTALLATION TOOL, GROMMET, NAS1368

**AIRPLANE MAINTENANCE:** YES

AMM 20-10-41

**COMPONENT MAINTENANCE:** NO

**USAGE & DESCRIPTION:** The ST1065C standard tools are used on all 737 airplanes.

The complete ST1065C-XA-Y part number for ST1065C is coded as:

"ST1065C" is the basic part number.

"XA" is coded where "X" is the nominal grommet size to be installed, in 1/16-inch fractions. "A" (when shown) is coded for a low profile die set.

"Y" is coded as the detail assembly number, where a detail assembly number "-1" is a set of 15 dies that does not include ST1065-8 hex bolt assemblies, only ST1065-2 hex head cap screw. A detail assembly number "-7" is a die set that includes ST1065-8 hex bolt assemblies.

ST1065C-X is used to install NAS1368-X plastic flip grommets. The ST1065C-3 installs grommets for NAS1368-3, ST1065C-4 installs grommets for NAS1368-4, ST1065C-32 installs grommets for NAS1368-32. ST1065C is functionally equivalent to A20006-32.

Each ST1065C-X-1 installation tool assembly consists of a set of 15: hex head cap screws, hex nuts, dies, punches, washers and a hex bolt assemblies.

Each ST1065C-X-7 tool consists of the same as ST1065C-X-1 except there are 15 ST1065-8 hex bolt assemblies included (ST1065C-2 hex head cap screw brazed onto a ST1065C-9 handle).

Refer to AMM 20-10-41 and the current ST1065C drawing for complete usage instructions.

ST1065C consists of:

ST1065C		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	INSTALLATION TOOL ASSEMBLY	ST1065C-3-1 OR -7*[1]
1	INSTALLATION TOOL ASSEMBLY	ST1065C-4-1 OR -7*[1]
1	INSTALLATION TOOL ASSEMBLY	ST1065C-6-1 OR -7*[1]
1	INSTALLATION TOOL ASSEMBLY	ST1065C-6A-1 OR -7*[1]
1	INSTALLATION TOOL ASSEMBLY	ST1065C-8-1 OR -7*[1]
1	INSTALLATION TOOL ASSEMBLY	ST1065C-10-1 OR -7*[1]
1	INSTALLATION TOOL ASSEMBLY	ST1065C-12-1 OR -7*[1]
1	INSTALLATION TOOL ASSEMBLY	ST1065C-14-1 OR -7*[1]
1	INSTALLATION TOOL ASSEMBLY	ST1065C-16-1 OR -7*[1]

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ST1065C		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	INSTALLATION TOOL ASSEMBLY	ST1065C-18-1 OR -7 <sup>*[1]</sup>
1	INSTALLATION TOOL ASSEMBLY	ST1065C-20-1 OR -7 <sup>*[1]</sup>
1	INSTALLATION TOOL ASSEMBLY	ST1065C-22-1 OR -7 <sup>*[1]</sup>
1	INSTALLATION TOOL ASSEMBLY	ST1065C-24-1 OR -7 <sup>*[1]</sup>
1	INSTALLATION TOOL ASSEMBLY	ST1065C-28-1 OR -7 <sup>*[1]</sup>
1	INSTALLATION TOOL ASSEMBLY	ST1065C-32-1 OR -7 <sup>*[1]</sup>
1	HEX BOLT ASSEMBLY	ST1065C-8 <sup>*[1]</sup>
1	HANDLE	ST1065C-9 <sup>*[1]</sup>
1	STORAGE BOX	

\*[1] "-1" INCLUDES ONLY THE ST1065C-2 HEX HEAD CAP SCREW WITHOUT THE S1065C-8 HEX BOLT ASSEMBLY. "-7" INCLUDES THE S1065C-8 HEX BOLT ASSEMBLY (ST1065C-2 HEX HEAD CAP SCREW BRAZED ONTO THE ST1065C-9 HANDLE).

**WEIGHT:** 6 lbs (2.7 kg)

**DIMENSIONS:** 12 x 5 x 3 inches (305 x 127 x 77 mm)

**NOTE:** A20006 replaces ST1065C for future procurement.

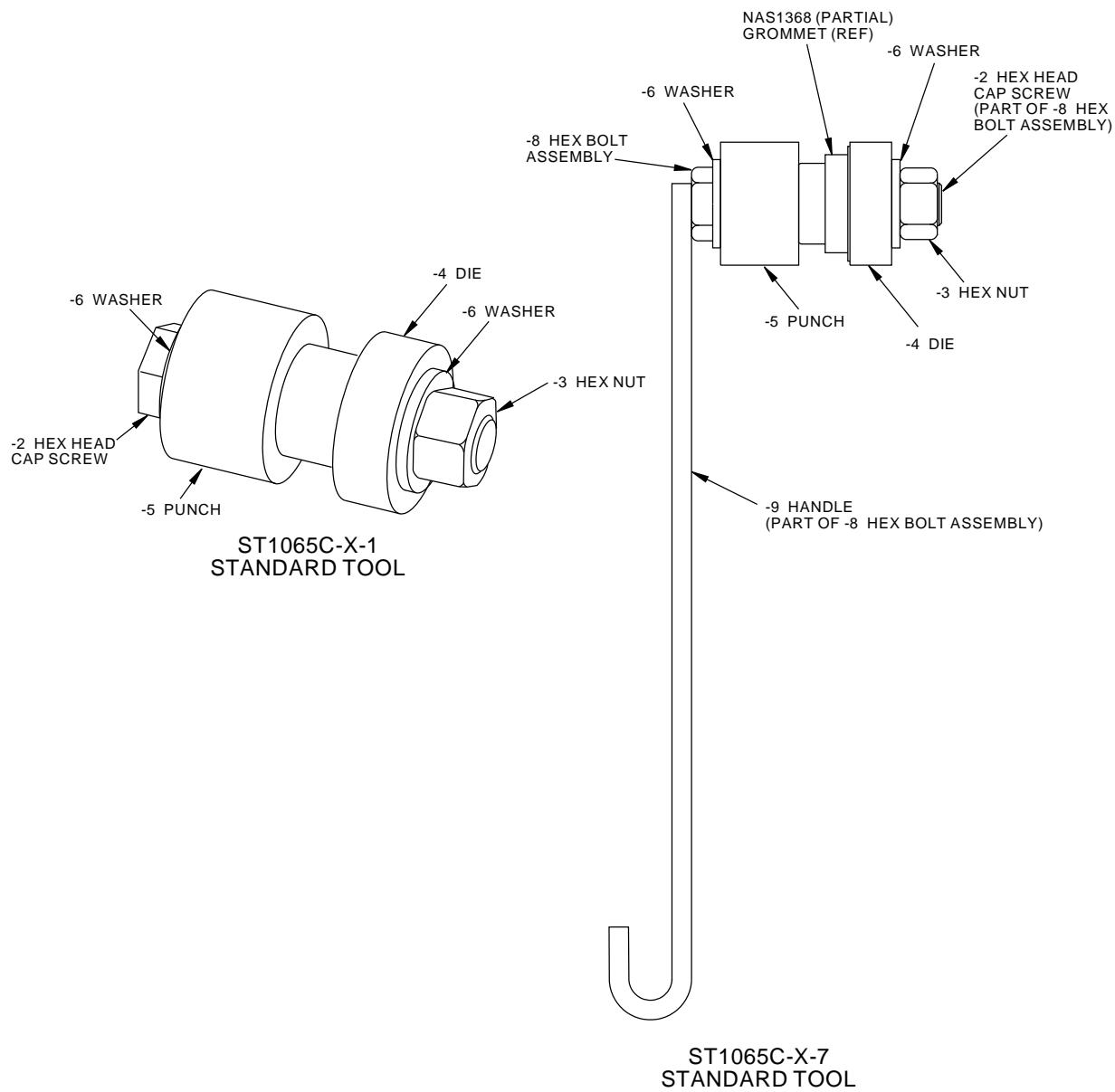
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K36386 S0006831399\_V3

NAS1368 Grommet Installation Tool Standard Tool  
Figure 1

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PART NUMBER: ST879A

NAME: HAND PRESETTING TOOL - FLARELESS TUBE FITTINGS MS21922

AIRPLANE MAINTENANCE: YES

AMM 20-10-51

COMPONENT MAINTENANCE: NO

USAGE & DESCRIPTION: The ST879A hand presetting tool is used on all 737 airplanes.

ST879A is used in combination with a customer-furnished ST879AF holding fixture. ST879A is used to preset a MS21922 flareless sleeve on a tube per BAC5001-4 specification. ST879A is used with the ST879AF holding fixture on a bench.

Tool code for swaging die: ST879A-D-3 "ST879A" - basic tool number "D" - swaging die "3" - nominal tubing diameter in 1/16 of an inch

Tool code for mandrel: ST879A-M-3-020 "ST879A" - basic tool number "M" - mandrel "3" - nominal tubing diameter in 1/16 of an inch "020" - nominal wall thickness in 1/1000 of an inch

Refer to AMM 20-10-51 and the current ST879A tool drawing for complete usage instructions.

The ST879A presetting tool is a basic drawing number. Tool combinations should be made from the ST879A drawing tables to accommodate the variations in tube wall thickness for the mandrel size and tube outside diameter for presetting die size.

WEIGHT: 0.5 lbs (0.2 kg)

DIMENSIONS: 4 x 2 inches (102 x 51 mm)

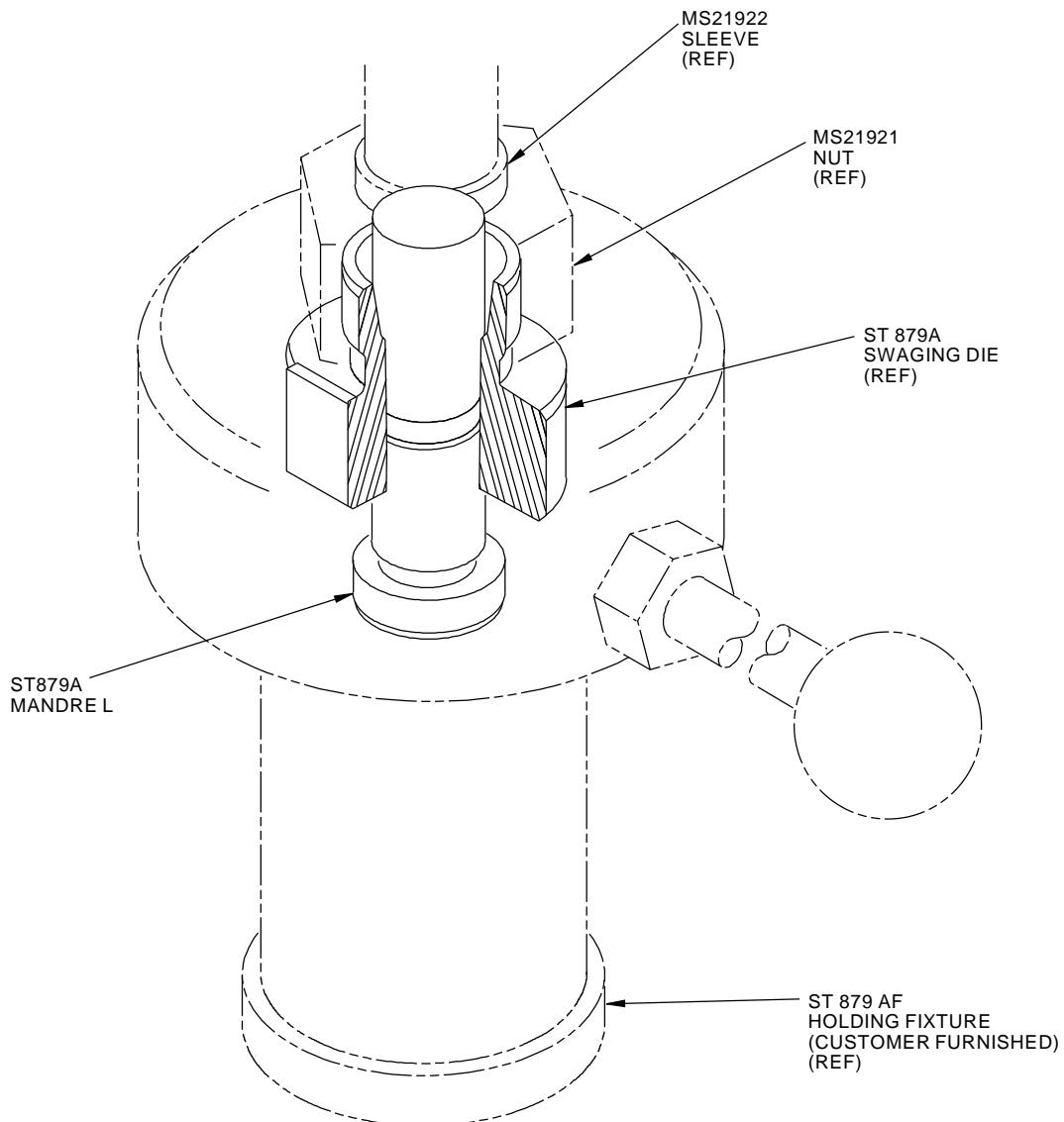
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M27068 S0006831401\_V3

**Flareless Tube Fittings MS21922 Hand Presetting Tool**  
**Figure 1**

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**PART NUMBER:** ST879AF

**NAME:** HOLDING FIXTURE - HAND PRESETTING TOOLS, ST879A

**AIRPLANE MAINTENANCE:** YES

AMM 20-10-51

**COMPONENT MAINTENANCE:** NO

**USAGE & DESCRIPTION:** The ST879AF holding fixture is used on all 737 airplanes.

ST879AF is used to retain the customer-furnished, ST879A mandrel and swaging die. ST879AF is clamped to prevent rotation and permit swaging while turning the MS21922 fitting. ST879AF is mounted on a customer-furnished bench.

Refer to AMM 20-10-51 and the current ST879A tool drawing complete usage instructions.

The ST879AF holding fixture assembly consists of a body, clamp ring, plunger, bottom plate, compression spring, lever, hex nut, socket head cap screw and a gear shift knob.

**WEIGHT:** 1 lb (0.45 kg)

**DIMENSIONS:** 4 x 2 inches (102 x 51 mm)

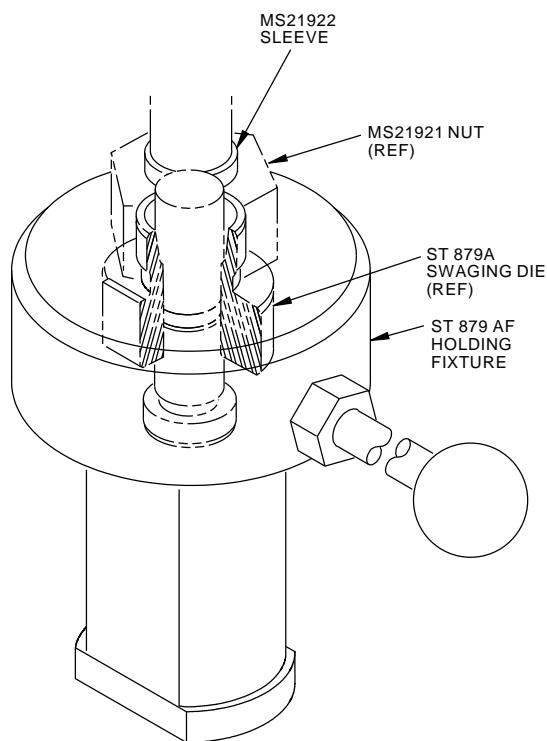
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M27062 S0006831403\_V3

**ST879A Hand Presetting Tools Holding Fixture**  
**Figure 1**

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**PART NUMBER: A20001-82, -152**

**NAME:** BOOM HOIST EQUIPMENT - GENERAL (400 POUND CAPACITY) (CE)

**AIRPLANE MAINTENANCE:** YES

AMM 78-31-02

**COMPONENT MAINTENANCE:** NO

**USAGE & DESCRIPTION:** The A20001-82 (option, non-CE qualified) or A20001-152 (preferred, CE qualified) boom hoist equipment is used on all 737-600 thru -900 airplanes.

A20001 is used in conjunction with a customer furnished C78022 CFM56 thrust reverser sling to remove or install the thrust reverser translating sleeve. The maximum load limit of A20001 is 400 pounds (181 kg).

Refer to AMM 78-31-02 and the current A20001 drawing for complete usage instructions.

The A20001-82 and -152 boom hoist are upright stands with a welded frame and base. They include casters and a towbar attachment assembly for mobility. The boom hoists have hydraulic components which control the 180-degree radius of operation of the boom assembly.

**WEIGHT:** 420 lbs (191 kg)

**DIMENSIONS:** 46 x 92 x 113 inches (1168 x 2337 x 2870 mm)

**NOTE:** A20001-152 replaces A20001-82 for future procurement.  
A20001-82 supersedes A20001-79.

**DECLARATION OF CONFORMITY:** A20001-152 requires a written Declaration of Conformity from the A20001-152 fabricator if it is to be used in the European Union. The design of A20001-152 meets the European requirements of Machinery Directive 2006/42/EC including its amendments. When used within the European Union, the fabricator of A20001-152 must also meet the requirements of that directive. At a minimum for the tool fabricator, this requires the retention of a technical file, a labeling of the equipment with the CE mark, and the completion of an EC Declaration of Conformity. If A20001-152 is to be used within the European Union and the Declaration of Conformity is missing, contact the fabricator of A20001-152 for a replacement Declaration of Conformity.

**OPERATING INSTRUCTIONS:** Refer to AMM 78-31-02 and the current A20001-152 drawing for instructions on the use of this equipment. A20001-152 shall only be used in conjunction with Boeing maintenance procedures to maintain Boeing airplanes.

Jacking Equipment:

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1. The following safety messages shall be included in the information for use and follow the form as denoted on the engineering drawing (they should mimic decals on the drawing or notes on the usage placard):
  - Study, understand, and follow all instructions before operating this device. This includes instructions furnished by the vendors for subcomponents of this equipment.
  - Do not exceed rated capacity.
  - Use only on hard level surfaces.
  - Failure to heed these markings may result in personal injury and/or property damage.

**MAINTENANCE:** General Cleaning: Basic care of the equipment includes cleaning the equipment of dirt, corrosives, or contaminants. Wipe off all surface dirt with a sponge dampened in plain water. Squeeze the sponge dry. Dip the sponge in a mild solution of water and commercial soap or detergent, clean the components and wipe dry with a clean cloth. Hang the components freely to dry, but away from excessive heat or steam.

Structural and Mechanical Lifting Devices, (supporting lifters):

1. Maintenance shall be done based on the recommendations made by the lifter manufacturer or qualified person.
2. Before adjustments and repairs are started on a lifter, the following precautions shall be taken:
  - All courses of power shall be disconnected, locked out, and tagged "Out of Service".
  - A lifter removed from service for repair shall be tagged "Out of Service".
3. Only a qualified person shall perform adjustments and tests when required.
4. Replacement parts shall be at least equal to the original manufacturer's specifications.
5. After adjustments and repairs have been made, the lifter shall not be returned to service until it has been inspected according to ASME B-30.20, para. 20-1.3.4.
6. Dated records of repairs and replacements shall be made.
7. Adjustments and repairs. Any hazardous conditions disclosed by the inspection requirements of ASME B-30.20, para. 20-1.3.1 shall be corrected before normal operations of the lifter is resumed. Adjustments and repairs shall be done under the direction of , or by a qualified person.

Caster and Brakes: Lubricate all casters as recommended by the manufacturer. Normal conditions may warrant lubrication every six months, but monthly lubrication may be necessary for applications in wet or corrosive environments.

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**PROOF LOAD:** Proof load testing for the A20001-152 lift fixture shall be performed per the current A20001-152 drawing proof load diagrams (example Reference Not Currently Available) and:

- in conjunction with initial fabrication
- subsequent to modification of this equipment (equipment shall only be modified in accordance with the A20001-152 drawing)
- after repair of load carrying components
- after replacement of load carrying components.
- Continuing integrity/safety of the device to be assured by inspection.
- Continuing integrity/safety of the device to be assured by inspection.

**INSPECTION:** FREQUENT

General inspection:

1. Missing fasteners.
2. Notes, Cautions and Warnings are legible
3. Usage placards are legible

Structural and Mechanical Lifting Devices (supporting lifter):

1. Visual Inspection by the operator before and during each lift of the device. Records are not required. Inspect for:
  - Structural deformation, cracks or excessive wear of any parts of the lifting device.
  - Loose or missing guards, fasteners, covers, stops or nameplates.
  - All functional operational mechanisms and automatic hold and release mechanisms for misadjustments interfering with operation.

Casters and Brakes:

1. Inspect the swivel assembly to see if excessive play exists due to wear. If swivel assembly is loose, it must be replaced.
2. If the caster has a king bolt and nut, ensure that it is securely fastened.
3. If the swivel does not turn freely, check for corrosion or dirt binding the raceways. It may be necessary to replace the swivel assembly or the entire caster.
4. For rigid casters, ensure the horns are not bent or distorted.
5. Check caster brakes for proper function before each use. Apply brakes one-at-a-time and ensure the brakes are not slipping or loose.
6. If brakes are slipping or loose due to damage or wear, replace the brakes and/or casters immediately and retest the brakes.

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PERIODIC

Welding Inspection:

1. Magnetic particle or dye penetrant inspection for all welds, after all proof load tests.
2. Inspect and evaluate per Welding Document A00001 Inspection Requirements Tables 1 & 2, and Acceptance Criteria Table 3.
3. Reject cracked or deformed parts

Structural and Mechanical Lifting Devices (supporting lifter):

1. A written record of a visual inspection, by a qualified person is required.
2. Inspection is made of external conditions for a continuing evaluation of the following factors:
  - Loose bolts or fasteners.
  - Excessive wear of linkages and other mechanical parts.
  - Excessive wear at hoist hooking points and load support clevises or pins.
  - Deficiencies found during the inspection are analyzed and the lifting device shall not be used, if deficiencies are determined to be hazardous.
  - The lifting device shall not be used until the hazardous deficiencies are corrected.

Casters and Brakes: Inspect king bolt, axle, swivel locks, brakes and wheel.

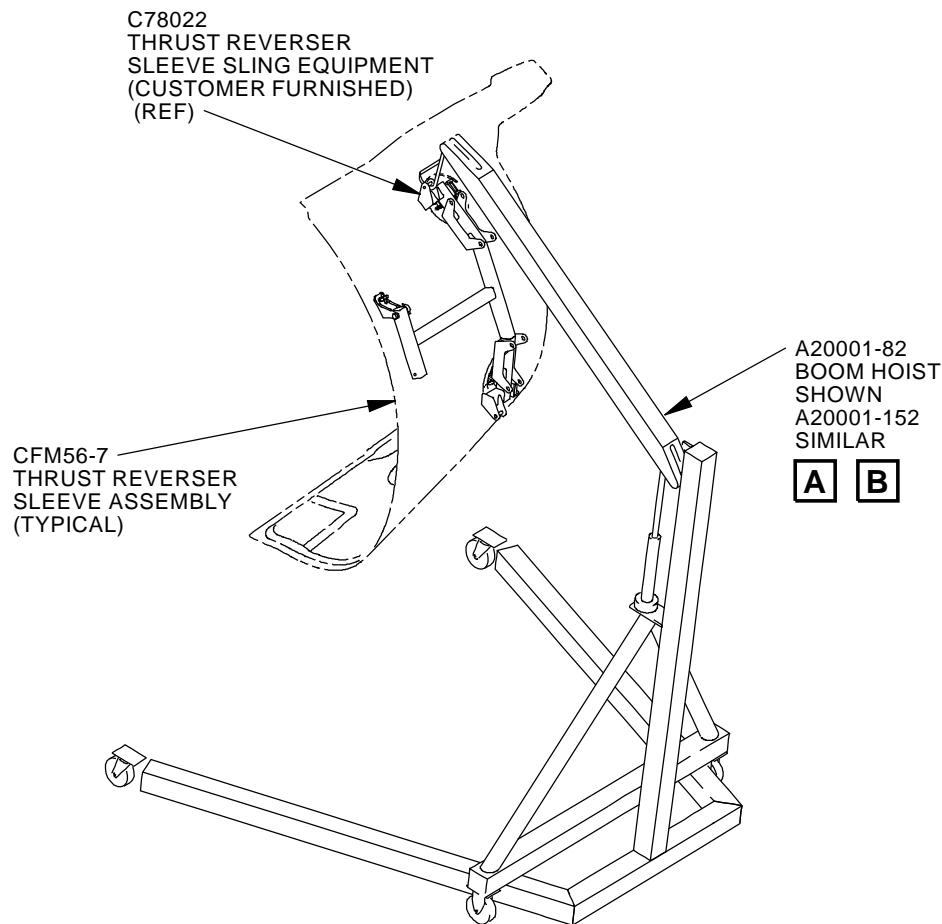
**STORAGE:** A20001-152 shall be stored clean, dry, free of exposure to fumes or corrosive elements and indoors.

**DECOMMISSIONING:** Parts and assemblies of A20001-152 shall be permanently altered to prevent their unauthorized reuse. Recycling is the preferred manner of disposal for those materials where that option is available.

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D37962 S0006831405\_V5

General (400 Pound Capacity) Boom Hoist Equipment  
Figure 1 (Sheet 1 of 3)

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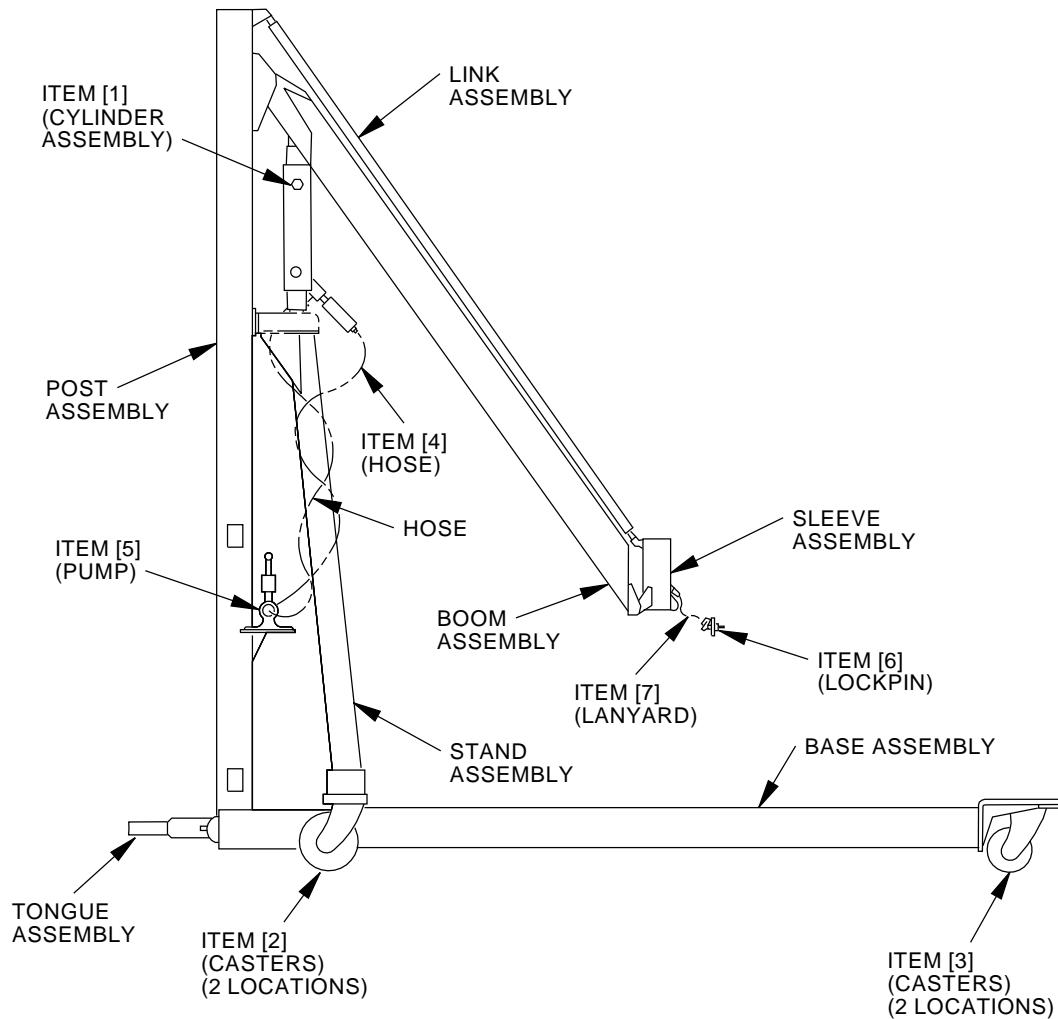
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A20001-82  
BOOM HOIST SHOWN

A

1564596 S0000290006\_V3

General (400 Pound Capacity) Boom Hoist Equipment  
Figure 1 (Sheet 2 of 3)

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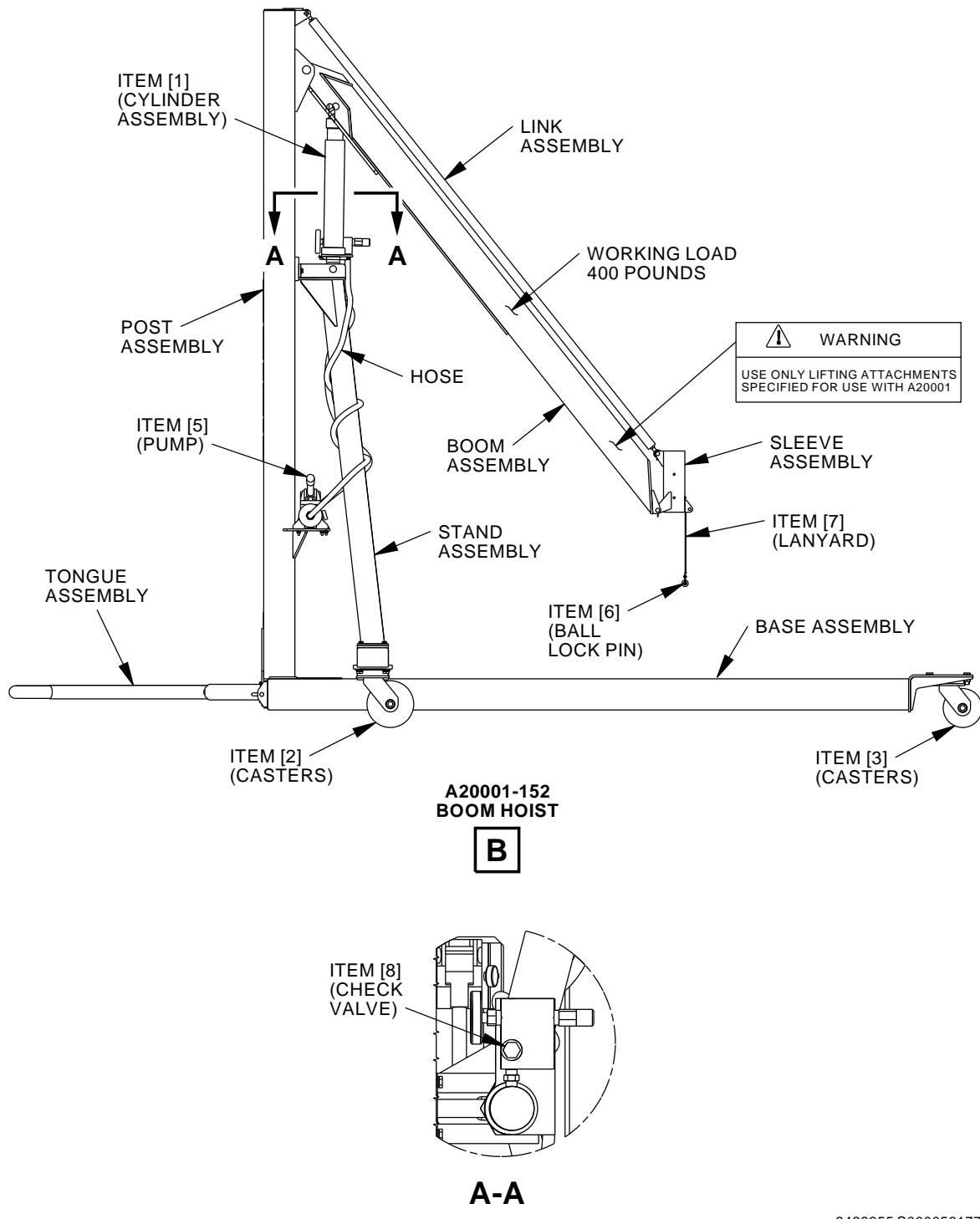
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2428355 S0000561775\_V1

General (400 Pound Capacity) Boom Hoist Equipment  
Figure 1 (Sheet 3 of 3)

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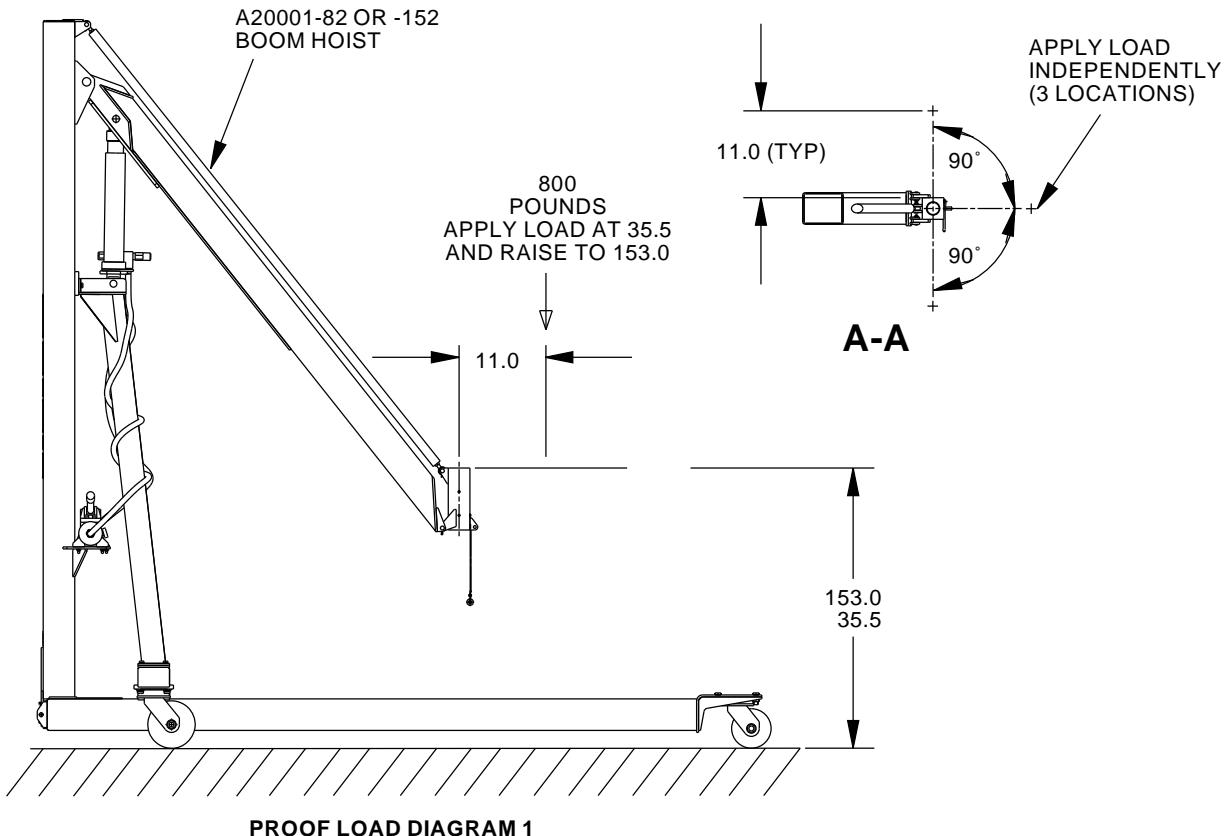
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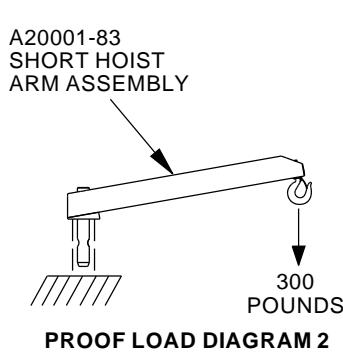
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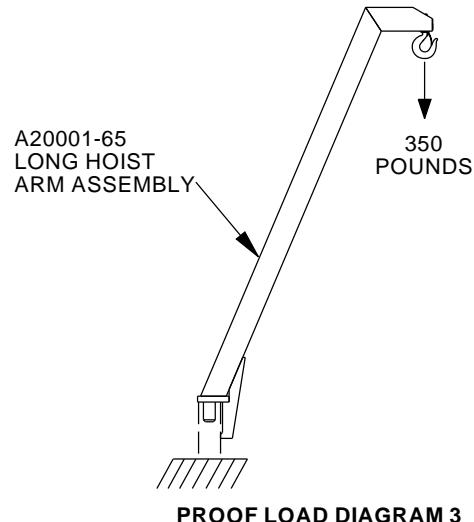
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PROOF LOAD DIAGRAM 1



PROOF LOAD DIAGRAM 2



PROOF LOAD DIAGRAM 3

2428446 S0000561776\_V1

A20001-152 Proof Load Diagrams (Example)  
Figure 2

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REPAIRABLE/REPLACEABLE PARTS			
ITEM NUMBER	PART NUMBER	NOMENCLATURE	VENDOR CODE
[1]	A20001-86	CYLINDER ASSEMBLY	---
[2]	A20001-11	CASTERS	96266
[3]	A20001-12	CASTERS	96266
[4]	A20001-172 (H-9206)	HOSE	26952
[5]	A20001-131 (P-392)	HYDRAULIC HAND PUMP	26952
[6]	A20001-141 (NAS1334C3C28D)	BALL LOCK PIN	---
[7]	A20001-142 (CL-63-KA-10.0)	CABLE ASSEMBLY	96266
[8]	A20001-133	CHECK VALVE	---

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**PART NUMBER: A20011-64, -76, -141**

**NAME:** BUSHING REMOVAL/INSTALLATION KIT - LANDING GEAR

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The A20011-64 (option) or A20011-76 (preferred) bushing removal/installation kit is used during component maintenance on all 767 airplanes. The A20011-141 bushing removal/installation kit is used during component maintenance on all 737 airplanes except 737-100 thru -500 airplanes.

A20011 is used to remove and install bushings in the main landing gear. The part number of the bushing must be known before the correct tools can be identified. A20011 is used to remove bearing part numbers: BACB28AU07, BACB28AU08, 161A1133-1, 161A1133-2, 161A1133-3, 161A1204-1, 161A1204-3, 161A1204-5, 161A1211-1, 161A1211-2, 161A2109-10, 161A2109-11, 161A4103-1, 161T1210-19, 161T1210-20, 161T1210-56, 161T2043-1, 161T2043-2, 161T2043-3, 161T2043-4, 161T2043-5, 161T2043-6, 161T2043-7, 161U0070-1, 161U2612-1, 161W1128-1, 161W2128-1, 161W3030-2, 161W3033-1, 161W3128-7, 161W3128-8, 161W3228-15, 161W3228-5, 161W4035-2, 162T3032-1, 162W2035-4, 162W2035-7, 162W2035-8 and 65-46150-25.

A20011 is used to stake bearing part numbers: BACB28AU07 and BACB28AU08.

A20011 is used to swage bearing part numbers: 161A1133-1, 161A1133-2, 161A1133-3, 161A1204-1, 161A1204-3, 161A1204-5, 161A1211-1, 161A1211-2, 161A2109-10, 161A2109-11, 161A4103-1, 161T1210-19, 161T1210-20, 161T1210-56, 161T2043-1, 161T2043-2, 161T2043-3, 161T2043-4, 161T2043-5, 161T2043-6, 161T2043-7, 161U0070-1, 161U2612-1, 161W1128-1, 161W2128-1, 161W3030-2, 161W3033-1, 161W3128-7, 161W3128-8, 161W3228-15, 161W3228-5, 161W4035-2, 162T3032-1, 162W2035-4, 162W2035-7, 162W2035-8 and 65-46150-25.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current A20011 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

A20011-76 and -141 consist of:

A20011-76		
QUANTITY	NOMENCLATURE	PART NUMBER
1	CUTTER ASSEMBLY	A20011-2
1	CUTTER ASSEMBLY	A20011-3

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A20011-76		
QUANTITY	NOMENCLATURE	PART NUMBER
1	CUTTER ASSEMBLY	A20011-4
1	REMOVAL MANDREL	A20011-9
1	REMOVAL MANDREL	A20011-10
1	REMOVAL MANDREL	A20011-11
1	CUTTER ASSEMBLY	A20011-23
1	CUTTER ASSEMBLY	A20011-24
1	CUTTER ASSEMBLY	A20011-25
1	CUTTER ASSEMBLY	A20011-26
1	CUTTER ASSEMBLY	A20011-27
1	CUTTER ASSEMBLY	A20011-28
1	SWAGE CONE	A20011-30
1	SWAGE CONE	A20011-31
1	SWAGE CONE	A20011-32
1	SWAGE CONE	A20011-33
1	SWAGE CONE	A20011-34
1	SWAGE CONE	A20011-35
1	REMOVAL MANDREL	A20011-36
1	REMOVAL MANDREL	A20011-37
1	REMOVAL MANDREL	A20011-38
1	REMOVAL MANDREL	A20011-39
1	WASHER	A20011-66
1	SWAGE CONE	A20011-67
1	BOLT	A20011-68
1	NUT	A20011-69
1	WASHER	A20011-70
1	BOLT	A20011-71
1	BOLT	A20011-72
1	BOLT	A20011-73
1	BOLT	A20011-74
1	NUT	A20011-75
1	CUTTER ASSEMBLY	A20011-77
1	REMOVAL MANDREL	A20011-80
1	STORAGE BOX	

A20011-141		
QUANTITY	NOMENCLATURE	PART NUMBER
1	CUTTER ASSEMBLY	A20011-23

**20-50-01**

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ILLUSTRATED TOOL AND EQUIPMENT MANUAL

(Continued)

A20011-141		
QUANTITY	NOMENCLATURE	PART NUMBER
1	REMOVAL MANDREL	A20011-36
1	WASHER	A20011-66
1	BOLT	A20011-68
1	NUT	A20011-69
1	WASHER	A20011-70
1	BOLT	A20011-71
1	BOLT	A20011-72
1	BOLT	A20011-73
1	BOLT	A20011-74
1	NUT	A20011-75
1	CUTTER ASSEMBLY	A20011-95
1	CUTTER ASSEMBLY	A20011-96
1	CUTTER ASSEMBLY	A20011-97
1	CUTTER ASSEMBLY	A20011-98
2	SWAGE CONE	A20011-99
2	SWAGE CONE	A20011-101
2	SWAGE CONE	A20011-102
1	BOLT	A20011-105
1	REMOVAL MANDREL	A20011-107
1	REMOVAL MANDREL	A20011-108
1	REMOVAL MANDREL	A20011-109
1	REMOVAL MANDREL	A20011-110
1	REMOVAL MANDREL	A20011-111
1	REMOVAL MANDREL	A20011-112
1	REMOVAL MANDREL	A20011-113
1	REMOVAL MANDREL	A20011-114
1	CUTTER ASSEMBLY	A20011-124
1	BOLT	A20011-125
1	CUTTER ASSEMBLY	A20011-126
1	CUTTER ASSEMBLY	A20011-127
1	SWAGE CONE	A20011-132
1	SWAGE CONE	A20011-133
2	SWAGE CONE	A20011-134
1	CUTTER ASSEMBLY	A20011-139
1	SWAGE CONE	A20011-140
1	CUTTER ASSEMBLY	A20011-142
1	REMOVAL ASSEMBLY	A20011-143

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ILLUSTRATED TOOL AND EQUIPMENT MANUAL

(Continued)

A20011-141		
QUANTITY	NOMENCLATURE	PART NUMBER
1	STORAGE BOX	

**WEIGHT:** 26 lbs (12 kg)

**DIMENSIONS:** 6 x 12 x 21 inches (152 x 305 x 533 mm)

**NOTE:** A20011-76 replaces A20011-64 for future procurement.

A20011-64 supersedes A20011-22 and A20011-1

A20011-141 supersedes A20011-103.

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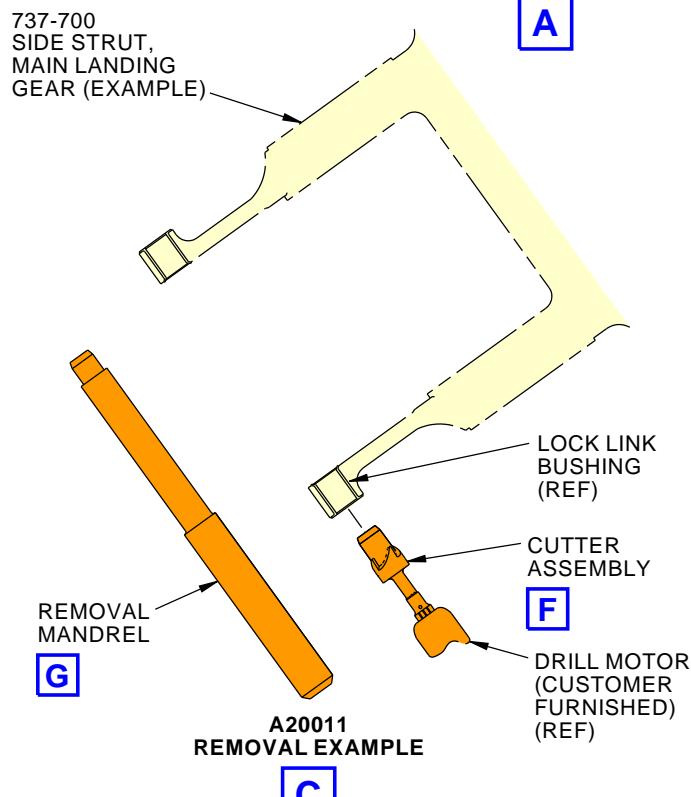
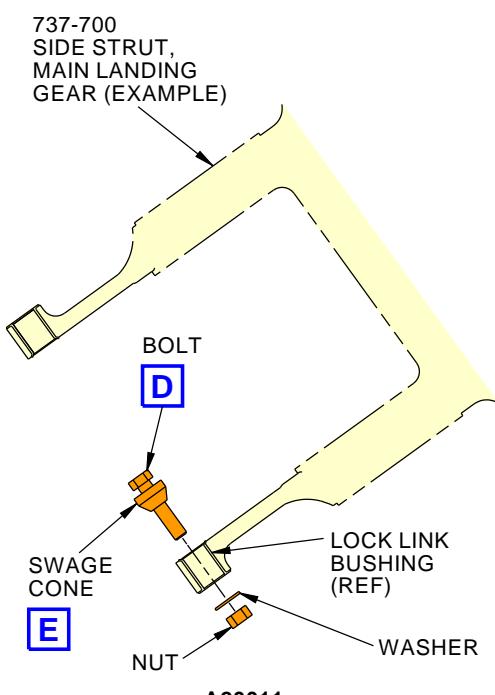
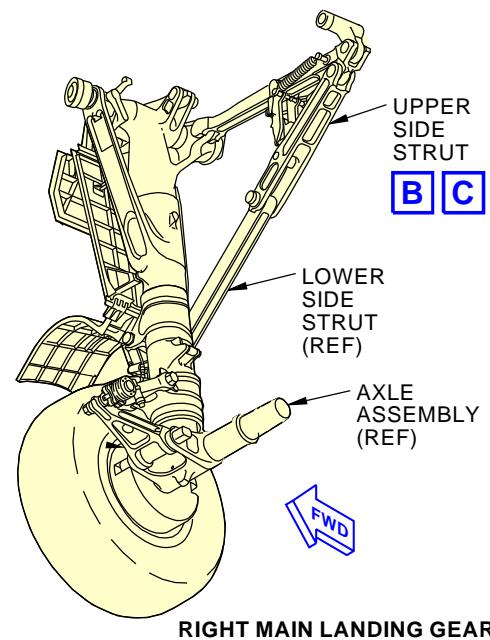
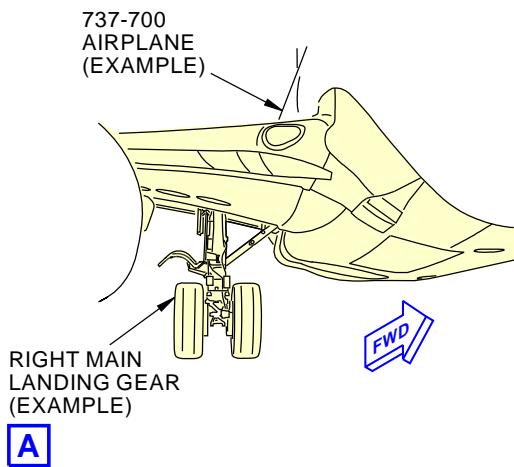
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2265190 S0000508260\_V1

Main Landing Gear Bushing Removal and Installation Kit  
Figure 1 (Sheet 1 of 2)

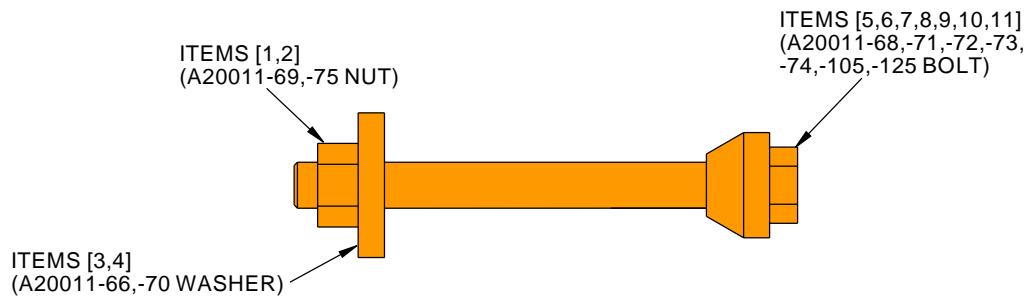
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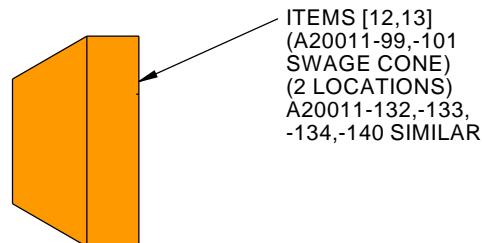
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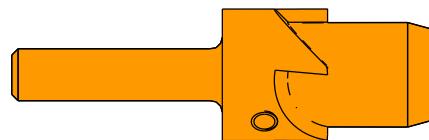
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**D**

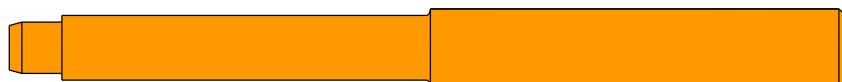


**E**



A20011-23  
CUTTER ASSEMBLY  
A20011-95,-96,-97,-98,-124,-126,-127,-139,-142SIMILAR

**F**



A20011-36,-38  
REMOVAL MANDREL  
A20011-107,-108,-109,-110,-111,-112,-113,-114,-143SIMILAR

**G**

2265192 S0000508261\_V1

**Main Landing Gear Bushing Removal and Installation Kit**  
**Figure 1 (Sheet 2 of 2)**

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REPAIRABLE/REPLACEABLE PARTS			
ITEM NUMBER	PART NUMBER	NOMENCLATURE	VENDOR CODE
[1]	A20011-69	NUT	
[2]	A20011-75	NUT	
[3]	A20011-66	WASHER	
[4]	A20011-70	WASHER	
[5]	A20011-68	BOLT	
[6]	A20011-71	BOLT	
[7]	A20011-72	BOLT	
[8]	A20011-73	BOLT	
[9]	A20011-74	BOLT	
[10]	A20011-105	BOLT	
[11]	A20011-125	BOLT	
[12]	A20011-99	SWAGE CONE	
[13]	A20011-101	SWAGE CONE	

**20-50-01**



737-600/700/800/900  
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: A20012-10, -11

NAME: SWAGING TOOL - BEARING

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: YES

CMM 78-31-15

OTHER MANUALS: YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The A20012-10 or -11 swaging tool is used during component maintenance on 767 airplanes equipped with 315T1511-2 or 315T3511-4 thrust reverser drag links.

The A20012-11 swaging tool is used during component maintenance on 747 airplanes equipped 315T3511-4 thrust reverser drag links.

A20012-10 is used to roller swage the S302T001-305 bearing onto the 315T1511-2 drag link to make 315T3511-1 drag link assembly.

A20012-11 is used on thrust reverser sleeve assemblies to roller swage the S302T001-302 bearing onto the 315T3511-4 drag link, making the 315T3511-3 drag link assembly.

A20012 is used to remove and install bushings in the main landing gear. The part number of the bearing must be known before the correct tools can be identified. A20012 is used on bearing part numbers: S302T001-302 and S302T001-305.

Refer to CMM 78-31-15, Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current A20012 drawing for complete usage instructions.

The A20012-10 and -11 swaging tools consist of:

A20012-10		
QUANTITY	NOMENCLATURE	PART NUMBER
1	BASE PLATE ASSEMBLY	A20012-5
1	LOWER ANVIL ASSEMBLY	A20012-12
1	UPPER ANVIL	A20012-14
1	STORAGE BOX	

A20012-11		
QUANTITY	NOMENCLATURE	PART NUMBER
1	BASE PLATE ASSEMBLY	A20012-5
1	LOWER ANVIL ASSEMBLY	A20012-13
1	UPPER ANVIL	A20012-15
1	STORAGE BOX	

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**737-600/700/800/900**  
**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**WEIGHT:** 2 lbs (0.9 kg)

**DIMENSIONS:** 3 x 3 x 3 inches (76 x 76 x 76 mm)

**NOTE:** A20012-10 supersedes A20012-1

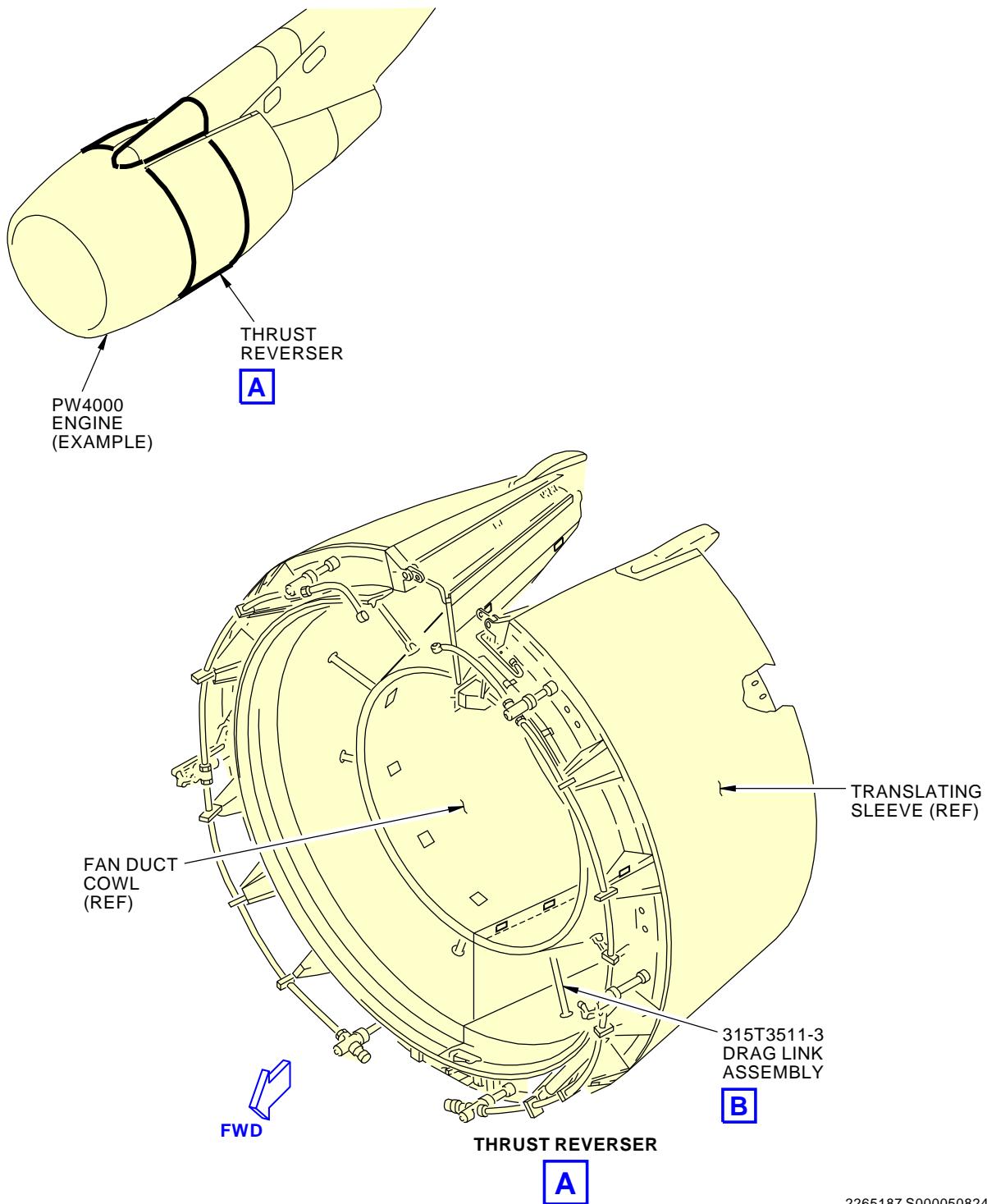
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2265187 S0000508248\_V1

Bearing Swaging Tool  
Figure 1 (Sheet 1 of 2)

**20-50-02**

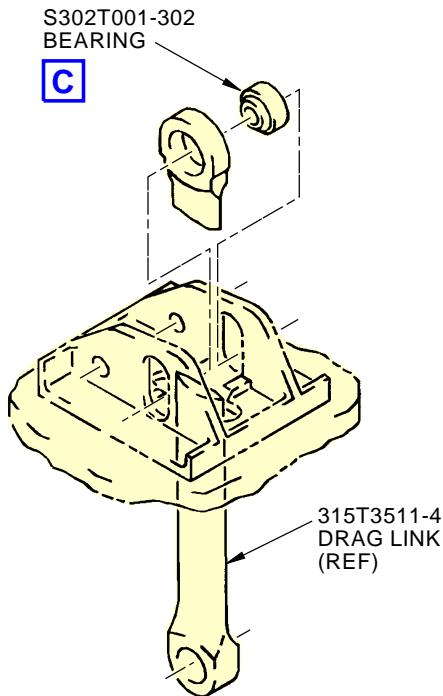
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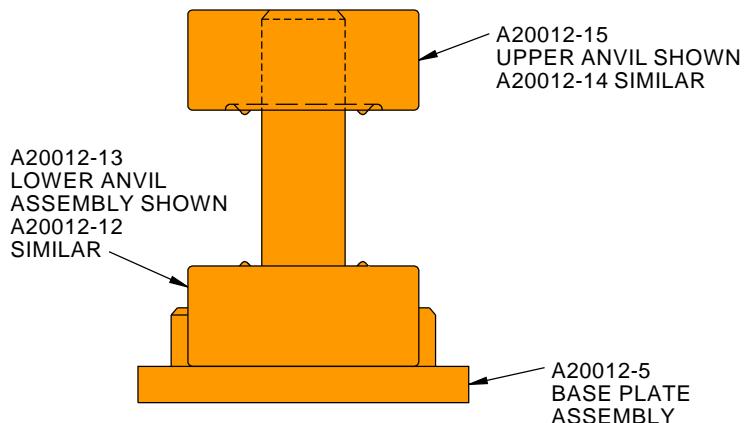


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ILLUSTRATED TOOL AND EQUIPMENT MANUAL



315T3511-3 DRAG LINK ASSEMBLY

**B**



A20012-11 SWAGING TOOL SHOWN  
A20012-10 SIMILAR

**C**

2265189 S0000508249\_V1

Bearing Swaging Tool  
Figure 1 (Sheet 2 of 2)

**20-50-02**

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**737-600/700/800/900**  
**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER: A32091**

**NAME:** HOLE SAW

**AIRPLANE MAINTENANCE:** YES

AMM 25-00-00, AMM 78-31-17

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The A32091 hole saw is used on all 707 thru 787 airplanes.

A32091 is used in conjunction with a customer-furnished ST927C arbor, pilot, anvil and drill motor to remove roller swaged bearings. A32091 is used to remove swaged lip metal, freeing the bearing from its housing.

A32091 is listed in the form A32091-XXXX, where:

“A32091” is the basic tool number.

“XXXX” is the hole saw diameter in 1/1000-inch.

A32091 is used to remove bearings. The part number of the bearing must be known before you can identify the correct tools to use. A32091 is used on bearing part numbers: BACB10AG22, BACB10EN12G, BACB10ES06G, BACB10FB10G, BACB10FC10, BACB10FH12G, BACB10GB10G, BACB10GD10G, KR8CNGV03, M81936/1-22, P2A4000-16, P2A4000-8, S302A006-3, S302T001-209, S302T001-210, S302T001-215, S302T001-216, S302T001-218, S302T001-219, S302T001-227, S302T001-234, S302T001-414, S302T001-420, S302T001-701, S302T001-702, S302T001-703, S302T001-801, S302T001-810, S302T001-813, S302T001-816, S302T001-817, S302T001-818, S302T001-821, S302T001-822, VTB13510, VTB13560, 10-60516-17, 10-61970-5, 10-61970-6, 10-61970-7, 311U0052-2, 311U0052-3, 311U0052-4, 60B00180-103, 60B00180-253, 60B00180-105, 60B00180-244, 60B00180-247, 60B00180-252, 60B00180-253, 60B00180-254, 60B00180-255, 60B00180-332, 60B00180-38, 60B00180-43, 60B00180-48, 60B00180-49, 60B00180-50, 60B00180-51, 60B00180-52, 60B00180-53, 60B00180-54, 60B00180-62, 60B00180-70, 60B00180-71, 60B00180-72, 60B00180-74, 60B00180-75, 69B94365-1, 69B94365-2, 69B94365-3, and 69B94365-4.

Refer to AMM 25-00-00, AMM 78-31-17, the current A32091 drawing and the Standard Overhaul Practices Manual SOPM 20-50-03 for complete usage instructions.

A32091 is made from high speed steel and varies in diameter from 0.7510 thru 0.1250 inch, 1.501 thru 2.000 inches and 3.501 thru 4.500 inches in 0.001- inch increments.

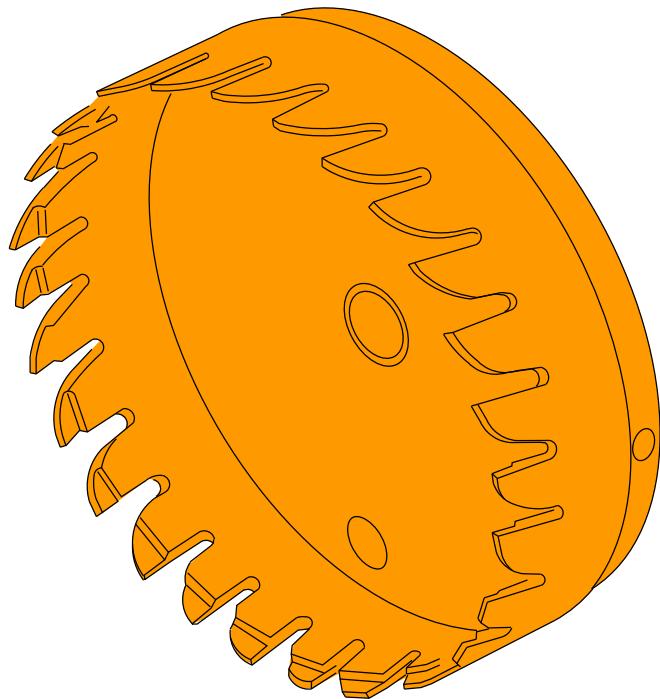
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ILLUSTRATED TOOL AND EQUIPMENT MANUAL



**A32091-XXXX HOLE SAW  
(EXAMPLE)**

2265640 S0000508285\_V1

**Hole Saw  
Figure 1**

**20-50-03**



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ILLUSTRATED TOOL AND EQUIPMENT MANUAL

**PART NUMBER: A52020-1**

**NAME:** MANDREL EQUIPMENT - BEARING INSTALLATION

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** YES

CMM 52-11-06, CMM 52-11-22

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The A52020-1 mandrel equipment is used during component maintenance on all 767 airplanes.

A52020 is used in conjunction with a customer-furnished bearing press. The part number of the bearing must be known before the correct tools can be identified. A52020 is used to install the FS1PP7DBE9927A (141T6175-series) bearing set.

Refer to CMM 52-11-06, CMM 52-11-22 the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current A52020 drawing for complete usage instructions.

A52020-1 consists of:

A52020-1		
QUANTITY	NOMENCLATURE	PART NUMBER
2	MANDREL ASSEMBLY	A52020-2
1	STORAGE BOX	

**WEIGHT:** 1 lb (0.45 kg)

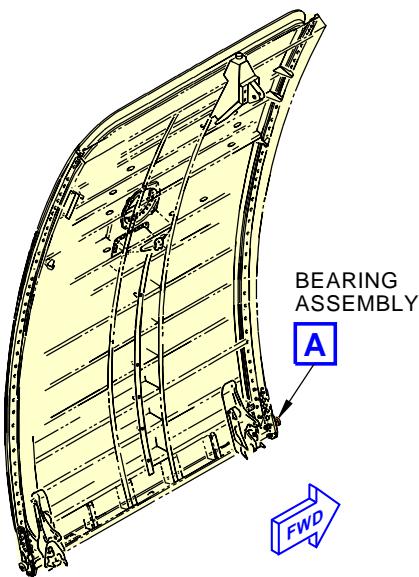
**DIMENSIONS:** 2 x 2 x 3 inches (51 x 51 x 76 mm)

**20-50-04**

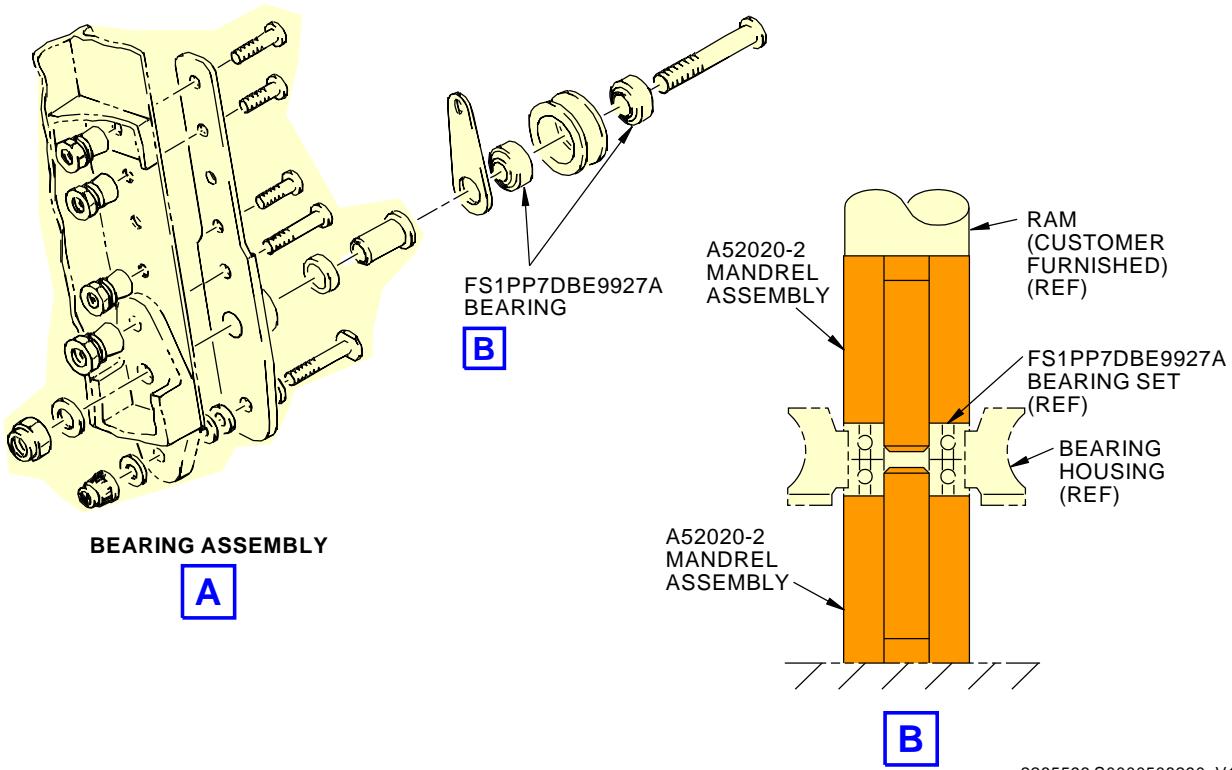
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**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**



**767 AFT ENTRY AND SERVICE  
DOOR ASSEMBLY**



2265593 S0000508290\_V1

**Bearing Installation Mandrel Equipment**  
**Figure 1**

**20-50-04**

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737-600/700/800/900  
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

**PART NUMBER:** B32066-1

**NAME:** ROLLER SWAGING AND REMOVAL EQUIPMENT - BEARING

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The B32066-1 roller swaging and removal equipment is used during component maintenance.

B32066 is used to swage and remove nose landing gear lower drag strut 60B00180-36 bearings.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current B32066 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

B32066-1 consists of:

B32066-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	ROLLER ASSEMBLY	B32066-2
1	SAW ASSEMBLY	B32066-3
1	REMOVAL ANVIL	B32066-4
1	SWAGING ANVIL	B32066-5
1	REMOVAL PILOT	B32066-6
1	SWAGING BUSHING	B32066-7
1	STORAGE BOX	

**WEIGHT:** 25 lbs (11 kg)

**DIMENSIONS:** 4 x 9 x 9 inches (102 x 279 x 279 mm)

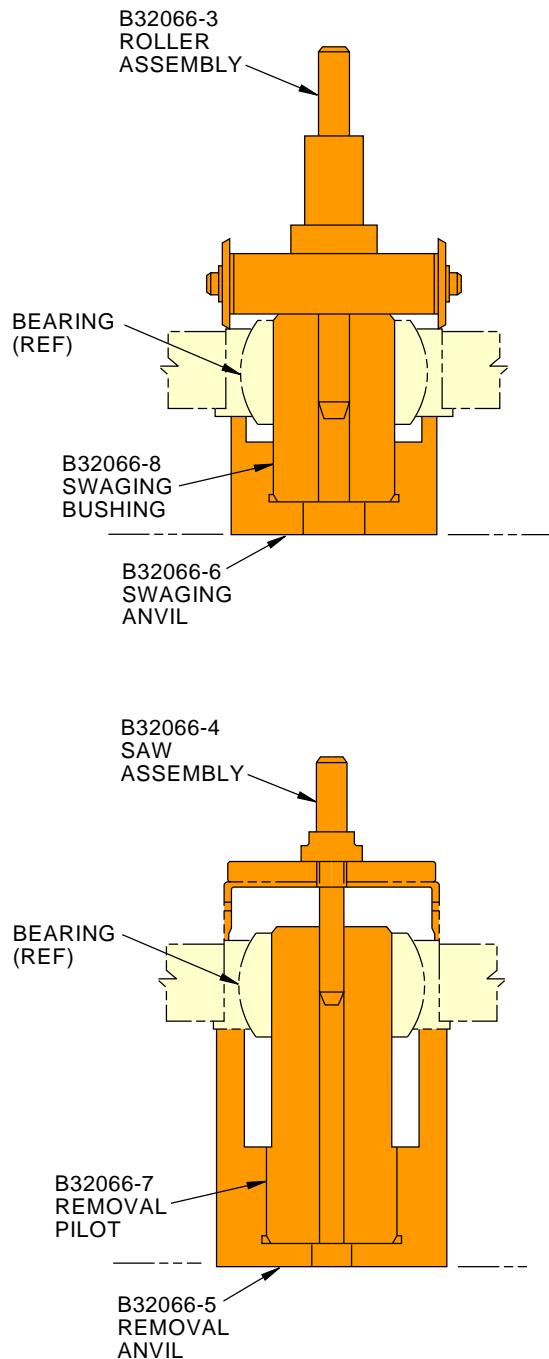
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2274606 S0000512100\_V1

**Bearing Roller Swaging and Removal Equipment**  
**Figure 1**

**20-50-05**

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**737-600/700/800/900**  
**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER: B32070-1**

**NAME:** INSTALLATION KIT - BUSHINGS, NOSE LANDING GEAR (NLG)

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** YES

CMM 32-21-15, CMM 32-21-20, CMM 32-21-21

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The B32070-1 bushings installation kit is used during component maintenance on all 747, 757 and 767 airplanes.

B32070 is used to swage the 69B82080-2 bushing during nose landing gear component maintenance.

Refer to CMM 32-21-15, CMM 32-21-20, CMM 32-21-21, the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current B32070 drawing for complete usage instructions. If the component overhaul instructions differ from SOPM 20-50-03, use the component overhaul instructions.

B32070-1 consists of:

B32070-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	SWAGE CONE	B32070-3
1	INSERT	B32070-4
1	BOLT	B32070-5
1	NUT	B32070-6
1	WASHER	B32070-7
1	STORAGE BOX	

**WEIGHT:** 0.1 lb (0.05 kg)

**DIMENSIONS:** 1 x 1 x 4 inches (25 x 25 x 102 mm)

**20-50-06**

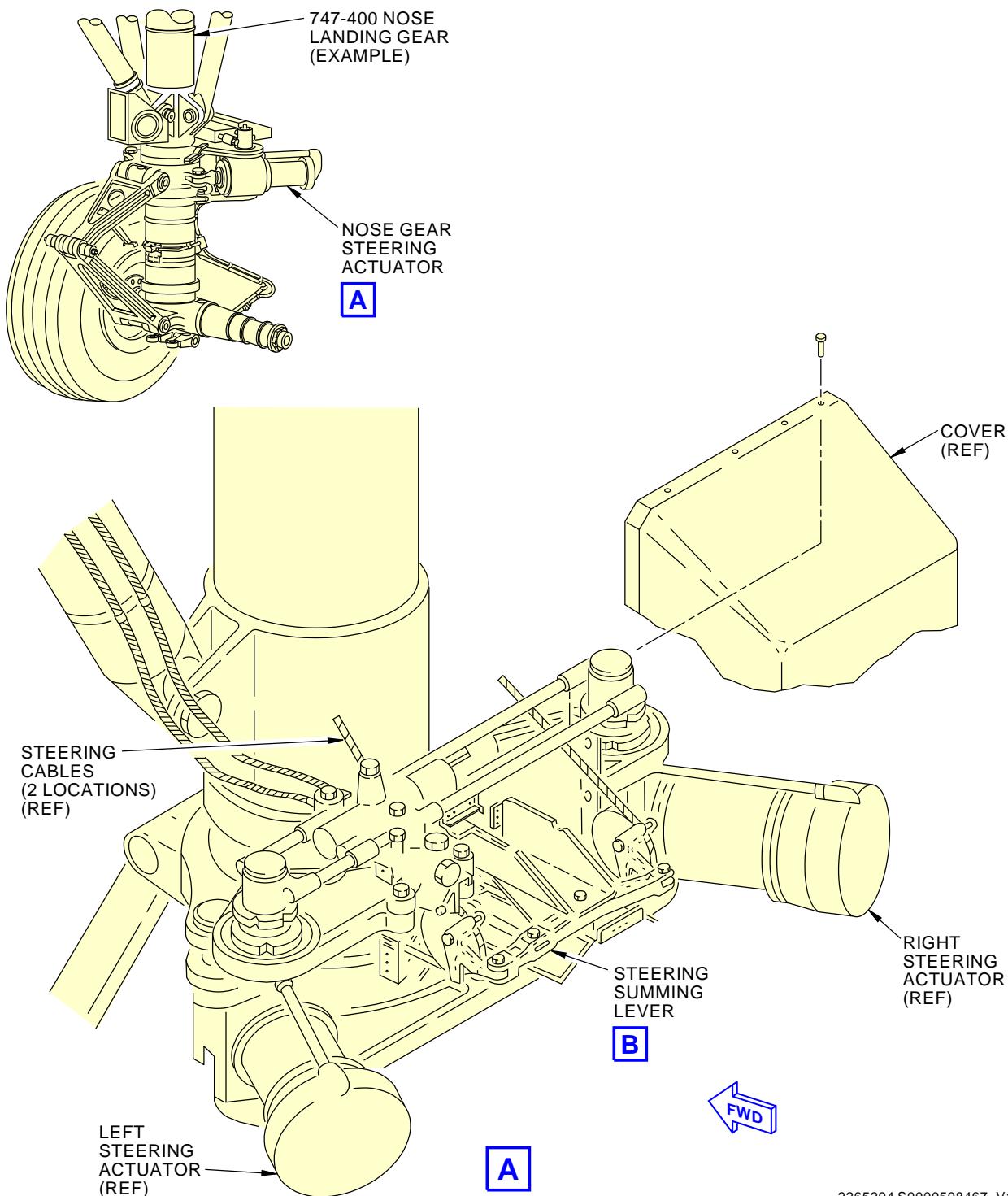
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2265294 S0000508467\_V1

Nose Landing Gear Bushings Installation Kit  
Figure 1 (Sheet 1 of 2)

**20-50-06**

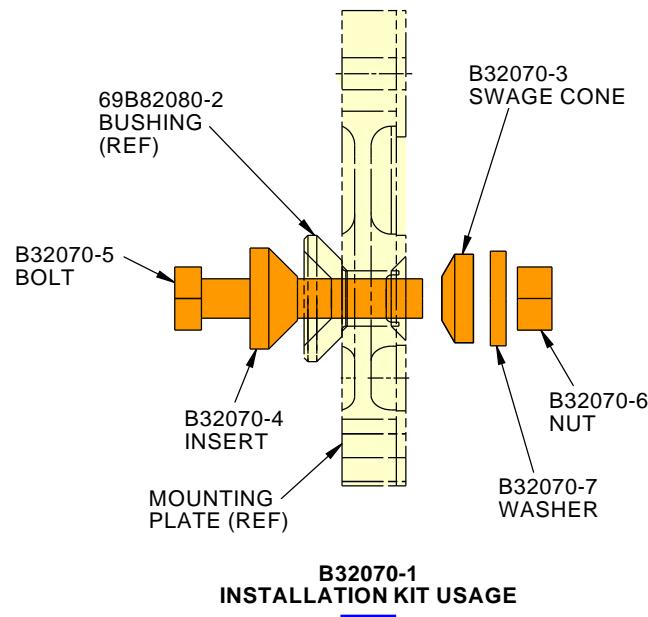
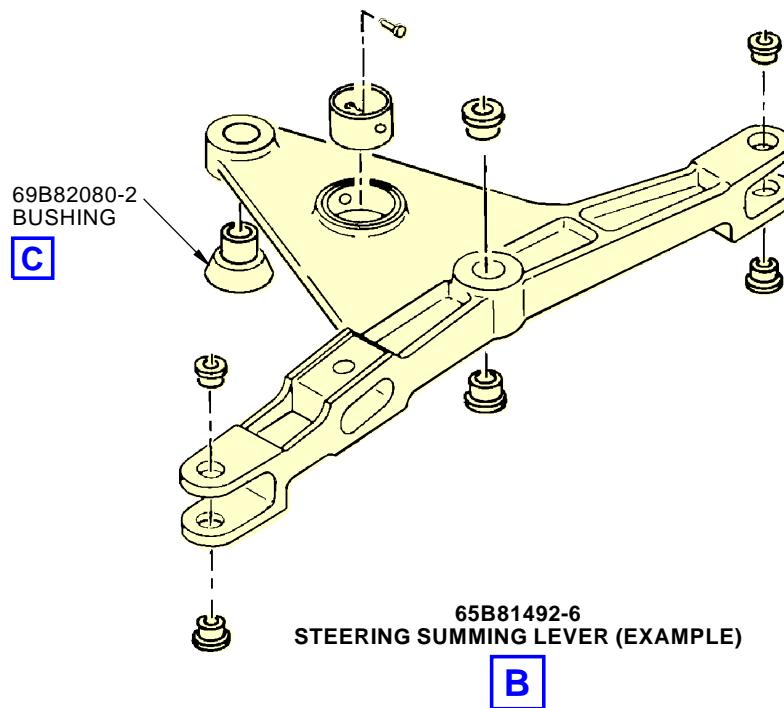
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2265304 S0000508468\_V1

Nose Landing Gear Bushings Installation Kit  
Figure 1 (Sheet 2 of 2)

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ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: C20001-1

NAME: ROLLER SWAGE - BEARING INSTALLATION, ELEVATOR TAB CONTROL CRANK ASSEMBLY

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: YES

CMM 27-31-97

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The C20001-1 roller swage is used during component maintenance.

C20001 is used to roller swage MKSP5AFS428, MKSP5AFS464, MS27645-5AR and MS27645-5ARG sleeves.

Refer to CMM 27-31-97, the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current C20001 drawing for complete usage instructions. If the component overhaul instructions differ from the data in SOPM 20-50-03, use the component overhaul instructions.

C20001-1 consists of:

C20001-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	ROLLER SWAGE ASSEMBLY	C20001-2
1	STORAGE BOX	

WEIGHT: 0.5 lbs (0.23 kg)

DIMENSIONS: 1.5 x 1.5 x 3 inches (38 x 38 x 76 mm)

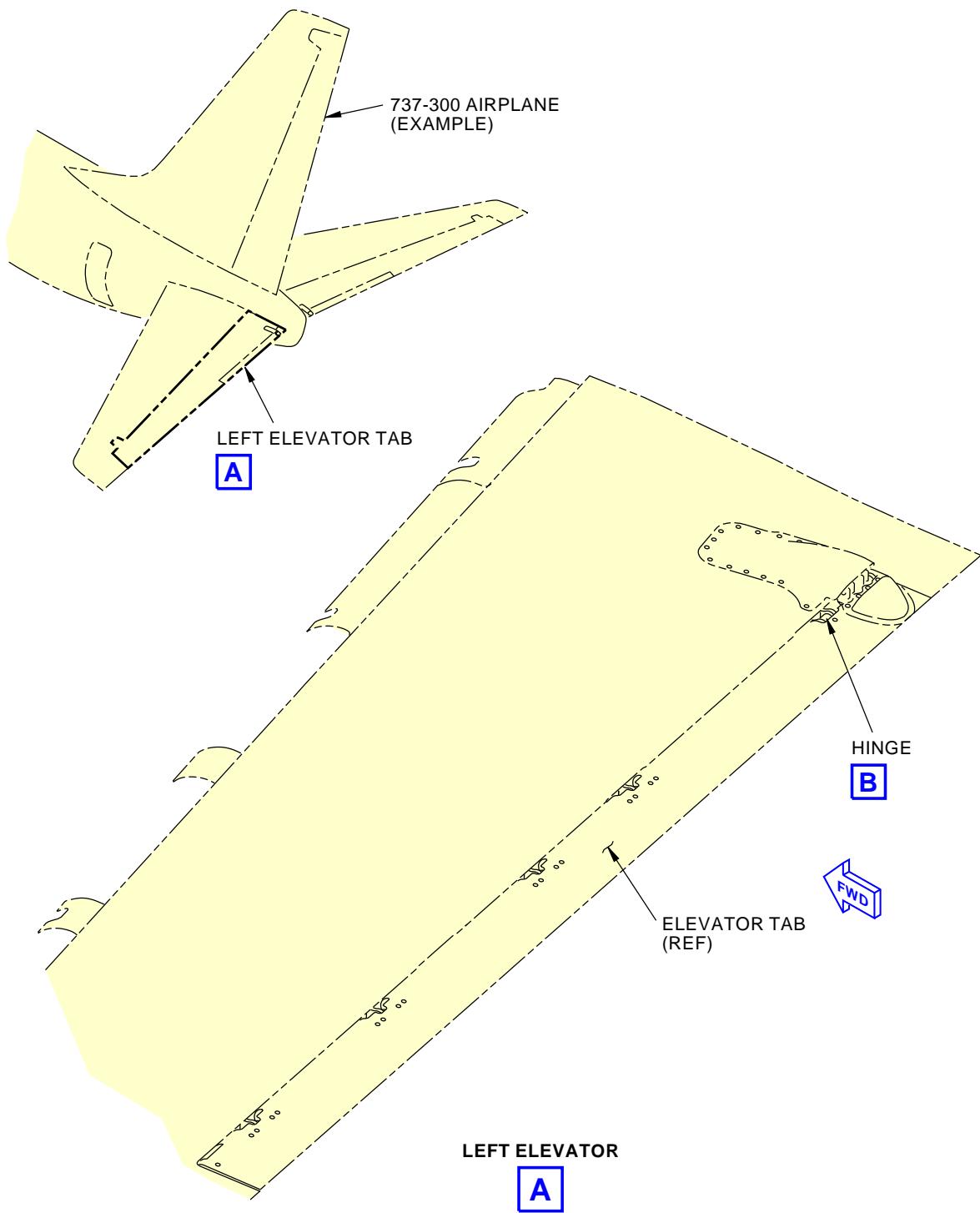
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2273913 S0000511912\_V1

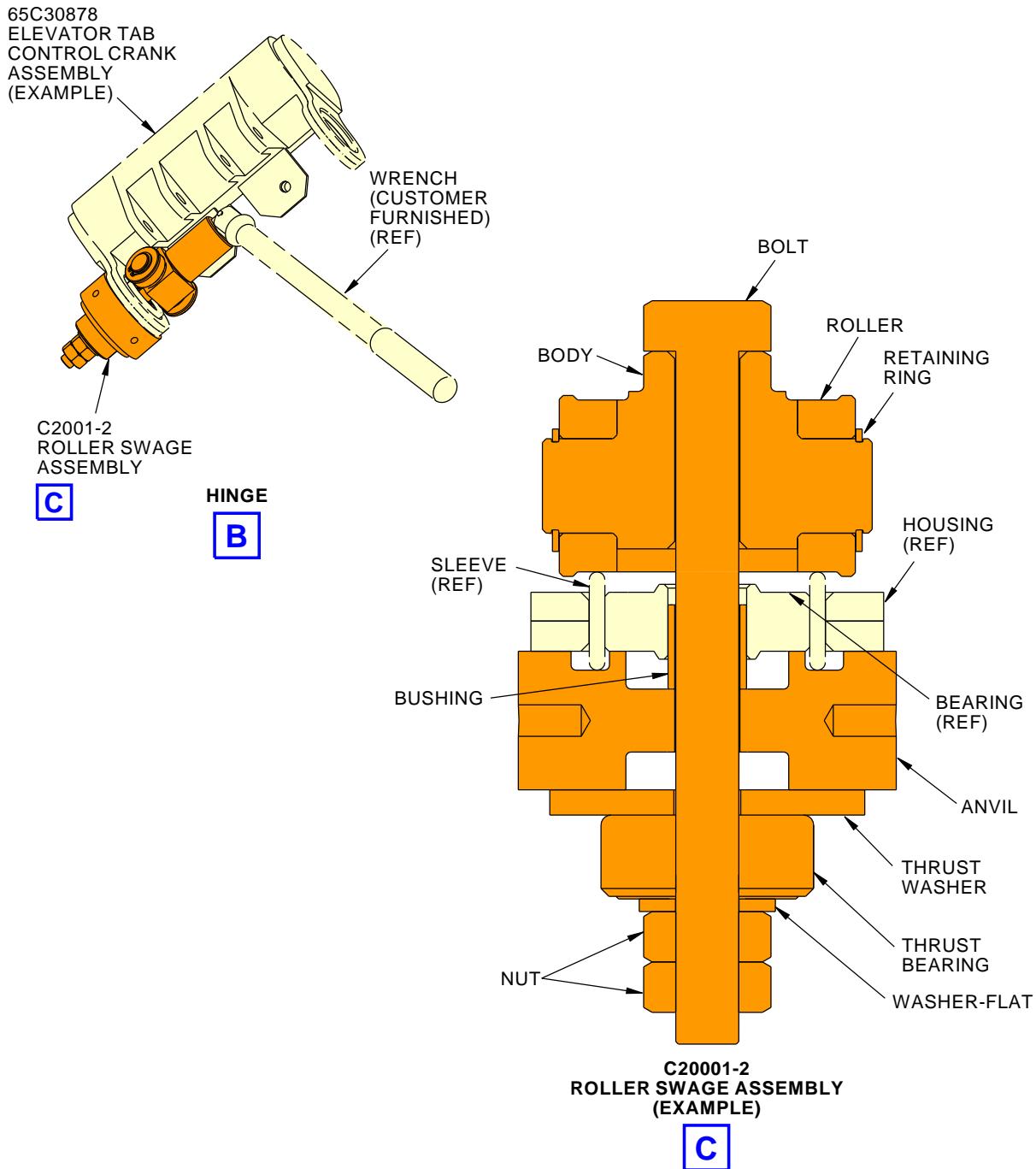
Elevator Tab Control Crank Assembly Bearing Installation Roller Swage  
Figure 1 (Sheet 1 of 2)

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2274076 S0000511915\_V1

**Elevator Tab Control Crank Assembly Bearing Installation Roller Swage**  
**Figure 1 (Sheet 2 of 2)**

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ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: C32009-1

NAME: SWAGING EQUIPMENT - OVERSIZE NOSE GEAR BEARING, UPPER DRAG BRACE

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The C32009-1 swaging equipment is used during component maintenance on all 737-100 thru -500 airplanes equipped with oversized nose gear, upper drag brace bearings.

C32009 is used to swage the 10-61970-4 nose gear upper drag brace oversize spherical bearing.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current C32009 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

C32009-1 consists of:

C32009-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	ROLLER ASSEMBLY	C32009-2
1	PRIMARY ANVIL	C32009-10
1	SECONDARY ANVIL	C32009-11
1	STORAGE BOX	

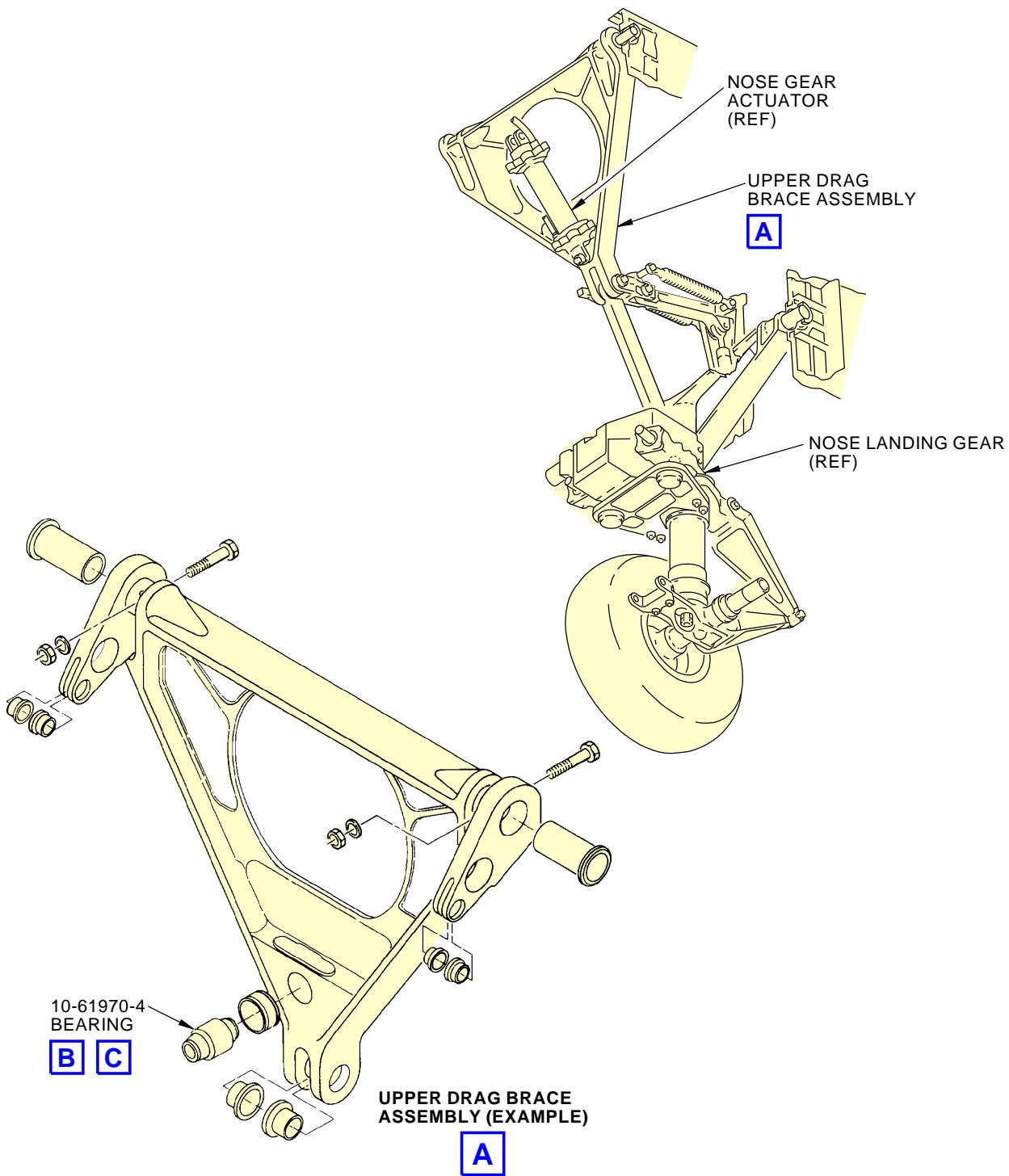
**20-50-08**

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2274131 S0000512024\_V1

Upper Drag Brace Oversize Nose Gear Bearing Swaging Equipment  
Figure 1 (Sheet 1 of 2)

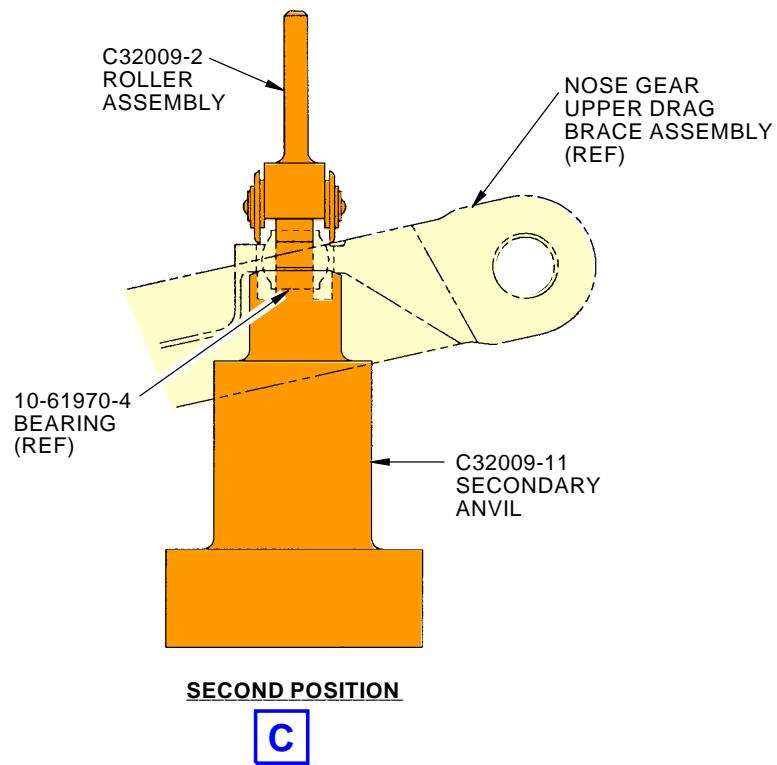
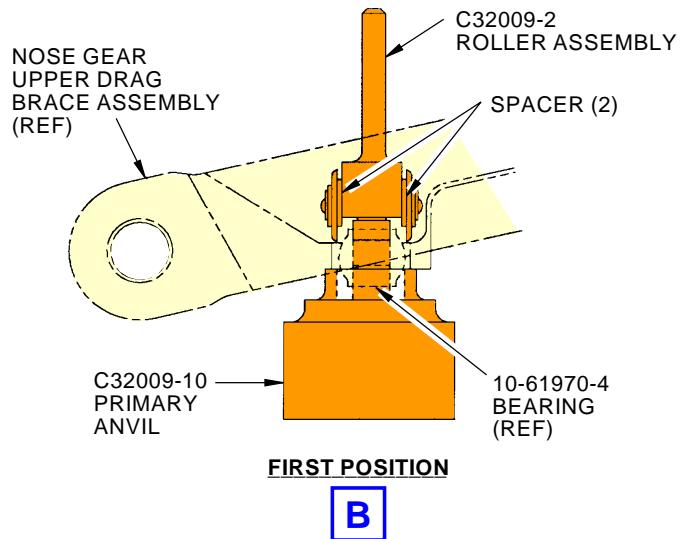
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2274149 S0000512026\_V1

**Upper Drag Brace Oversize Nose Gear Bearing Swaging Equipment**  
**Figure 1 (Sheet 2 of 2)**

**20-50-08**



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PART NUMBER: C57001-1

NAME: ROLLER SWAGING EQUIPMENT - HINGE BRACKET

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The C57001-1 roller swaging equipment is used during component maintenance.

C57001 is used to roller swage bearings with diameters of 0.560-inch and 0.619-inch.

C57001 is used to roller swage bearings: ABW4V110, AMB5V4002, AW4V73, KWB428, P27850 and 03-506-04E005.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current C57001 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

C57001-1 consists of:

C57001-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	SWAGE ASSEMBLY	C57001-2
1	SLEEVE	C57001-3
1	STORAGE BOX	

**20-50-09**

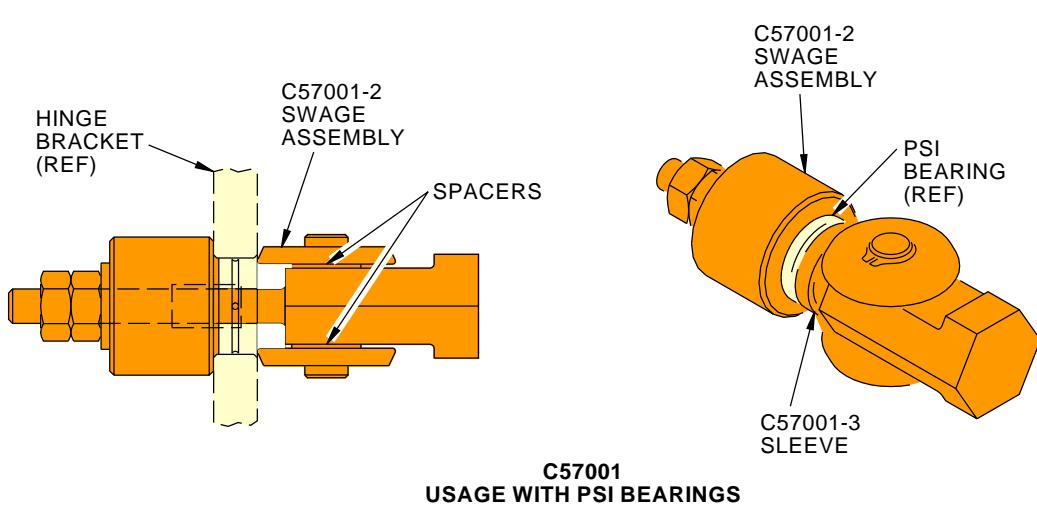
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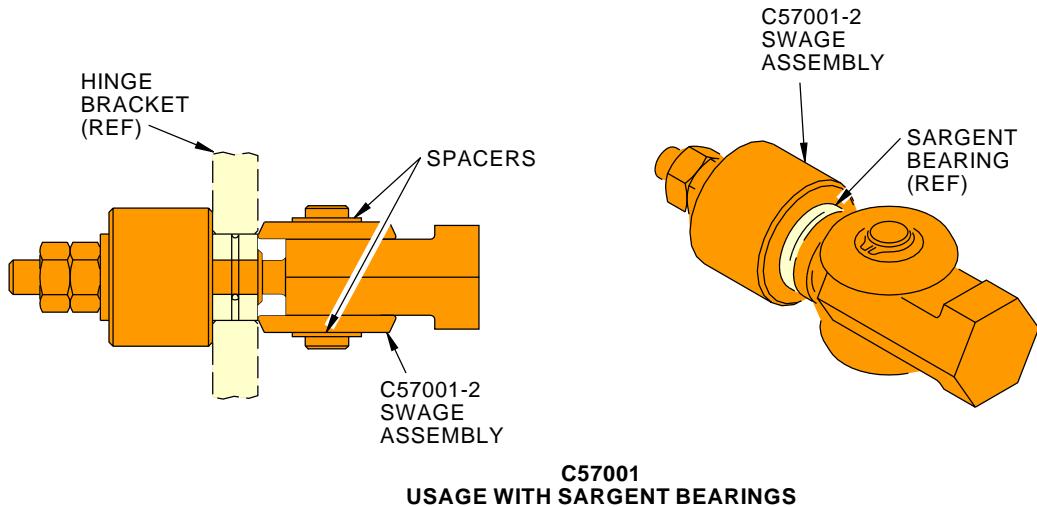
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C57001  
USAGE WITH PSI BEARINGS



C57001  
USAGE WITH SARGENT BEARINGS

C57001-1  
HINGE BRACKET ROLLER SWAGING EQUIPMENT

2272418 S0000511408\_V1

Hinge Bracket Roller Swaging Equipment  
Figure 1

**20-50-09**



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PART NUMBER: F70071-1

NAME: RETAINER - BEARING, THRUST REVERSER

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: YES

CMM 78-02-14, CMM 78-02-29, CMM 78-02-44, CMM 78-02-64, CMM 78-38-01

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The F70071-1 retainer is used during component maintenance on airplanes equipped with JT3, JT4 or JT8 engines.

F70071 is used to hold the inner and outer clam shell hinge shafts, bearing and bearing spacer together when these parts are installed in the clam shell hinge.

F70071 is used to retain the BACB10C645 bearing.

Refer to CMM 78-02-14, CMM 78-02-29, CMM 78-02-44, CMM 78-02-64, CMM 78-38-01, the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current F70071 drawing for complete usage instructions. If the component overhaul instructions differ from SOPM 20-50-03, use the component overhaul instructions.

F70071 is a cylinder of low carbon, seamless, cadmium or zinc plated, steel tubing, 1-inch long and 1.65-inch outside diameter.

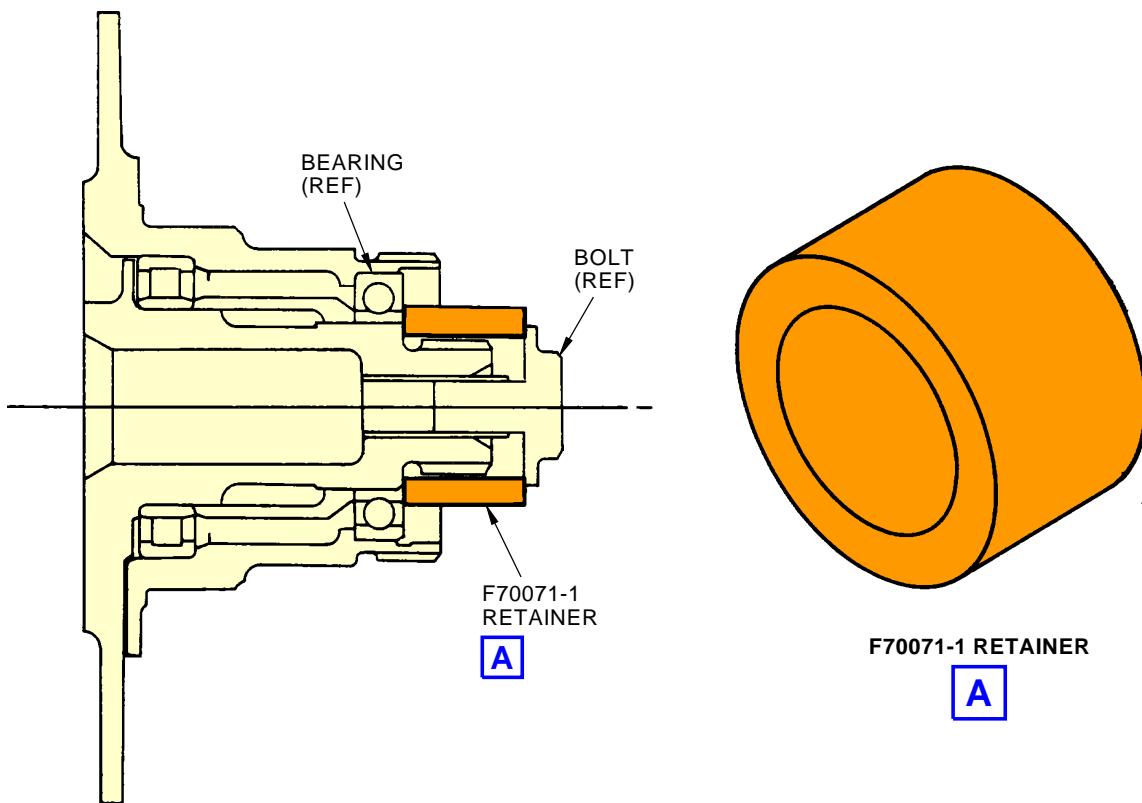
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2272691 S0000511463\_V1

**Thrust Reverser Bearing Retainer**  
**Figure 1**

**20-50-10**



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**PART NUMBER:** F70073-1

**NAME:** SLEEVE - BEARING, THRUST REVERSER

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** YES

CMM 78-02-14, CMM 78-02-29, CMM 78-02-44, CMM 78-02-64, CMM 78-38-01

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The F70073-1 retainer is used during component maintenance on airplanes equipped with JT3, JT4 or JT8 engines.

F70073 is used to install the clam shell roller bearing ring in the housing and on the outer shaft. After pressing the outer ring into the housing and the inner ring onto the outer shaft, the sleeve is placed into the housing. The bearing is filled with rollers by placing them in their groove and sliding them one by one into the slot of the sleeve. The outer shaft is placed in position and while the inner ring on the outer shaft is held against the end of the sleeve, the sleeve is slowly withdrawn until the bearing is assembled.

F70073 is used to install the BACB10C645 bearing.

Refer to CMM 78-02-14, CMM 78-02-29, CMM 78-02-44, CMM 78-02-64, CMM 78-38-01, the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current F70073 drawing for complete usage instructions. If the component overhaul instructions differ from SOPM 20-50-03, use the component overhaul instructions.

F70073-1 is fabricated heat treated steel, with a sleeve outside diameter of 3.540 to 3.535-inches, inside diameter of 3.25-inches and length of 2.62-inches. F70073-1 is cadmium or zinc plated

**NOTE:** F70073 is not required for 707/720 airplanes delivered after April, 1966, and those JT3D powered airplanes incorporating Service Bulletin 2211.

**20-50-11**

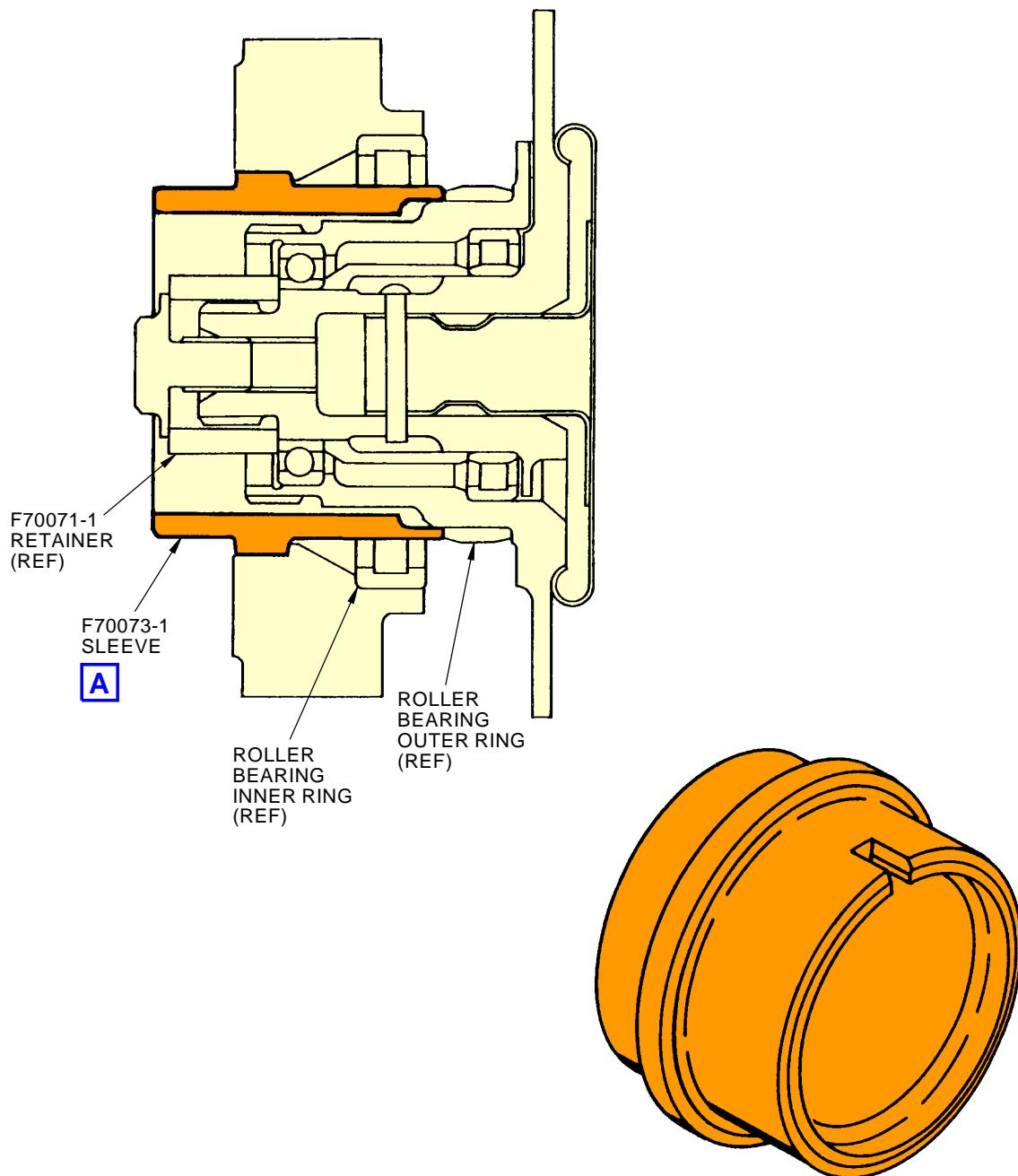
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F70073-1 SLEEVE



2272627 S0000511471\_V1

Thrust Reverser Bearing Sleeve  
Figure 1

**20-50-11**

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**PART NUMBER:** F70150

**NAME:** PULLER ASSEMBLY - CONTROL ACTUATOR BEARING

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** YES

CMM 27-02-03, CMM 27-02-08, CMM 27-09-01, CMM 27-09-11

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The F70150 puller assembly is used during component maintenance on 707 and 720 airplanes.

F70150 is used to pull the bearing from the drum and housing of the inboard aileron tab control actuator and the rudder trim actuator. Slots are provided in the actuator housings to gain access for F70150. The part number of the bearing must be known before the correct tools can be identified. F70150 is used on bearing part numbers: AN202KP23B, BACB10A823 and MS20202KP23B.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03, CMM 27-02-03, CMM 27-02-08, CMM 27-09-01, CMM 27-09-11 and the current F70150 drawing for complete usage instructions. If the component overhaul instructions differ from SOPM 20-50-03, use the component overhaul instructions.

F70150 is a screw-type, two-jaw, puller with outside fingers. F70150 is fabricated from cadmium plated, 4130 steel.

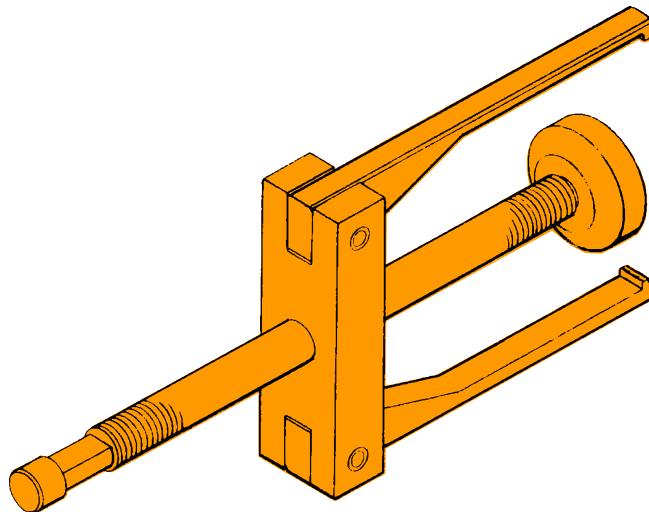
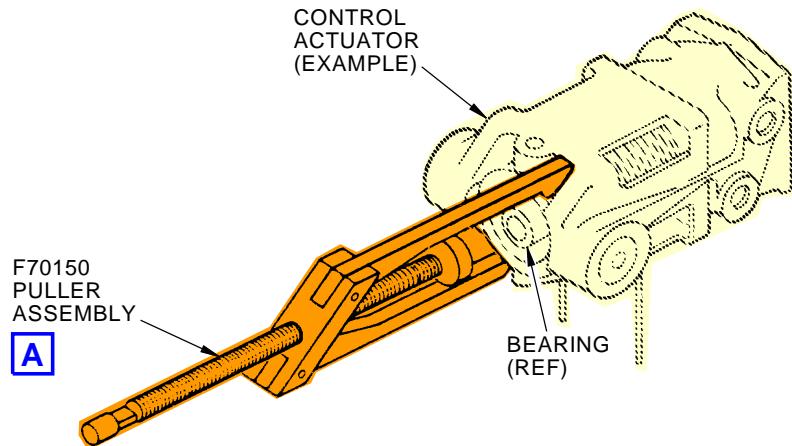
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F70150  
PULLER ASSEMBLY

**A**

2265309 S0000508473\_V1

**Control Actuator Bearing Puller Assembly**  
**Figure 1**

**20-50-12**

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**PART NUMBER:** F70197-1

**NAME:** BEARING REMOVAL TOOL

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The F70197-1 bearing removal tool is used during component maintenance.

F70197 is used to remove roller swaged bearings BLFR8-148, 10-60545-36 and 10-60545-57 when the bearing installations cannot be brought to a drill press.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current F70197 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

F70197-1 consists of:

F70197-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	PILOT	F70197-101
1	ALIGNMENT BUSHING	F70197-201
1	SAW	F70197-301
1	LINER BUSHING	F70197-401
1	ARBOR	F70197-500
1	3/8-16 FINISHED JAM NUT	F70197-600
1	1/2-20 FINISHED JAM NUT	F70197-700
1	STORAGE BOX	

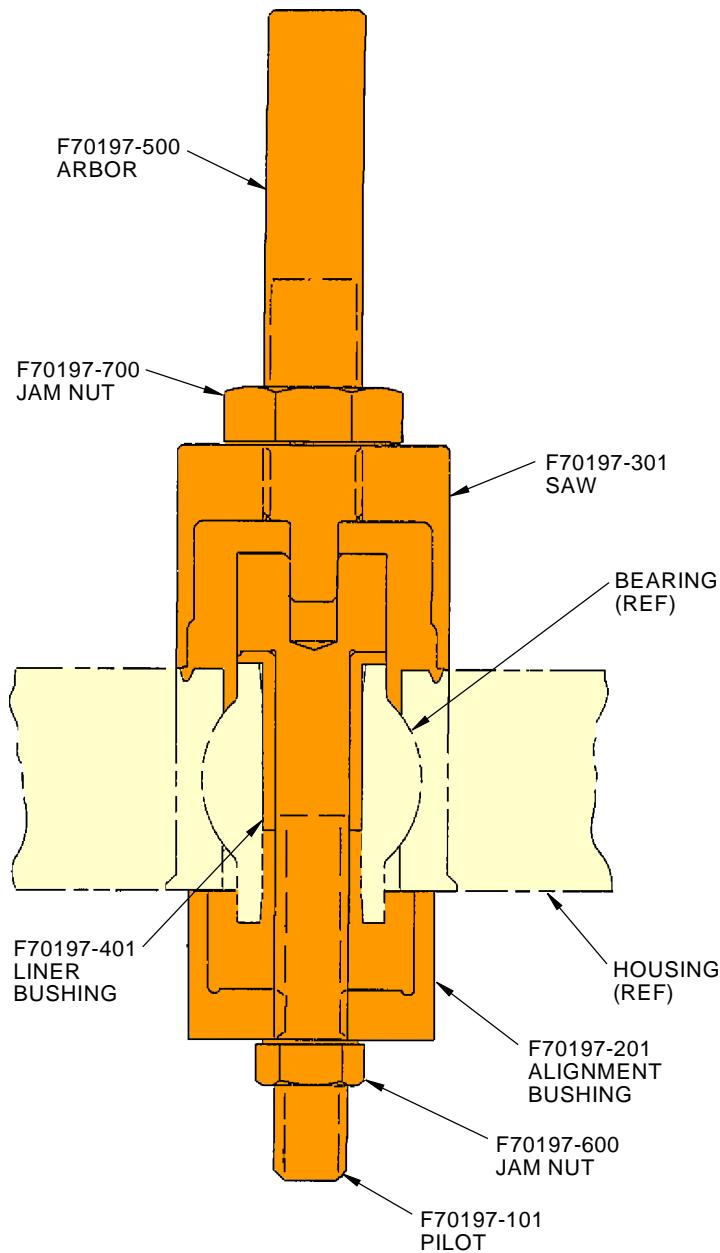
**20-50-13**

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2273436 S0000511749\_V1

**Bearing Removal Tool**  
**Figure 1**

**20-50-13**



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**PART NUMBER:** F70292-1

**NAME:** ROLLER SWAGING TOOL - SLEEVE, ROD AND HEAD ENDS, MAIN LANDING GEAR ACTUATOR

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The F70292-1 roller swaging tool is used during component maintenance on 707 airplanes.

F70292 is used in conjunction with a customer-furnished drill press.  
F70292 is used to swage the bearing retaining sleeve when replacing the rod end and head end bearings in the main landing gear actuator.

F70292 is used to sleeve swage bearings: BACB10C130H and DP138H.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current F70292 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

F70292-1 consists of:

F70292-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	ROLLER ASSEMBLY	F70292-2
1	ANVIL	F70292-3
1	STORAGE BOX	

**20-50-14**

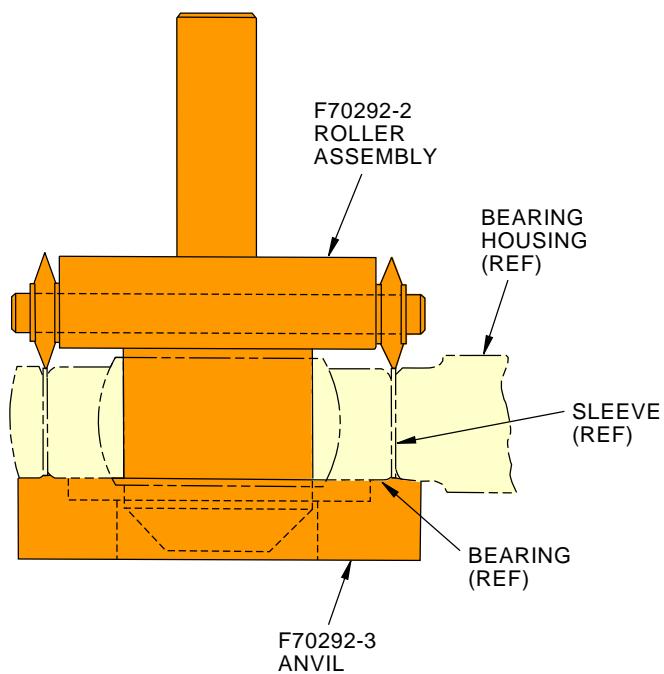
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F70292-1 ROLLER SWAGING TOOL

2272802 S0000511428\_V1

Main Landing Gear Actuator Rod and Head Ends Sleeve Roller Swaging Tool  
Figure 1

**20-50-14**

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**PART NUMBER:** F70297-1

**NAME:** ROLLER SWAGING TOOL - BEARING HOUSING DRIVE SCREW,  
FILLET FLAP

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The F70297-1 roller swaging tool is used during component maintenance on 707 airplanes.

F70297 is used in conjunction with a customer-furnished drill press.  
F70292 is used to swage the bearing retaining sleeve when replacing the rod end and head end bearings in the main landing gear actuator.

F70297 is used to roller swage the BACB10C196 bearing.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current F70297 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

F70297-1 consists of:

F70297-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	ROLLER ASSEMBLY	F70297-2
1	ANVIL ASSEMBLY	F70297-3
1	ANVIL ASSEMBLY (OPPOSITE F70297-3)	F70297-4
1	THRUST BEARING	F70297-9
1	BOLT	AN12-77A
1	STORAGE BOX	

**20-50-15**

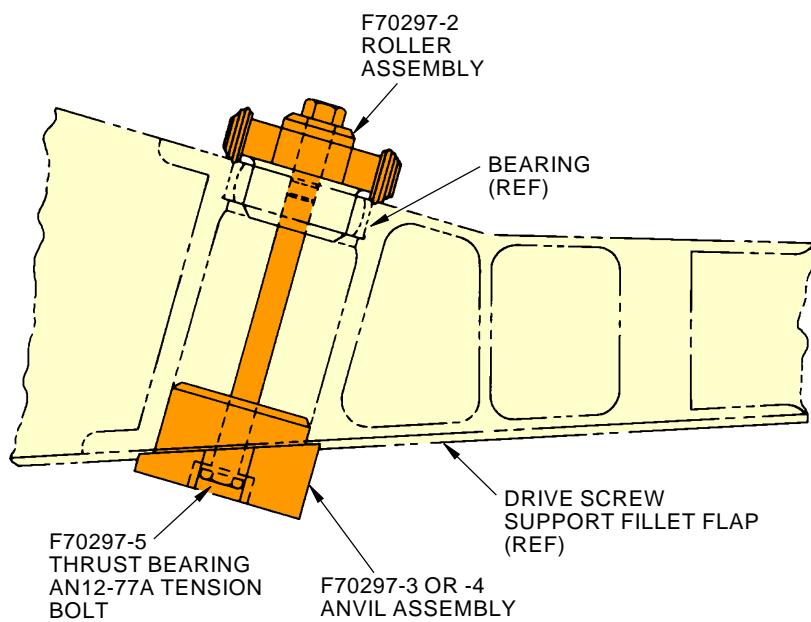
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**F70297-1 ROLLER SWAGING TOOL**

2272755 S0000511436\_V1

**Fillet Flap Bearing Housing Drive Screw Roller Swaging Tool**  
**Figure 1**

**20-50-15**

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**PART NUMBER:** F70321-1, -2, -3, -4, -5, -6, -7, -8, -9, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -20,  
-21, -22, -23, -24, -25, -26, -27, -28, -29, -30, -31, -32, -33, -34, -35, -36, -37, -38, -39, -40

**NAME:** INSTALLATION MANDREL - SHRINK FIT BUSHING

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The F70321-1 thru -40 installation mandrels are used during component maintenance on all Boeing airplanes.

F70321 is used to hold, align and install shrink fit bushings. Each mandrel also helps to maintain the chilled installation temperatures. Each F70321 is a step-machined brass bar, featuring a larger knurled diameter for handling and a smooth, smaller diameter. The smaller diameter is inserted into the inside diameter of a chilled (shrink-fit) bushing for installation into an appropriate housing. The larger diameter of F70321 prevents further insertion. The small, smooth diameter of F70321 is manufactured in 40 various diameters, from 0.176 inch (F70321-1) to 1.997 inches (F70321-40).

The part number of the bushing must be known before the correct tools can be identified. F70321 is used on bushing part number: 315W3145-10.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current F70321 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

Each F70321-X is a step-machined, brass bar.

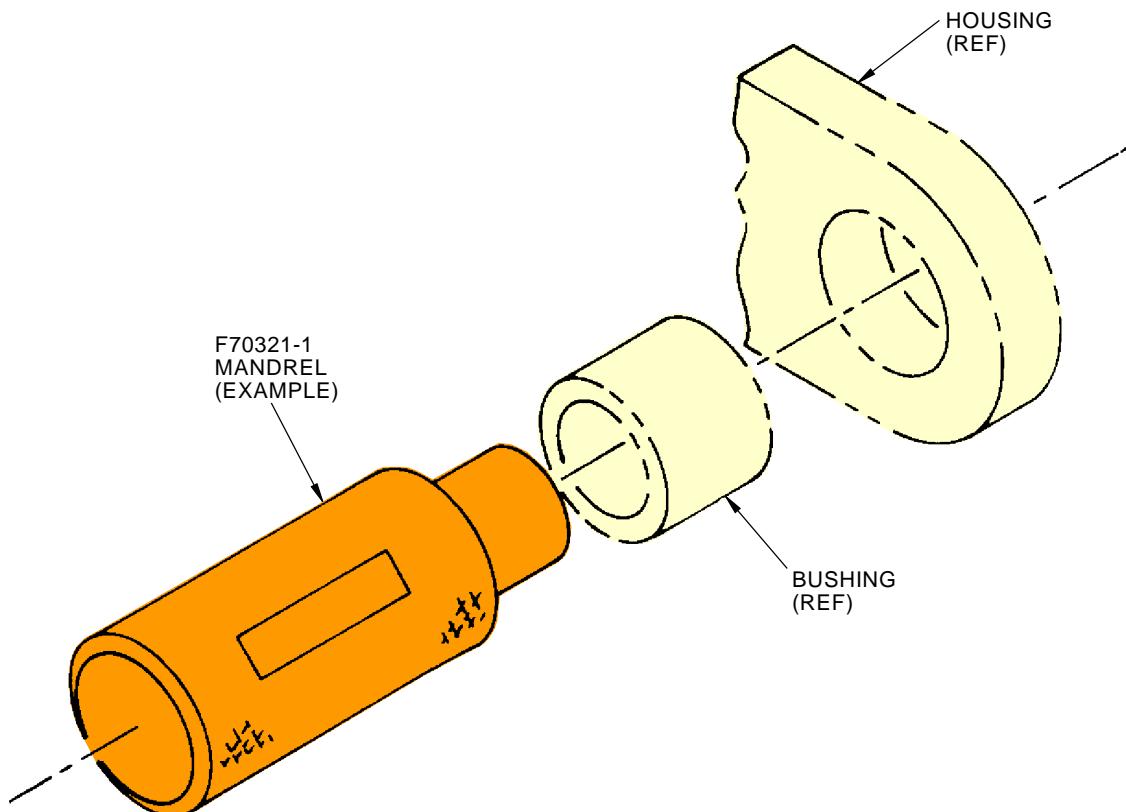
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2265312 S0000508483\_V1

**Shrink Fit Bushing Installation Mandrel**  
**Figure 1**

**20-50-16**



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## ILLUSTRATED TOOL AND EQUIPMENT MANUAL

**PART NUMBER:** F71313-6, -7, -8, -9, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -20, -21, -22, -23, -24, -25, -31, -32, -33, -34, -35, -36, -37, -38, -39, -40, -41, -42, -43, -44, -45, -46, -47, -48, -49, -50

**NAME:** WRENCH - SOCKET, ROD END BEARING

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** YES

CMM 20-50-03, CMM 32-30-11, CMM 32-30-13, CMM 32-30-21, CMM 32-30-31, CMM 32-30-41, CMM 32-50-11

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The F71313-13, -14, -15, -17, -18, -19, -20 and -21 (options) or F71313-38, -39, -40, -42, -43, -44, -45 and -46 (preferred) wrenches are used during component maintenance on 707 airplanes.

The F71313-6, -7, -8, -9, -18, -19, -24 and -25 (options) or F71313-31, -32, -33, -34, -43, -44, -49 and -50 (preferred) wrenches are used during component maintenance on 727 airplanes.

The F71313-6, -8, -10, -11, -12, -16, -22 and -23 (options) or F71313-31, -33, -35, -36, -37, -41, -47 and -48 (preferred) wrenches are used during component maintenance on 737 airplanes.

The F71313-8 (option) or -33 (preferred) are only used on 737-100 airplanes, line numbers 1 thru 26. F71313-22 (option) or -47 (preferred) are used on 737-400 airplanes equipped with heavy duty brakes.

The F71313-18 and -19 (options) or -43 and -44 (preferred) wrenches are used on 757 package freighters or 757 combi's on the 65-25326 main cargo door assembly. F71313 are used on bearing part number 69-30541.

The F71313 wrenches are used to hold or turn rod end bearings without damage during assembly, disassembly or adjustment of assemblies with specified torque requirements.

Wrenches F71313-6, -7, -8, -12, -13, -14, -15, -20, -23, -24, -25, -31, -32, -33, -37, -38, -39, -40, -45, -48, -49 and -50 require a customer-furnished 3/8-inch drive wrench. Wrenches F71313-9, -10, -11, -16, -17, -18, -19, -34, -35, -36, -41, -42, -43 and -44 require a customer-furnished 1/2-inch drive wrench. Wrenches F71313-21, -22, -46 and -47 require a customer-furnished 3/4-inch drive wrench.

Refer to CMM 20-50-03, CMM 32-30-11, CMM 32-30-13, CMM 32-30-21, CMM 32-30-31, CMM 32-30-41, CMM 32-50-11, the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current F71313 drawing for complete usage instructions.

F71313 wrenches are cast from manganese bronze, SAE 430, Type B, or machined from manganese bronze bar stock ZZ-M-80, Class B.

**NOTE:** F71313-31 thru -50 replace F71313-6 thru -25 for future procurement.

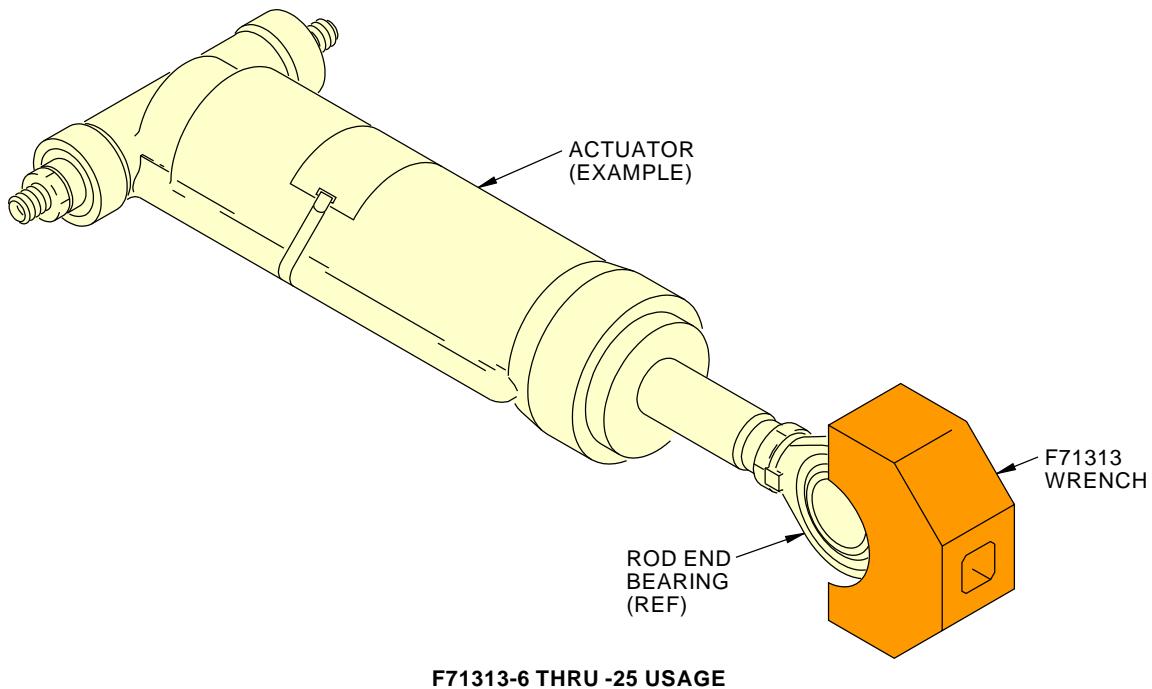
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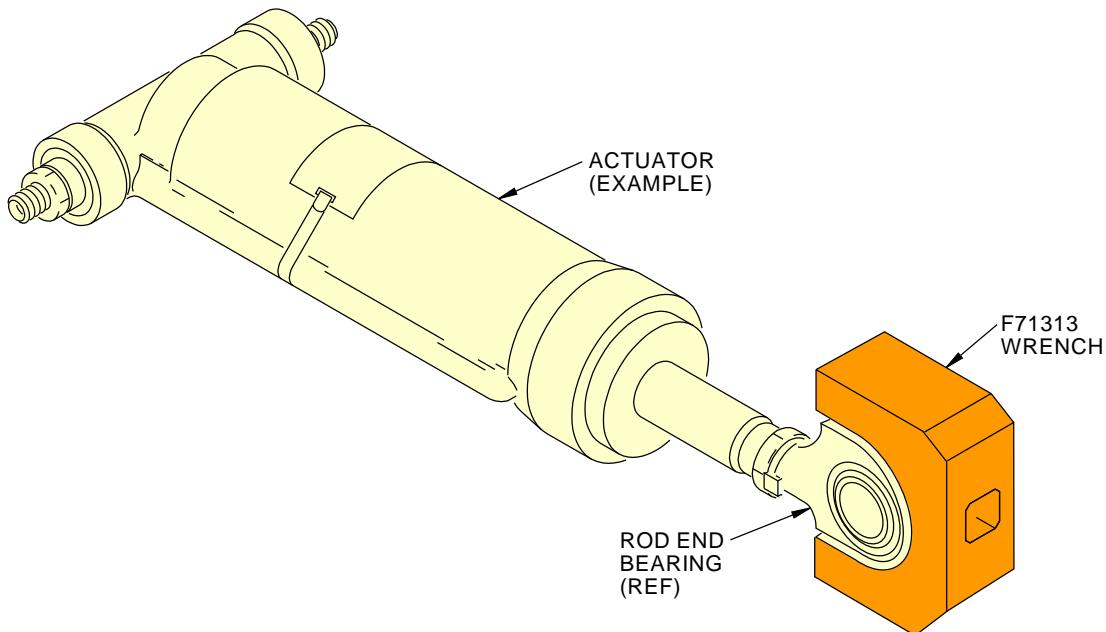
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F71313-6 THRU -25 USAGE



F71313-31 THRU -50 USAGE

2265340 S0000508491\_V1

Rod End Bearing Socket Wrench  
Figure 1

**20-50-17**

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**PART NUMBER:** F72813-1

**NAME:** BEARING STAKING TOOL ASSEMBLY

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The F72813-1 bearing staking tool assembly is used during component maintenance.

F72813 is used to anvil swage the BACB10M24 or 10-60545-111S spherical bearings only. F72813 is a two-step swage and is used in limited clearance areas.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current F72813 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

F72813-1 consists of:

F72813-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	PRIMARY ANVIL ASSEMBLY	F72813-2
1	SECONDARY ANVIL ASSEMBLY	F72813-3
1	ANVIL LOCK ASSEMBLY	F72813-4
1	ROLLER ASSEMBLY	F72813-9
1	STORAGE BOX	

**20-50-18**

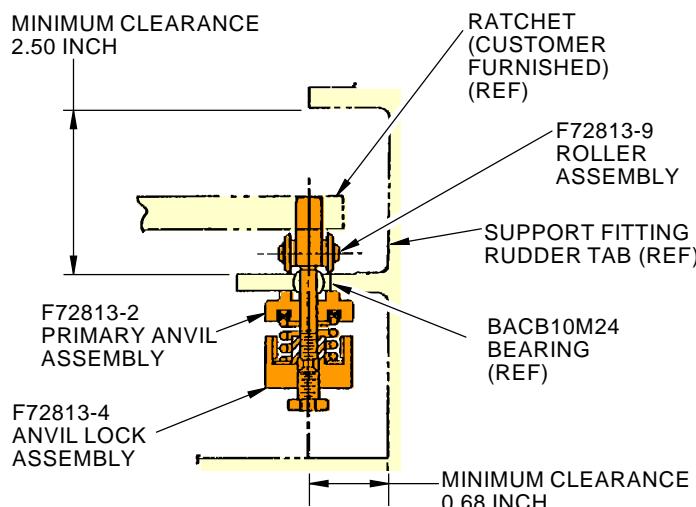
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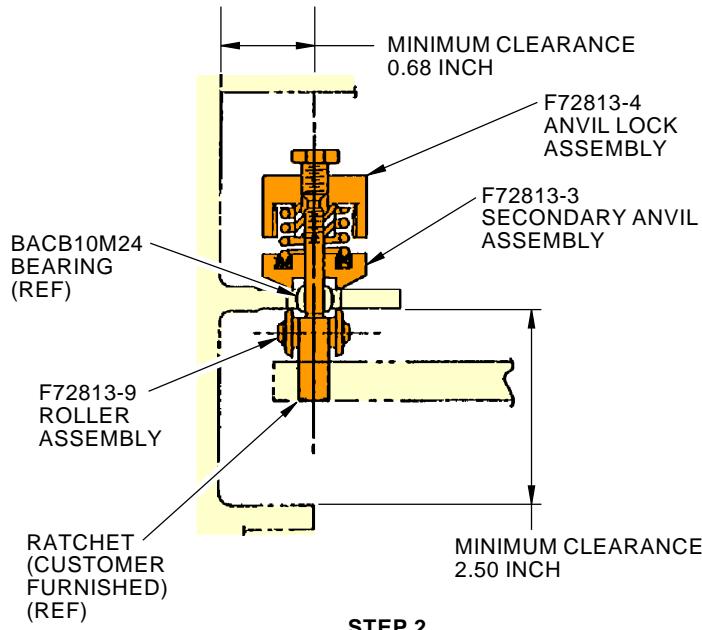
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STEP 1



F72813-1  
BEARING STAKING TOOL ASSEMBLY USAGE

22272760 S0000511612\_V1

Bearing Staking Tool Assembly  
Figure 1

**20-50-18**

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**PART NUMBER:** F72820-1

**NAME:** BEARING PULLER ASSEMBLY

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The F72820-1 bearing puller assembly is used during component maintenance.

F72820 is used to remove 10-60545-48 bearings from support fittings on the inboard mid-flap at wing station 124.2 and 203.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current F72820 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

F72820-1 consists of a U-shaped yoke, a bolt, an insert, and a pin. The insert is retained in the carriage assembly by the pin. The bolt is tightened to pull the bearing.

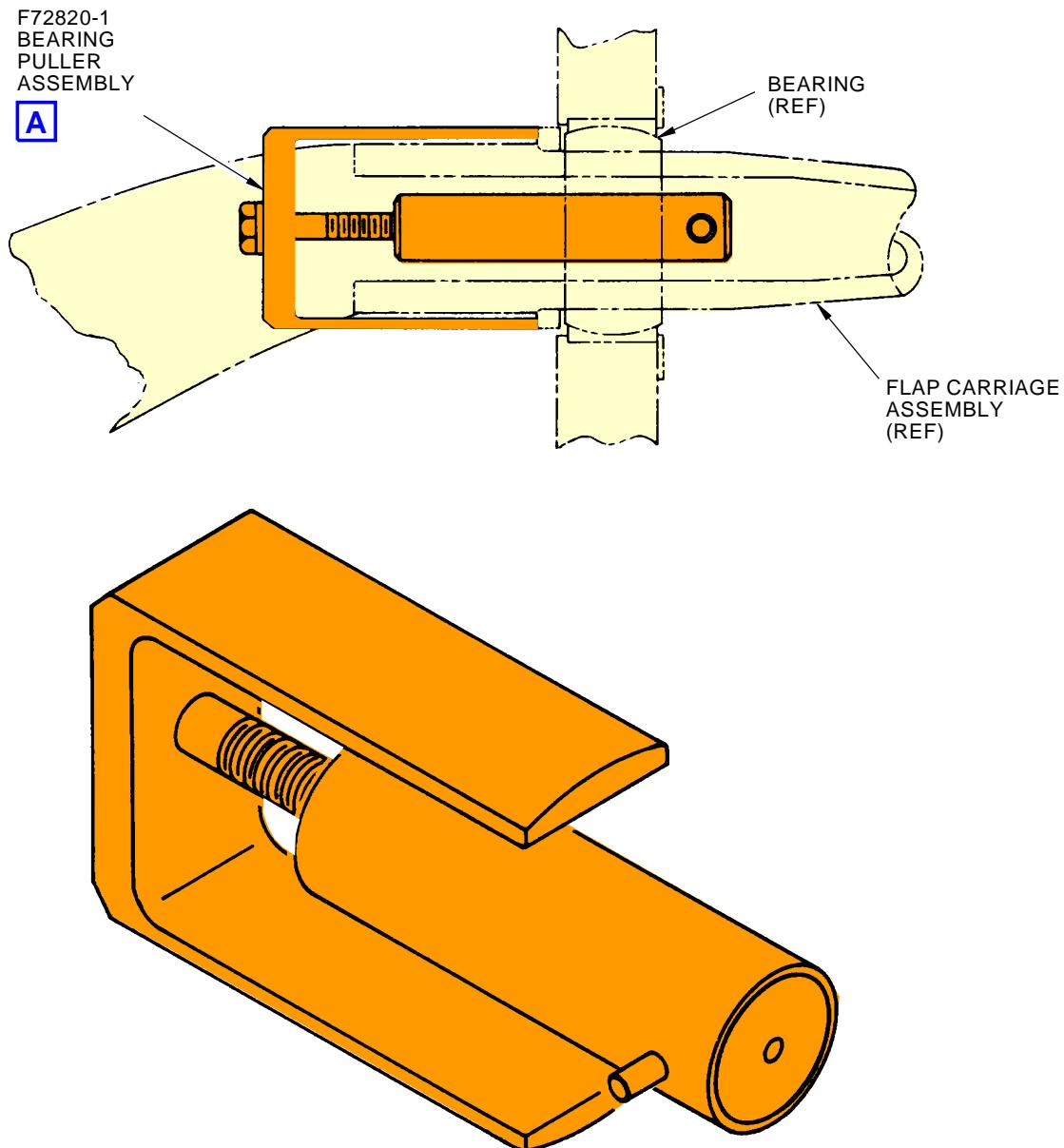
**20-50-19**

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F72820-1  
BEARING PULLER ASSEMBLY

A

2273697 S0000512006\_V1

Bearing Puller Assembly  
Figure 1

**20-50-19**

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**PART NUMBER:** F72865-1

**NAME:** PRESSURE STAKING TOOL - FORWARD LINK PIVOT BEARING,  
THRUST REVERSER

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** YES

CMM 78-30-21

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The F72865-1 pressure staking tool bushing is used during component maintenance on all 727 airplanes.

F72865 is used for pressure staking the 69-57625 bearing into the 65-65698 forward link pivot bearing on the JT8D thrust reverser.

F72865 is used to line, roller, ring or anvil swage bearings in the thrust reverser. The part number of the bearing must be known before the correct tools can be identified. F72865 is used on bearing part numbers: BAN10696, LHSSG10AP, USB10-105, 12903, 55562, 55699 and 69-57625-1

Refer to CMM 78-30-21, the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current F72865 drawing for complete usage instructions. If the component overhaul instructions differ from SOPM 20-50-03, use the component overhaul instructions.

F72865-1 consists of:

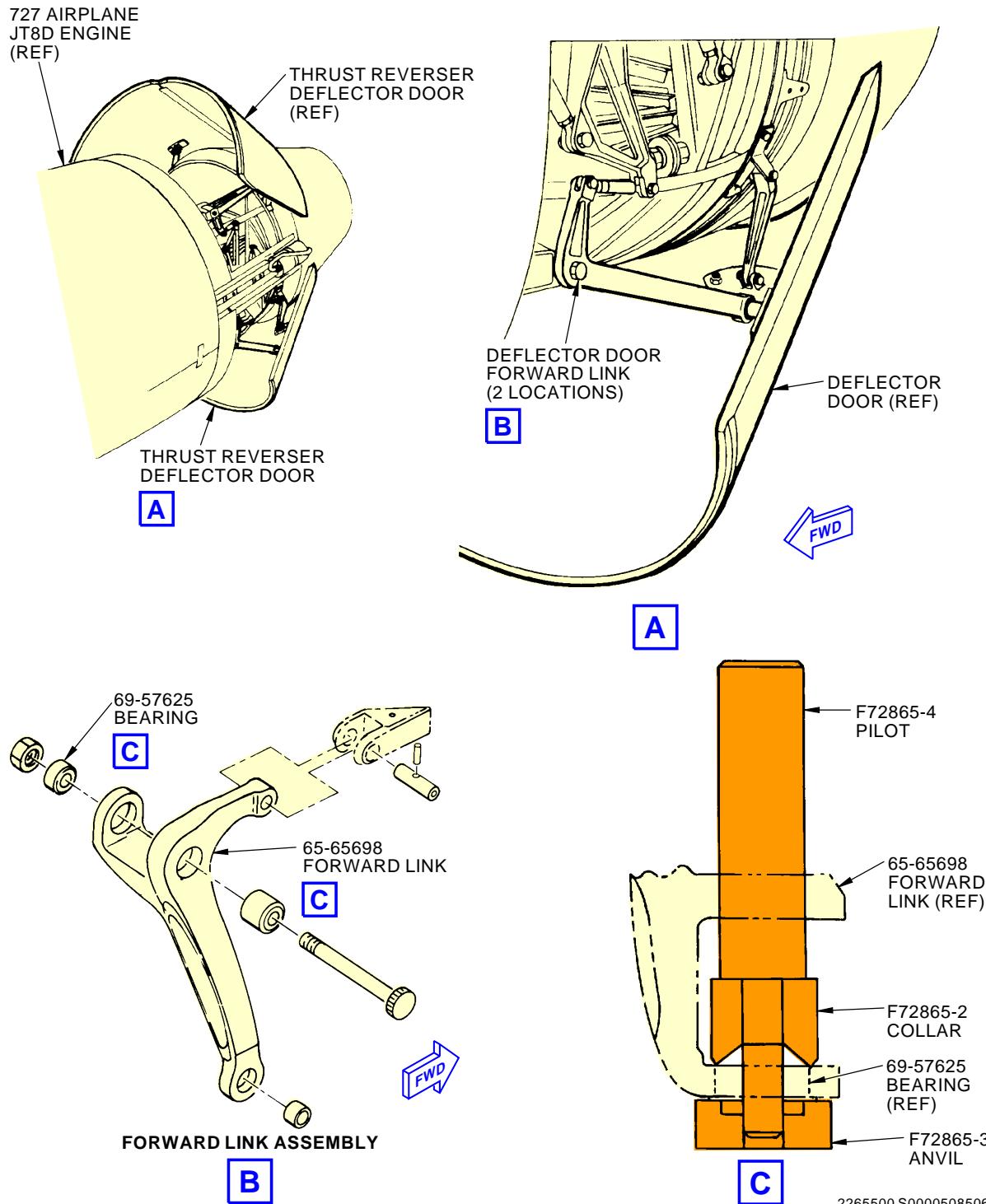
F72865-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	COLLAR	F72865-2
1	ANVIL	F72865-3
1	PILOT	F72865-4
1	STORAGE BOX	

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2265500 S0000508506\_V1

**Thrust Reverser Forward Link Pivot Bearing Pressure Staking Tool**  
**Figure 1**

**20-50-20**

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**PART NUMBER:** F72896-1

**NAME:** BUSHING STAKING TOOL - APU DUCT FLANGE SUPPORT

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** YES

CMM 36-10-01

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The F72896-1 bushing staking tool is used during component maintenance on all 727 airplanes.

F72896 is used to stake the BACB28B-4-239P flanged bushings onto the flanged APU duct support.

F72896 is used to stake flanged bushings onto the flanged APU duct support. The part number of the bearing must be known before the correct tools can be identified. F72896 is used on bearing part number BACB28B-4-239.

Refer to CMM 36-10-01, the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current F72896 drawing for complete usage instructions. If the component overhaul instructions differ from SOPM 20-50-03, use the component overhaul instructions.

F72896-1 consists of:

F72896-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	HOLDING TOOL ASSEMBLY	F72896-2
1	SCREW	F72896-3
1	CURLING PUNCH ASSEMBLY	F72896-4
1	FLATTENER ASSEMBLY	F72896-6
1	STORAGE BOX	

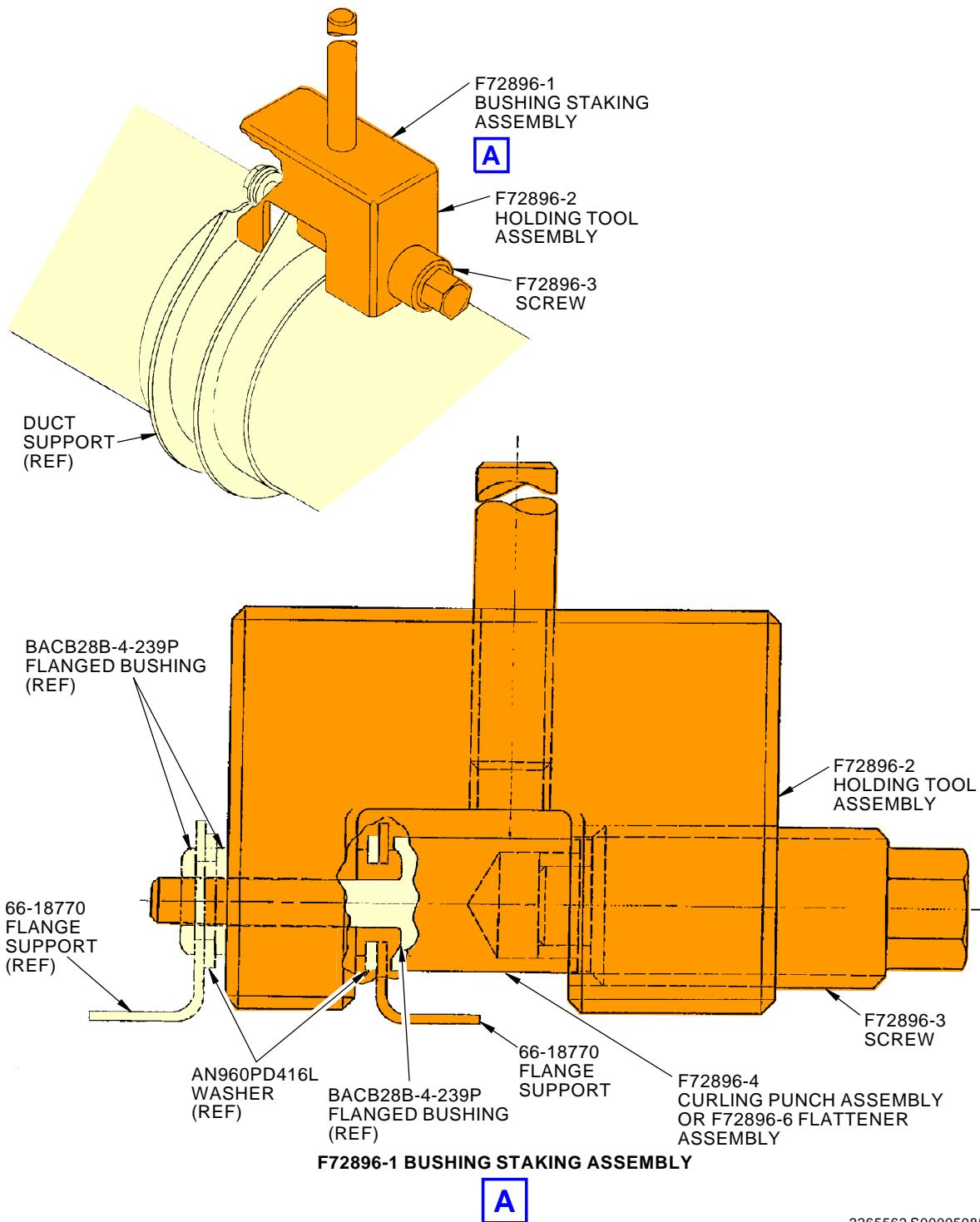
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2265562 S0000508516\_V1

APU Duct Flange Support Bushing Staking tool  
Figure 1

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PART NUMBER: F72916-1

**NAME:** ROLLER SWAGING ASSEMBLY - BEARING HOUSING CONTROL CRANK

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The F72916-1 roller swaging assembly is used during component maintenance on 727 airplanes.

F72916 roller swages the bearing in the 65-21905 rudder trim coordination control crank. The part number of the bearing must be known before the correct tools can be identified. F72916 is used on bearing part numbers: AN201KP5A, BACB10A683, BACB10BX5, BACB10FS5 and MS20201KP5A.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current F72916 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

F72916-1 consists of:

F72916-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	SPINDLE	F72916-2
1	PILOT	F72916-3
1	SHAFT	F72916-4
2	COLLAR	F72916-5
2	ROLLER ASSEMBLY	F72916-6
1	BOLT	AN6-16
1	CLEVIS BOLT	AN21-14
1	CASTELLATED NUT	AN320-1
1	SELF LOCKING NUT	MS21044N6
1	STORAGE BOX	

**NOTE:** F72916-1 replaces the cancelled SE27-2001 for future procurement.

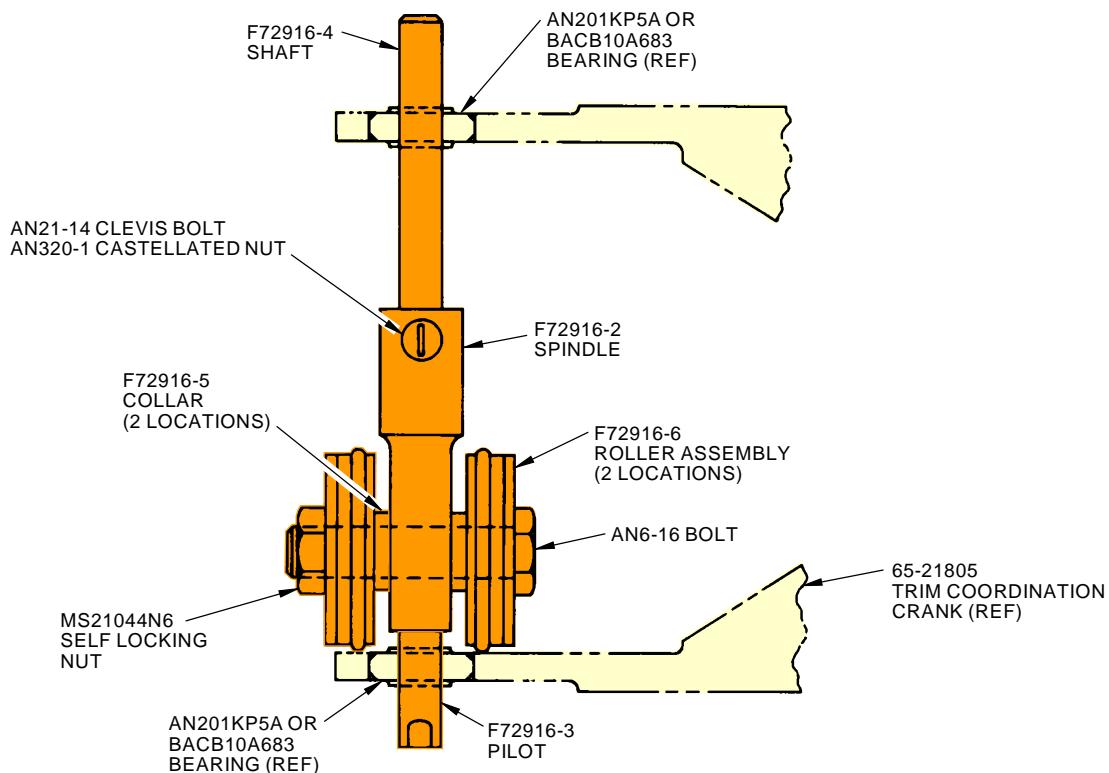
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**F72916-1**  
**ROLLER SWAGING EQUIPMENT USAGE**

2265707 S0000508540\_V1

**Bearing Housing Control Crank Roller Swaging Assembly**  
**Figure 1**

**20-50-22**

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**PART NUMBER: F72975-1**

**NAME:** BEARING INSTALLATION TOOL - TORQUE LIMITER, FLAP TRANSMISSION

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The F72975-1 bearing installation tool is used during component maintenance.

F72975 is used to press the GB98 bearing into the input clutch plate during assembly of the 727 flap transmission torque limiter.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current F72975 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

F72975-1 consists of:

F72975-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	PRESS MANDREL	F72975-2
1	ANVIL	F72975-3
1	STORAGE BOX	

**NOTE:** F72975-1 replaces the cancelled SE27-5102 for future procurement.

**20-50-23**

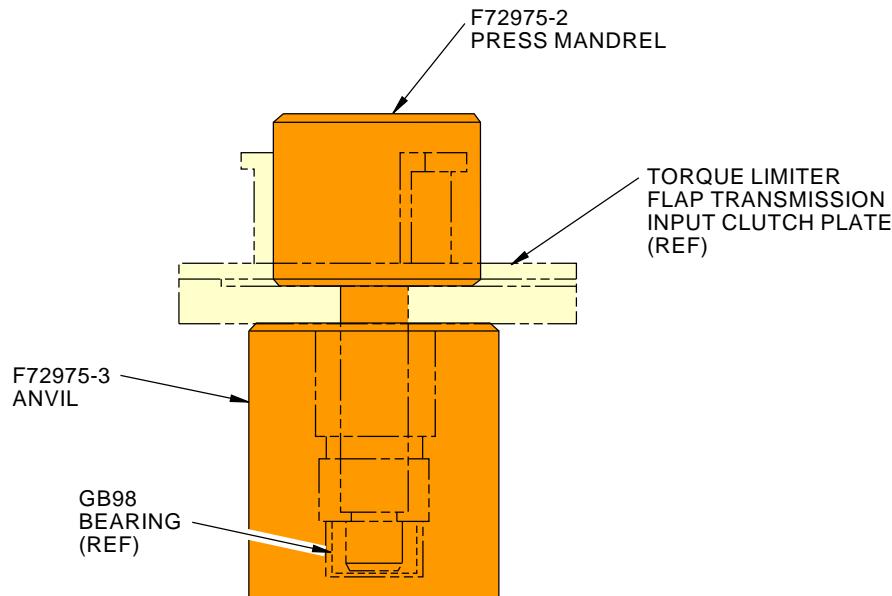
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F72975-1  
BEARING INSTALLATION TOOL

2273114 S0000511769\_V1

Flap Transmission Torque Limiter Bearing Installation Tool  
Figure 1

**20-50-23**

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**PART NUMBER: F73012-1**

**NAME:** SWAGING EQUIPMENT - ROLLER, LOCK ACTUATOR BARREL, MAIN LANDING GEAR

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The F73012-1 is used during component maintenance on 727 airplanes. F73012 is used to roller swage the 10-61905-6 bearings into the main landing gear 65-26414-17 lock actuator barrel.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current F73012 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

F73012-1 consists of:

F73012-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	ROLLER ASSEMBLY	F73012-2
1	ANVIL	F73012-7
1	BOLT	AN6-5A
1	BOLT	AN6-16A
1	WASHER	AN96-616L
1	THRUST BEARING	TB612
1	STORAGE BOX	

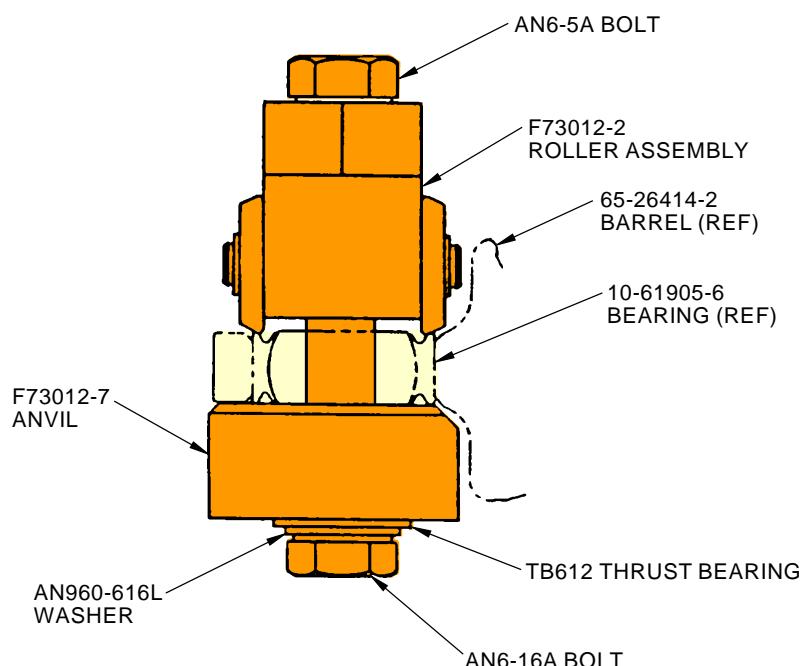
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**F73012-1  
SWAGING EQUIPMENT USAGE**

2265711 S0000508548\_V1

**Main Landing Gear Lock Actuator Barrel Roller Swaging Equipment  
Figure 1**

**20-50-24**

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**737-600/700/800/900**  
**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER:** F80113-37, -50, -61, -64, -70, -88, -95, -105

**NAME:** KIT - ROLLER SWAGE

**AIRPLANE MAINTENANCE:** YES

AMM 78-31-17

**COMPONENT MAINTENANCE:** YES

CMM 32- 11-02, CMM 32-11-06, CMM 32-11-07, CMM 32-11-10, CMM 32-21-02, CMM 55-20-17

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The F80113-37, -50 (optional to -105), -61, -64 (optional to -105), -70 (optional to -88), -88 (preferred to -70) and -105 (preferred to -50 and -64) kits are used during component maintenance on all 707 thru 787 airplanes.

The F80113-95 kit is used during component maintenance on all 777 airplanes.

F80113 is used to roller swage bearings by hand with a spanner wrench. The part number of the bearing must be known before the correct tools can be identified. F80113 is used on bearing part numbers: AMB20-1001, AMB22-1001, BACB10AB10, BACB10AB20, BACB10AB4, BACB10AB4M, BACB10AB6, BACB10AB8M, BACB10AG8, BACB10A88, BACB10CN6, BACB10EN04G, BACB10EN05G, BACB10EN06G, BACB10EN07G, BACB10EN08G, BACB10EN09G, BACB10EN10G, BACB10EN12G, BACB10ES06AG, BACB10ES06G, BACB10FA12G, BACB10FB06G, BACB10FB07G, BACB10FB08G, BACB10FB09G, BACB10FB10G, BACB10FB12G, BACB10FB14G, BACB10FB16G, BACB10FB18G, BACB10FB20G, BACB10FC05, BACB10FC06, BACB10FC07, BACB10FC08, BACB10FC09, BACB10FC10, BACB10FC12, BACB10FC14, BACB10FC16, BACB10FE08, BACB10FE10, BACB10FE12, BACB10FE14, BACB10FH06G, BACB10FH07G, BACB10FH08G, BACB10FH09G, BACB10FH10G, BACB10FH12G, BACB10GB06G, BACB10GB07G, BACB10GB08G, BACB10GB09G, BACB10GB10G, BACB10GB12G, BACB10GB14G, BACB10GB16G, BACB10GB18G, BACB10GB20G, BACB10GC06G, BACB10GC07G, BACB10GD06G, BACB10GD07G, BACB10GD08G, BACB10GD09G, BACB10GD10G, BACB10GD12G, BACB10GD14G, BACB10GD16G, BACB10GD18G, BACB10GD20G, BACB10HA08, BACB10HA10, BACB10JE05, BLFR20-097, BLFR8-148, BNG20E119P016, BNG20E119P032, BNG20E119P093, BNG20E119P125, DAS12-30A1-504, DAS12-30A1-505, DAS6-24A1-518, DAS8-28A1-518, KRP141608V, KR8CNGV03, KSC111008V, KSC135216B, KSC234708V, KSC274009V, KSC401605B, KSC401707B, LHSSG10AD, MS14103-10, MS14103-12, MS14103-14, MS14103-8, MS21154B6, MS21230-10, MS21230-12, MS21230-8, M81936/1-10R, P20360, P20370, P21920, P21920-1, P22960, P22970, P29820,

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P29820P30, P29820P60, S012T236-402, S012T236-700, S012T236-701, S012T236-710, S302T001-206, S302T001-209, S302T001-210, S302T001-215, S302T001-216, S302T001-218, S302T001-223, S302T001-227, S302T001-229, S302T001-234, S302T001-300, S302T001-301, S302T001-302, S302T001-303, S302T001-309, S302T001-404, S302T001-408, S302T001-414, S302T001-419, S302T001-420, S302T001-423, S302T001-701, S302T001-702, S302T001-703, S302T001-801, S302T001-803, S302T001-804, S302T001-805, S302T001-806, S302T001-807, S302T001-821, S302T001-822, S302T001-825, USB10-104,

VTB00030, VTB01130, VTB01140, VTB02240, VTB08550, VTB10820P30, VTB10820P60, WG4B, YTA261, 10-60545-144S, 10-60545-145S, 10-60545-146S, 10-60545-150S, 10-60545-151, 10-60545-151S, 10-60545-154S, 10-60545-155S, 10-60545-156S, 10-60545-157S, 10-60545-163S, 10-60545-163SA, 10-60545-200S, 10-60545-207S, 10-60545-36, 10-60545-40, 10-60545-45, 10-60545-57, 10-60545-64, 10-60545-77, 10-61846-2, 10-61903-5, 10-61905-6, 10-62000-1, 12897, 251W2128-2, 293W2514-1, 293W2514-2, 293W2514-3, 311U0052-2, 55530, 60B00180-103, 60B00180-107, 60B00180-204, 60B00180-227, 60B00180-228, 60B00180-244, 60B00180-246, 60B00180-247, 60B00180-249, 60B00180-250, 60B00180-251, 60B00180-252, 60B00180-254, 60B00180-27, 60B00180-271, 60B00180-272, 60B00180-29, 60B00180-291, 60B00180-293, 60B00180-300, 60B00180-301, 60B00180-332, 60B00180-38, 60B00180-43, 60B00180-46, 60B00180-48, 60B00180-49, 60B00180-50, 60B00180-51, 60B00180-52, 60B00180-71, 60B00180-74, 60B00180-75, 60B96213-1, 69-57622-1, 69-66801-3, 69B17663-1, 69B94365-1, 69B94365-2, 69B94365-3 and 69B94365-4,

F80113-37 is used to roller swage bearings having swage diameter 2 3/8 thru 2 5/8-inches.

F80113-50 for bearings 5/8 thru 2 3/8-inch swage diameters.

F80113-61 for bearings 3 7/8 thru 4 1/8-inch swage diameters.

F80113-64 for bearings 5/8 thru 2 3/8-inch swage diameters.

F80113-70 for bearings 3 thru 3 3/8-inch swage diameters.

F80113-88 for bearings 3 thru 3 5/8-inch swage diameters.

F80113-95 for bearings 5 1/4-inch swage diameter.

F80113-105 for bearings 15/32 thru 2 3/8-inch swage diameter.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03, AMM 78-31-17, CMM 32- 11-02, CMM 32-11-06, CMM 32-11-07, CMM 32-11-10, CMM 32-21-02, CMM 55-20-17 and the current F80113 drawing for complete usage instructions. If the component overhaul instructions differ from SOPM 20-50-03, use the component overhaul instructions.

F80113 kits consists of body assemblies, pilots, spacers, rollers, anvils, bolts, nuts, oil impregnated bronze thrust bearings, and retaining rings. Each F80113 roller swage kit is contained in an individual storage box.

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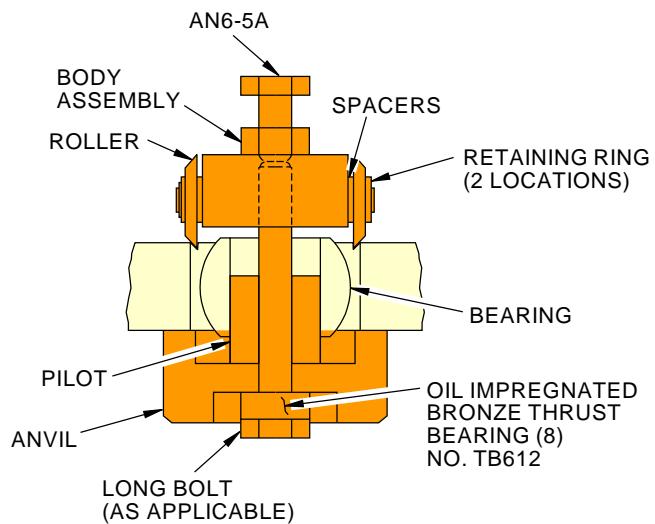
**WEIGHT:** F80113-37 - 3 lbs (1.4 kg)  
F80113-50 - 12 lbs (5.5 kg)  
F80113-61 - 6 lbs (2.7 kg)  
F80113-64 - 13 lbs (5.9 kg)  
F80113-70 - 8 lbs (3.6 kg)  
F80113-88 - 9 lbs (4.1 kg)  
F80113-95 - 17 lbs (7.7 kg)  
F80113-105 - 13 lbs (5.9 kg)

**DIMENSIONS:** Each roller swage kit: 8 x 12 x 12 inches (203 x 305 x 305 mm)

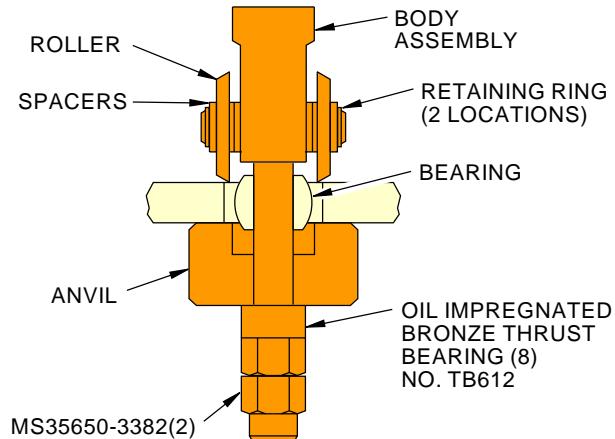
**NOTE:** F80113-88 replaces F80113-70 for future procurement.  
F80113-105 replaces F80113-64 and F80113-50 for future procurement.  
F80113-61 supersedes F80113-44.  
F80113-50 supersedes F80113-34.

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**F80113-37,-50,-61,-64,-70,-88,-105**  
TYPICAL BEARING INSTALLATION



**F80113-50,-64**  
TYPICAL BEARING INSTALLATION

2266006 S0000508609\_V1

**Roller Swage Kit**  
Figure 1 (Sheet 1 of 2)

**20-50-25**

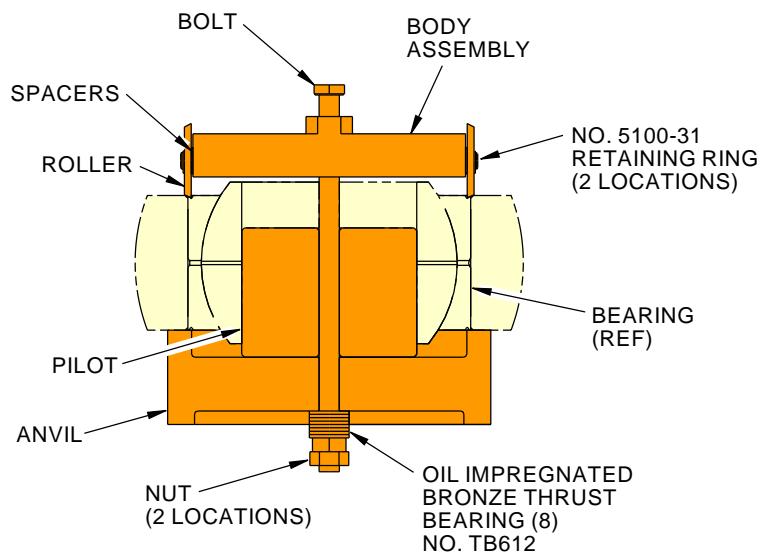
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F80113-95  
TYPICAL BEARING INSTALLATION

2266017 S0000508610\_V1

Roller Swage Kit  
Figure 1 (Sheet 2 of 2)

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**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER: F80117-1, -10**

**NAME:** SWAGE ASSEMBLY - ROLLER

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The F80117-1 or -10 swage assemblies are used on 737-100 thru -500 airplanes.

F80117-1 is used during component maintenance to manually roller swage bearing 10-60545- 205S (without an aluminum sleeve).

F80117-10 roller swage assembly is used during component maintenance to manually roller swage an aluminum sleeve to hold bearing 10-60545-205S.

F80117-1 or -10 roller swage assembly is used to manually swage bearing 10-60545-205S onto the 65-44913 main landing gear actuator head assembly.

F80117-1 is used to roller swage bearing KSC218124B, 10-60545-205S and 10-60545-205SA,

F80117-10 is used to sleeve swage bearing KSC218124B, 10-60545-205S and 10-60545-205SA,

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current F80117 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

F80117-1 and -10 consist of:

F80117-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	BODY ASSEMBLY	F80117-2
1	PILOT	F80117-5
2	ROLLER	F80117-6
1	ANVIL	F80117-7
1	TENSION BOLT	F80117-8
1	LOCK BOLT	F80117-9
1	THRUST BEARING	TB-1016
2	RETAINING RING	5100-50
1	STORAGE BOX	

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F80117-10		
QUANTITY	NOMENCLATURE	PART NUMBER
1	PILOT	F80117-5
1	TENSION BOLT	F80117-8
1	LOCK BOLT	F80117-9
1	ROLLER ASSEMBLY	F80117-11
1	ANVIL	F80117-13
1	THRUST BEARING	TB-1016
1	STORAGE BOX	

**WEIGHT:** 9 lbs (4 kg)

**DIMENSIONS:** 4 x 4 x 9 inches (102 x 102 x 229 mm)

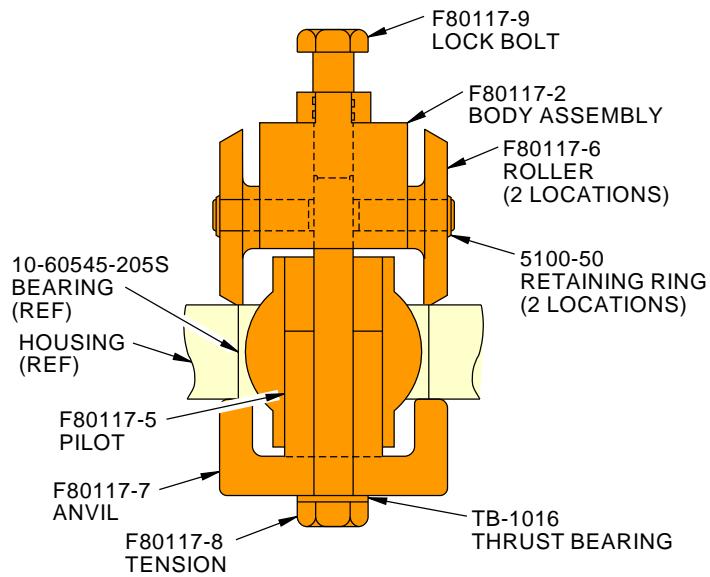
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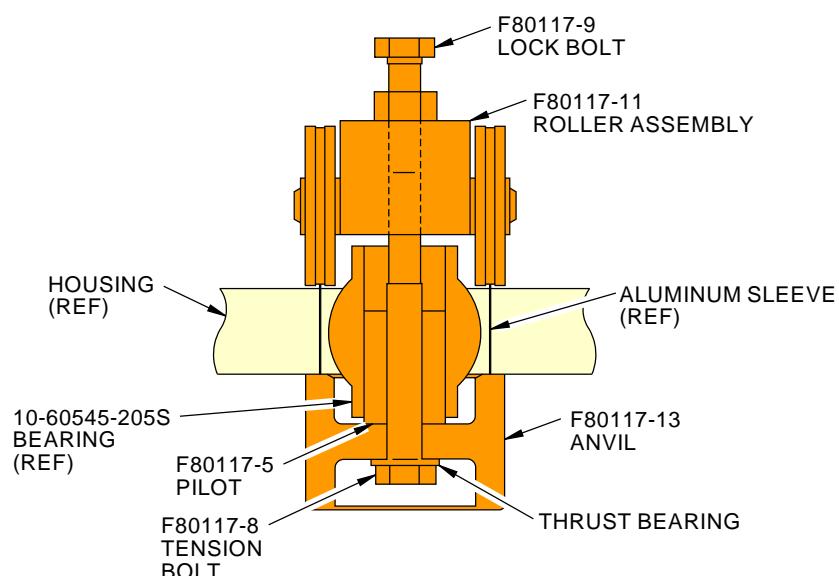
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**F80117-1  
SWAGE ASSEMBLY USAGE**



**F80117-10  
SWAGE ASSEMBLY USAGE**

2266053 S0000508637\_V1

**Roller Swage Assembly**  
**Figure 1**

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**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER:** F80118-1, -15, -27, -31, -38, -42

**NAME:** KIT - BEARING RETENTION/REMOVAL

**AIRPLANE MAINTENANCE:** YES

AMM 27-31-11, AMM 27-31-74

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The F80118-1 sleeve swage kit is used on 737 airplanes equipped with 10-60545-148, BACB10A30DDM, YD134, YD134A, BR8P-81 or BR8N-71 bearings.

The F80118-15 (option, F80118-42 preferred) sleeve swage kit is used on 737 airplanes equipped with DA510-26B1-4, DA510-26B1-7 or DA510-26A1-4 bearings.

The F80118-27 (option, F80118-42 preferred) removal kit is used on 737 airplanes equipped with DA510-26B1-4, DA510-26B1-7 or DA510-26A1-4 bearings.

The F80118-31 bearing sleeve swage kit is used to install bearings during component maintenance on 737 airplanes equipped with MS14104 bearings on elevator control mast.

The F80118-38 (option, F80118-42 preferred) swage and removal kit is used on 737 airplanes equipped with DA510-26B1-4, DA510-26B1-7 or DA510-26A1-4 bearings on elevator control mast.

The F80118-42 (preferred) swage and removal kit is used on 737 airplanes equipped with DSA10-26B1-7, DAS10-26A1-4, DAS10-26B1-502 and DAS10-26B-504 bearing.

F80118-1, -15 and -31 are used to swage bearing retention sleeves. F80118-27 is used to remove bearing retention sleeves. F80118-38 combines F80118-15 (bearing swage) and F80118-27 (bearing removal).

F80118 is used to remove bearing part numbers: DAS10-26A1-4, DAS10-26A1-501, DAS10-26B1-4, DAS10-26B1-502, DAS10-26B1-504 and DAS10-26B1-7.

F80118 is used to roller swage bearing part numbers: BACB10A30DDM, BR8N71, BR8P81 and 10-60545-148.

F80118 is used to sleeve swage bearing part numbers: BACB10F16, BACB10M32, DAS10-26A1-4, DAS10-26A1-501, DAS10-26B1-4, DAS10-26B1-502, DAS10-26B1-504, DAS10-26B1-7, YD134, YD134A, YD134B, and 60B00180-101.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03, AMM 27-31-11, AMM 27-31-74 and the current F80118 drawing for complete usage instructions. If the usage instructions differ from SOPM 20-50-03, use the component overhaul instructions.

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F80118-1, -15, -31 -27, -38 and -42 consist of:

F80118-1 SLEEVE SWAGE KIT		
QUANTITY	NOMENCLATURE	PART NUMBER
2	ROLLER	F80118-2
2	ROLLER	F80118-3
1	ANVIL	F80118-4
1	PILOT	F80118-5
1	PILOT	F80118-6
1	PILOT	F80118-7
1	BODY ASSEMBLY	F80118-8
1	BOLT	F80118-11
1	LOCK BOLT	F80118-12
2	RETAINING RING	F80118-45
1	THRUST BEARING	F80118-46
1	STORAGE BOX	

F80118-15 SLEEVE SWAGE KIT		
QUANTITY	NOMENCLATURE	PART NUMBER
1	SHAFT	F80118-17
1	BUSHING	F80118-18
1	ANVIL	F80118-20
1	DETENT PIN	F80118-24
1	PLAIN WASHER	F80118-25
2	HEX JAM NUT	F80118-26
1	BODY ASSEMBLY	F80118-23
1	THRUST BEARING	F80118-47
1	STORAGE BOX	

F80118-27 REMOVAL KIT		
QUANTITY	NOMENCLATURE	PART NUMBER
1	SHAFT	F80118-17
1	BUSHING	F80118-18
1	ANVIL	F80118-20
1	DETENT PIN	F80118-24
1	PLAIN WASHER	F80118-25
2	HEX JAM NUT	F80118-26
1	CUTTER	F80118-29
1	THRUST BEARING	F80118-47
1	STORAGE BOX	

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F80118-31 SLEEVE SWAGE KIT		
QUANTITY	NOMENCLATURE	PART NUMBER
1	SHAFT	F80118-17
1	DETENT PIN	F80118-24
1	PLAIN WASHER	F80118-25
2	HEX JAM NUT	F80118-26
1	BODY ASSEMBLY	F80118-32
1	ANVIL	F80118-34
1	BUSHING	F80118-35
1	THRUST BEARING	F80118-47
1	STORAGE BOX	

F80118-38 SWAGE AND REMOVAL KIT		
QUANTITY	NOMENCLATURE	PART NUMBER
1	SHAFT	F80118-17
1	BUSHING	F80118-18
1	ANVIL	F80118-20
1	BODY ASSEMBLY	F80118-23
1	DETENT PIN	F80118-24
1	PLAIN WASHER	F80118-25
2	HEX JAM NUT	F80118-26
1	CUTTER	F80118-29
1	THRUST BEARING	F80118-47
1	STORAGE BOX	

F80118-42 SWAGE AND REMOVAL KIT		
QUANTITY	NOMENCLATURE	PART NUMBER
1	SHAFT	F80118-17
1	BUSHING	F80118-18
1	ANVIL	F80118-20
1	BODY ASSEMBLY	F80118-23
1	DETENT PIN	F80118-24
1	PLAIN WASHER	F80118-25
2	HEX JAM NUT	F80118-26
1	CUTTER	F80118-29
1	ANVIL	F80118-44
1	THRUST BEARING	F80114-47
1	STORAGE BOX	

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**WEIGHT:** F80118-1 - 3 lbs (1.4 kg)

F80118-15 - 1.2 lbs (0.5 kg)

F80118-27, -31 or -38 - 1.5 lbs (0.7 kg)

F80118-42 - 2 lbs (0.9)

**DIMENSIONS:** F80118-1 - 2 x 6 x 12 inches (51 x 152 x 305 mm)  
F80118-15, -27, -31, -38 or -42 - 2 x 6 x 9 inches (51 x 152 x 229 mm)

**NOTE:** F80118-42 replaces F80118-15, -27 and -38 for future procurement.

**20-50-27**

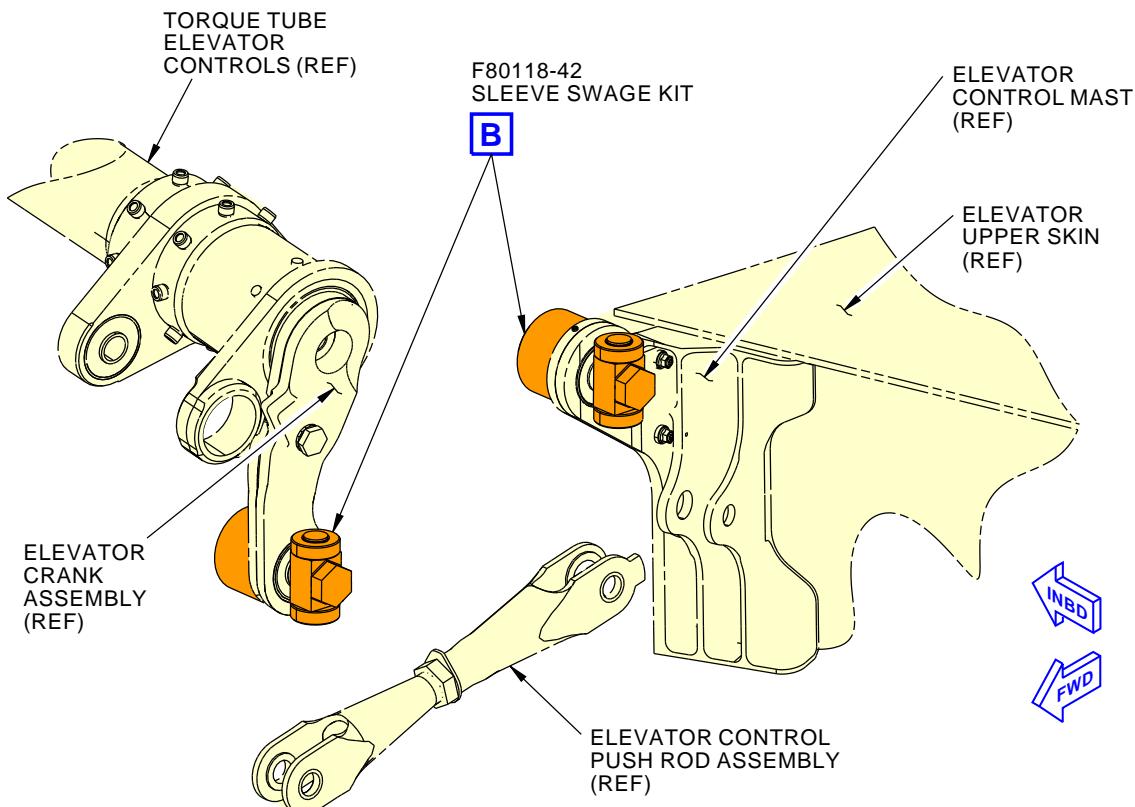
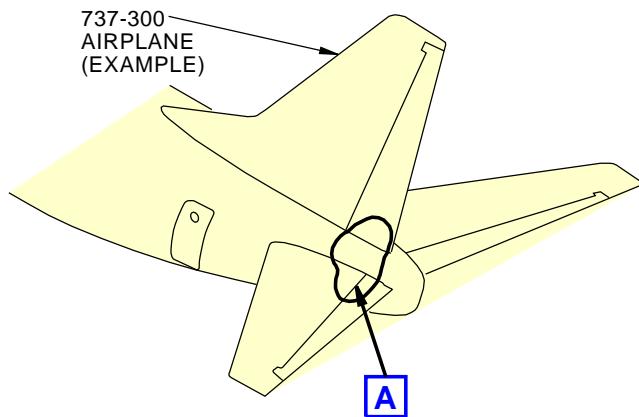
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LEFT HAND ELEVATOR SHOWN  
(ELEVATOR AND HORIZONTAL STABILIZER NOT SHOWN FOR CLARITY)



2266103 S0000508689\_V1

Bearing Retention Sleeve Retention Kit  
Figure 1 (Sheet 1 of 3)

20-50-27

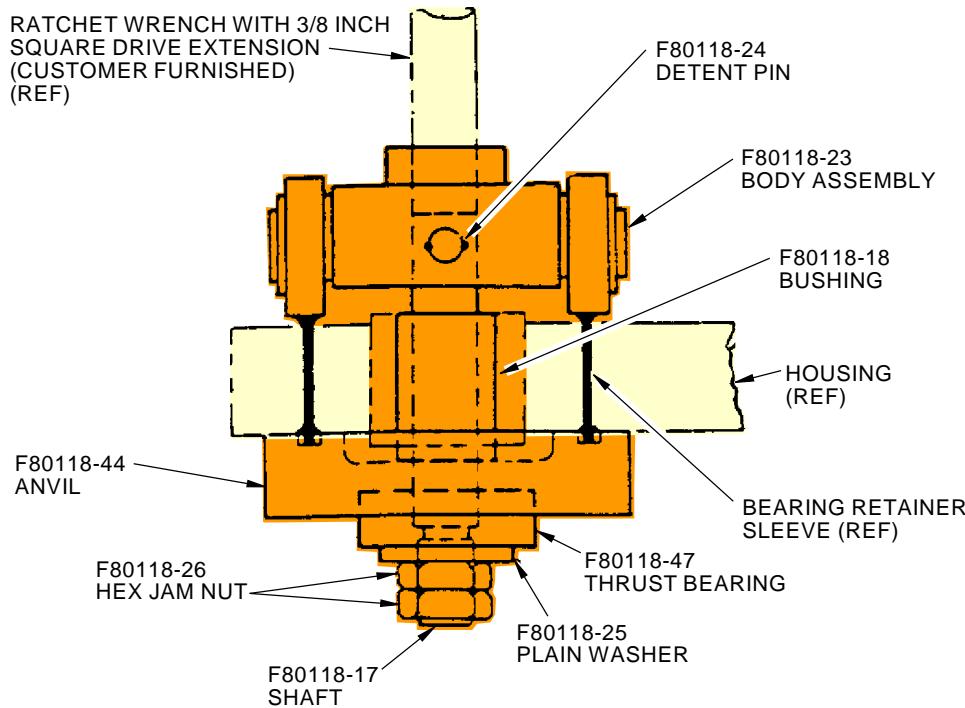
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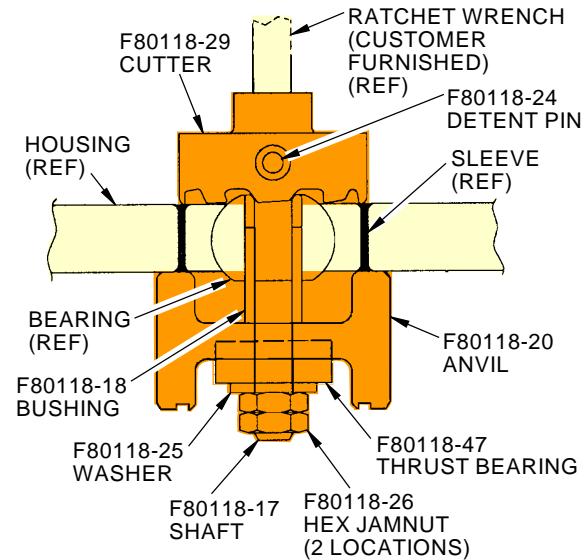
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F80118-42 SWAGE AND REMOVAL KIT SHOWN  
SWAGE USAGE



F80118-42 SWAGE AND REMOVAL KIT SHOWN  
REMOVAL USAGE

B

2266223 S0000508691\_V1

Bearing Retention Sleeve Retention Kit  
Figure 1 (Sheet 2 of 3)

20-50-27

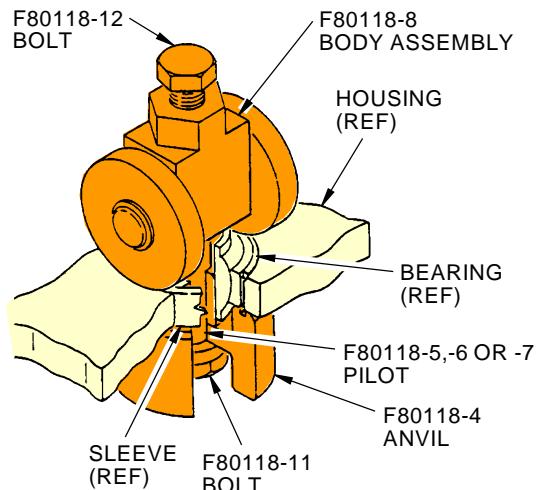
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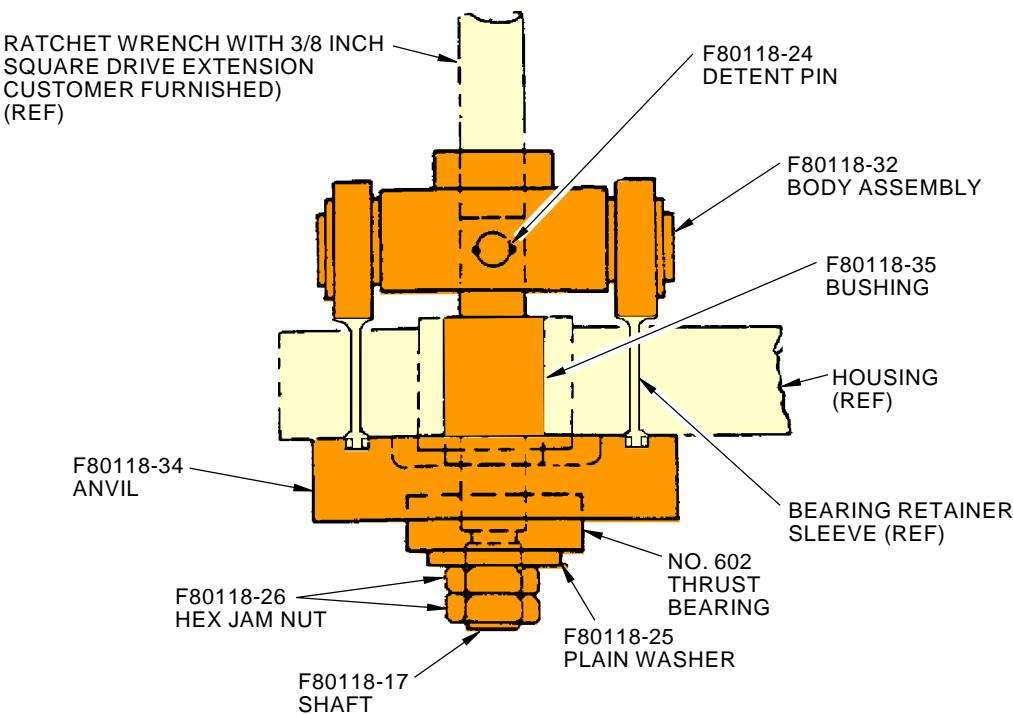
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**F80118-1  
SLEEVE SWAGE KIT**



**F80118-31  
SWAGE KIT**

2266231 S0000508692\_V1

Bearing Retention Sleeve Retention Kit  
Figure 1 (Sheet 3 of 3)

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**PART NUMBER: F80205-1**

**NAME:** BEARING SWAGING EQUIPMENT

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The F80205-1 bearing swaging equipment is used during component maintenance.

F80205-1 is used to roller swage spherical bearings specification part numbers 10-61846-3, 10-61970-2 and 10-61970-3 in place into the nose gear upper drag brace assembly, per specification BAC5435.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current F80205 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

F80205-1 consists of:

F80205-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	ROLLER ASSEMBLY	F80205-2
1	PRIMARY ANVIL	F80205-3
1	SECONDARY ANVIL	F80205-4
1	STORAGE BOX	

**NOTE:** F80205 is replaced by Rexnord part number RST2677 for future procurement.

**20-50-28**

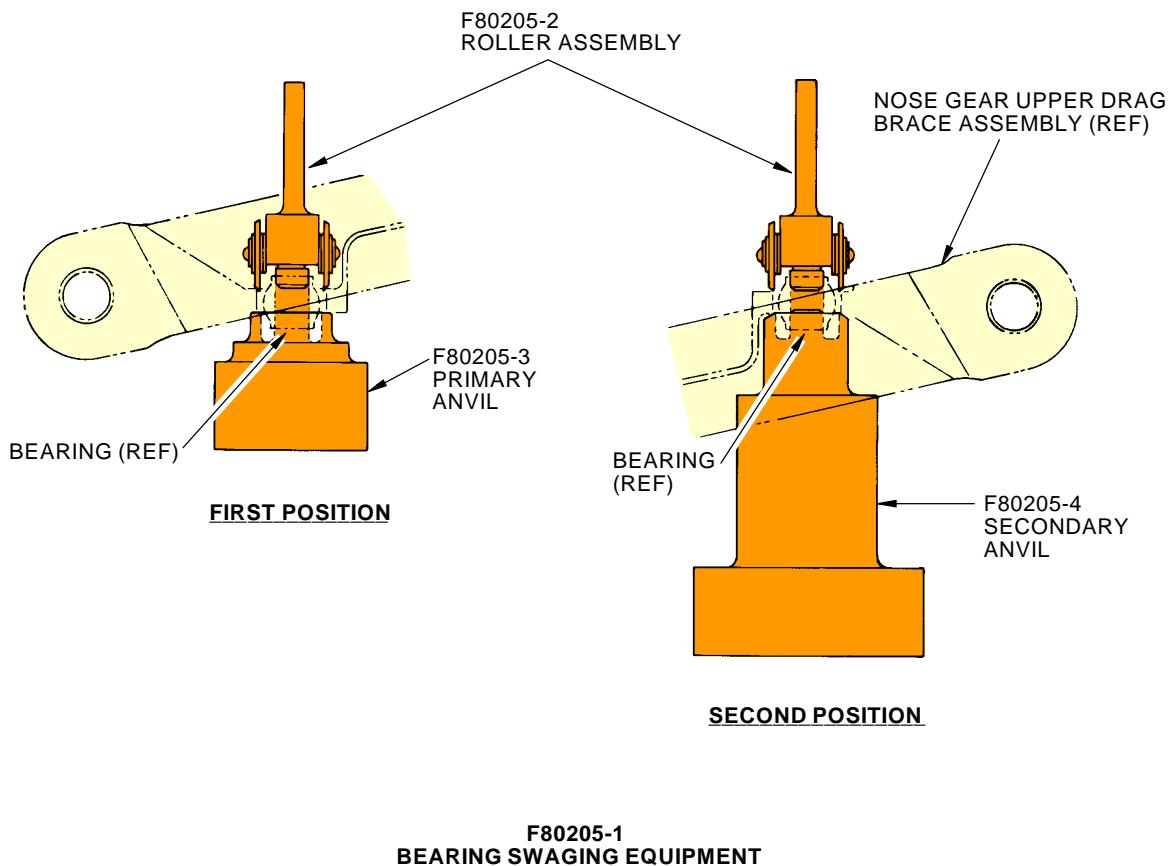
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2273643 S0000512013\_V1

Bearing Swaging Equipment  
Figure 1

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ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: G20001-1, -18

NAME: SWAGING EQUIPMENT - FORE FLAP LEVER BEARING

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: YES

CMM 57-52-31

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The G20001-1 and -18 are used during component maintenance.

G20001-1 swaging equipment is typically used during component maintenance of inboard trailing edge fore flap assemblies. G20001-1 is used to roller swage BACB10FE12, MS14103-12, MS21230-12, MS21130-12 or MS21132-12 bearings into 65B02023-3, -4 or -6 levers.

G20001-18 swaging equipment is typically used during component maintenance of inboard trailing edge fore flap assemblies. G20001-18 is used to roller swage specification 10-60545-207S bearings into 65B02023-9, -10, -12 or -14 levers.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current G20001 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

G20001-1 and -18 consist of:

G20001-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	BODY ASSEMBLY	G20001-2
1	ANVIL	G20001-7
1	STORAGE BOX	

G20001-18		
QUANTITY	NOMENCLATURE	PART NUMBER
1	BODY ASSEMBLY	G20001-19
1	ANVIL	G20001-20
1	STORAGE BOX	

WEIGHT: G20001-1 - 1 lb (0.45 kg)  
G20001-18 - 1.6 lb (0.73 kg)

DIMENSIONS: 3 x 4 x 10 inches (76 x 102 x 254 mm)

NOTE: G20001-18 supersedes G20001-10.

20-50-29

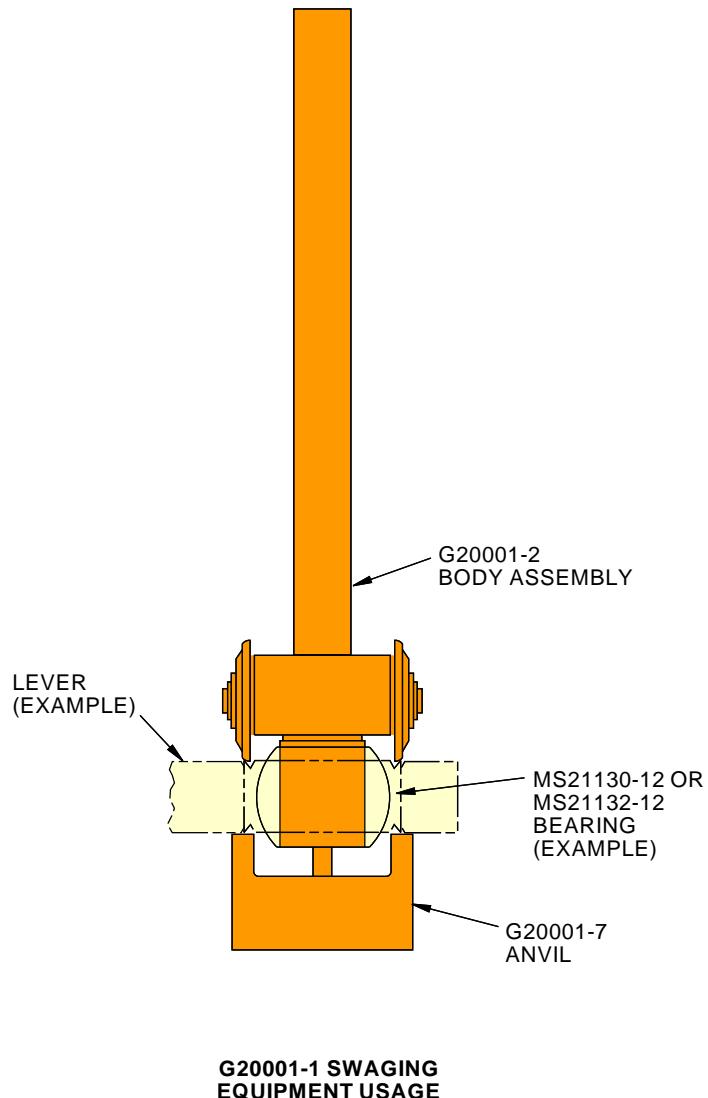
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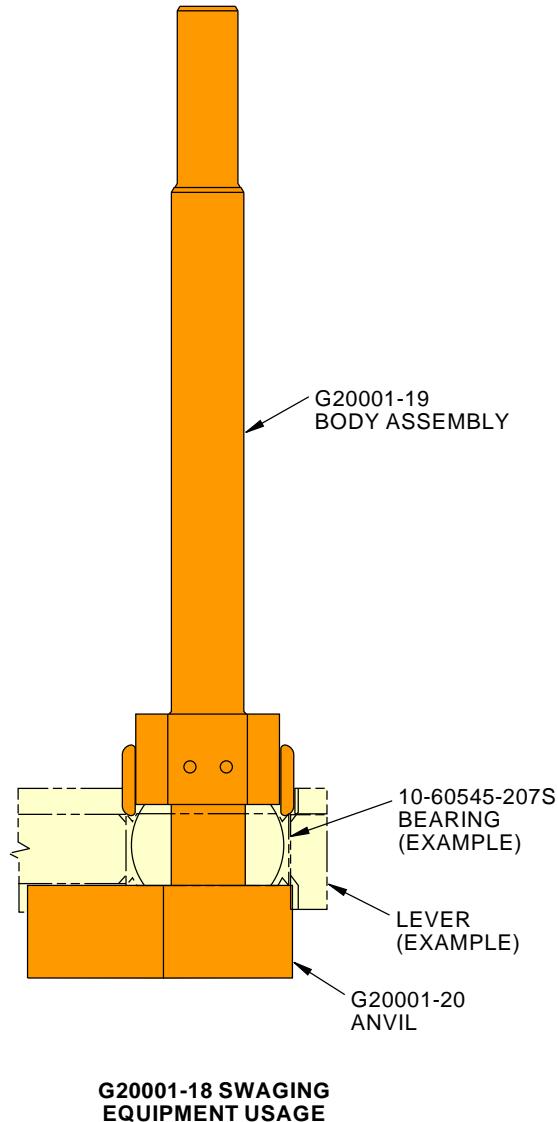
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Fore Flap Lever Bearing Swaging Equipment  
Figure 1 (Sheet 1 of 2)

**20-50-29**



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2274118 S0000511901\_V1

Fore Flap Lever Bearing Swaging Equipment  
Figure 1 (Sheet 2 of 2)

**20-50-29**



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ILLUSTRATED TOOL AND EQUIPMENT MANUAL

**PART NUMBER:** G20003-15

**NAME:** STAKING EQUIPMENT - MAIN LANDING GEAR. ACTUATOR

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The G20003-15 staking equipment is used during component maintenance.

G20003 is used to assemble and stake 60B00178-5 bearings into 65B01570 or 65B01501 wing landing gear retract actuators with 69B80028-1 sleeves.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current G20003 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

G20003-15 consists of:

G20003-15		
QUANTITY	NOMENCLATURE	PART NUMBER
1	DIE ASSEMBLY	G20003-16
1	SHIM	G20003-4
1	SHIM	G20003-5
1	SHIM	G20003-6
1	STORAGE BOX	

**WEIGHT:** 10 lbs (4.5 kg)

**DIMENSIONS:** 7 x 10 x 10 inches (178 x 254 x 254 mm)

**NOTE:** G20004 replaces G20003 and ST929-2B for future procurement.

G20003-15 supersedes G20003-1.

G20003 supersedes 7MIT65B01502.

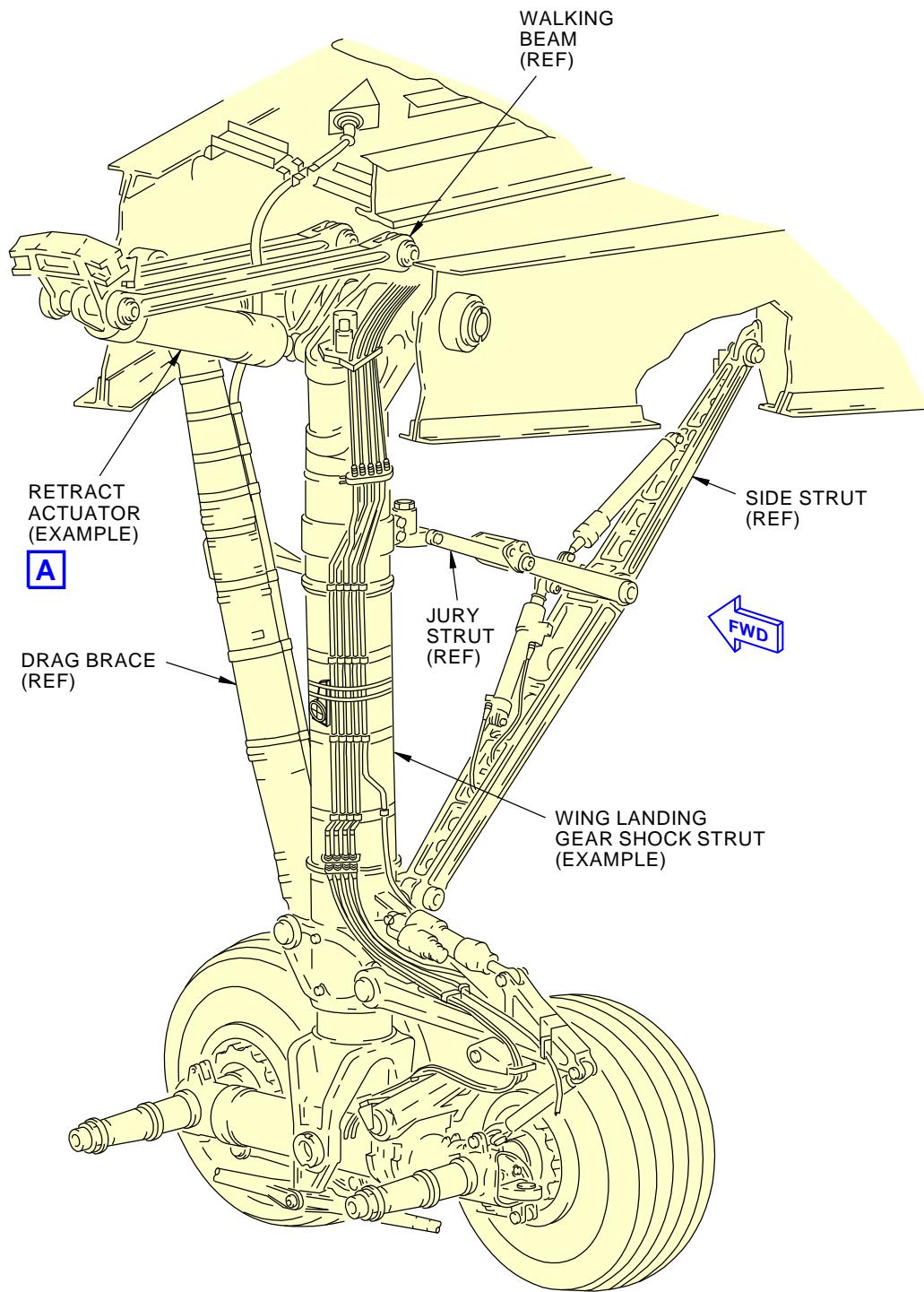
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2274427 S0000512092\_V1

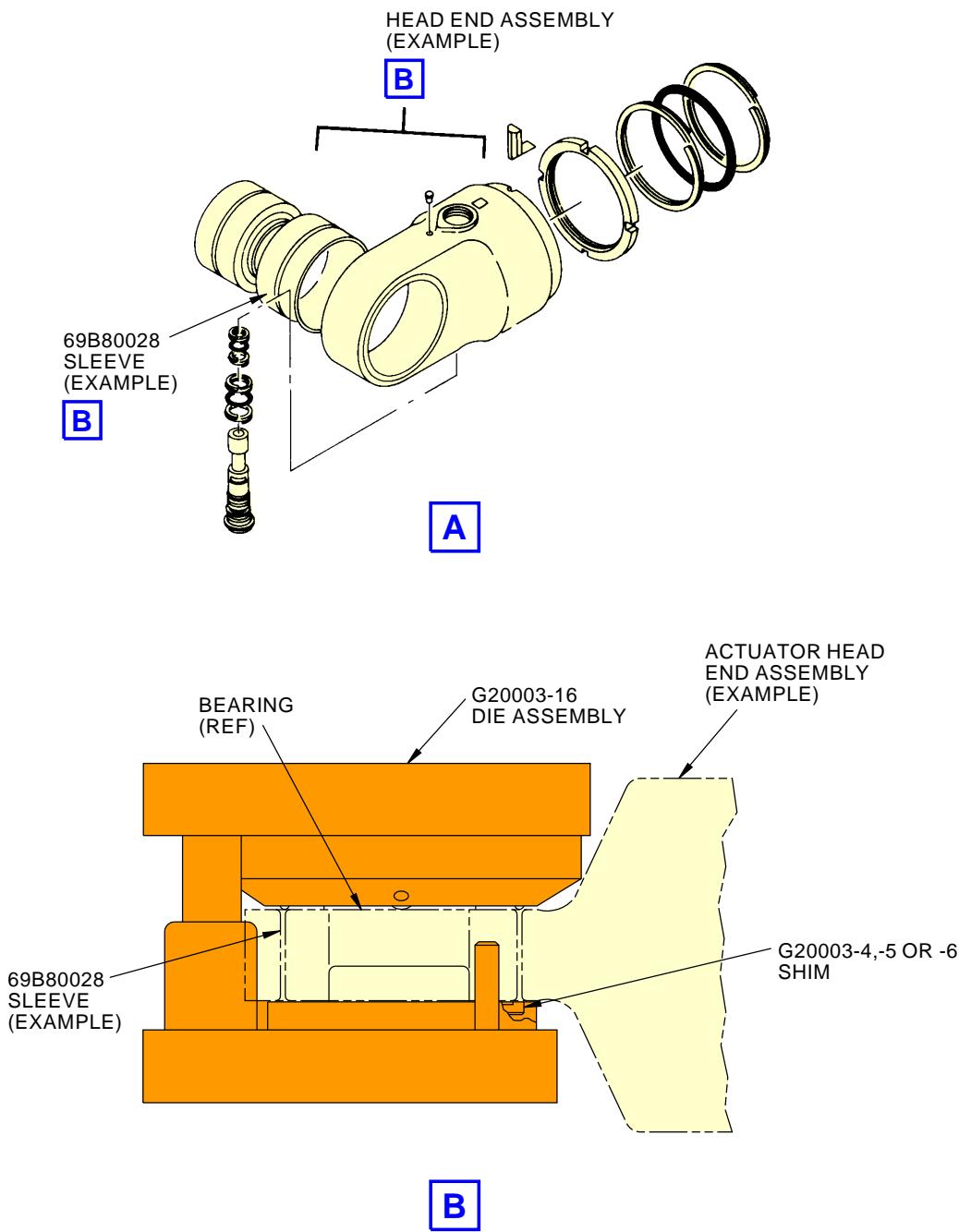
**Main Landing Gear Actuator Staking Equipment**  
**Figure 1 (Sheet 1 of 2)**

**20-50-30**

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**737-600/700/800/900**  
**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**



2274511 S0000512093\_V1

**Main Landing Gear Actuator Staking Equipment**  
**Figure 1 (Sheet 2 of 2)**

**20-50-30**



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ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: G20004-15

**NAME:** STAKING EQUIPMENT - BODY LANDING GEAR AND WING LANDING GEAR, RETRACT ACTUATOR, ROD END AND HEAD END

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** YES

CMM 32-32-11, CMM 32-32-12, CMM 32-33-11

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The G20004-15 staking equipment is used during component maintenance.

G20004 is used to assemble and stake 60B00178-4 and -5 bearings into 65B01570 or 65B01501 wing landing gear retract actuators. G20004 is also used to assemble and stake 65B01502 body landing gear retract actuators with 69B80080-1 sleeves.

Refer to CMM 32-32-11, CMM 32-32-12, CMM 32-33-11, the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current G20004 drawing for complete usage instructions. If the component overhaul instructions differ from the data in SOPM 20-50-03, use the component overhaul instructions.

G20004-15 consists of:

G20004-15		
QUANTITY	NOMENCLATURE	PART NUMBER
1	STAKING PUNCH ASSEMBLY	G20004-16
1	STAKING ANVIL ASSEMBLY	G20004-17
1	STAKING PUNCH	G20004-4
1	STAKING PUNCH	G20004-5
1	STAKING ANVIL	G20004-6
1	STAKING ANVIL	G20004-7
1	STORAGE BOX	

**WEIGHT:** 15 lbs (7 kg)

**DIMENSIONS:** 7 x 16 x 24 inches (178 x 406 x 610 mm)

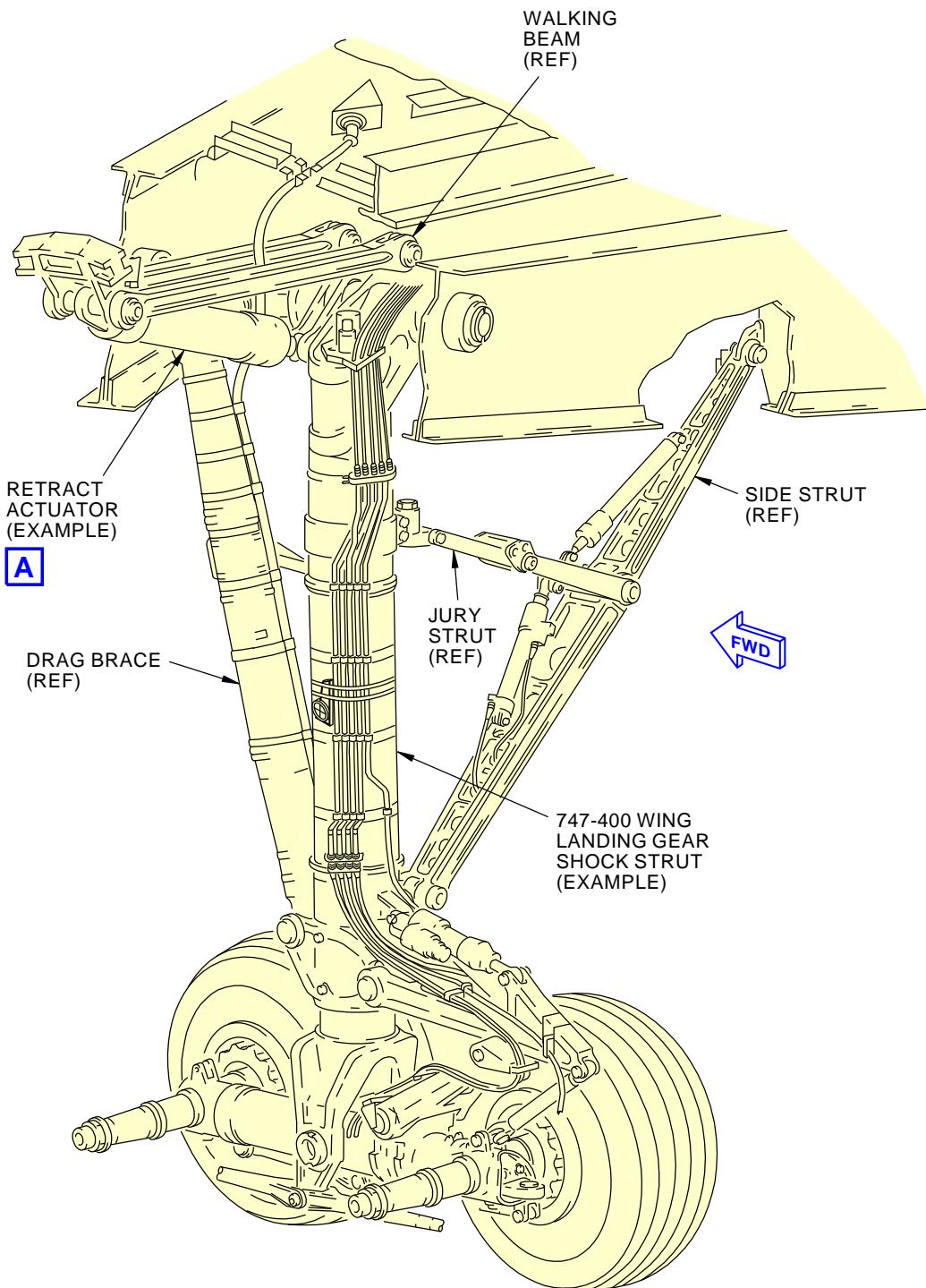
**NOTE:** G20004 replaces G20003 and ST929-2B for future procurement.  
G20004-15 supersedes G20004-1.

**20-50-31**

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2274281 S0000512082\_V1

Rod and Head End Retract Actuator, Body and Wing Landing Gear, Staking Equipment  
Figure 1 (Sheet 1 of 3)

**20-50-31**

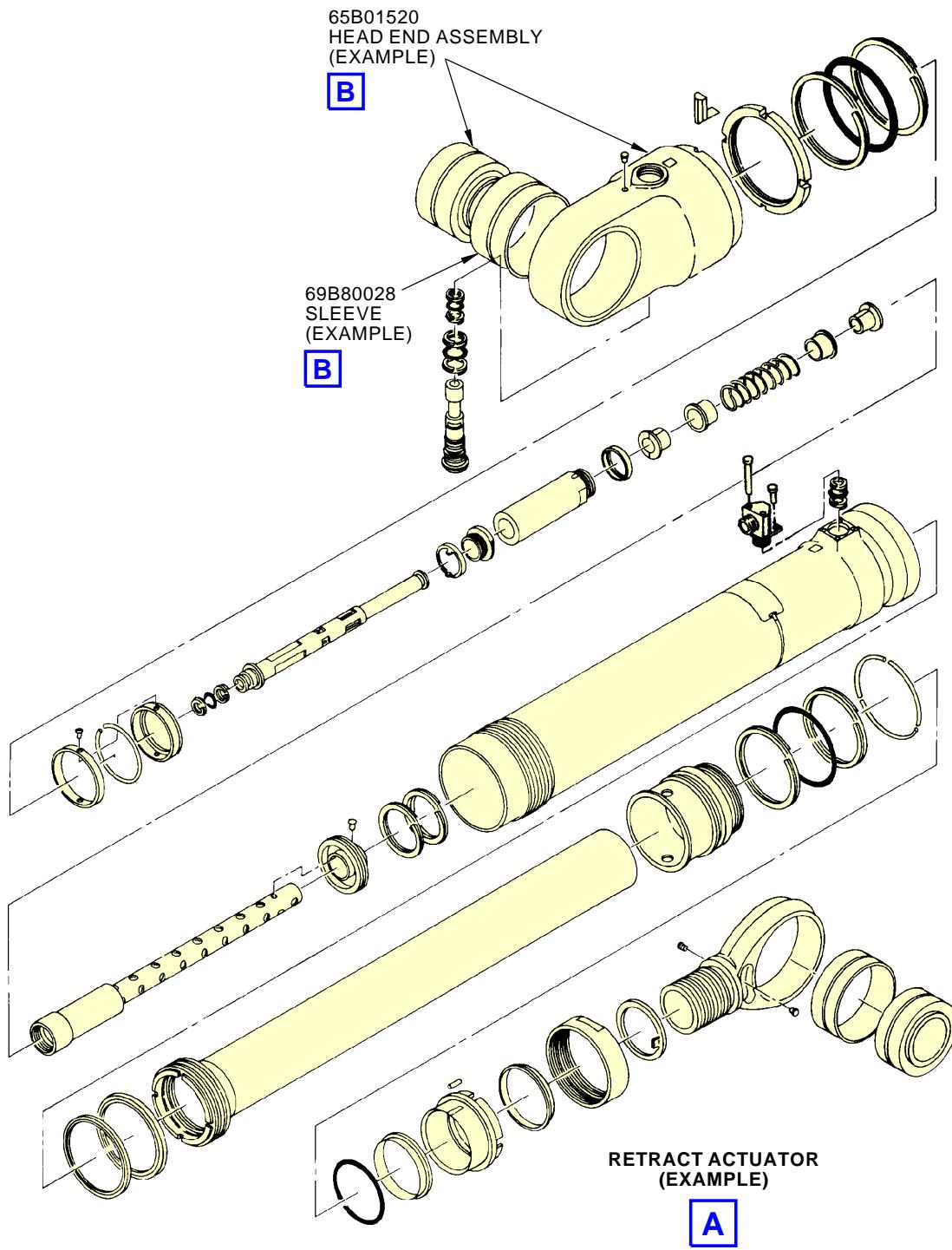
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2274351 S0000512083\_V1

Rod and Head End Retract Actuator, Body and Wing Landing Gear, Staking Equipment  
Figure 1 (Sheet 2 of 3)

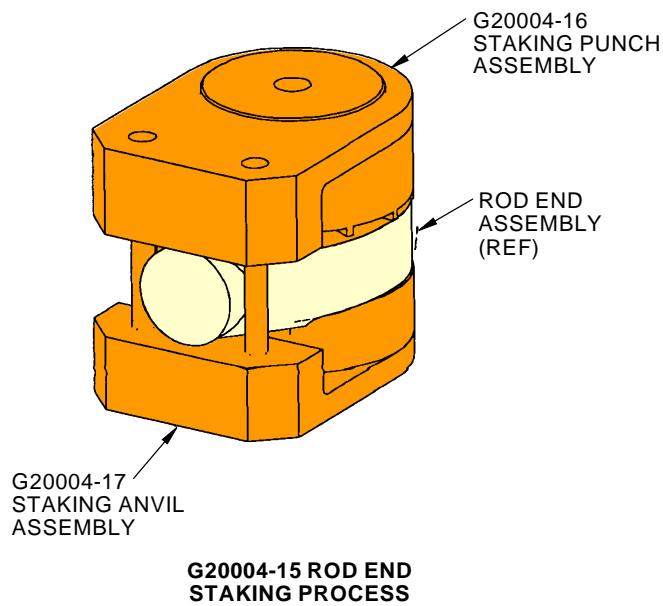
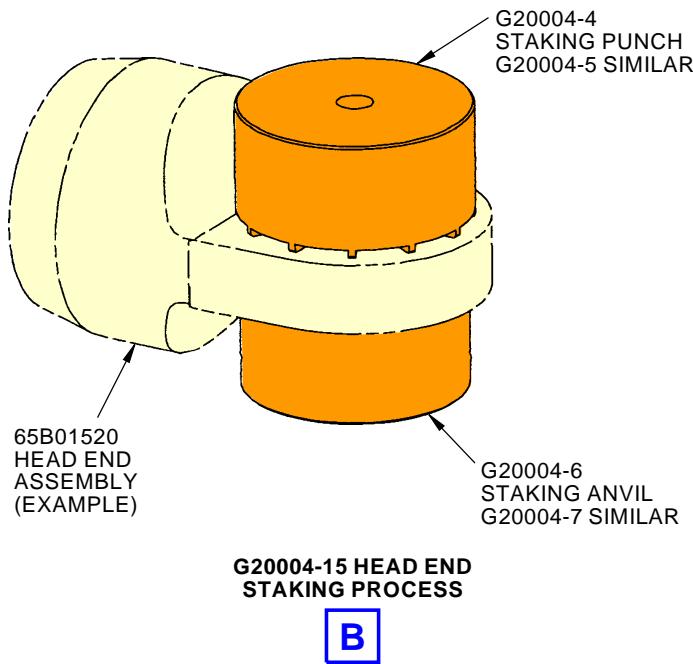
**20-50-31**

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2274382 S0000512085\_V1

Rod and Head End Retract Actuator, Body and Wing Landing Gear, Staking Equipment  
Figure 1 (Sheet 3 of 3)

**20-50-31**



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PART NUMBER: G32019-1

**NAME:** ROLLER SWAGING EQUIPMENT - OUTBOARD TRUNNION BEARING ASSEMBLY, MAIN LANDING GEAR

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** YES

CMM 32-13-31, CMM 32-13-34, CMM 32-13-35, CMM 32-13-38, CMM 32-13-39

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The G32019-1 roller swaging equipment is used during component maintenance.

G32019 is used in conjunction with a customer-furnished drill press for roller swaging of 747-100 thru -400 airplane, outboard trunnion bearing assemblies. G32019 is used on Boeing part numbers: 65B05206 bearing assembly, 69B13387-1 sleeve and 65B05215 ball bearings.

Refer to CMM 32-13-31, CMM 32-13-34, CMM 32-13-35, CMM 32-13-38, CMM 32-13-39, the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current G32019 drawing for complete usage instructions. If the component overhaul instructions differ from the data in SOPM 20-50-03, use the component overhaul instructions.

G32019-1 consists of:

G32019-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	BASE ASSEMBLY	G32019-2
1	SWAGING ASSEMBLY	G32019-3
1	STORAGE BOX	

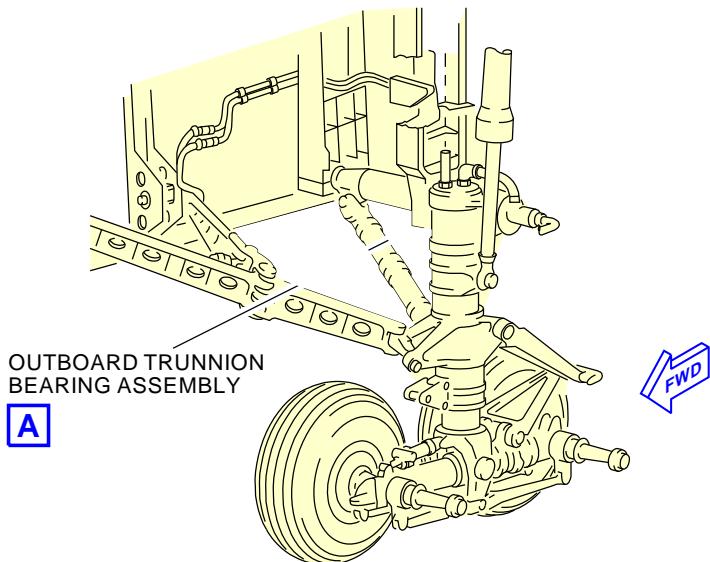
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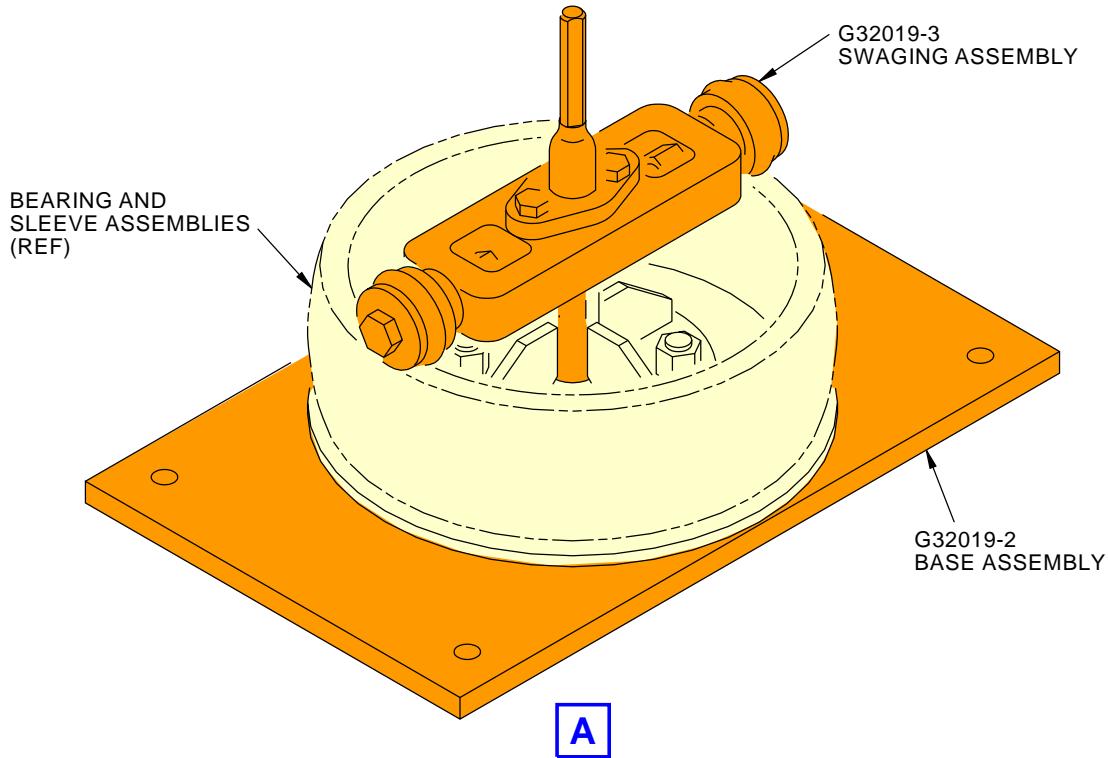
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747 BODY LANDING GEAR



2273710 S0000512130\_V1

Main Landing Gear Outboard Trunnion Bearing Assembly roller Swaging Equipment  
Figure 1

**20-50-32**



**737-600/700/800/900**  
**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER: G78004-1, -12**

**NAME:** INSTALLATION/REMOVAL EQUIPMENT - OVERSIZE BEARING

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** YES

CMM 78-31-11

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The G78004-1 (option) or G78004-12 (preferred) installation/removal equipment is used during component maintenance on 747-100 thru -300 airplanes equipped with JT9D-7F engines.

G78004 is used to install or remove oversized fan thrust reverser blocker door hinge P21460 bearings on the JT9D-7F engine.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current G78004 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

G78004-12 consists of:

G78004-12		
QUANTITY	NOMENCLATURE	PART NUMBER
1	ROLLER ASSEMBLY	G78004-2
2	ANVIL	G78004-7
1	CUTTER ASSEMBLY	G78004-13
1	STORAGE BOX	

**NOTE:** G78004-12 replaces G78004-1 for future procurement.

**20-50-33**

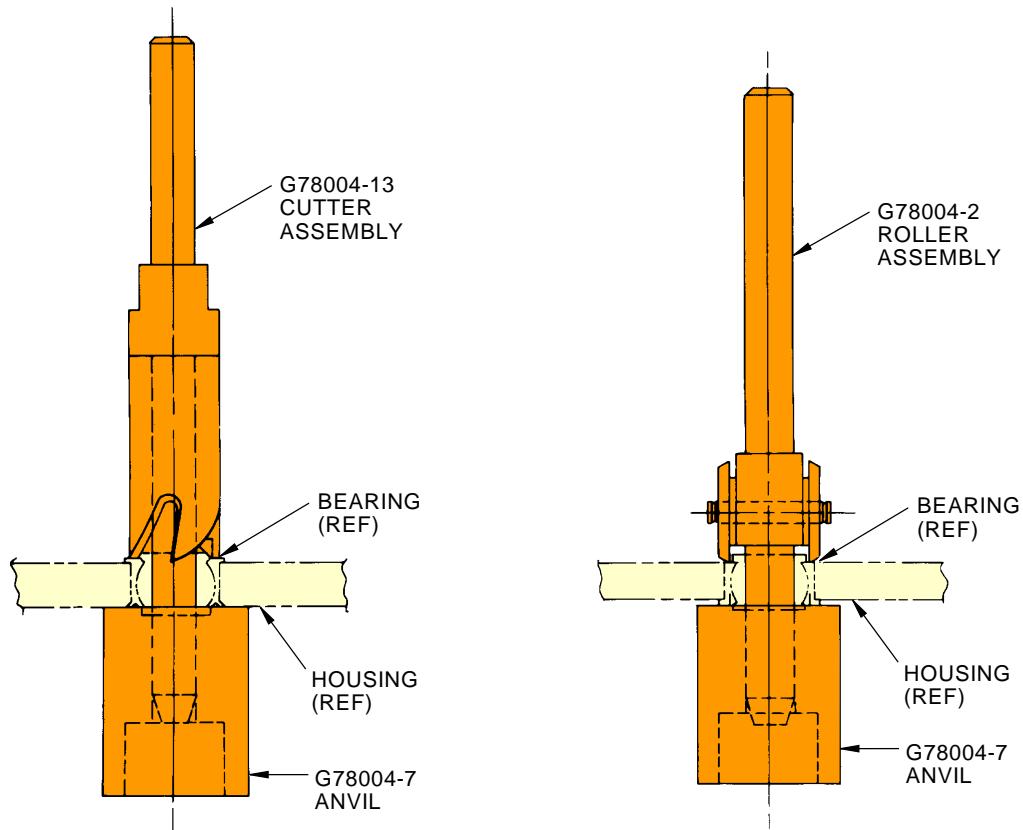
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G78004-12 REMOVAL USAGE

G78004-12 INSTALLATION USAGE

2273890 S0000511939\_V1

Oversize Bearing Installation/Removal Equipment  
Figure 1

**20-50-33**



**737-600/700/800/900**  
**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER:** J20010-1, -2, -3, -4, -5, -6, -7, -8

**NAME:** WRENCH - SPANNER, BEARING RETAINER NUT

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The J20010-1 and -5 bearing retainer nut spanner wrenches are used during component maintenance on all 747, 757 and 767 airplanes.

The J20010-4 bearing retainer nut spanner wrench is used during component maintenance on all 737-600 thru -900 airplanes.

The J20010-2, -3, -5, -6, -7 and -8 bearing retainer nut spanner wrenches are used during component maintenance on all 777 airplanes.

J20010 is used to remove or install bearing retainer nuts and bearing races. Two J20010 spanner wrenches and two customer furnished 3/8 inch drive wrenches are required for bearing removal and installation. The part number of the bearing must be known before the correct tools can be identified. J20010 is used on bearing part numbers: S302T001-213, S302T001-306, S302T001-307, S302T001-409, S302T001-415, S302T001-417, S302T001-425, S302T001-428, S302T001-433, S302T001-434, S302T001-435, S302T001-437 and S302T001-438.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current J20010 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

J20010-1 consists of a single, J20010-1 spanner wrench.

J20010-2 consists of a single, J20010-2 spanner wrench.

J20010-3 consists of a single, J20010-3 spanner wrench.

J20010-4 consists of a single, J20010-4 spanner wrench.

J20010-5 consists of a single, J20010-5 spanner wrench.

J20010-6 consists of a single, J20010-6 spanner wrench.

J20010-7 consists of a single, J20010-7 spanner wrench.

J20010-8 consists of a single, J20010-8 spanner wrench.

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**WEIGHT:** J20010-1 - 0.12 lbs (0.05 kg)

J20010-2 - 0.30 lbs (0.14 kg)

J20010-3 - 0.44 lbs (0.20 kg)

J20010-4 - 0.12 lbs (0.05 kg)

J20010-5 - 0.06 lbs (0.03 kg)

J20010-6 - 0.09 lbs (0.04 kg)

J20010-7 - 0.13 lbs (0.06 kg)

J20010-8 - 0.47 lbs 0.21 kg)

**DIMENSIONS:** J20010-1 - 0.7 x 1.2 x 1.2 inches (17.8 x 30.5 x 30.5 mm)

J20010-2 - 0.7 x 1.9 x 1.9 inches (17.8 x 48.3 x 48.3 mm)

J20010-3 - 0.7 x 2.3 x 2.3 inches (17.8 x 58.4 x 58.4 mm)

J20010-4 - 0.7 x 1.3 x 1.3 inches (17.8 x 33 x 33 mm)

J20010-5 - 0.7 x 0.9 x 0.9 inches (17.8 x 22.9 x 22.9 mm)

J20010-6 - 0.7 x 1.1 x 1.1 inches (17.8 x 27.9 x 27.9 mm)

J20010-7 - 0.7 x 1.3 x 1.3 inches (17.8 x 33 x 33 mm)

J20010-8 - 0.7 x 2.3 x 2.3 inches (17.8 x 58.4 x 58.4 mm)

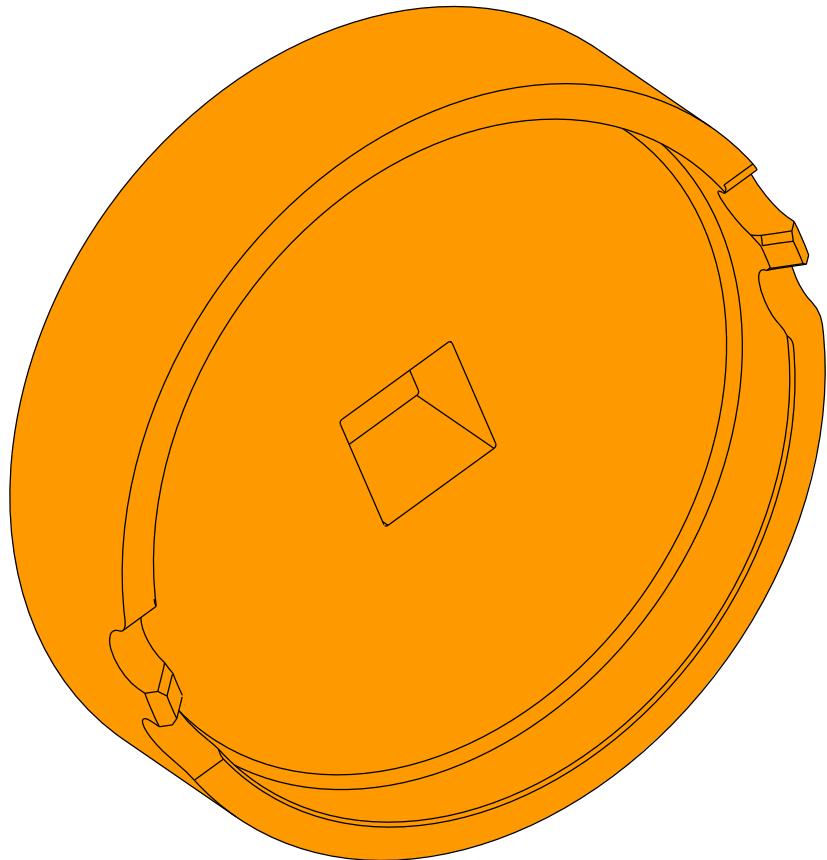
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**J20010-3 SPANNER WRENCH SHOWN  
J20010-1,-2,-4,-5,-6,-7,-8 SIMILAR**

2266234 S0000508738\_V1

**Bearing Retainer Nut Spanner Wrench  
Figure 1**

**20-50-34**

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PART NUMBER: J32092-1

NAME: BUSHING REPLACEMENT AND HONING KIT - MAIN LANDING GEAR

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: YES

CMM 32-11-03

USAGE & DESCRIPTION: J32092-1 bushing replacement and honing kit is used on all 777 airplanes.

J32092 is used to remove and replace 161W1122 bushings. J32092 includes honing equipment. The part number of the bushring must be known before the correct tools can be identified. J32092 is used to remove or install bearing part number SA60-75A1-501.

Refer to CMM 32-11-03 and the current J32092 drawing for complete usage instructions.

J32092-1 consists of:

J32092-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	INSTALLATION ASSEMBLY	J32092-2
1	EXPANDABLE BUSHING ASSEMBLY	J32092-3
1	HONE ASSEMBLY	J32092-4
1	PUMP ASSEMBLY	J32092-5
1	DRILL MOTOR ASSEMBLY	J32092-6
1	TRUEING SLEEVE ASSEMBLY	J32092-7
1	DRAWBOLT	J32092-9
1	INSTALLATION CUP	J32092-10
1	INSTALLATION CAP	J32092-11 <sup>*[1]</sup>
1	REMOVAL CUP	J32092-12
1	REMOVAL DIE	J32092-13
1	FACE SPANNER	J32092-14
2	FLANGE NUT	J32092-15
1	HEX KEY 1/4	J32092-16
1	HEX KEY 5/16	J32092-17
1	HYDRAULIC CYLINDER 30 TON	J32092-18
1	HYDRAULIC HOSE	J32092-19
4	STONE SET ROUGH	J32092-20
1	PUMP WRENCH	J32092-21
2	SCREW	J32092-22 <sup>*[2]</sup>
2	SCREW	J32092-23 <sup>*[1]</sup>
4	STONE SET FINISH	J32092-24

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(Continued)

J32092-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	STORAGE BOX	

\*[1] J32092-11 AND -23 ARE STOWED ON J32092-2.

\*[2] J32092-22 IS STOWED ON J32092-18.

**WEIGHT:** 130 lbs (59 kg)

**DIMENSIONS:** 12 x 28 x 39 inches (305 x 711 x 991 mm)

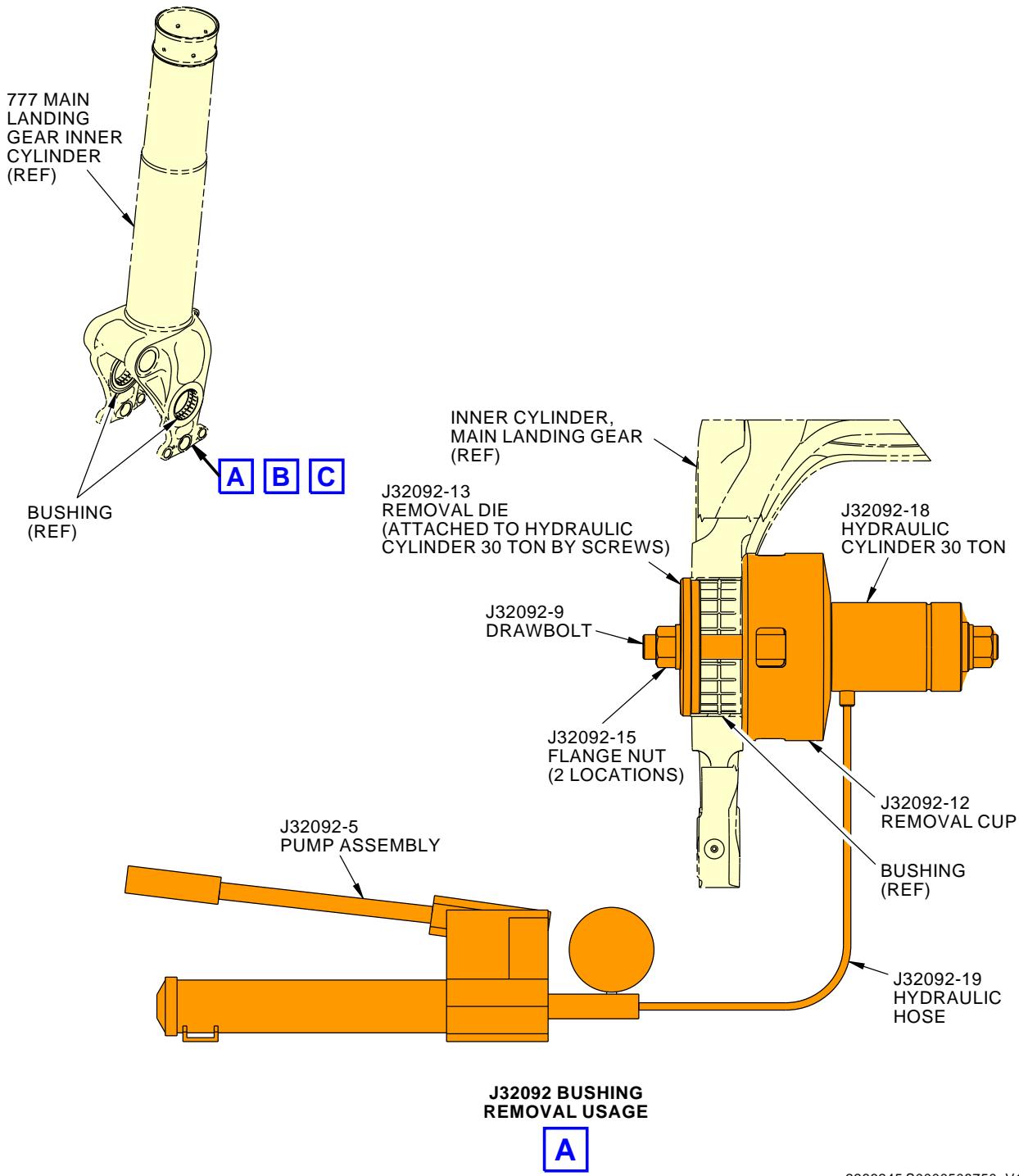
**NOTE:** J32092 is optional to MIT161W1122.

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2266245 S0000508750\_V1

**Main Landing Gear Bushing Replacement and Honing Kit**  
**Figure 1 (Sheet 1 of 5)**

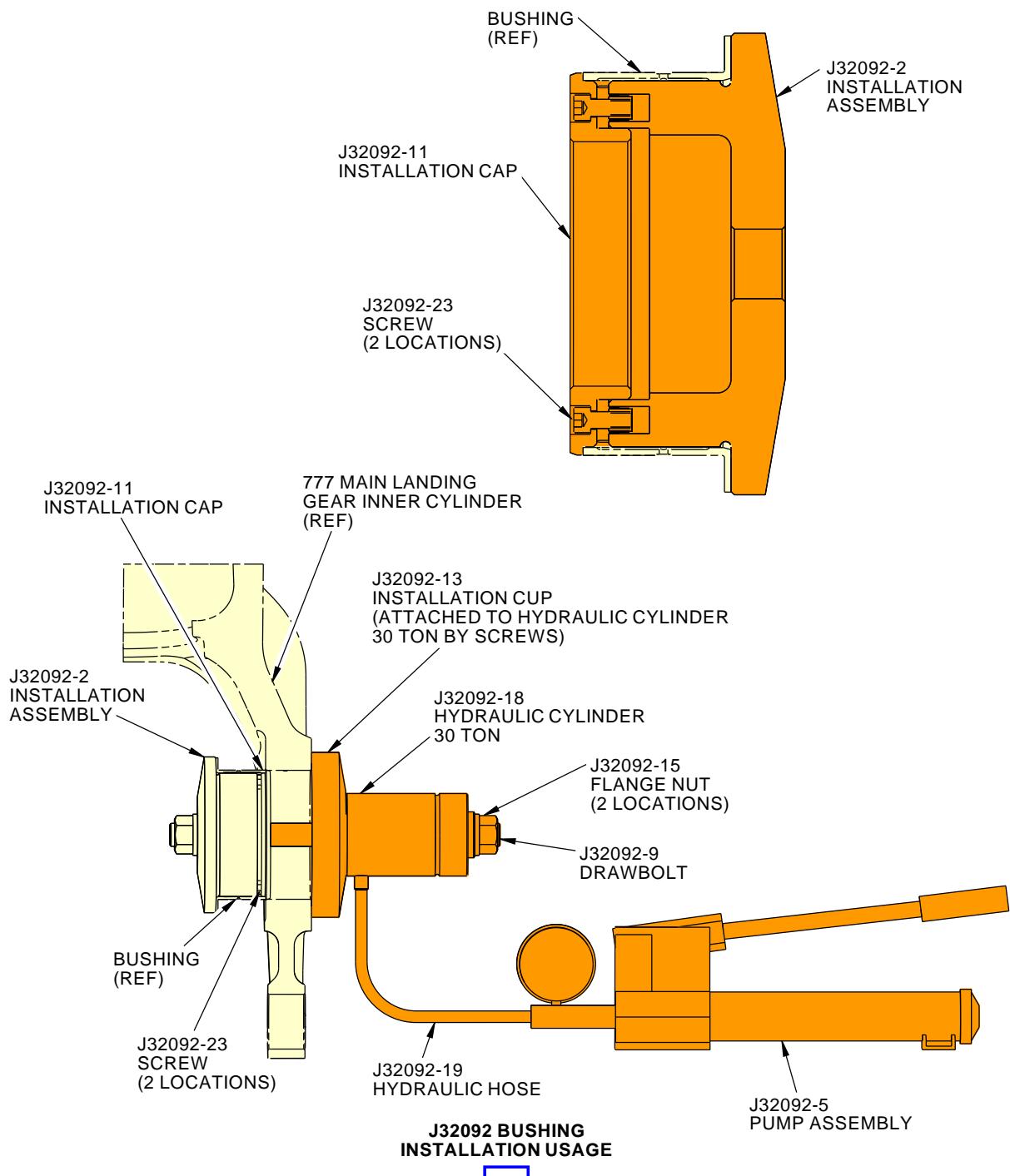
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2266255 S0000508751\_V1

Main Landing Gear Bushing Replacement and Honing Kit  
Figure 1 (Sheet 2 of 5)

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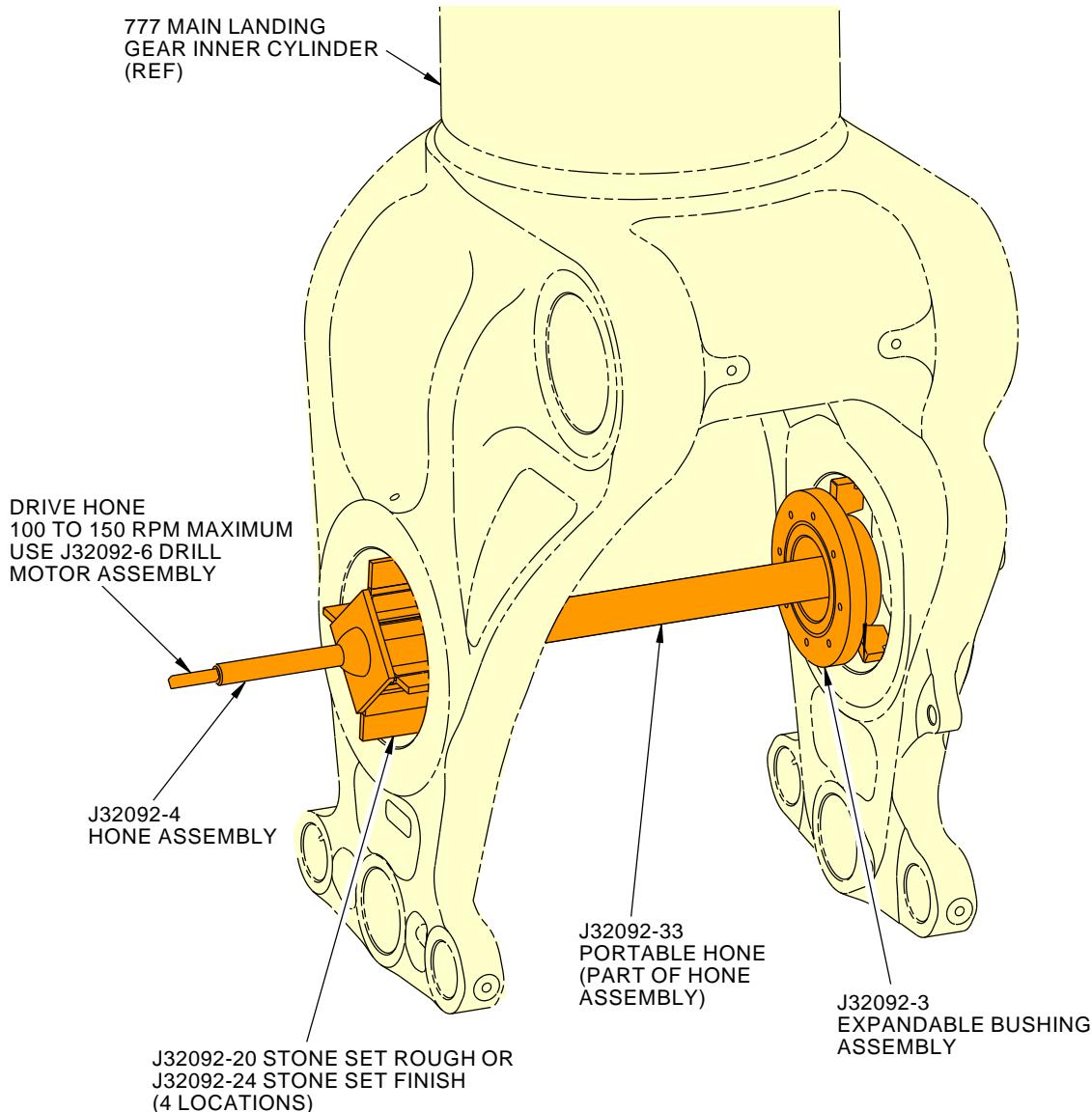
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J32092 HONING USAGE



2266259 S0000508752\_V1

Main Landing Gear Bushing Replacement and Honing Kit  
Figure 1 (Sheet 3 of 5)

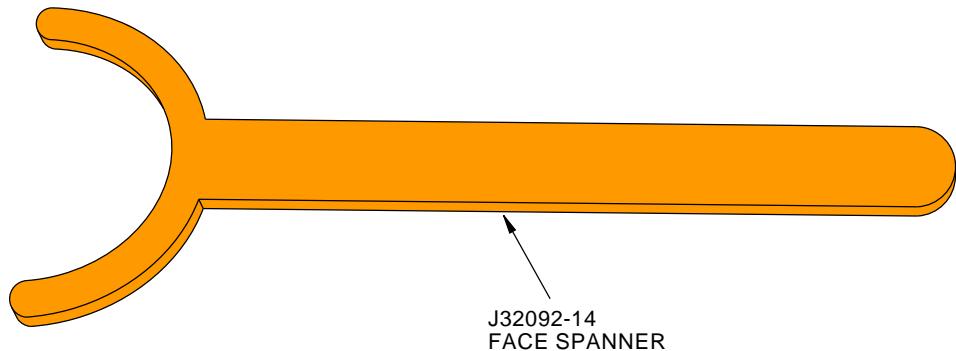
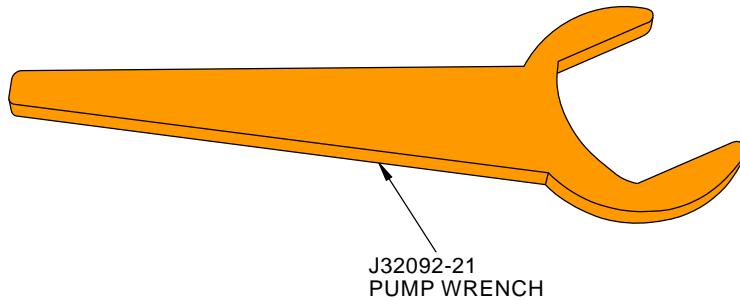
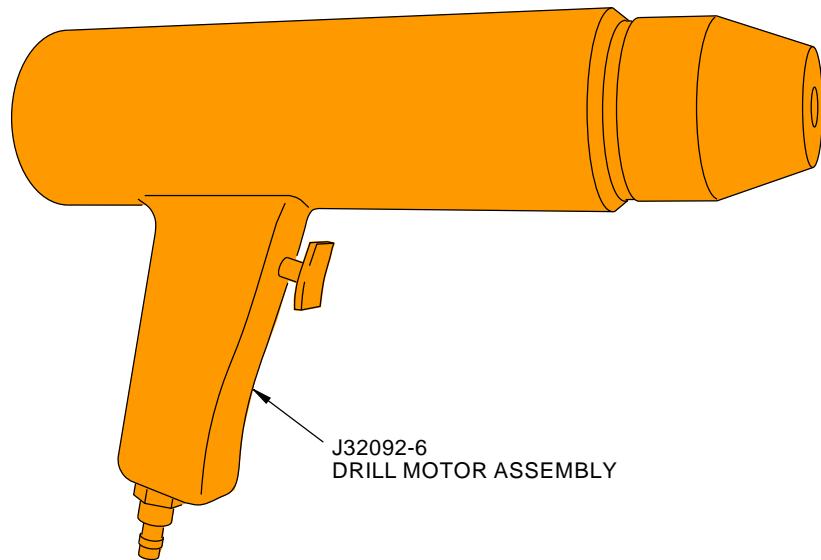
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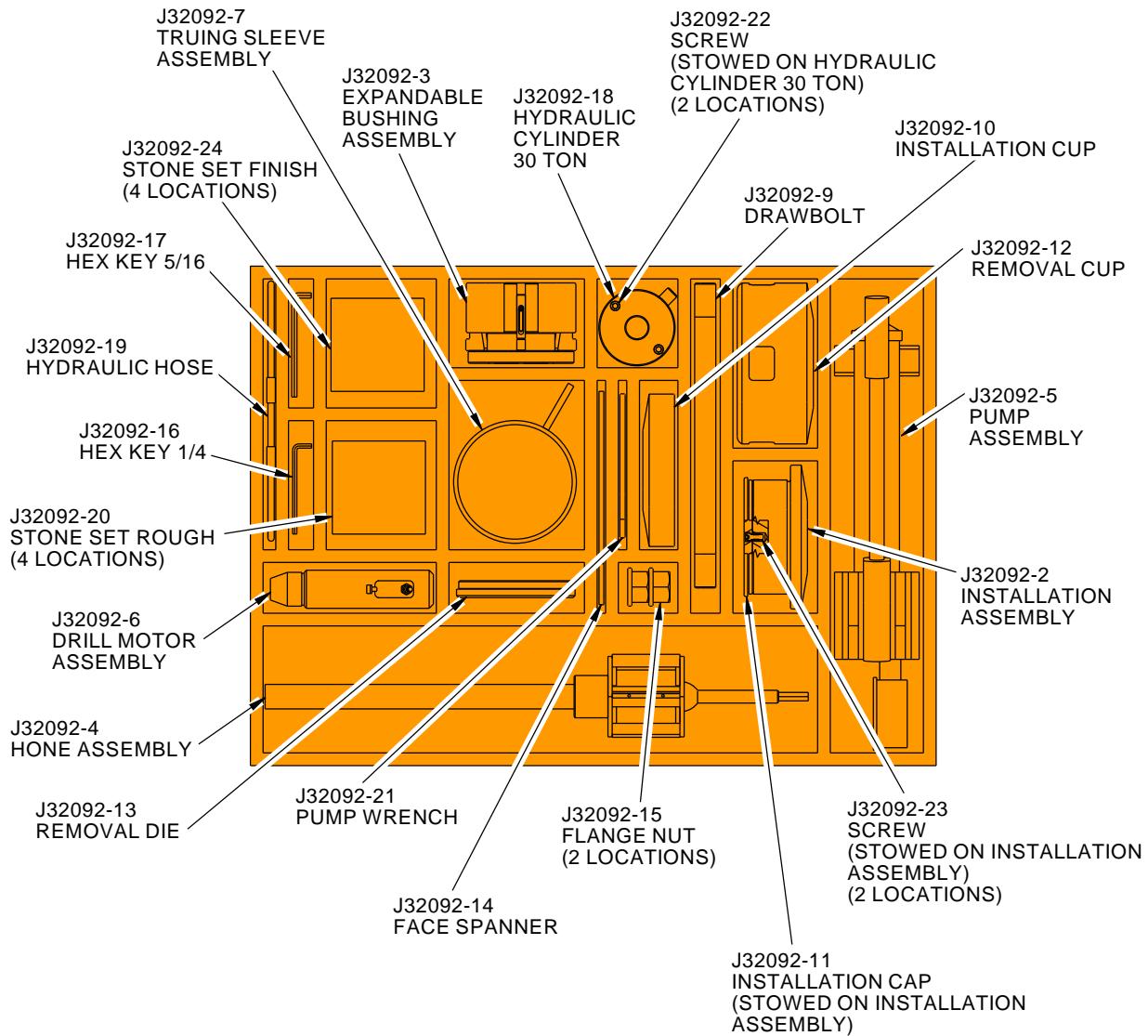


2266298 S0000508754\_V1

**Main Landing Gear Bushing Replacement and Honing Kit**  
**Figure 1 (Sheet 4 of 5)**

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**J32092-1 STORAGE BOX ARRANGEMENT**

2266297 S0000508753\_V1

**Main Landing Gear Bushing Replacement and Honing Kit**  
**Figure 1 (Sheet 5 of 5)**

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PART NUMBER: MIT161W1122

NAME: MISCELLANEOUS TOOL - BUSHING REPLACEMENT AND HONING KIT, INNER CYLINDER, CENTER AXLE

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: YES

CMM 32-11-03

OTHER MANUALS: YES

SB777-32-0080, SB 777-32A0082, SOPM 20-50-03

USAGE & DESCRIPTION: The MIT161W1122 miscellaneous tool is used during component maintenance.

MIT161W1122 is used to remove or install 161W1122 bushings on the 161W1120-series inner cylinder assembly. MIT161W1122 includes honing equipment.

Refer to CMM 32-11-03, SB777-32-0080, SB 777-32A0082, the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current MIT161W1122 drawing for complete usage instructions. If the component overhaul instructions differ from the data in SOPM 20-50-03, use the component overhaul instructions.

MIT161W1122 consists of:

MIT161W1122		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	DRILL MOTOR ASSEMBLY	-2
1	MOTOR	-3
1	AIR FITTING	-4
2	FLANGE NUT	-5
1	HEX KEY 1/4-INCH	-6
1	HEX KEY 5/16-INCH	-7
1	PUMP WRENCH 1 13/16	-8
1	FACE SPANNER	-9
1	HYDRAULIC CYLINDER 30-TON	-10
1	HYDRAULIC PUMP	-11
1	GAUGE ADAPTER	-12
1	GAUGE	-13
1	HYDRAULIC HOSE	-14
1	PORTABLE HONE	-15
1	MASTER HOLDER	-16
1	STONE SUPPORT	-17
4	STONE SET ROUGH	-18

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(Continued)

MIT161W1122		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
4	STONE SET FINISH	-19
2	SOCKET HEAD SCREW GR8	-21
1	INSTALLATION ASSEMBLY	-201
1	REMOVAL CUP	-205
1	DRAWBOLT	-206
1	REMOVAL DIE	-207
1	INSTALLATION CUP	-208
1	EXPANDABLE BUSHING ASSEMBLY	-301
1	TRUEING SLEEVE WELDMENT	-309
1	STORAGE BOX	

NOTE: MIT161W1122 is optional to J32092.

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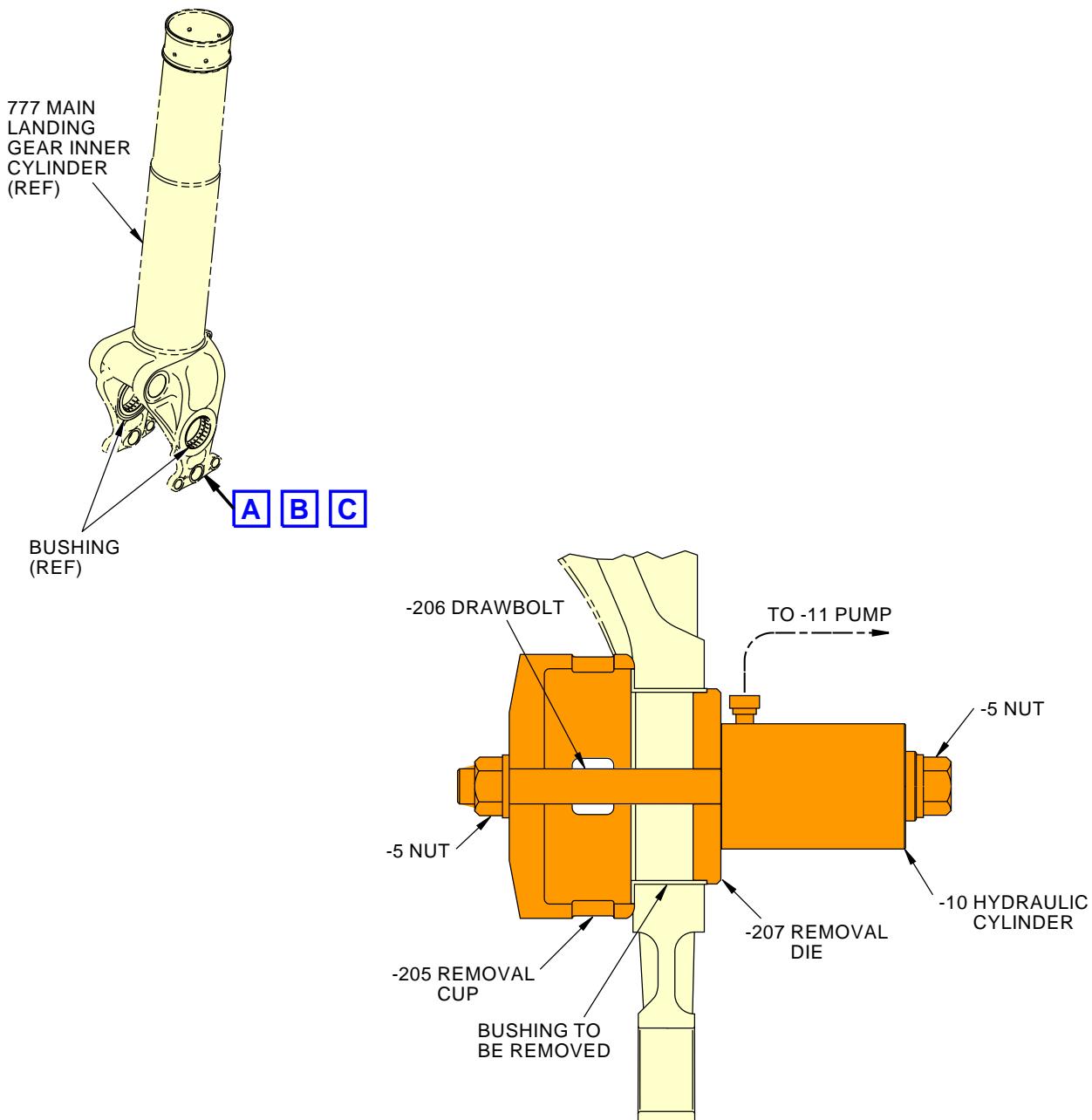
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MIT161W1122 MISCELLANEOUS  
TOOL REMOVAL USAGE

A

2266794 S0000508759\_V1

Center Axle Inner Cylinder Bushing Replacement and Honing Kit Miscellaneous Tool  
Figure 1 (Sheet 1 of 4)

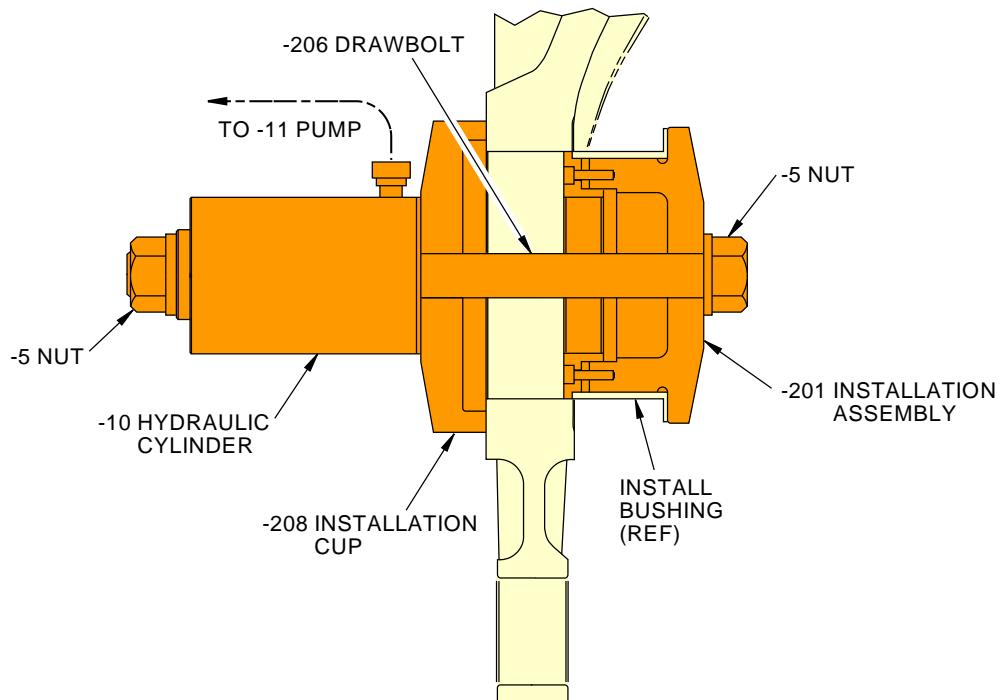
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MIT161W1122 MISCELLANEOUS  
TOOL REMOVAL USAGE

**B**

2266815 S0000508760\_V1

Center Axle Inner Cylinder Bushing Replacement and Honing Kit Miscellaneous Tool  
Figure 1 (Sheet 2 of 4)

**20-50-36**

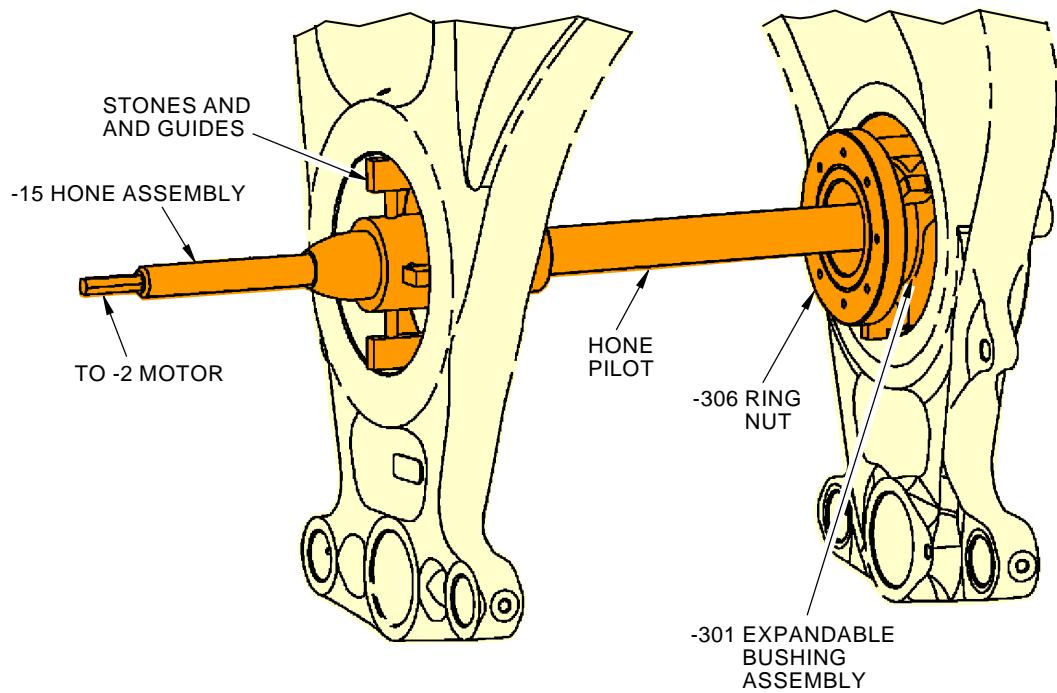
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MIT161W1122 MISCELLANEOUS  
TOOL HONING USAGE

C

2266872 S0000508762\_V1

Center Axle Inner Cylinder Bushing Replacement and Honing Kit Miscellaneous Tool  
Figure 1 (Sheet 3 of 4)

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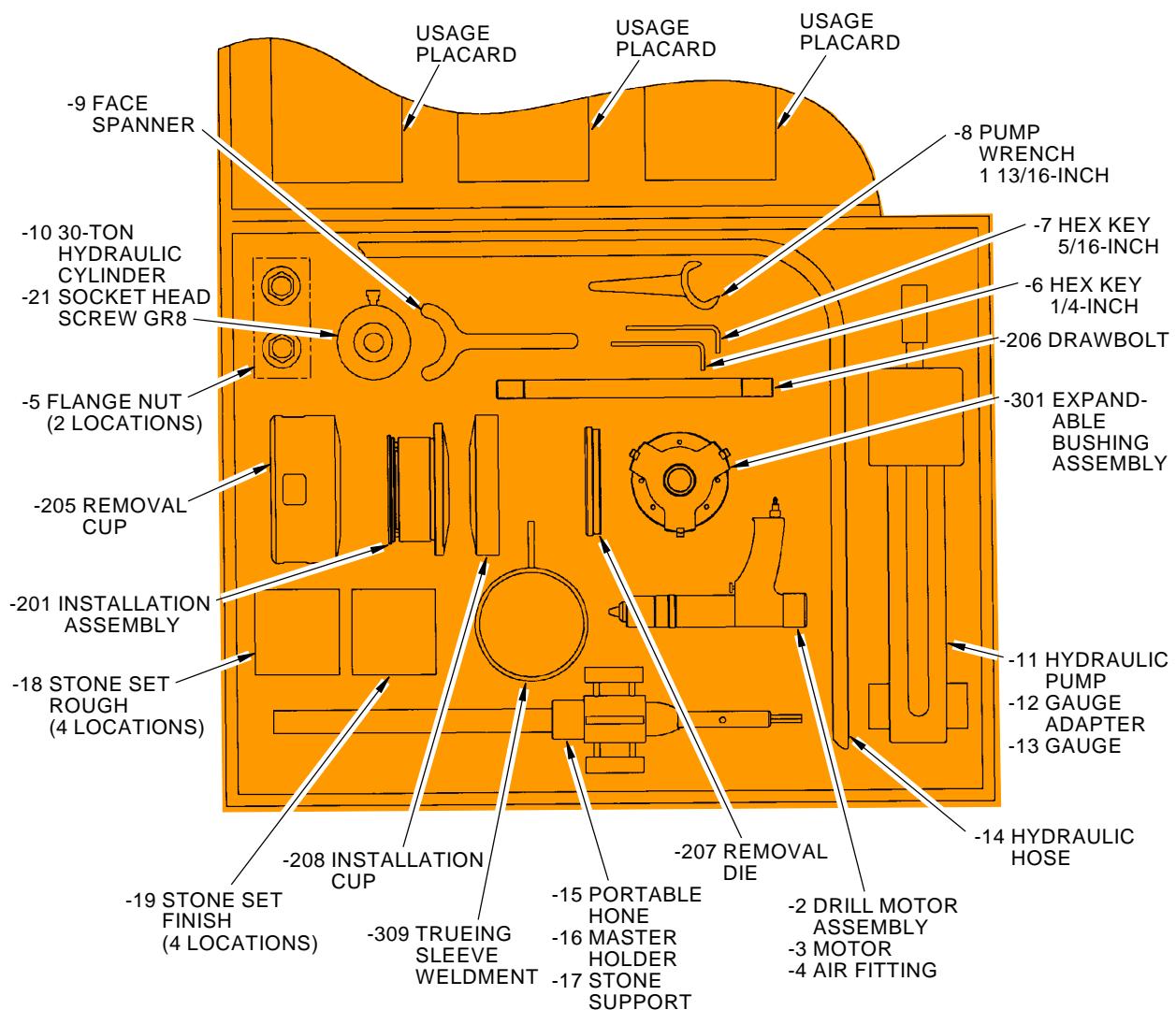
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MIT161W1122 STORAGE BOX AND CONTENTS

2267329 S0000508769\_V1

Center Axle Inner Cylinder Bushing Replacement and Honing Kit Miscellaneous Tool  
Figure 1 (Sheet 4 of 4)

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PART NUMBER: MIT311A1550

NAME: MISCELLANEOUS TOOL - BEARING REPLACEMENT KIT, 737 THRUST REVERSER

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The MIT311A1550 miscellaneous tool is used during component maintenance on CFM56-3 thrust reversers.

MIT311A1550 is used to install, stake, test the staking and remove the vibration isolator of the 311A1553-7 or -8 and 311A1744-1 or -2 thrust reverser hinge assemblies. MIT311A1550 is used as a special jig on bearings LM321-57, S302A006-1, S302A006-2 and S302A006-4.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current MIT311A1550 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

MIT311A1550 consists of:

MIT311A1550		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	BODY ASSEMBLY	-2
1	NUT	-4
1	BEARING HOUSING ASSEMBLY	-10
1	KNURLED KNOB	-13
1	RATCHETING BOX WRENCH	-16
1	AIR WRENCH	-17
1	SHAFT	-19
1	ADAPTER	-202
2	SAW	-203
1	PULLER ASSEMBLY	-207
1	KNOB	-209
1	EXTRACTOR	-210
1	NUT	-217
1	WASHER	-218
1	SHAFT ASSEMBLY	-221
1	LOCATOR PLUG	-222
1	SPANNER WRENCH	-223
1	CLAMPING ASSEMBLY	-301

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(Continued)

MIT311A1550		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	PRESSURE GAUGE	-305
1	PUNCH ASSEMBLY	-308
1	ANVIL ASSEMBLY	-311
1	COMPRESSION ROD	-315
1	PUMP ASSEMBLY	-316
1	SPACER BUSHING	-319
2	PRESSURE PLATE	-321
1	STORAGE BOX	

**20-50-37**

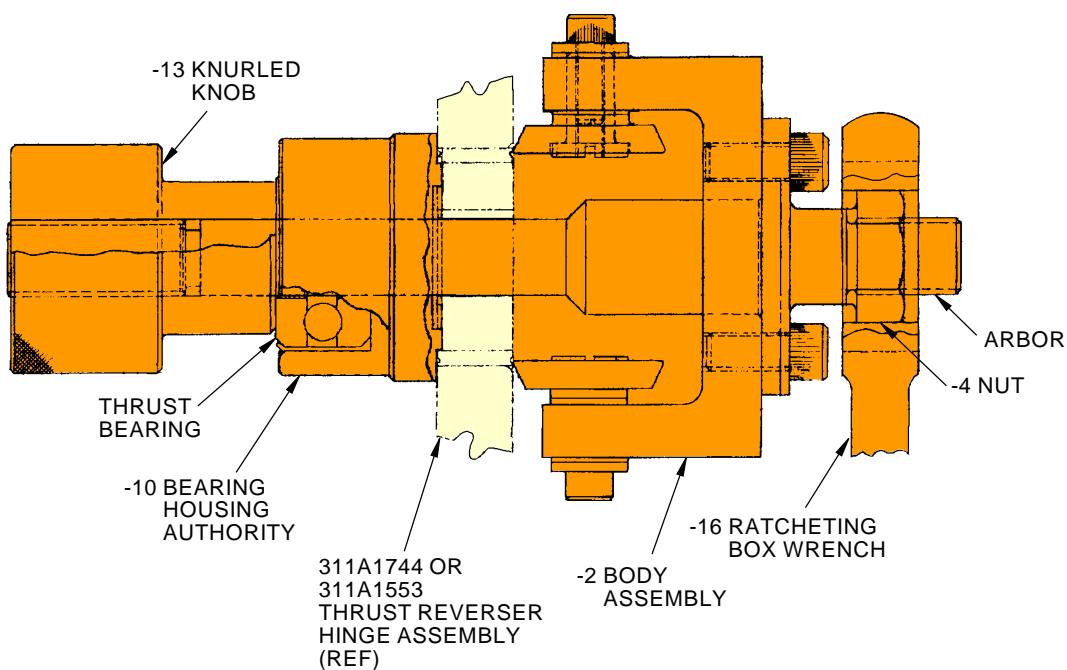
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MIT311A1550 ROLLER STAKING  
CONFIGURATION

2273480 S0000511845\_V1

737 Thrust Reverser Bearing Replacement Kit Miscellaneous Tool  
Figure 1 (Sheet 1 of 3)

**20-50-37**

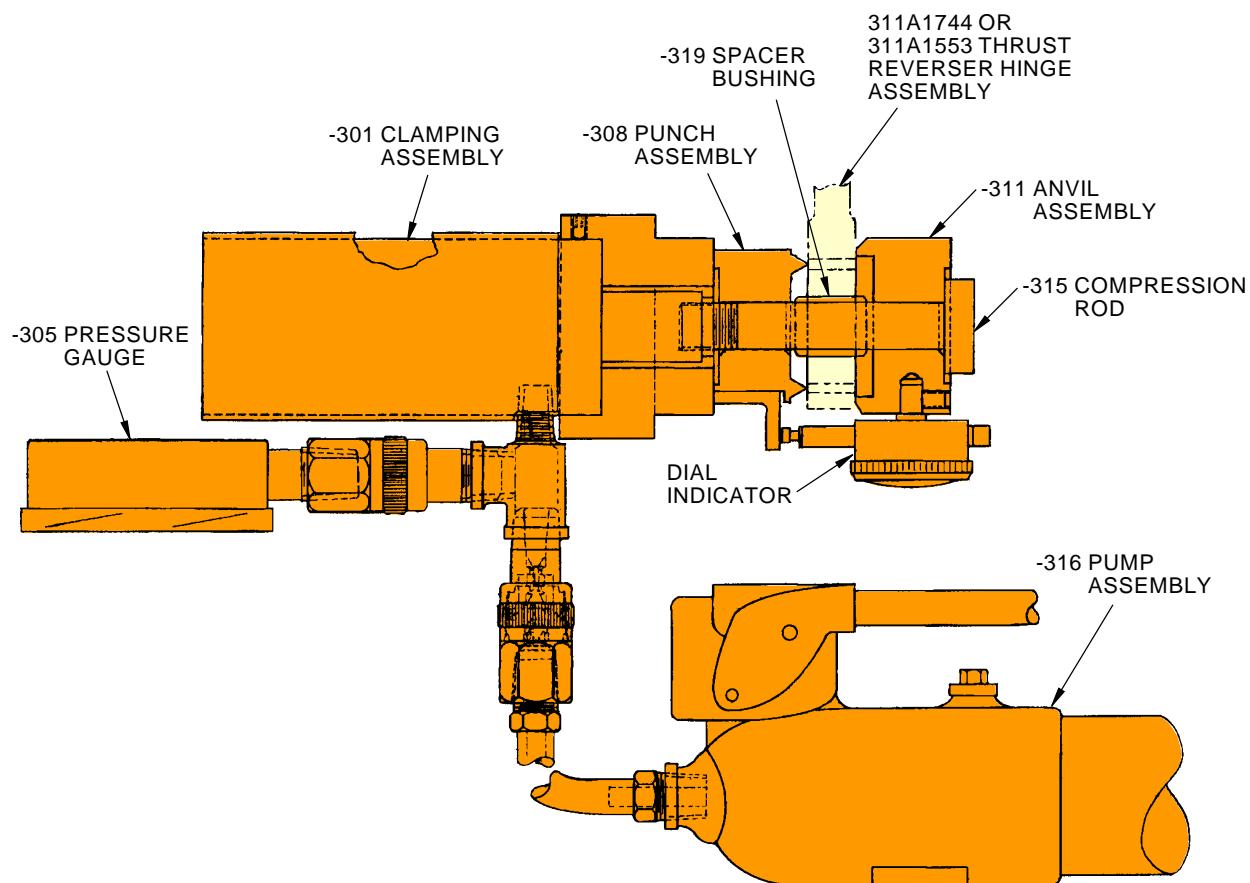
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MIT311A1550 BEARING INSTALLATION  
CONFIGURATION

2273622 S0000511847\_V1

737 Thrust Reverser Bearing Replacement Kit Miscellaneous Tool  
Figure 1 (Sheet 2 of 3)

**20-50-37**

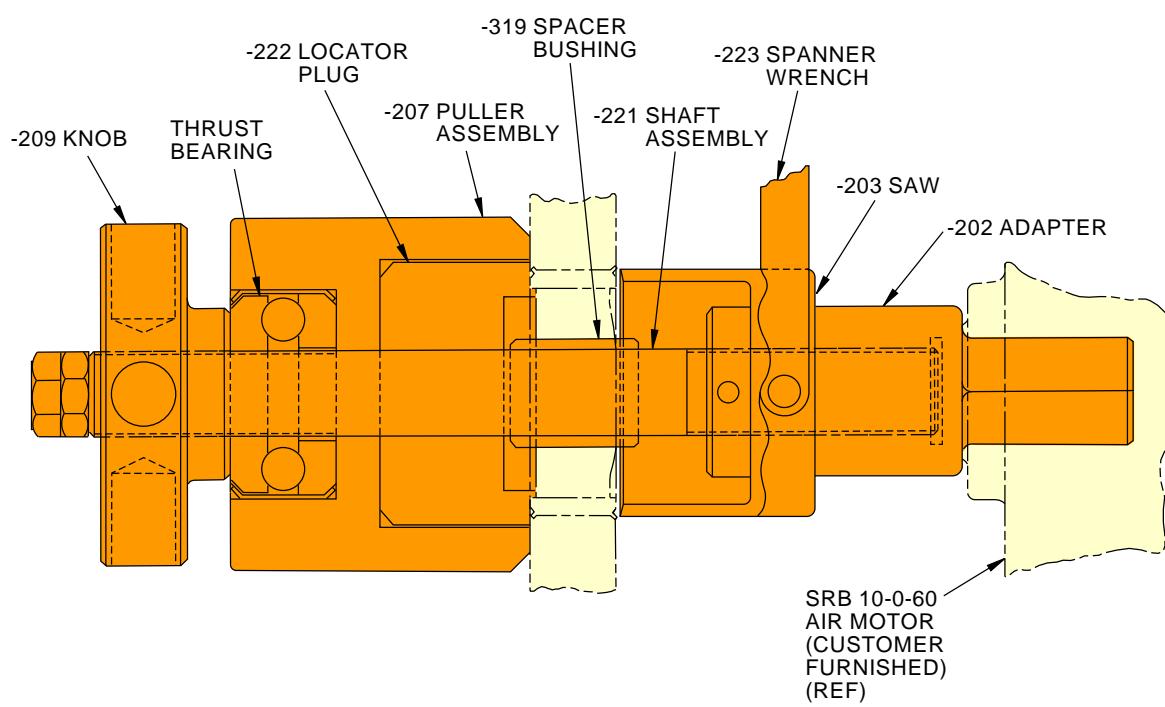
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MIT311A1550 CUTTER  
CONFIGURATION

2273701 S0000511848\_V1

737 Thrust Reverser Bearing Replacement Kit Miscellaneous Tool  
Figure 1 (Sheet 3 of 3)

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**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER:** MIT314T3281-3

**NAME:** FITTING ASSEMBLY - TOGGLE HINGE, CORE COWL

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The MIT314T3281-3 fitting assembly is used during component maintenance on 767 airplanes equipped with JT9D engines.

MIT314T3281-3 is a spanner wrench that is used to remove or install bearings S302T001-406 and -411 on the 314T3281-series core cowl hinge toggle fittings. MIT314T3281-3 is used in pairs to hold the race and tighten or loosen the mating nut or retaining ring. The part number of the bearing must be known before the correct tools can be identified. MIT314T3281-3 is used on bearing part numbers: S302T001-202, S302T001-211, S302T001-217, S302T001-224, S302T001-225, S302T001-226, S302T001-231, S302T001-233, S302T001-406, S302T001-411 and S302T001-436.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current MIT314T3281-3 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

MIT314T3281-3 consists of two MIT314T3281-3 spanners contained in a storage box.

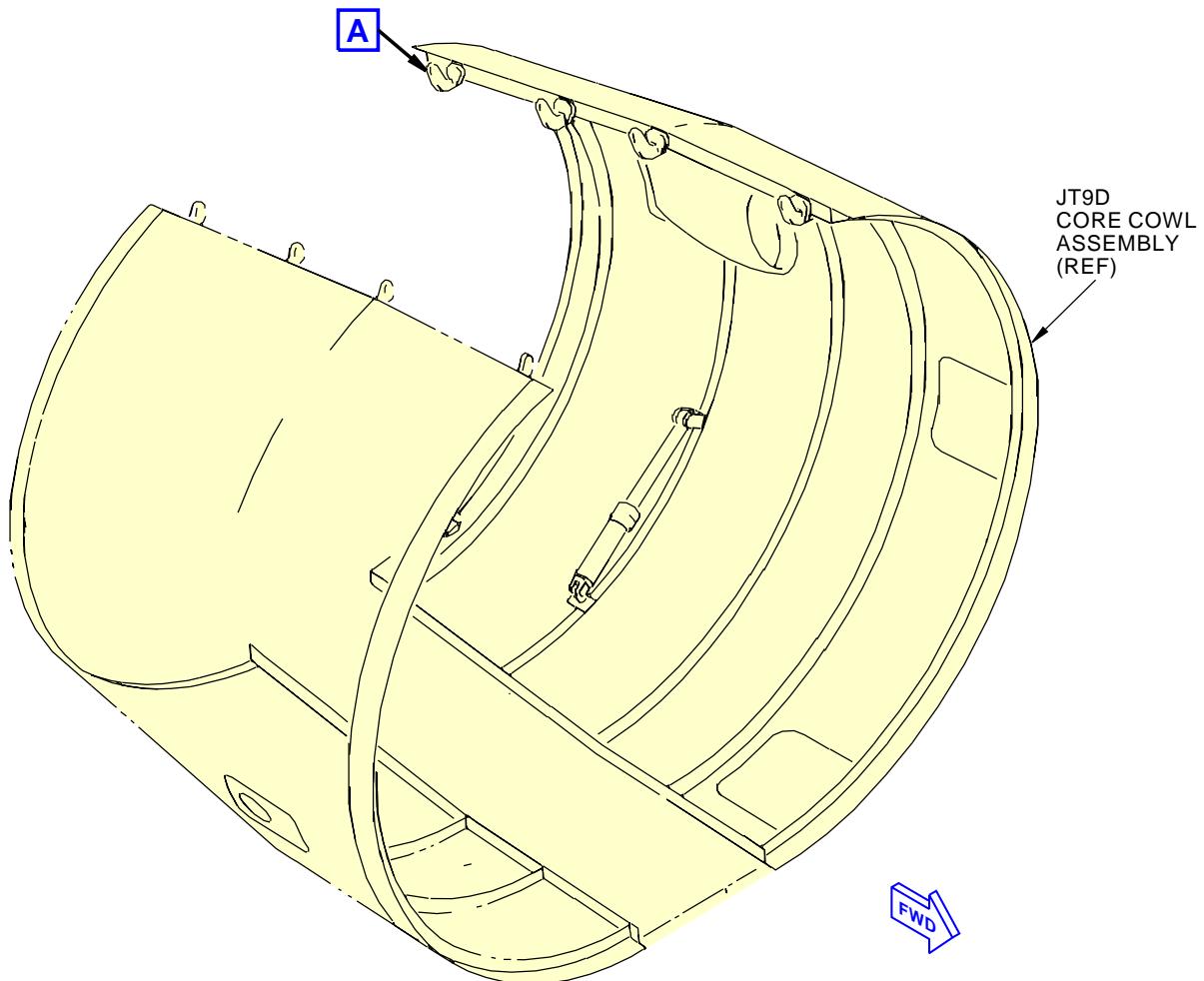
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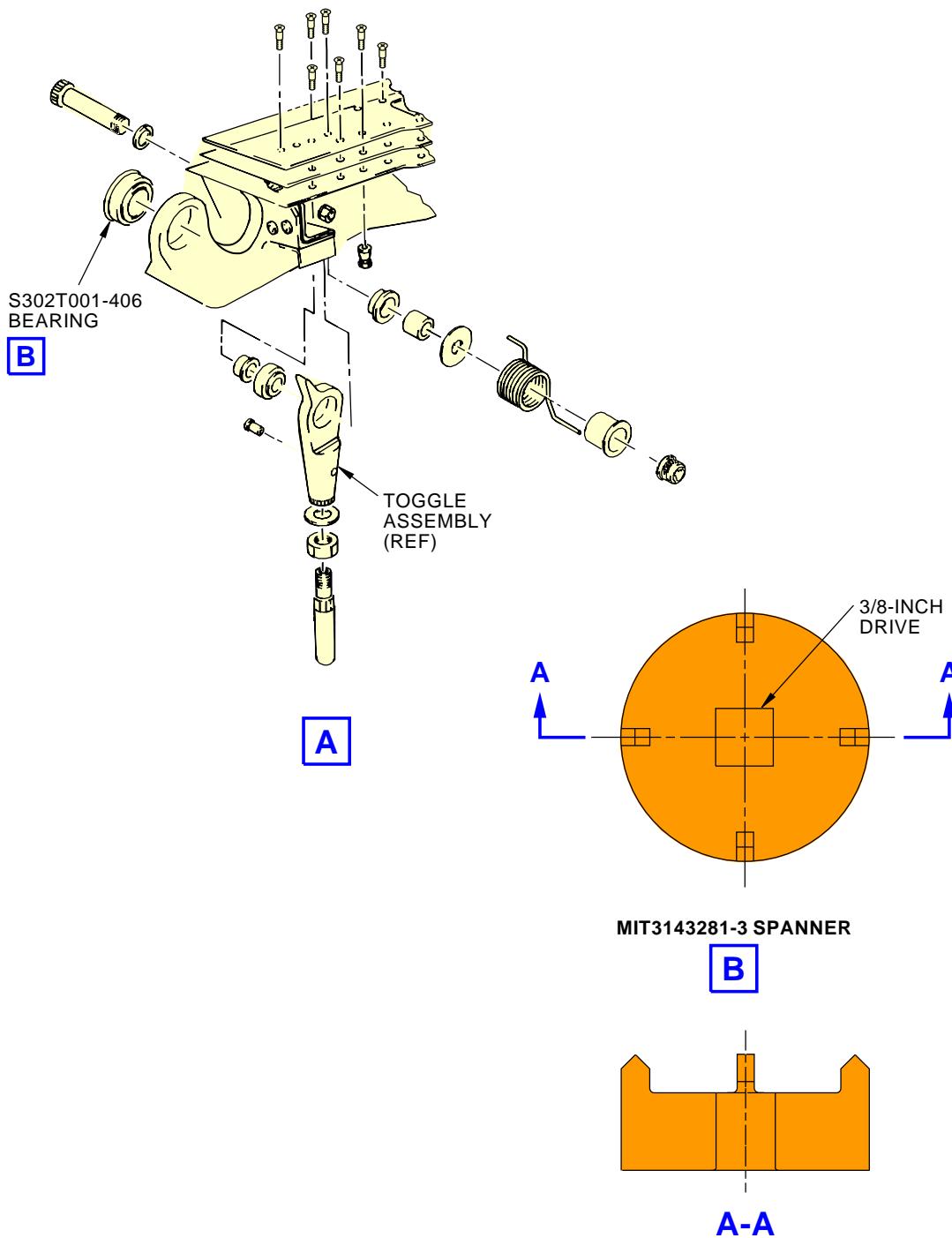


2266301 S0000508820\_V1

**Core Cowl Toggle Hinge Fitting Assembly**  
**Figure 1 (Sheet 1 of 2)**

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**BOEING**  
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2266628 S0000508821\_V1

Core Cowl Toggle Hinge Fitting Assembly  
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PART NUMBER: MIT315W3402

NAME: MISCELLANEOUS TOOL - BUSHING REPLACEMENT, LATCH BEAM

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The MIT315W3402 miscellaneous tool is used during component maintenance.

MIT315W3402 is used to remove, replace and swage the BACB28AT bearing and the 315W3423-1 and -2 bushings common to the bifurcation duct latch beam assembly.

MIT315W3402 includes:

A -201 removal tool assembly to extract bushings.

A collection of -3, -4, -5 and -7 reamers to enlarge the bore, remove corrosion and final dimensioning.

A -206 chamfer tool assembly to clean up the inside chamfer.

A -210 drift to drive a new bushing into a hole.

A -211 swage tool assembly to swage the bushing

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current MIT315W3402 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

MIT315W3402 consists of:

MIT315W3402		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	REMOVAL TOOL ASSEMBLY	-201
1	CHAMFER TOOL ASSEMBLY	-206
1	INSTALLATION DRIFT	-210
1	SWAGE TOOL ASSEMBLY	-211
1	NUT ASSEMBLY	-218
1	CHAMFER GAUGE ASSEMBLY	-221
4	REAMER	-3
4	REAMER	-4
4	REAMER	-5
4	REAMER	-7
1	STORAGE BOX	

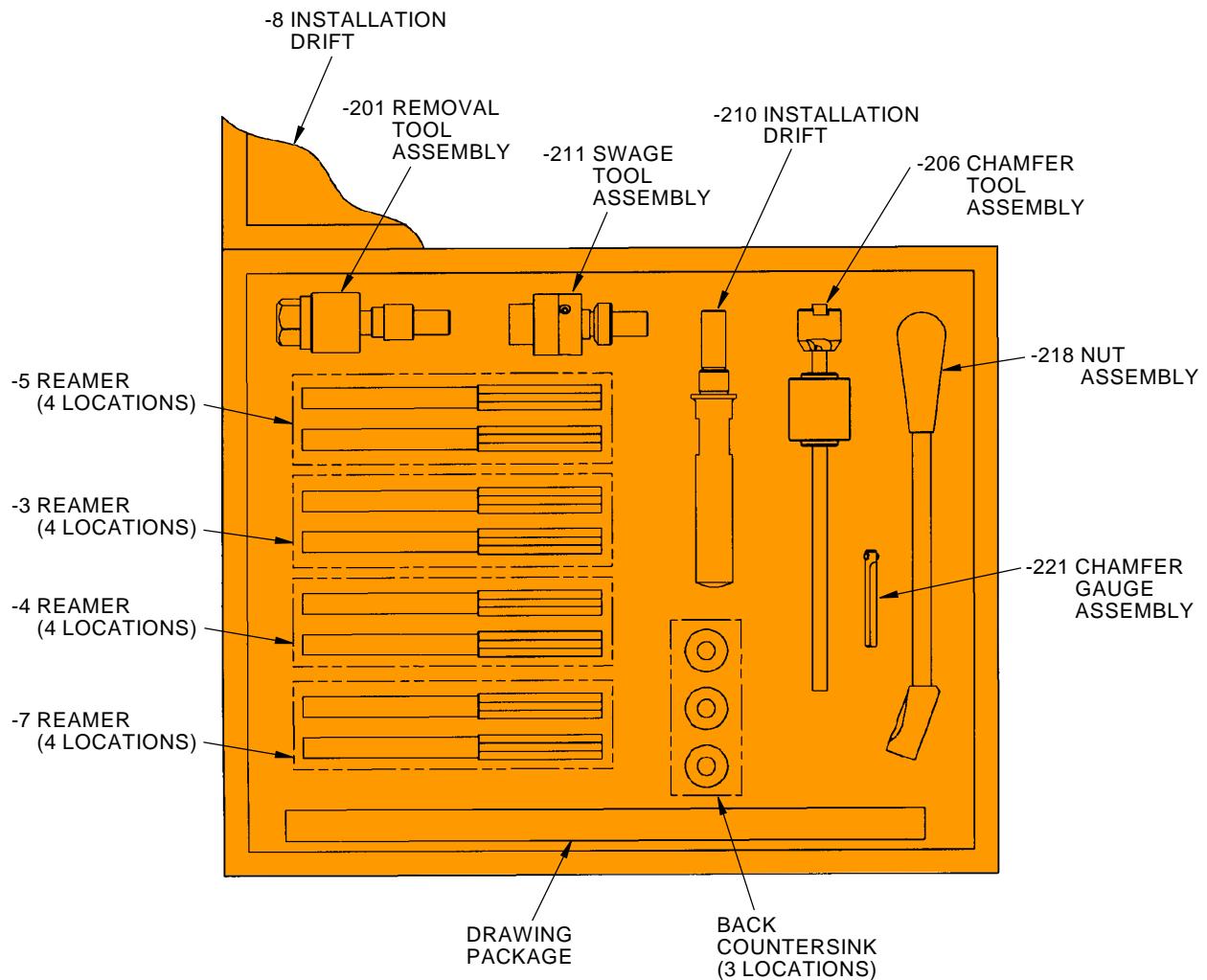
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MIT315W3402 BUSHING REPLACEMENT  
MISCELLANEOUS TOOL

2273290 S0000511741\_V1

Latch Beam Bushing Replacement Miscellaneous Tool  
Figure 1

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**PART NUMBER:** MIT65B02023

**NAME:** BEARING SWAGING TOOL - FOREFLAP LEVER

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** YES

CMM 57-52-31

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The MIT65B02023 bearing swaging tool is used during component maintenance.

MIT65B02023 is used to roller swage BACB10FE12, MS14103-12, MS21230- 12, and 10-60545-207S bearings into 65B02023 flap lever assemblies. Swaging pressure is applied by mounting the body assembly in a drill press.

Refer to CMM 57-52-31, the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current MIT65B02023 drawing for complete usage instructions. If the component overhaul instructions differ from the data in SOPM 20-50-03, use the component overhaul instructions.

MIT65B02023 consists of:

MIT65B02023		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	BODY ASSEMBLY	-1
1	ANVIL	-6
1	STORAGE BOX	

**20-50-40**

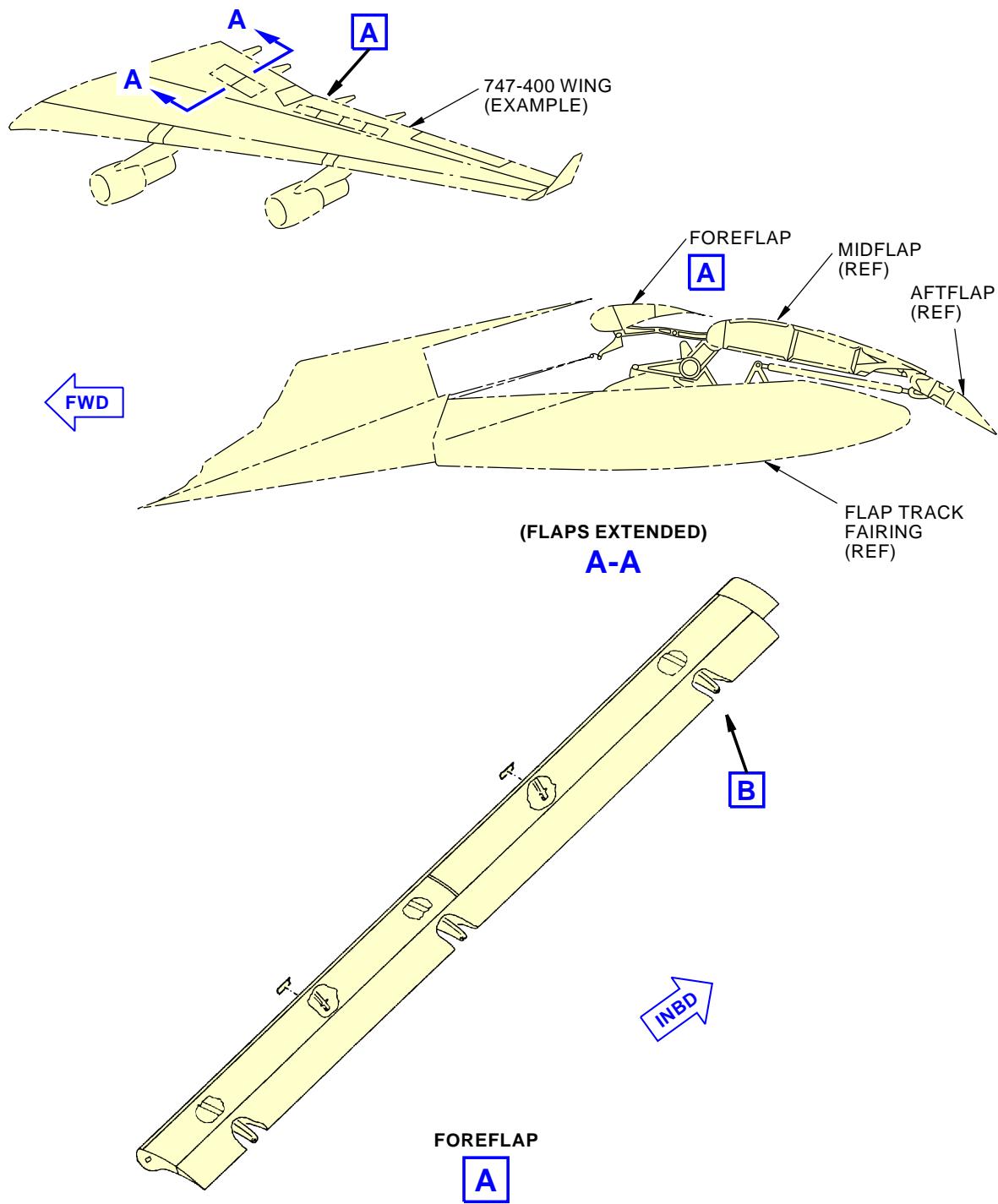
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2272975 S0000511513\_V1

Foreflap Lever Bearing Swaging Tool  
Figure 1 (Sheet 1 of 2)

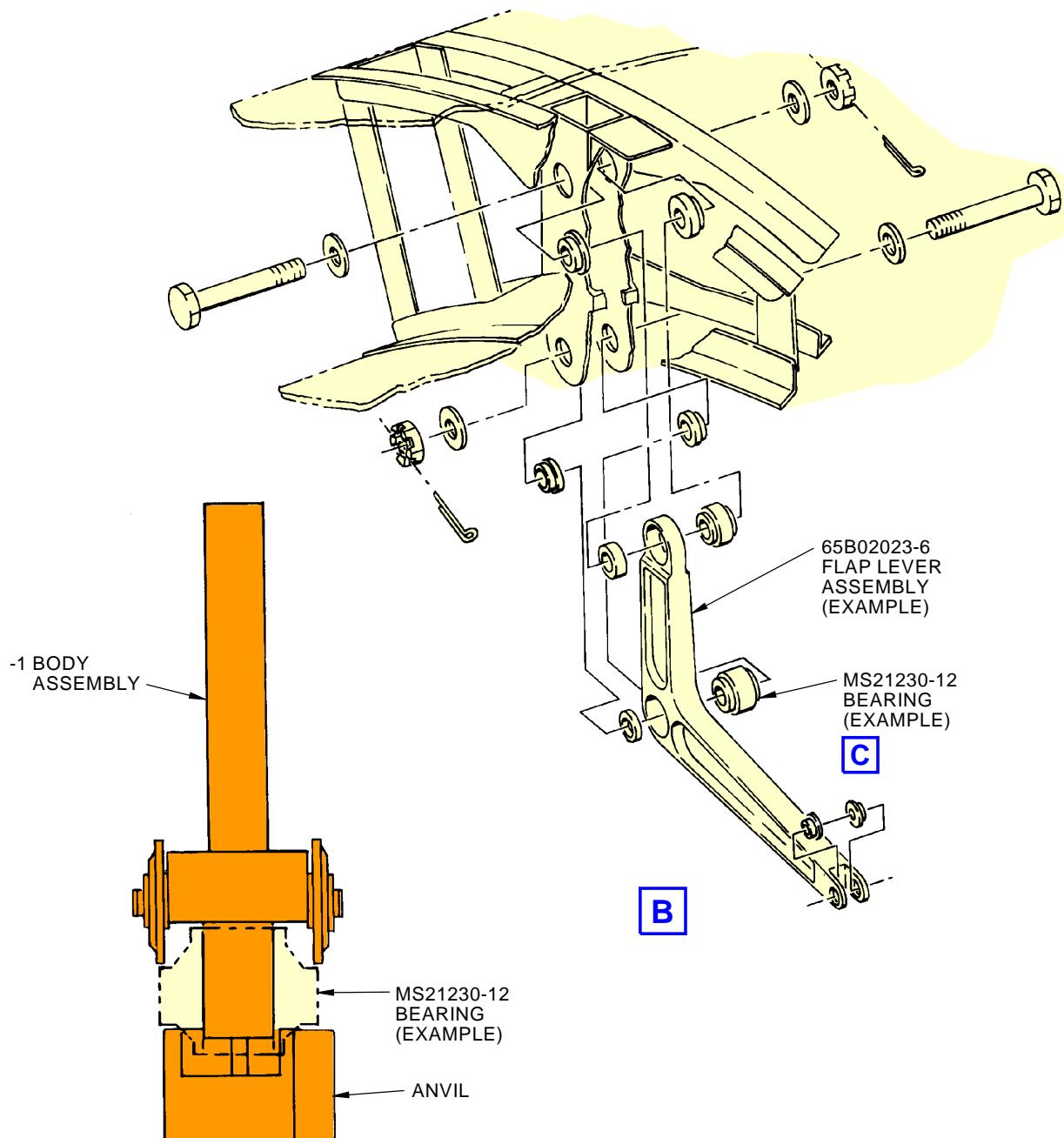
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MIT65B02023 BEARING SWAGING TOOL USAGE

**C**

2273091 S0000511514\_V1

Foreflap Lever Bearing Swaging Tool  
Figure 1 (Sheet 2 of 2)

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**PART NUMBER:** MIT65B02505

**NAME:** SWAGING TOOL - STATION 2598 BULKHEAD TRUSS BEARING

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The MIT65B02505 swaging tool is used during component maintenance.

MIT65B02505 is used to provide a means of swaging the spherical bearings in the Sta 2598 bulkhead truss fittings while installed on the airplane. The bearing and sleeve are installed in the truss fitting and the swaging tool is installed. The MIT65B02505 bolt is held, the nut is tightened and the sleeve deforms. The MIT65B02505 retainer and anvil installation is reversed to swage the top side of the bearing and sleeve.

MIT65B02505 is used to roller swage bearings: BACB10A208GM2, BACB10A243GCM2, BACB10X11M and BACB10X11MT.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current MIT65B02505 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

MIT65B02505 consists of a bolt, nut, rollers, roller blocks, nut, anvil, and thrust bearing.

**20-50-41**

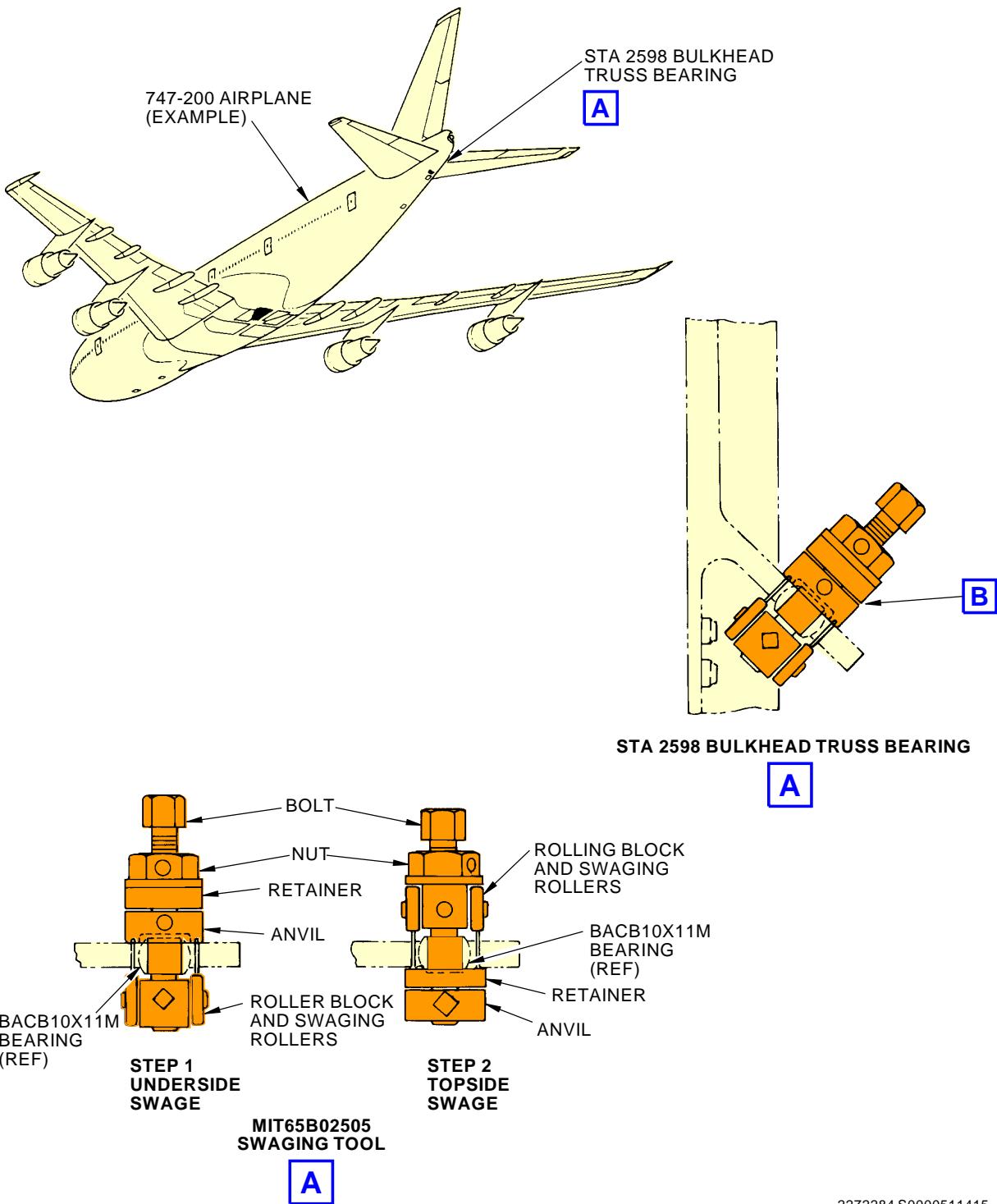
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2272284 S0000511415\_V1

Station 2598 Bulkhead Truss Bearing Swaging Tool  
Figure 1

**20-50-41**

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ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: MIT65B05336

**NAME:** BUSHING SWAGING TOOL - LOWER JURY STRUT, WING LANDING GEAR

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The MIT65B05336 bushing swaging tool is used during component maintenance.

MIT65B05336 is used to swage 69B00349-1 and -2 bushings to the lower 65B05336 jury strut of the 747-100 thru -300 wing landing gear.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current MIT65B05336 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

MIT65B05336 consists of:

MIT65B05336		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	MANDREL	-1
1	BOLT	-2
2	WASHER	-3
2	NUT	-4
1	STORAGE BOX	

**20-50-42**

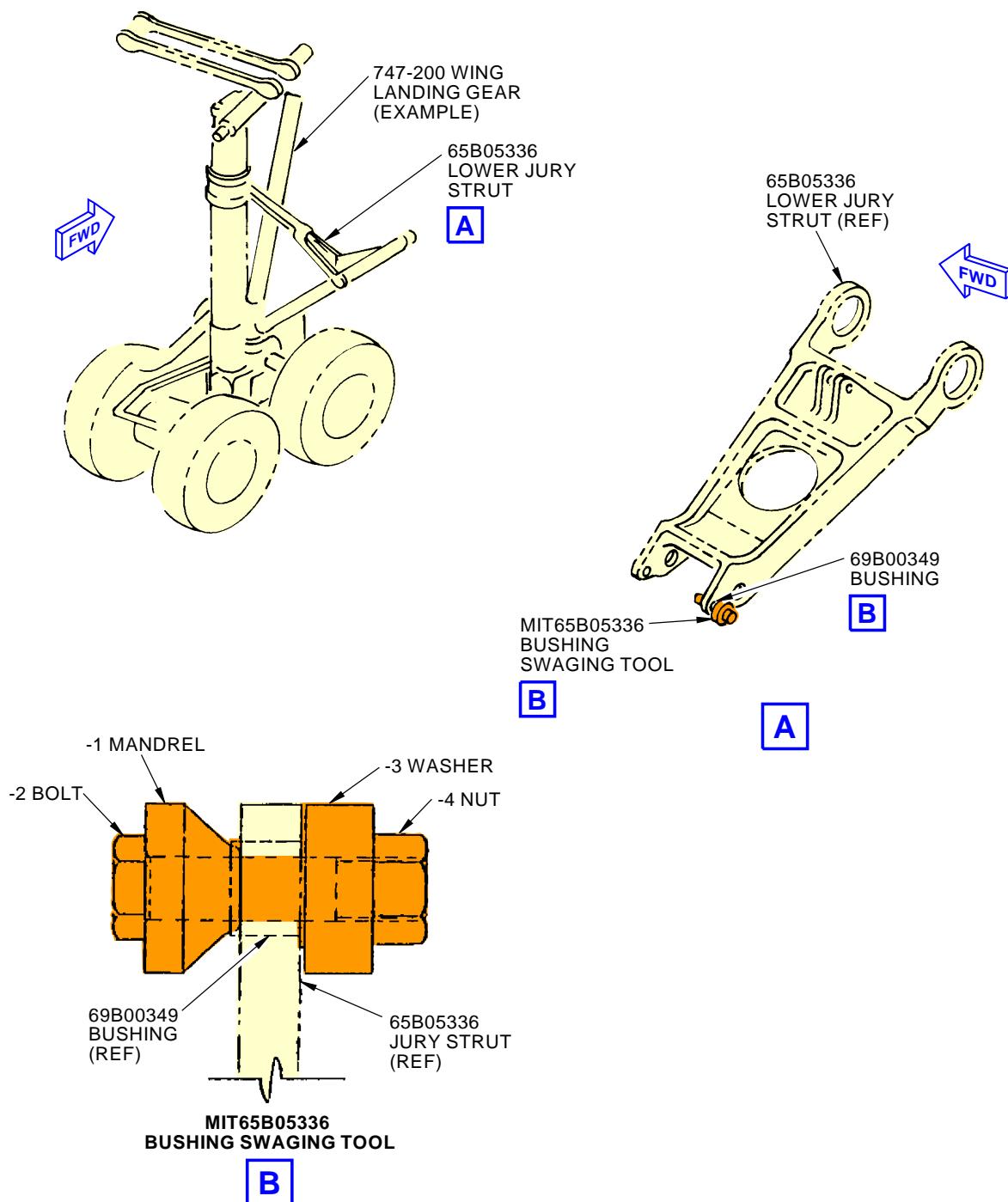
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2273917 S0000512118\_V1

Wing Landing Gear Lower Jury Strut Bushing Swaging Tool  
Figure 1

**20-50-42**

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PART NUMBER: MIT65B05338

NAME: BUSHING SWAGING TOOL - UPPER JURY STRUT, WING LANDING GEAR

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The MIT65B05338 bushing swaging tool is used during component maintenance.

MIT65B05338 is used to swage 69B00348-1 and -2 bushings to the 65B05338 upper jury strut of the 747-100 thru -400 wing landing gear.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current MIT65B05338 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

MIT65B05338 consists of:

MIT65B05338		
QUANTITY	MIT65B05338	DETAIL NUMBER
1	HEX SHAFT END PLATE	-3
2	SCREW	-5
1	SHAFT ASSEMBLY	-11
1	STORAGE BOX	

**20-50-43**

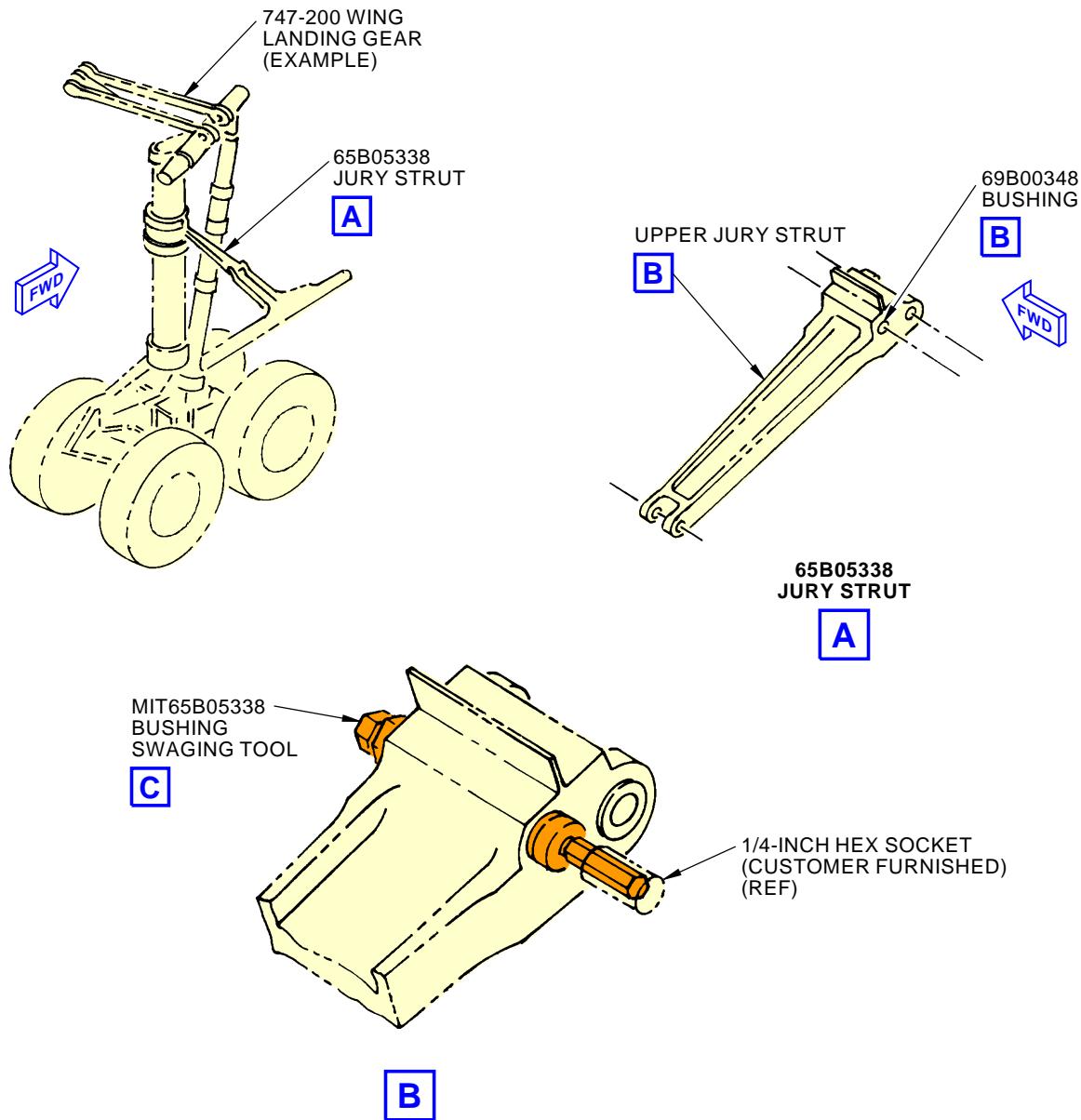
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2273960 S0000512115\_V1

Wing Landing Gear Upper Jury Strut Bushing Swaging Tool  
Figure 1 (Sheet 1 of 2)

**20-50-43**

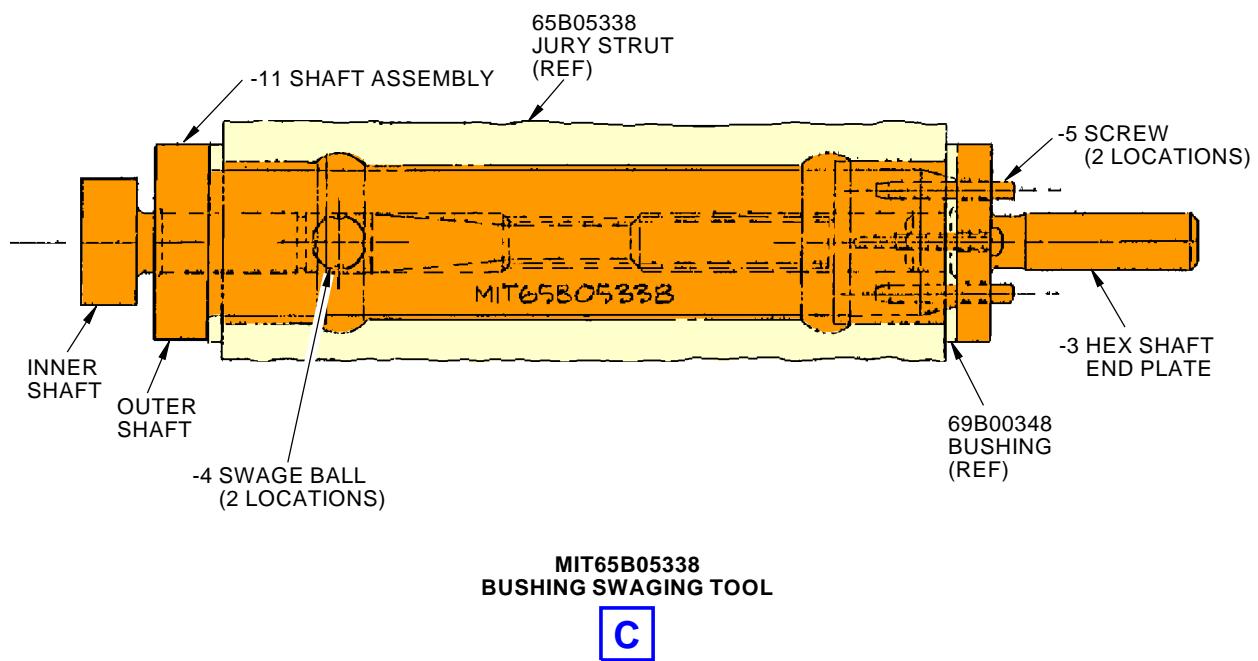
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MIT65B05338  
BUSHING SWAGING TOOL

C

2274044 S0000512116\_V1

Wing Landing Gear Upper Jury Strut Bushing Swaging Tool  
Figure 1 (Sheet 2 of 2)

**20-50-43**

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PART NUMBER: MIT65B10901

NAME: ROLLER SWAGE - SPHERICAL BEARING SLEEVE

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The MIT65B10901 roller swage is used during component maintenance.

MIT65B10901 is used for sleeve swaging the spherical bearing of the 65B10901-17 and -18 wing gear door actuator beam assembly.

MIT65B10901 is used on BACB10FF16, MS14104-16 and MS21233-16 bearings.

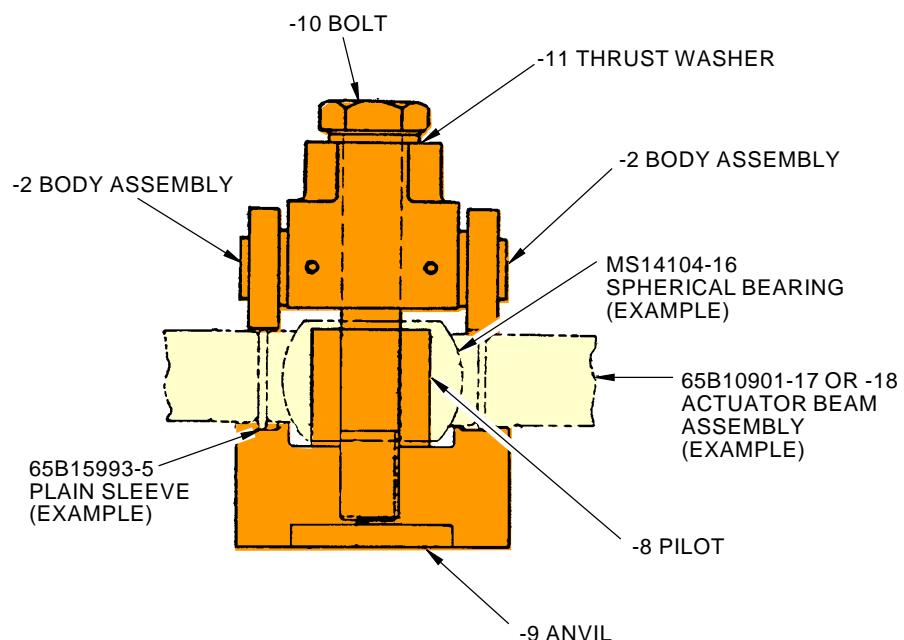
Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current MIT65B10901 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

MIT65B10901 consists of:

MIT65B10901		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	BODY ASSEMBLY	-2
1	PILOT	-8
1	ANVIL	-9
1	BOLT	-10
1	THRUST WASHER	-11
1	STORAGE BOX	

**20-50-44**

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**MIT65B10901**  
**ROLLER SWAGE USAGE**

2272957 S0000511587\_V1

**Spherical Bearing Sleeve Roller Swage**  
**Figure 1**

**20-50-44**



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ILLUSTRATED TOOL AND EQUIPMENT MANUAL

**PART NUMBER:** MIT65B63429

**NAME:** BALL STAKING TOOL - BEARING

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The MIT65B63429 ball staking tool is used during component maintenance.

MIT65B63429 is used to ball stake YN44WOPP2FTA114 bearings in the lateral guide base on the main cargo deck. MIT65B63429 is inserted into the guide base bearing counter bore which has mating radius cutouts which index the staking tool.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current MIT65B63429 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

MIT65B63429 is a rectangular steel block with four spherical head drill rod pins pressed-fit into each corner of the block.

**20-50-45**

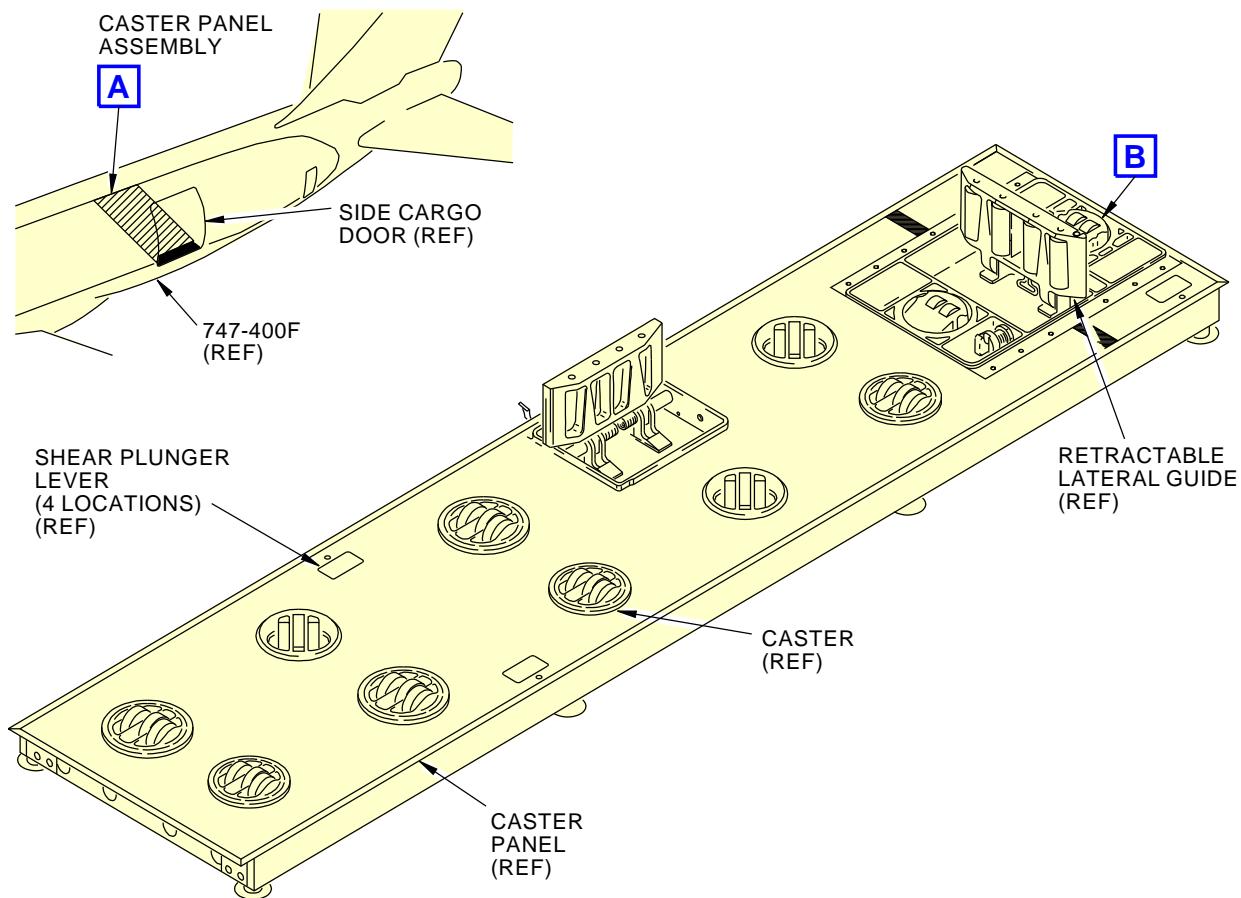
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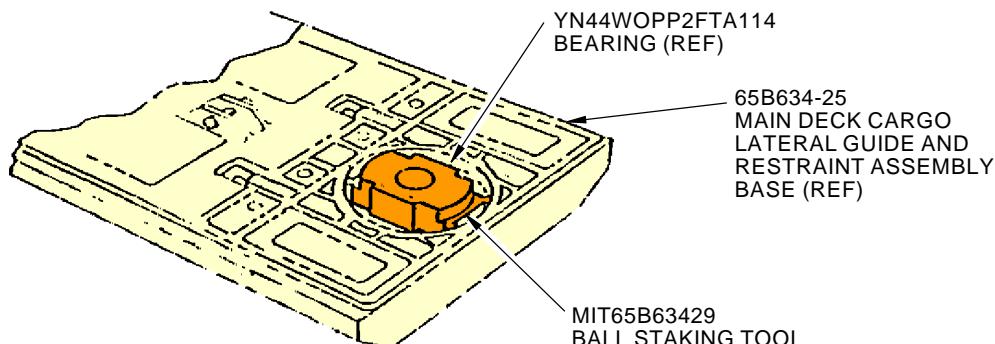


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CASTER PANEL ASSEMBLY  
(TYPICAL)

A



B

2273677 S0000511997\_V1

Bearing Ball Staking Tool  
Figure 1

**20-50-45**



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ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: MIT65B90361

NAME: TOOL - ROLLER SWAGING, 60B00180-302 BEARING

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The MIT65B90361 tool is used during component maintenance on 747-100 thru -300 airplanes equipped with the 65B90361 engine mount link.

MIT65B90361 is used to roller swage the 60B00180-302 bearing in place on the 65B90361 engine mount link. A mandrel pilots into a bushing under the bearing to be swaged. The bearing is mounted on an anvil. Rotation of the mandrel swages the outer bearing race. The part number of the bearing must be known before the correct tools can be identified. MIT65B90361 is used on bearing part numbers: 60B00180-302 and 60B00180-305.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current MIT65B90361 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

MIT65B90361 consists of:

MIT65B90361		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	ROLLER ASSEMBLY	-1
1	ANVIL	-3
1	ANVIL	-4
1	BUSHING	-5
1	STORAGE BOX	

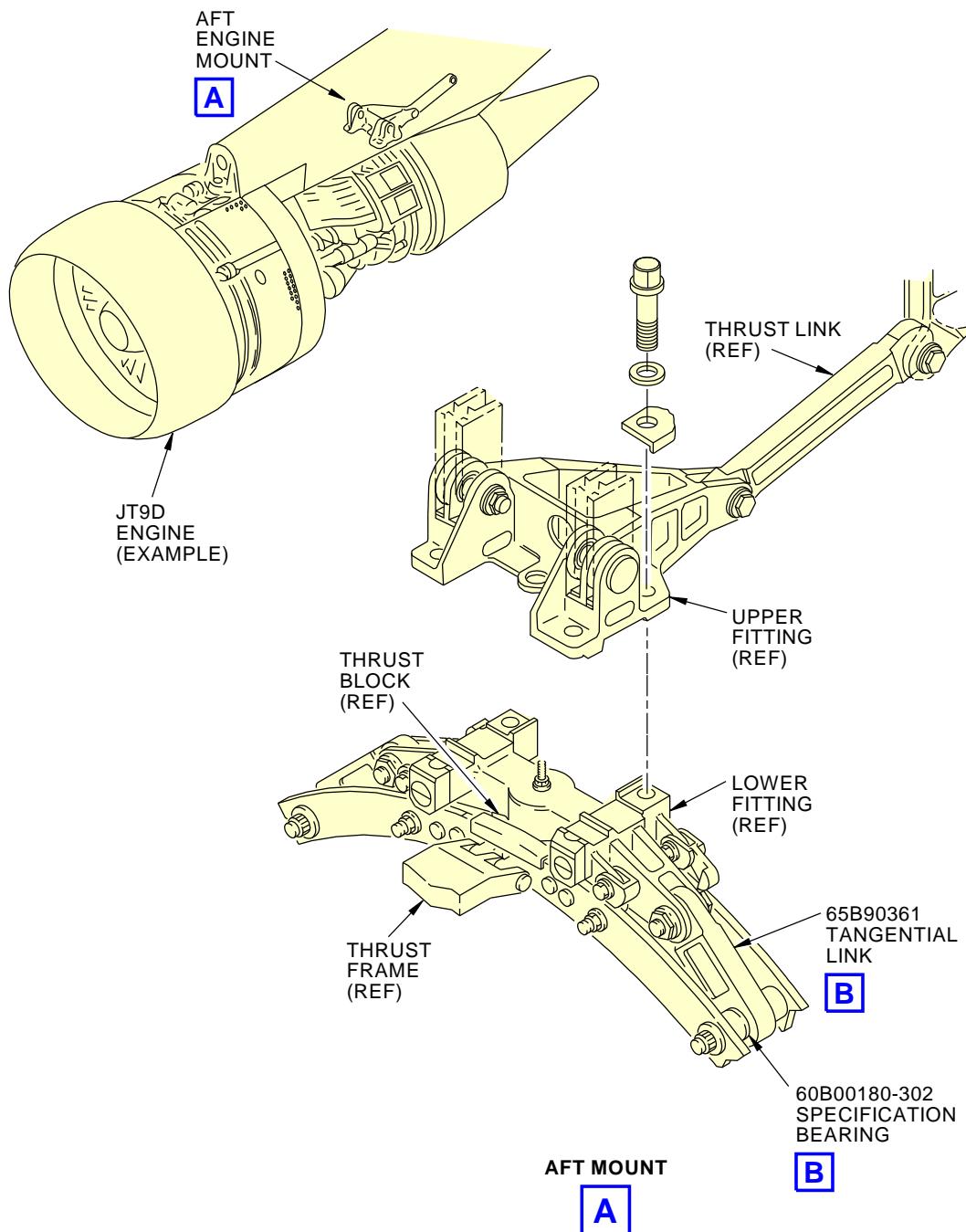
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2266338 S0000508846\_V1

**60B00180-302 Bearing Roller Swaging Tool**  
**Figure 1 (Sheet 1 of 2)**

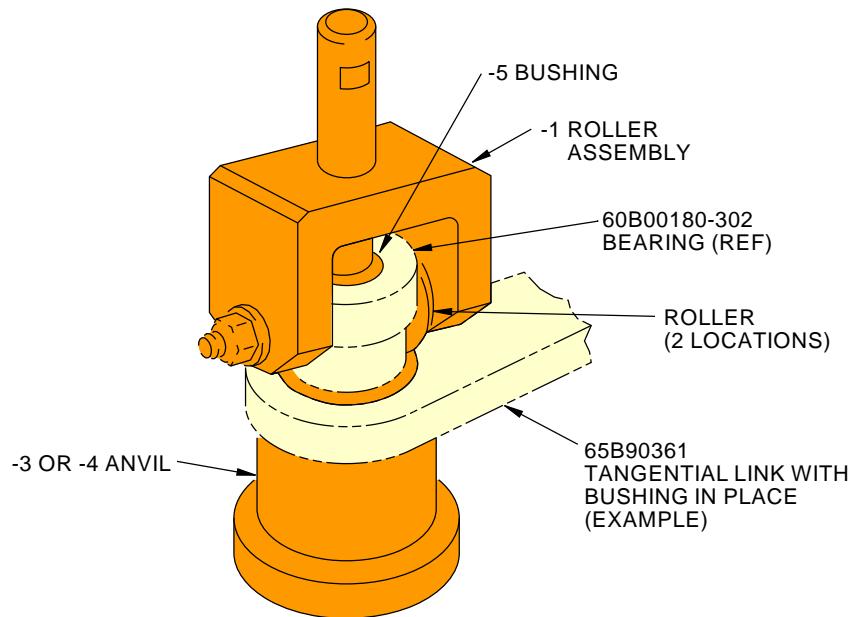
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MIT65B90361 TOOL

**B**

2266341 S0000508848\_V1

**60B00180-302 Bearing Roller Swaging Tool**  
**Figure 1 (Sheet 2 of 2)**

**20-50-46**

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ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: MIT65B97321

NAME: INSTALLATION AND REMOVAL TOOL - ROLLER SWAGED BEARING

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The MIT65B97321 installation and removal tool is used during component maintenance on 747-100 thru -300 airplanes.

MIT65B97321 is used to roller swage or remove 60B97207-1 and 60B97208-1 bearings.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current MIT65B97321 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

MIT65B97321 consists of:

MIT65B97321		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	ROLLER ASSEMBLY	-1
1	PRIMARY ANVIL	-6
1	SECONDARY ANVIL	-7
1	CUTTER ASSEMBLY	-8
1	STORAGE BOX	

**20-50-47**

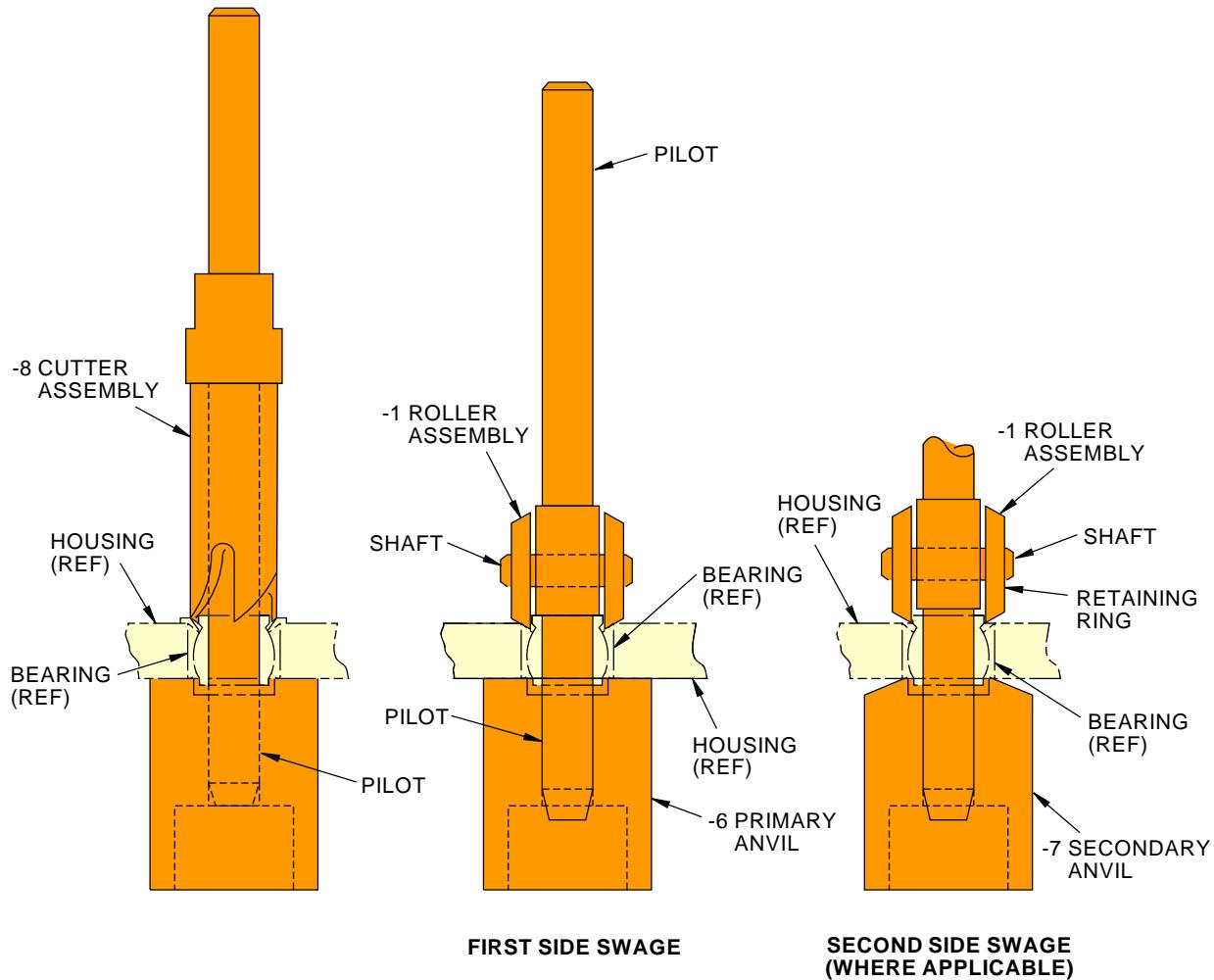
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MIT65B97321 INSTALLATION AND  
REMOVAL TOOL USAGE

2266343 S0000508852\_V1

Roller Swaged Bearing Installation And Removal Tool  
Figure 1

**20-50-47**

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PART NUMBER: ST1064

**NAME:** STAKING TOOL - BACB28B7

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST1064 staking tool is used on 707 airplanes.

ST1064 is used in conjunction with a customer-furnished Huck, CP-353-RP lock bolt gun. ST1064 is used to stake BACB28B7 bushings. Staking a bushing requires two steps: The first step uses a -3 curling punch. On the second step, the -3 curling punch is replaced with a -4 flattener to complete the staking.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST1064 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST1064 consists of:

ST1064		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	PIN	-1
1	ANVIL	-2
1	CURLING PUNCH	-3
1	FLATTENER	-4

**20-50-48**

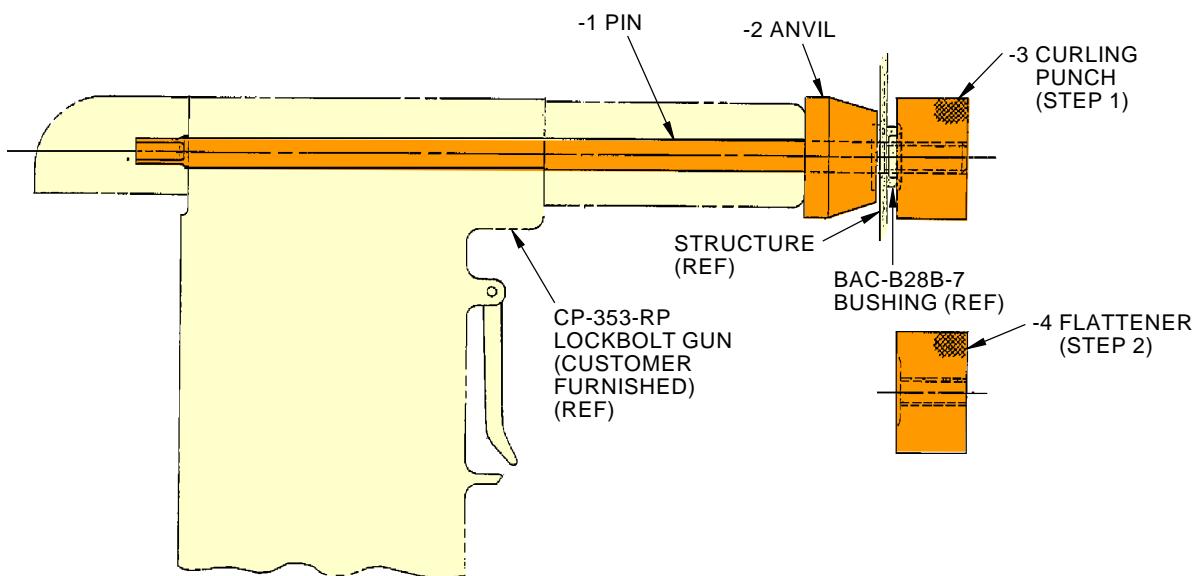
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**ST1064 STAKING TOOL**

2266365 S0000508943\_V1

**BACB28B7 Staking Tool**  
**Figure 1**

**20-50-48**

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ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: ST1212

**NAME:** ARBOR - HOLE SAW

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST1212 arbor is used during component maintenance on all Boeing airplanes.

ST1212 is used in conjunction with the customer-furnished ST1212E (typical) hole saw. ST1212 holds and guides the hole saw during cutting. ST1212 is used to remove bearing. The part number of the bearing must be known before the correct tools can be identified. ST1212 is used to remove bearing part numbers: KSSB4-13D, LHSSG4-11A, NC4DG3, S302T001-300, S302T001-301, S302T001-404, S302T001-408 and S302T001-410.

ST1212 is designated in the form "ST1212-XX-Y" where:

"ST1212" is the basic tool number.

"XX" is the variation, from -2 to -14, such as multiblade arbors, spring pilots, micro-stops, waste ejecting, etc.

"Y" is the threads in 1/16-inch.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST1212 drawings for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST1212-XX-Y arbors are fabricated from various tooling steels.

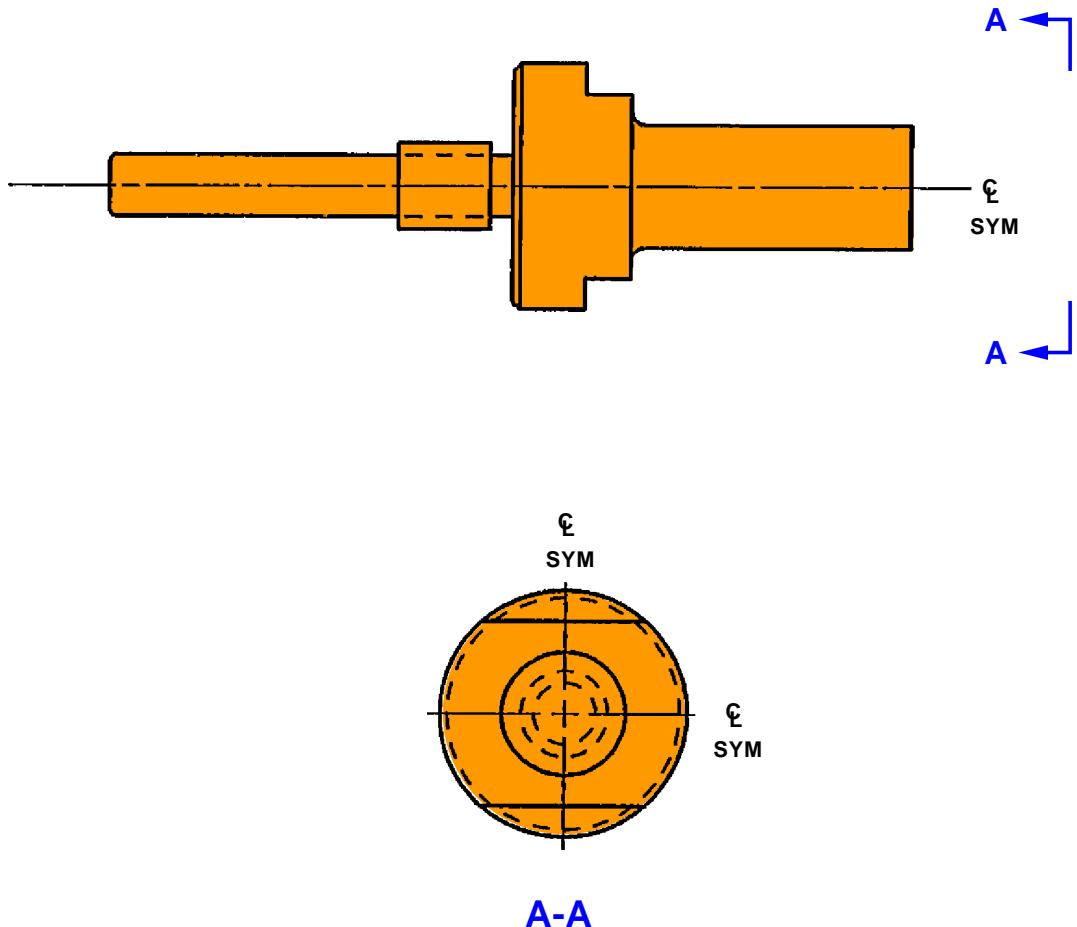
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**ST1212-2 ARBOR (EXAMPLE)**

2266374 S0000508963\_V1

**Hole Saw Arbor**  
**Figure 1**

**20-50-49**



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**PART NUMBER:** ST1212E

**NAME:** STANDARD TOOL - HOLE SAW

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** YES

CMM 49-21-02

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST1212E standard tool is used during component maintenance on all Boeing airplanes.

ST1212E is used in conjunction with a customer-furnished drill press and ST1212 arbor. ST1212E is used to remove the staking lip from roller staked bearings, allowing bearing removal. The part number of the bearing must be known before the correct tools can be identified. ST1212E is used to remove bearing part numbers: BACB28AB18, BACB28AB8, KSSB4-13D, LHSSG4-11A, NC4DG3, S302T001-300, S302T001-301, S302T001-404, S302T001-408 and S302T001-410.

ST1212E is designated in the form ST1212E-XXX-(YYY), where:

“ST1212” is the basic tool number.

“E” is the series.

“XXX” is the cutter diameter in 1/1000-inch.

“(YYY)” is used for diameter sizes 0.751 thru 1.250 only if 5/16-24 NF2 threads are required. “YYY” is omitted for standard thread size.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST1212E drawings for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST1212E blades are fabricated from M2, M3 or M7 high speed steel, heat treated to Rc 63-66..

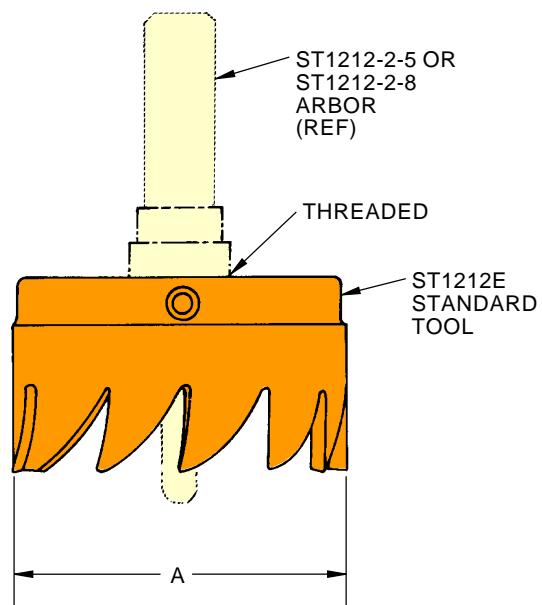
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**ST1212E STANDARD TOOL  
(EXAMPLE)**

2266379 S0000508982\_V1

**Hole Saw Standard Tool  
Figure 1**

**20-50-50**

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**PART NUMBER: ST2570-28**

**NAME:** SCREWDRIVER - SPECIAL FOR BACB10B CAM FOLLOWER BEARINGS

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST2570-28 screwdriver is used on 707 airplanes.

ST2570-28 is used to hold the BACB10B cam follower bearing while the nut is tightened.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST2570-28 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST2570-28 consists of a single ST2570-28 screwdriver.

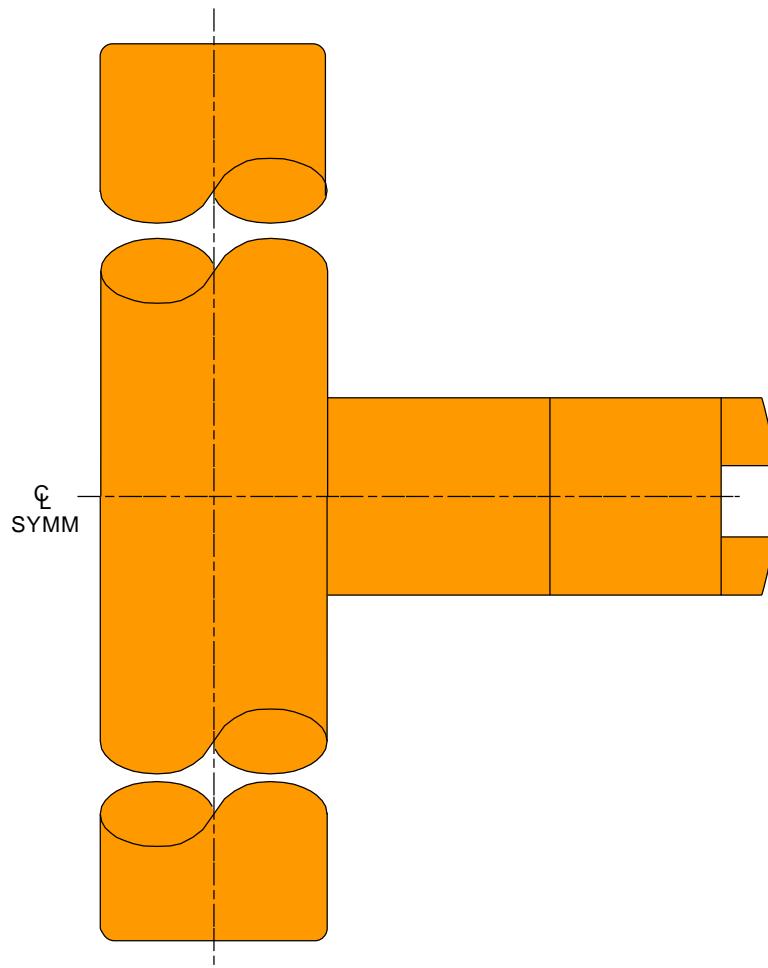
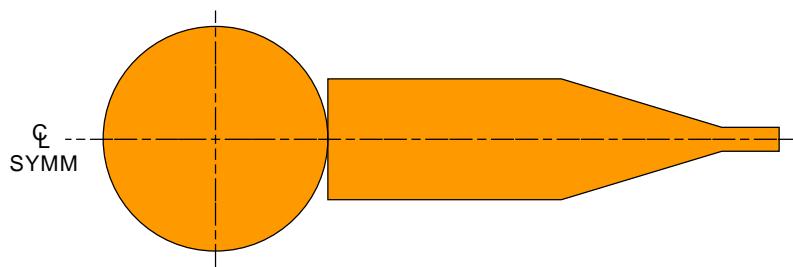
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**ST2570-28 SCREWDRIVER**

2266549 S0000509019\_V1

**BACB10B Cam Follower Bearing Special Screwdriver**  
**Figure 1**

**20-50-51**

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ILLUSTRATED TOOL AND EQUIPMENT MANUAL

**PART NUMBER:** ST2580-103

**NAME:** WRENCH - ROD END

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST2580-103 wrench is used during component maintenance on 707 airplanes.

ST2580-103 is used with a customer-furnished torque or socket wrench to tighten the BACB10A and BACB10C series rod ends on rod assemblies. ST2580-103-1 is used on BACB10A-435 rod ends. ST2580-103-2 is used on BACB10C-53H rod ends. ST2580-103-3 is used on BACB10A-436 rod ends. ST2580-103-4 is used on BACB10C-57H rod ends.

ST2580-103 is designated in the form "ST2580-103-X" where:

"ST2580" is the basic part number.

"103" is the series.

"X" is the dash number.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST2580-103 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST2580-103 consists of: ST2580-103-1, ST2580-103-2, ST2580-103-3 and ST2580-103-4 wrenches.

**20-50-52**

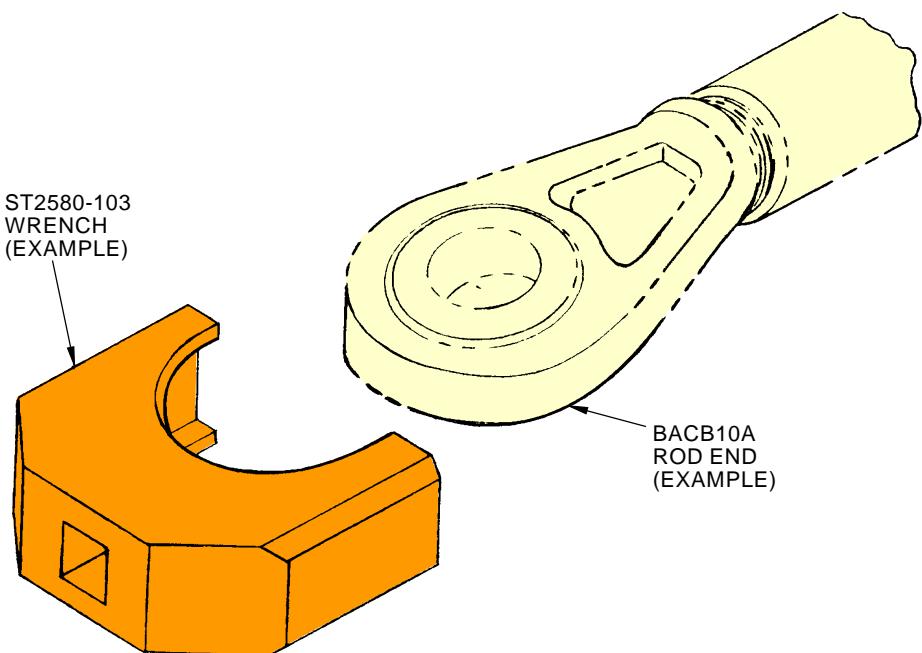
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ILLUSTRATED TOOL AND EQUIPMENT MANUAL



2266550 S0000509026\_V1

Rod End Wrench  
Figure 1

**20-50-52**

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ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: ST2580-286-8

NAME: STANDARD TOOL - SPANNER WRENCH, FACE TYPE

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: YES

CMM 55-20-17

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The ST2580-286-8 standard tool is used during component maintenance. ST2580-286-8 is used to hold and tighten the BACB10JG04BCJ02F bearing during component maintenance.

The ST2580-286-8 tools are designated in the form "ST2580-286-8-X" where:

"ST2580" is the basic tool number.

"286" is the series.

"8" is the variation.

"X" is the detail or assembly number.

Refer to CMM 55-20-17, the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST2580-286-8 drawing for complete usage instructions. If component overhaul instructions differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST2580-286-8 consists of:

ST2580-286-8		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	SHAFT ASSEMBLY	-2
1	RESTRAINER ASSEMBLY	-5
1	SPANNER	-9
1	STORAGE BOX	

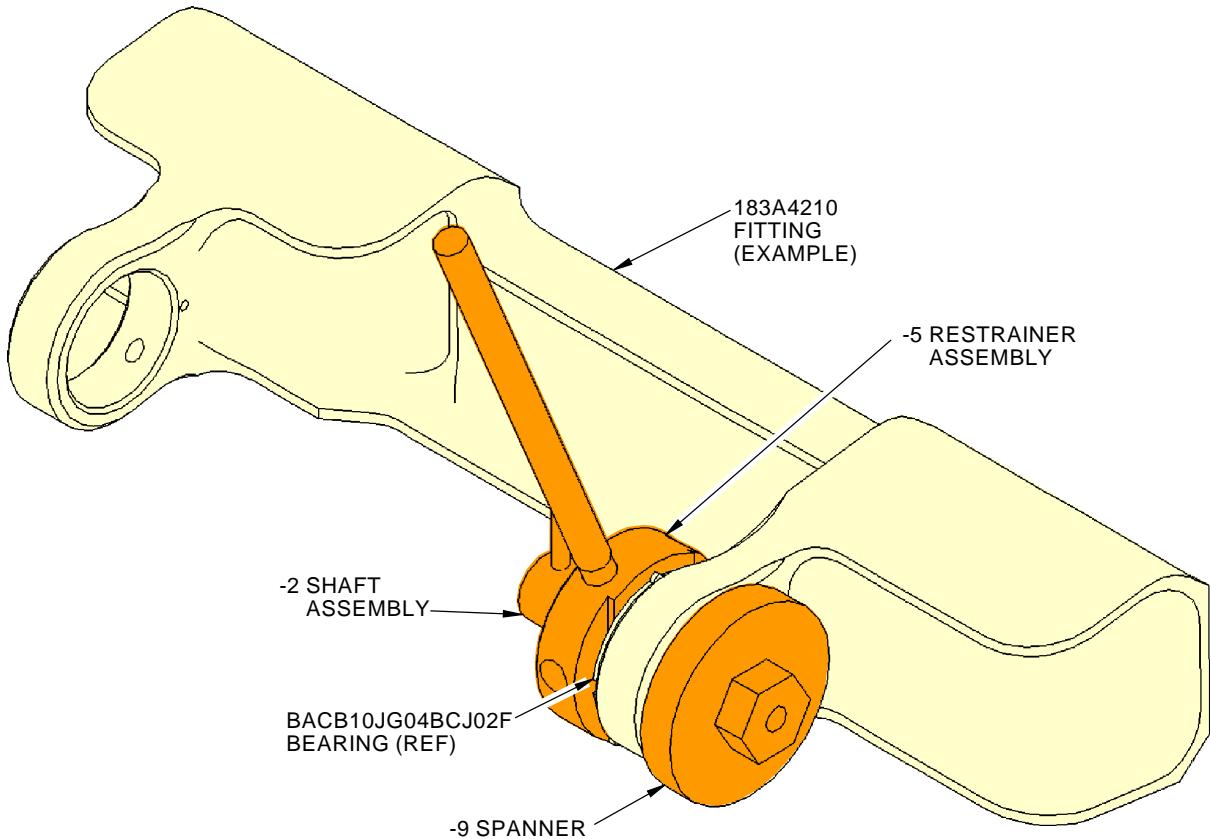
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**ST2580-286-8**  
**STANDARD TOOL USAGE**

2272907 S0000511599\_V1

**Face Type Spanner Wrench Standard Tool**  
**Figure 1**

**20-50-53**

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**737-600/700/800/900**  
**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER: ST2597**

**NAME:** PLIERS - RETAINER RING

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST2597 pliers are used during component maintenance on all Boeing airplanes.

ST2597 is used to install or remove NAS 50, 51, 669 and 670 retainer (snap) rings. ST2597 is furnished in three different types for internal/external and different sizes of retainer rings.

ST2597 is designated in the form "ST2597-X-(B)" where:

"ST2597" is the basic part number.

"X" is the vendor code number.

"(B)" is for a bent nose type, omitted for all others.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST2597 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST2597 consists of three types of retainer ring pliers with various sizes of those types.

**20-50-54**

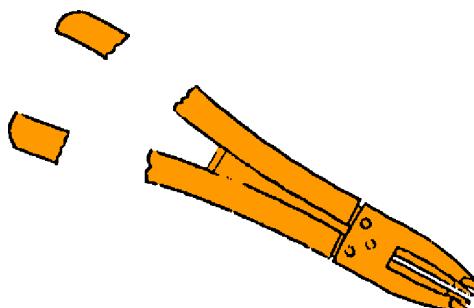
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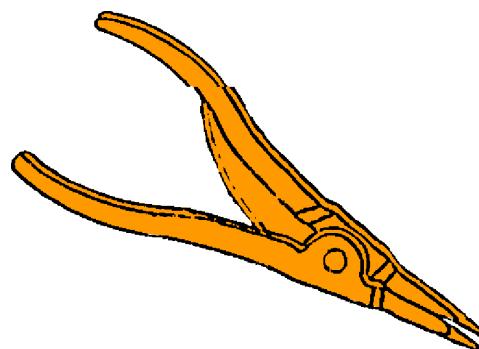
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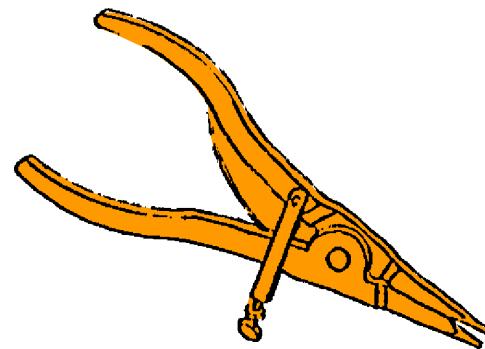
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TYPE 1



TYPE 2



TYPE 3

**ST2597 RETAINER RING PLIERS**

2266555 S0000509030\_V1

**Retainer Ring Pliers**  
**Figure 1**

**20-50-54**



**737-600/700/800/900**  
**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER: ST30-8783**

**NAME:** ROAD MAP, TEST TOOL BEARING, PROOF LOAD TEST

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST30-8783 road map is used on all Boeing airplanes. ST30-8783 provides a set-up guide for the ST8783 series tooling to proof load various bearing per the BAC5435 specification. ST30-8783 provides proof load tooling information including drawbar, loading, anvil, retainer and pin.

ST30-8783 is designated in the form "ST30-8783-X" where:

"ST30-8783" is the basic tool number.

"X" is the kit number.

ST30-8783 includes information to proof load the following bearings:  
BACB10AB20, BACB10AB8M, BACB10AG22, BACB10AG4,  
BACB10FA04G, BACB10FA06G, BACB10FA10G, BACB10FA12G,  
BACB10FB08G, BACB10FB10G, BACB10FE07, BACB10FH12G,  
BACB10GC04G, BACB10GC06G, BACB10GD08G, BACB10GD10G,  
S302T001-209, S302T001-216, S302T001-303, S302T001-414,  
S302T001-419, S302T001-423, S302T001-801, S302T001-802,  
S302T001-807, S302T001-810, S302T001-811, S302T001-813,  
S302T001-816, S302T001-817, S302T001-818, S302T001-821,  
S302T001-822, S302T001-823, S302T001-824, S302T001-825,  
VTB01140, VTB08550, 251W2128-1 and 251W2128-2,

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST30-8783 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST30-8783 shows the lists of tools required for ST8783 series bearing proof load testing.

**20-50-55**

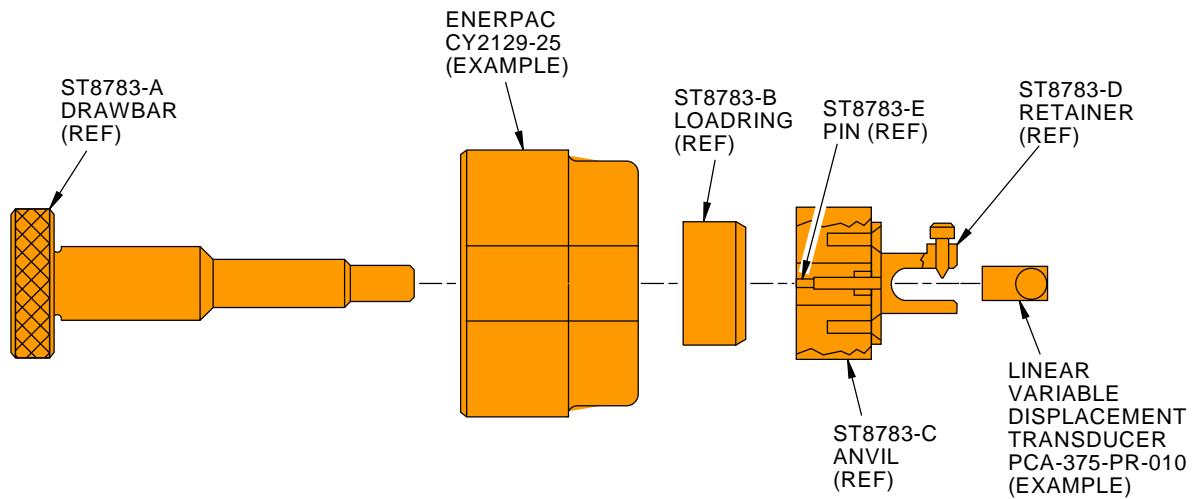
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ST30-8783 ROAD MAP,  
TYPICAL SMALL BEARING TEST ASSEMBLY  
(EXPLODED VIEW)

2266557 S0000509038\_V1

Proof Load Test Tool Bearing Road Map  
Figure 1

**20-50-55**



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ILLUSTRATED TOOL AND EQUIPMENT MANUAL

**PART NUMBER:** ST30-8783A

**NAME:** ROAD MAP FOR BEARING PROOF LOAD TESTING

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST30-8783A road map is used on all Boeing airplanes. ST30-8783A provides a set-up guide for the ST8783A series tooling to proof load various bearing per the BAC5435 specification. ST30-8783A provides proof load tooling information including drawbar, loading, sleeve, nut and retainer.

ST30-8783A is designated in the form "ST30-8783A-X" where:

"ST30-8783" is the basic tool number.

"A" is the series.

"X" is the kit number.

ST30-8783A includes information to proof load the following bearings:  
BACB10AB10, BACB10AB20, BACB10AB5, BACB10AB6,  
BACB10AG10, BACB10AG4, BACB10CH5, BACB10CN4, BACB10CN9,  
BACB10ER04G, BACB10ES04G, BACB10ES05G, BACB10ES06AG,  
BACB10FA04G, BACB10FA05G, BACB10FA06G, BACB10FA08G,  
BACB10FA10G, BACB10FB05G, BACB10FC04, BACB10FC05,  
BACB10FC06, BACB10FC10, BACB10FE04, BACB10FE07,  
BACB10FE08, BACB10FH05G, BACB10FJ06G, BACB10GB05G,  
BACB10GD05G, KR10CEGB, KR10CNGB, MS14101-10, MS14101-12,  
MS14101-4, MS14101-5, MS14101-5A, MS14101-6, MS14103-10,  
MS14103-5, MS14103-6, MS21232-10, MS21232-5, P21790, P22960,  
P22970, S302T001-200, S302T001-207, S302T001-209, S302T001-212,  
S302T001-215, S302T001-216, S302T001-219, S302T001-220,  
S302T001-229, S302T001-232, S302T001-236, S302T001-302,  
S302T001-413, S302T001-421, S302T001-808, S302T001-820,  
VTB08590, 10-60545-111S, 10-60545-114S, 10-60545-117S,  
10-60545-140S, 10-60545-140SA, 10-60545-163S, 10-60545-163SA,  
10-60545-200S, 10-60545-201S, 10-60545-203S, 10-61903-5,  
10-61905-2, 10-61970-2, 60B00180-302, 60B00180-305, 60B00180-306,  
60B00180-333, 60B00180-351, 60B00180-37, 60B00180-38,  
60B00180-40, 60B00180-68

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST30-8783A drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST30-8783A shows the lists of tools required for ST8783 series bearing proof load testing.

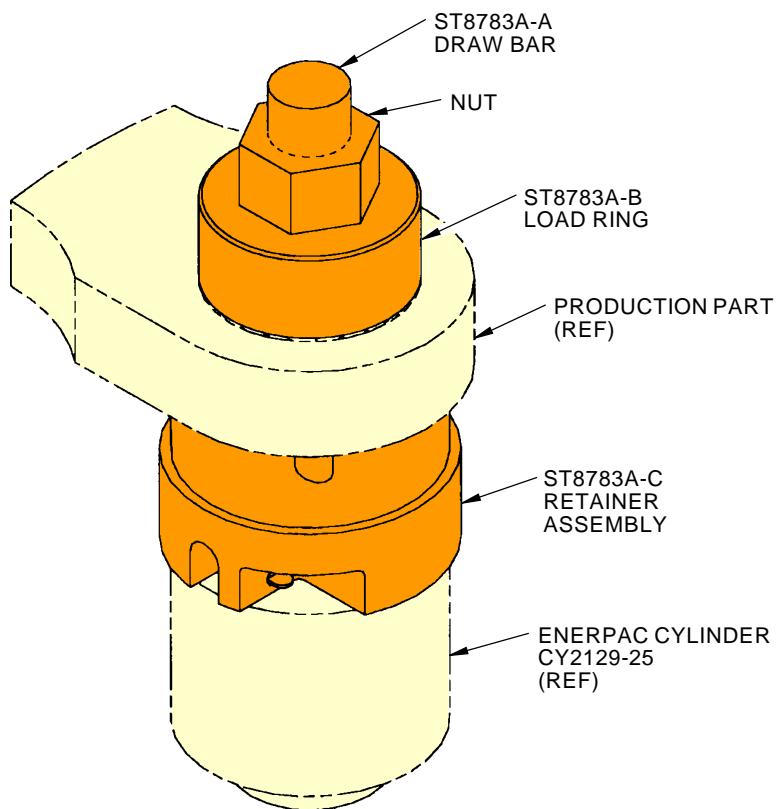
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**ST30-8783A BEARING TEST ASSEMBLY  
(EXAMPLE)**

2267532 S0000509210\_V1

**Road Map for Bearing Proof Load Testing  
Figure 1**

**20-50-56**



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ILLUSTRATED TOOL AND EQUIPMENT MANUAL

**PART NUMBER:** ST321-A

**NAME:** SUPPORT - BUSHING INSTALLATION, ARBOR PRESS

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST321-A support is used during component maintenance on all Boeing airplanes. ST321-A is used in conjunction with a customer-furnished arbor press. ST321-A is used to hold parts during bearing installation.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current A20011 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST321-A consists of three pieces of corrosion resistant steel and four flat head screws.

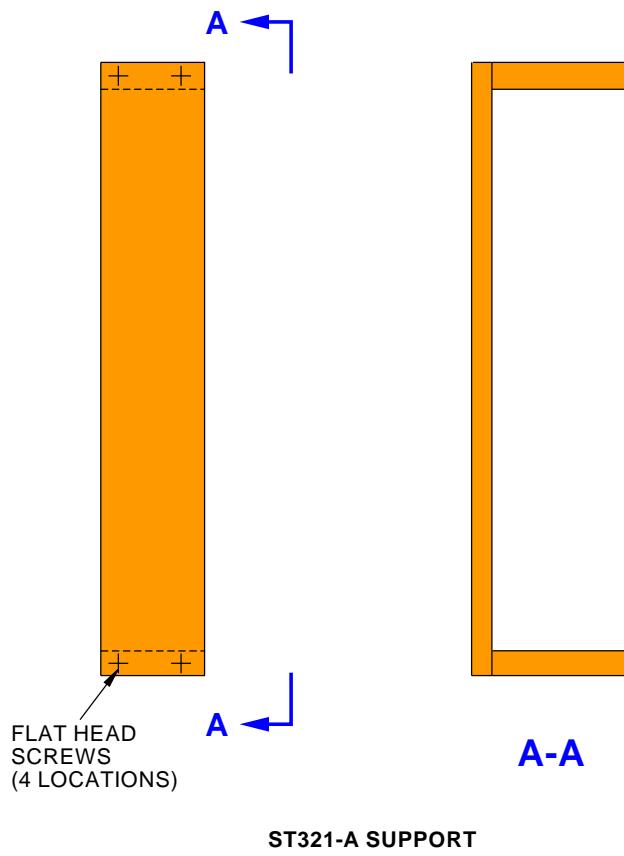
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**ST321-A SUPPORT**

2267395 S0000509232\_V1

**Arbor Press Bushing Installation Support**  
**Figure 1**

**20-50-57**



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PART NUMBER: ST8783-6

**NAME:** STANDARD TOOL - ASSEMBLY, PROOF LOAD TEST EQUIPMENT,  
BACB10FB08GC BEARING INSTALLATION

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST8783-6 standard tool is used during component maintenance.

ST8783-6 is used in conjunction with a customer-furnished Enerpac cylinder CY2129-25 and linear variable displacement transducer PCA-375-PR-010. ST8783-6 is used to locate and clamp a swaged bearing installation while applying a load to verify correct assembly.

ST8783-6 is used on bearing BACB10GB08G.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST8783-6 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST8783-6 consists of:

ST8783-6		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	DRAWBAR	-2
1	LOAD RING	-3
1	ANVIL	-4
1	RETAINER	-5
1	COMPRESSION SPRING	-7
2	SOCKET HEAD CAP SCREW	-8
1	NYLON SOCKET HEAD CAP SCREW	-9
1	STEP PAD	-10
1	PIN	-11

**20-50-58**

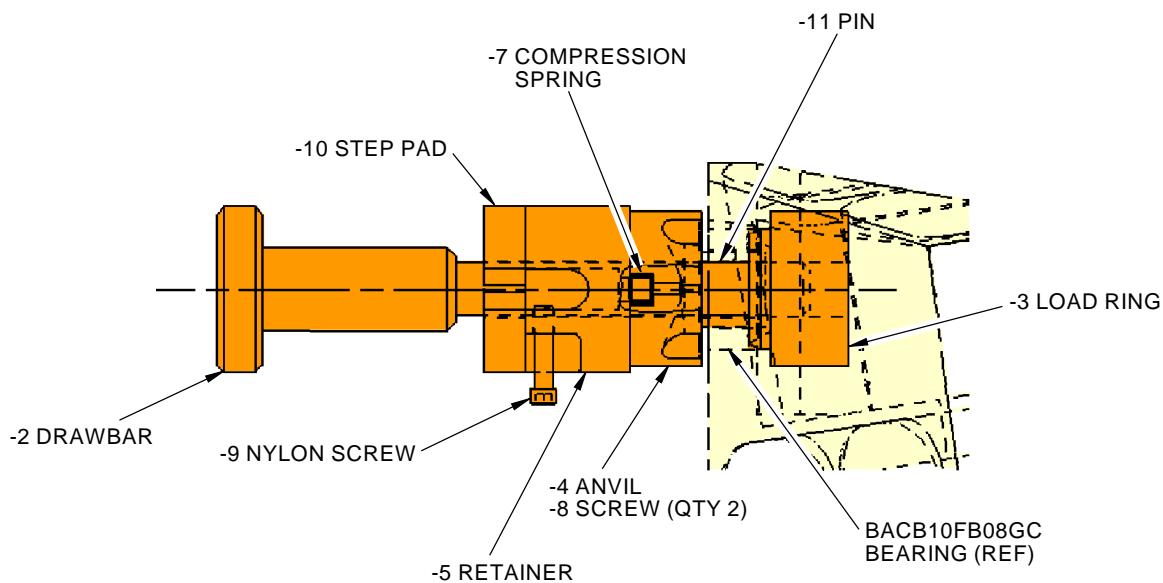
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**ST8783-6**  
**STANDARD TOOL USAGE**

2272939 S0000511595\_V1

**BACB10FB08GC Bearing Installation Proof Load Test Equipment Assembly Standard Tool**  
**Figure 1**

**20-50-58**

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**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER: ST8783F**

**NAME:** STANDARD TOOL - BEARING RETENTION PROOF TEST

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST8783F standard tool is used during component maintenance on all Boeing airplanes.

ST8783F is used to test bearing assemblies for compliance with the BAC5435 specification for side load retention.

The complete tool number is designated by "ST8783F-XXX-YY-Z", where:

"ST8783" is the basic part number.

"F" is the variation.

"XXX" is the housing bore diameter in 1/1000-inch.

"YY" is the bearing length in 1/100-inch.

"Z" is the detail or assembly number. -1 test assembly for bearings with an inside diameter 0.375-inch or larger. -16 test assembly for bearings with an inside diameter smaller than 0.375-inch. "K" for a kit of both the -1 and -16 test assemblies and the -4 indicator holder assembly.

ST30-8783F includes information to proof load the following bearings:  
BACB10AB10, BACB10AB20, BACB10AB5, BACB10AB6,  
BACB10AB8M, BACB10AG10, BACB10AG22, BACB10AG4,  
BACB10CH5, BACB10CN4, BACB10CN9, BACB10ER04G,  
BACB10ES04G, BACB10ES05G, BACB10ES06AG, BACB10FA04G,  
BACB10FA05G, BACB10FA06G, BACB10FA08G, BACB10FA10G,  
BACB10FA12G, BACB10FB05G, BACB10FB08G, BACB10FB10G,  
BACB10FC04, BACB10FC05, BACB10FC06, BACB10FC10,  
BACB10FE04, BACB10FE07, BACB10FE08, BACB10FH05G,  
BACB10FH12G, BACB10FJ10G, BACB10GB05G, BACB10GC08G,  
BACB10GB10G, BACB10GC04G, BACB10GC06G,  
BACB10GD05G, BACB10GD08G, BACB10GD10G, DAS16-40A1-509,  
KR10CEGB, KR10CNGB, MS14101-10, MS14101-12, MS14101-4,  
MS14101-5, MS14101-5A, MS14101-6, MS14103-10, MS14103-5,  
MS14103-6, MS21232-10, MS21232-5, P21790, P22960, P22970,  
S251W125-2, S302T001-200, S302T001-207, S302T001-209,  
S302T001-212, S302T001-215, S302T001-216, S302T001-219,  
S302T001-229, S302T001-232, S302T001-236, S302T001-301,  
S302T001-302, S302T001-303, S302T001-413, S302T001-414,  
S302T001-416, S302T001-419, S302T001-420, S302T001-421,  
S302T001-423, S302T001-801, S302T001-802, S302T001-807,  
S302T001-808, S302T001-810, S302T001-811, S302T001-813,  
S302T001-816, S302T001-817, S302T001-818, S302T001-820,  
S302T001-821, S302T001-822, S302T001-823, S302T001-824,

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S302T001-825, VTB01140, VTB08550, 10-60545-111S, 10-60545-114S,  
10-60545-117S, 10-60545-140S, 10-60545-140SA, 10-60545-163S,  
10-60545-163SA, 10-60545-200S, 10-60545-201S, 10-60545-203S,  
10-61903-5, 10-61905-2, 10-61970-2, 10-61970-3, 10-61970-4,  
10-61970-5, 10-61970-6, 10-61970-7, 251W2128-1, 251W2128-2,  
60B00180-302, 60B00180-305, 60B00180-306, 60B00180-333,  
60B00180-351, 60B00180-37, 60B00180-38, 60B00180-40 and  
60B00180-68

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST8783F drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST8783F consists of:

ST8783F		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	TYPE I TEST ASSEMBLY	-1
1	TYPE II TEST ASSEMBLY	-16
1	INDICATOR HOLDER ASSEMBLY	-4

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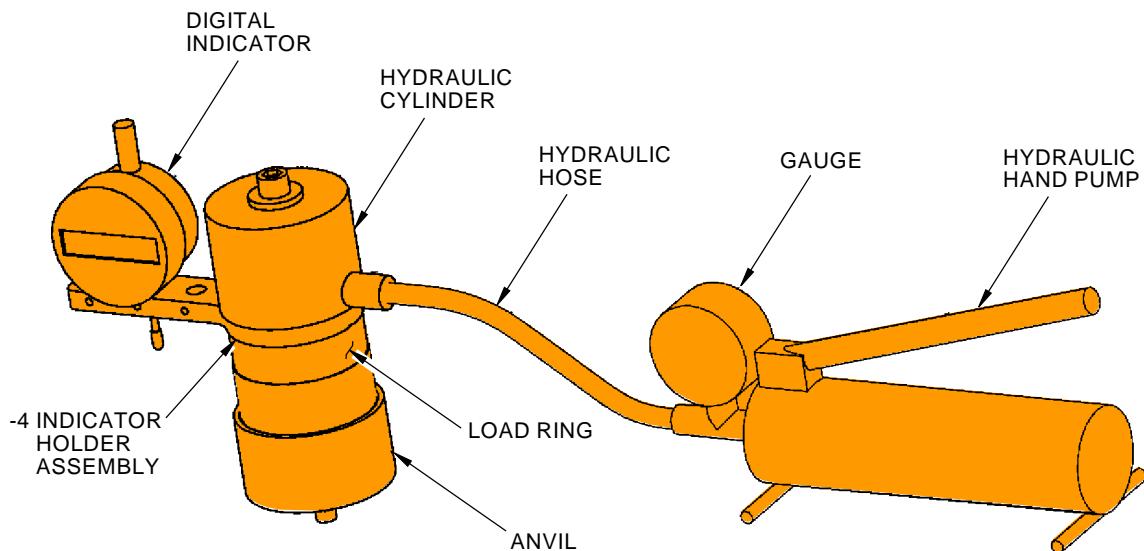
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ST8783-1 OR -16 TEST ASSEMBLY  
(EXAMPLE)

2267363 S0000509245\_V1

Bearing Retention Proof Test Standard Tool  
Figure 1

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ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: ST918A

NAME: MANDREL - BEARING PRESSING BACB10A

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The ST918A mandrel is used during component maintenance for all Boeing airplanes equipped with BACB10A (ball) bearings.

The ST918A series mandrels are used in conjunction with a customer-furnished press to install bearings into housings prior to staking.

ST918A tool code number is listed as ST918A-XXXX-YYYY, where:

“ST918A” is the basic tool number

“XXXX” is the bearing bore in 1/1000-inch.

“YYYY” is the bearing outside diameter in 1/1000-inch.

ST918A is used to press bearing part numbers: AN200KP10, AN200KP37B, AN200KP4, AN200KP5, AN200KP6, AN200KS10, AN200KP8, AN200KS3, AN200KS3L, AN200KS4, AN200KS6, AN200K3L, AN201KP10A, AN201KP12A, AN201KP16A, AN201KP16B5, AN201KP20A, AN201KP3, AN201KP3A, AN201KP4, AN201KP4A, AN201KP5, AN201KP5A, AN201KP6A, AN201KP8, AN201KP8A, AN202KP21B, AN202KP23B, AN202KP25B, AN202KP29B, AN202KP33B, AN202KP37B, AN202KP49B, AN206DSP4, AN206DSP6, AN206DSP8, AN207DPP4, AN207DPP5, BACB10AB10, BACB10AB20, BACB10AB4, BACB10AB4M, BACB10AB5, BACB10AB6, BACB10AB8M, BACB10AC10, BACB10AC3L, BACB10AC4, BACB10AC4A, BACB10AC5, BACB10AC5A, BACB10AC6, BACB10AC6A, BACB10AC8, BACB10AG22, BACB10AG4, BACB10AG7, BACB10AG8, BACB10AH10, BACB10AH3L, BACB10AH5, BACB10AH6, BACB10AN4, BACB10AP10, BACB10AP12, BACB10AP16, BACB10AP3, BACB10AP4, BACB10AP5, BACB10AP6, BACB10AP8, BACB10AR4, BACB10AR5, BACB10AR6, BACB10AS10, BACB10AS12, BACB10AS14, BACB10AS17, BACB10AS21, BACB10AS25, BACB10AS29, BACB10AS33, BACB10AT12PP,

BACB10AT3MM, BACB10AT4, BACB10AT4MM, BACB10AT8, BACB10AU16, BACB10AU21, BACB10AU23, BACB10AU25, BACB10AU29, BACB10AU33, BACB10AU37, BACB10AU47, BACB10AU49, BACB10AU72, BACB10AW16, BACB10AW21, BACB10AW37, BACB10AZ17PP, BACB10AZ35PP, BACB10A102, BACB10A103, BACB10A103H, BACB10A105H, BACB10A117H, BACB10A119, BACB10A120, BACB10A122, BACB10A122A, BACB10A127, BACB10A130, BACB10A131H, BACB10A136, BACB10A136H, BACB10A137, BACB10A141, BACB10A141H, BACB10A147, BACB10A151, BACB10A151GC, BACB10A155GC,

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BACB10A156GC, BACB10A163GC, BACB10A170GC, BACB10A174,  
BACB10A174GC, BACB10A176GC, BACB10A177, BACB10A177GC,  
BACB10A180M2, BACB10A19, BACB10A201, BACB10A201G,  
BACB10A203GCM2, BACB10A203GD, BACB10A203GM2,  
BACB10A204GM2, BACB10A208GM2, BACB10A21, BACB10A211GM2,  
BACB10A213GM2, BACB10A214GM2, BACB10A215GM2,  
BACB10A217GM2, BACB10A220GM2, BACB10A235, BACB10A236,  
BACB10A237, BACB10A238, BACB10A239, BACB10A240,  
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BACB10C93R, BACB10ES06AG, BACB10EX16, BACB10EX23,  
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HHDSP8, KP3AL, KR4CNGV, KSBG10-9, SBG14N25SSD3, KSBG14N3,  
KSBG8N3, KSBN8, KSB10-9, KSC111008V, KSC135216B,  
KSC145700BZ12G, KSC234708V, KSC274009V, KSC277705B,  
KSC312312BZG, KSC401605B, KSC401707B, KSSB2025, KSSN48-6,  
LA3624A, LHSSG6AJ, LHSS3R, LHSS8AD, L3119, MB538DDE9595,  
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MB543DDSD610, MKP4A, MKP5A, MKP6A, MKSP5A, MKSP5E9104,  
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MS14104-9, MS20200KP4, MS20200KP5, MS20200K3L,  
MS20201KP10A, MS20201KP12A, MS20201KP20A, MS20201KP3A,  
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MS20202KP25B, MS20202KP29B, MS20202KP33B, MS20202KP37B,  
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MS27261KSP6, MS27261KSP6A, MS27261KSP8, MS27645-5AR,  
M81936/1-22, M930EK, P2A4000-16, P2A4000-8, P20280,  
S012T236-402, S012T236-700, S012T236-701, S012T236-702,  
S012T236-703, S012T236-704, S012T236-705, S012T236-706,  
S012T236-707, S012T236-708, S012T236-709, S012T236-710,  
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S302T001-207, S302T001-209, S302T001-210, S302T001-215,  
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10-60545-36, 10-60545-40, 10-60545-42, 10-60545-45, 10-60545-50,  
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10-60545-63, 10-60545-64, 10-60545-66, 10-60545-71, 10-60545-72,  
10-60545-78, 10-60545-82, 10-60545-87, 10-61345-1, 10-61846-1,  
10-61903-5, 10-61905-1, 10-61905-2, 10-61905-3, 10-61905-5,  
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60B90143-1, 60B96203-1, 60B96213-1, 60B98100-1, 60B98101-1,  
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69B15036-1, 69B15036-2, 69B15036-3, 69B94365-1, 69B94365-2,  
69B94365-3, 69B94365-4, 78245.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST918A drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

The ST918A series of tools are circular mandrels with appropriately sized flanges and pilots to fit inner and outer races of the various bearings. A cylindrical shank provides a means of mounting the mandrel in a press.

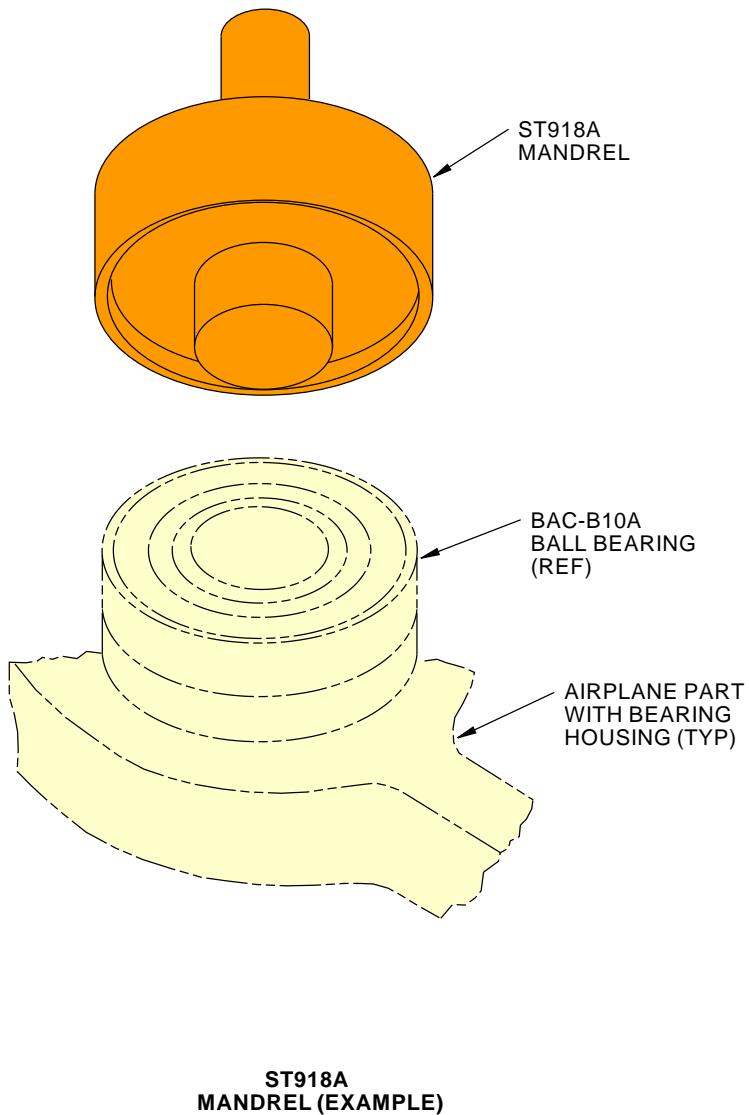
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**Bearing Pressing BACB10A Mandrel**  
**Figure 1**

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PART NUMBER: ST918B

NAME: MANDREL - BEARING PRESSING BACB10B

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST918B mandrel is used during component maintenance for all Boeing airplanes equipped with BACB10B (needle) bearings. The ST918B series mandrels are used in conjunction with a customer-furnished press to install bearings into housings prior to staking. ST918B tool code number is listed as "ST918B-X-YYY-ZZZZ", where: "ST918B" is the basic tool number. "X" is the tool mounting code (types 1 thru 4). Mandrel types permit a selection of the thickness of the annular tool surface that touches the bearing outer race. Types 1 and 4 are for bearings with a thin outer race. Types 2 and 3 are for bearings with a heavy outer race. Refer to the ST918B drawing for complete information. "YYY" is the bearing bore in 1/1000-inch. "ZZZZ" is the bearing outside diameter in 1/1000-inch.

ST918B is used to press bearing part numbers: AS24461-10, AS24461-12, AS24461-20, AS24461-24, AS24461-8, BACB10BH59, BACB10BH64, BACB10BM28-16, BACB10B101S, BACB10B103ZP, BACB10B104ZP, BACB10B105J, BACB10B105ZP, BACB10B107J, BACB10B108ZP, BACB10B112ZP, BACB10B114ZP, BACB10B115ZP, BACB10B130, BACB10B131, BACB10B132, BACB10B135, BACB10B136, BACB10B137, BACB10B145, BACB10B146, BACB10B147, BACB10B148, BACB10B149, BACB10B150, BACB10B151, BACB10B153, BACB10B154, BACB10B158, BACB10B160, BACB10B161, BACB10B162, BACB10B168P, BACB10B171P, BACB10B262R, BACB10B28PLT, BACB10B317, BACB10B45, BACB10B70PLT, BACB10CC10, BACB10CC12, BACB10CC16, BACB10CC20, BACB10CC4, BACB10CC6, BACB10CC7, BACB10CC8, BACB10CD7, BACB10CE12, BACB10CE14, BACB10CE3, BACB10CE32, BACB10CE48, BACB10CE5, BACB10CE56, B38DD, MS24461-10, MS24461-12, MS24461-20, MS24461-24, MS24461-8, 10-60516-39 and 3NBE514ZP.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST918B drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

The ST918B series of tools are circular mandrels with appropriately sized flanges and pilots to fit inner and outer races of the various bearings. A

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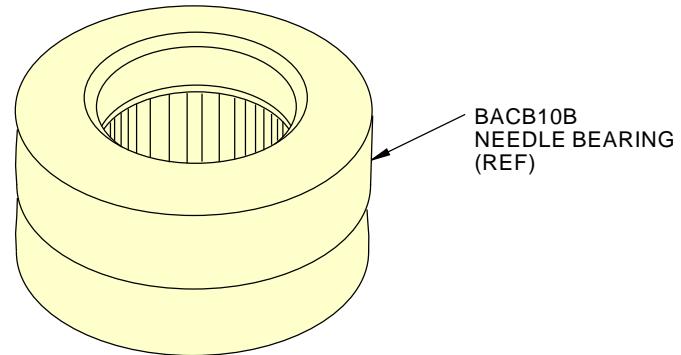
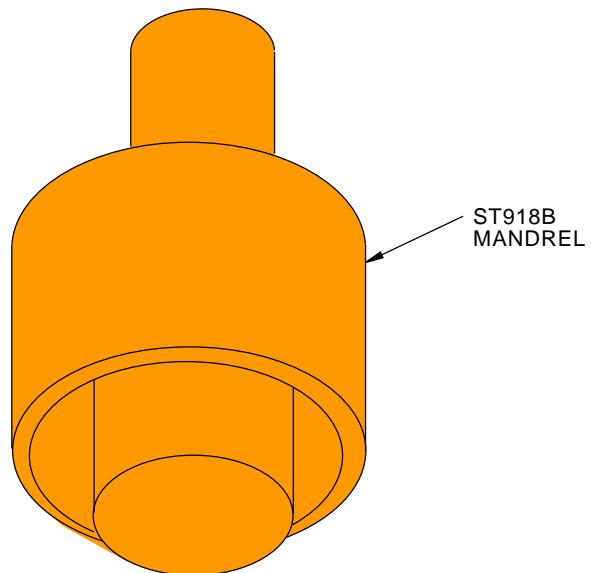


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cylindrical shank provides a means of mounting the mandrel in a press.

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**ST918B MANDREL  
(EXAMPLE)**

2267636 S0000509521\_V1

**Bearing Pressing BACB10B Mandrel  
Figure 1**

**20-50-61**



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PART NUMBER: ST918C

NAME: MANDREL - BEARING PRESSING BACB10C

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The ST918C mandrel is used during component maintenance for all 747-100 thru -400 airplanes equipped with BACB10C (roller) bearings.

The ST918C series mandrels are used in conjunction with a customer-furnished press to install bearings into housings prior to staking.

ST918C tool code number is listed as "ST918C-XXX-YYY", where:

"ST918" is the basic tool number

"C" is the series.

"XXX" is the bearing bore in 1/1000-inch.

"YYY" is the bearing outside diameter in 1/1000-inch.

ST918C is used to press bearing part numbers: A-6Y, A-8F, A10, A10Y, BACB10A153, BACB10A212G, BACB10A357GC, BACB10BG1S, BACB10CH10, BACB10CH100, BACB10CH12, BACB10CH120, BACB10CH14, BACB10CH4, BACB10CH40, BACB10CH5, BACB10CH50, BACB10CH53, BACB10CH55, BACB10CH6, BACB10CH60, BACB10CH65, BACB10CH650, BACB10CH7, BACB10CH8, BACB10CH80, BACB10CH85, BACB10CH9, BACB10CJ16, BACB10CK5, BACB10CK6, BACB10CK8, BACB10CL10, BACB10C130H, BACB10C134H, BACB10C134HR, BACB10C135, BACB10C135H, BACB10C137Y, BACB10C150H, BACB10C151, BACB10C153, BACB10C16H, BACB10C160GH, BACB10C160H, BACB10C161GH, BACB10C182, BACB10C162, BACB10C161H, BACB10C196, BACB10C201, BACD10C207H, BACB10C226, BACB10C228, BACB10C23Y, BACB1026H, BACB10C34H, BACB10C78Y, BACB10C79, BACB10C79HR, BACB10C85, BACB10C85R, BACB10C85Y, BACB10C92, BACB10C92H, BACB10C93H, BACB10C94H, BACB10C95, BACB10C95Y, BACB10C97, BACB10C97Y, BACB10C99AYT, BACB10F6, BACB10GX100J, BACB10GX120J, BACB10GX122J, BACB10GX14J, BACB10GX40J, BACB10GX50J, BACB10GX53J, BACB10GX55J, BACB10CGX63J, BACB10GX65J, BACB10GX80J, BACB10GX85J, BACB10M28, BACB10W2, BACB10W2T, BAN10696, BR10H, BR5, BR6, BR6H, BR8, BR8H, B5539WZZFS428, DSRP5, LHSSG10AE, LHSSG10AP, MKSP4AFS428, S012T236-400, S012T236-401, USB10-105, YD170A, 10-60545-11, 10-60545-123, 10-60545-148, 10-60545-207S, 10-60545-76, 10-61846-2, 12903, 254W2002-5, 55562, 55699, 60B00179-501, 60B00180-46, 60B10024-6 and 69-57625-1.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and

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the current ST918C drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

The ST918C series of tools are circular mandrels with appropriately sized flanges and pilots to fit inner and outer races of the various bearings. A cylindrical shank provides a means of mounting the mandrel in a press.

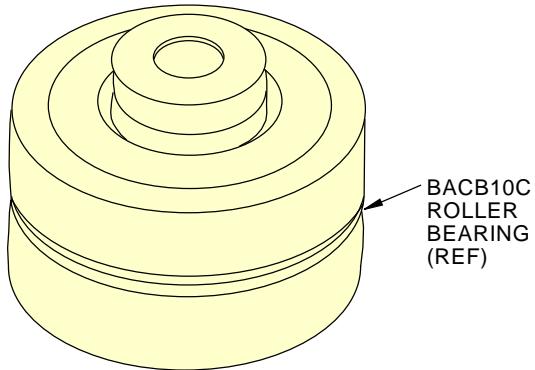
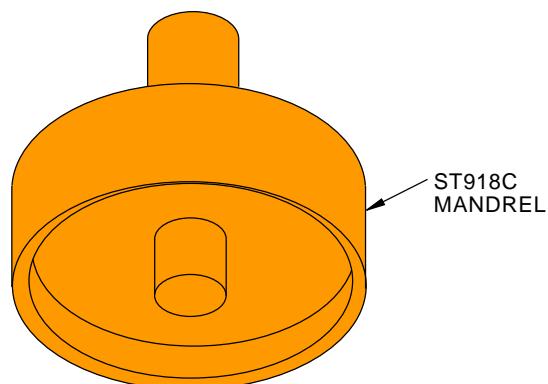
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**ST918C MANDREL  
(EXAMPLE)**

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**Bearing Pressing BACB10C Mandrel  
Figure 1**

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**PART NUMBER:** ST918CA-1000-1625

**NAME:** BEARING INSTALLATION TOOL

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST918CA-1000-1625 bearing installation tool is used during component maintenance on 727 airplanes.

ST918CA-1000-1625 is used to install bearing BACB10C150H in torque tube support 65-20951 and on drive shaft 69-16332-1.

The "ST918CA-1000-1625" tool number is defined as:

"ST918" is the basic tool number.

"CA" is the modification.

"1000" is the bearing inside diameter in 1/1000-inch.

"1625" is the bearing outside diameter in 1/1000-inch.

ST918CA-1000-1625 is used to install bearing part number BACB10C150H.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST918CA-1000-1625 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST918CA-1000-1625 consists of:

ST918CA-1000-1625		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	CUP	-2
1	"C" CLAMP	-3
1	LEFT HAND SIDE PLATE	-4
1	RIGHT HAND SIDE PLATE	-5

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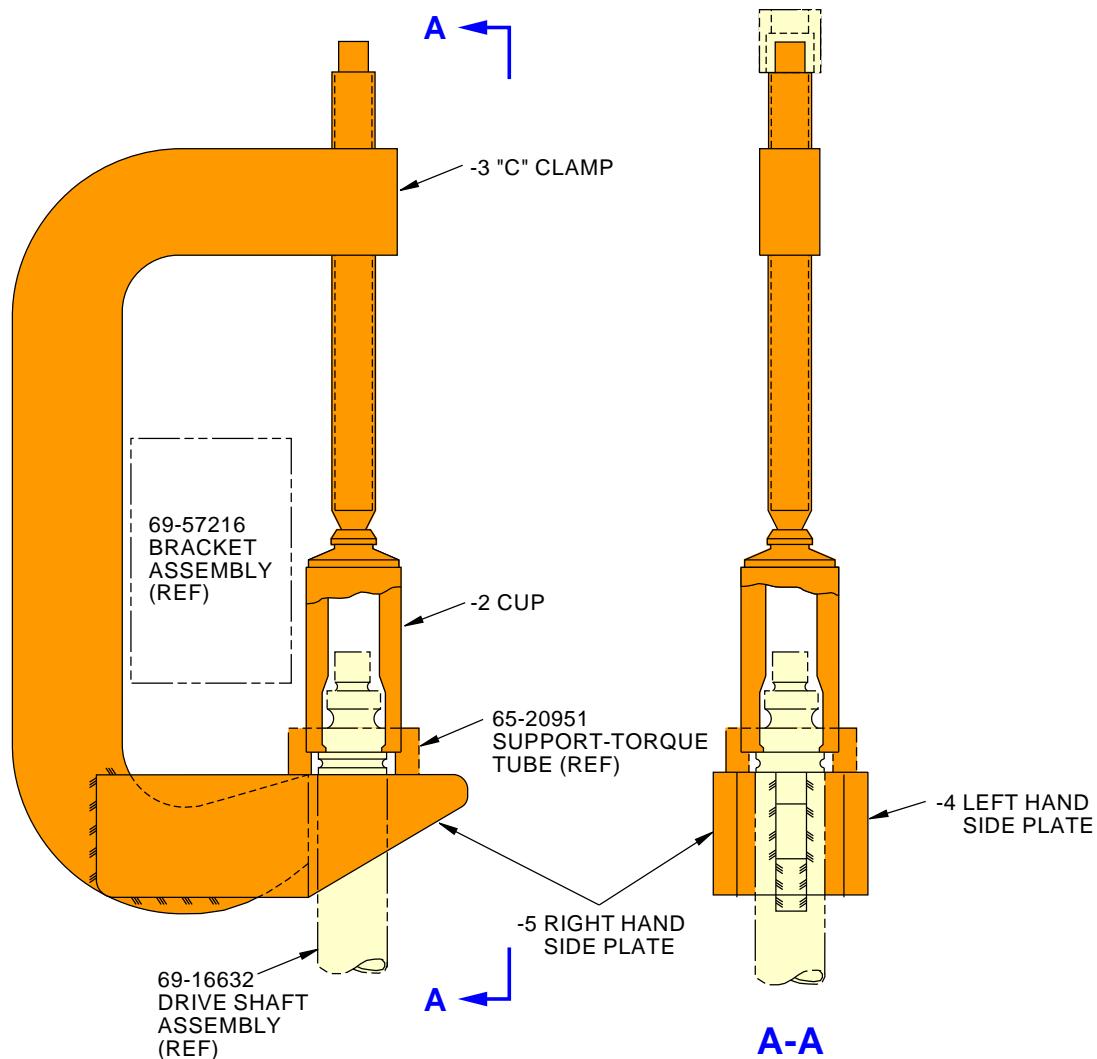
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ST918CA-1000-1625 BEARING  
INSTALLATION TOOL

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Bearing Installation Tool  
Figure 1

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PART NUMBER: ST918D

NAME: MANDREL - BEARING PRESSING BACB10D

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST918D mandrel is used during component maintenance for all Boeing airplanes equipped with BACB10D (sintered) bearings.

The ST918D series mandrels are used in conjunction with a customer-furnished press to install bearings into housings prior to staking.

Two numbering systems for ST918D are in use. The current system for ST918D is designated as "ST918D-XXX-YYYY-ZZZ", where:

"ST918D" is the basic tool number.

"XXX" is the nominal bearing bore in 1/1000-inch

"YYYY" is the nominal bearing outside diameter in 1/1000-inch.

"ZZZ" is the minimum bearing length in 1/1000-inch.

In the obsolete system for ST918D, the tool dash number corresponds to the bearing BACB10D dash number application; for example: Mandrel ST918D-154, fits bearing, BACB10D154.

ST918D is used to press bearing part numbers: AA397-1, AA741, A397, BACB10D108, BACB10D113, BACB10D12F, BACB10D124, BACB10D130, BACB10D131, BACB10D149F, BACB10D15F, BACB10D154, BACB10D155, BACB10D158, BACB10D165, BACB10D168, BACB10D172, BACB10D175, BACB10D2, BACB10D20F, BACB10D203, BACB10D31F, BACB10D33F, BACB10D4F, BACB10D42F, BACB10D45F, BACB10D46F, BACB10D5F, BACB10D52, BACB10D58F, BACB10D6F, BACB10D61T, BACB10D67T, BACB10D71SF, BACB10D75F, BACB10D87F, BACB10D90, BACB10D92, C316K-0125, C792A0450, 10-60516-37, 10-60516-39, 10-60516-95, 10-60516-104, 257U0004-4, 3-71003, 30-1917, 4-80142, 6-68012, 6-68012-1, 6-68066, 6-68066-1, 65-54852-3, 65-54855-12, 65-54855-19, 65-67747-4, 65B08377-4, 65B08377-6, 66-13255-1, 66-25126, 69-35552-1, 69-35553-1, 69-41384-3, 69-45425-1, 69-56022-1 and 69-60125

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST918D drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

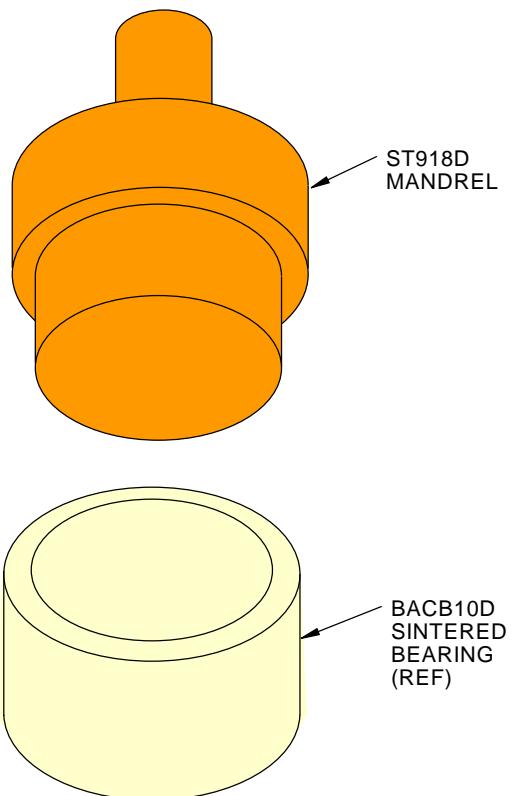
The ST918D series of tools are circular mandrels with appropriately sized flanges and pilots to fit inner and outer races of the various bearings. A cylindrical shank provides a means of mounting the mandrel in a press.

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**Bearing Pressing BACB10D Mandrel**  
**Figure 1**

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PART NUMBER: ST919

**NAME:** SUPPORT - BEARING INSTALLATION

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST919 bearing installation support is used during component maintenance on all Boeing airplanes.

ST919 is used in conjunction with customer-furnished ST919-MP mounting plate and ST918 mandrels to support airplane parts while bearings are being installed or removed. The ST919-MP mounting plate is used to hold the ST919 support.

ST919 is designated as "ST919-XXX", where:

"ST919" is the basic tool number.

"XXX" is the bearing outside diameter in 1/1000-inch.

ST919 is used to press bearing part numbers: AN200KP4, AN200KP5, AN200KS3L, AN200KS6, AN201KP5, AN201KP5A, AN201KP6A, AN202KP23B, AN202KP25B, AN202KP33B, AN206DSP4, AN207DPP4, AS24461-10, AS24461-20, AS24461-24, BACB10AC3L, BACB10AC4A, BACB10AC5, BACB10AC5A, BACB10AC6, BACB10AC6A, BACB10AH3L, BACB10AH6, BACB10AN4, BACB10AP10, BACB10AP4, BACB10AP5, BACB10AP6, BACB10AP8, BACB10AR4, BACB10AR6, BACB10AS10, BACB10AS12, BACB10AS14, BACB10AS17, BACB10AS21, BACB10AS25, BACB10AS29, BACB10AS33, BACB10AT12PP, BACB10AU16, BACB10AU21, BACB10AU23, BACB10AU25, BACB10AU29, BACB10AU33, BACB10AW16, BACB10AW21, BACB10AW37, BACB10AZ17PP, BACB10AZ35PP, BACB10A103, BACB10A103H, BACB10A105H, BACB10A120, BACB10A127, BACB10A136, BACB10A136H, BACB10A141, BACB10A141H, BACB10A155GC, BACB10A170GC, BACB10A203GD, BACB10A203GM2, BACB10A204GM2, BACB10A208GM2, BACB10A212G, BACB10A235, BACB10A239, BACB10A240, BACB10A243GCM2, BACB10A252GCM2, BACB10A253GCM2, BACB10A27DD, BACB10A27DDH, BACB10A28DD, BACB10A28DDH, BACB10A29DD, BACB10A29DDH, BACB10A30DD, BACB10A30DDH, BACB10A32DD, BACB10A33DDH, BACB10A331, BACB10A35DD, BACB10A35DDH, BACB10A357GC, BACB10A38, BACB10A47, BACB10A519, BACB10A519H, BACB10A538, BACB10A543, BACB10A544, BACB10A553, BACB10A554, BACB10A561, BACB10A563, BACB10A581, BACB10A583, BACB10A629, BACB10A664, BACB10A666, BACB10A671, BACB10A672, BACB10A683, BACB10A689, BACB10A690, BACB10A694, BACB10A821, BACB10A822, BACB10A823, BACB10A824, BACB10A827, BACB10A828, BACB10A829,

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BACB10A830, BACB10BG1S, BACB10BG3D, BACB10BG3S,  
BACB10BG5S, BACB10BM28-16, BACB10BW16, BACB10BW21,  
BACB10BW23, BACB10BW25, BACB10BW29, BACB10BW33,  
BACB10BX5, BACB10BX6, BACB10BX8, BACB10BY3L, BACB10BY4,  
BACB10BY5, BACB10B101S, BACB10B104ZP, BACB10B112ZP,  
BACB10B114ZP, BACB10B115ZP, BACB10B28PLT, BACB10B70PLT,  
BACB10CA4, BACB10CA6, BACB10CB4, BACB10CB6, BACB10CC16,  
BACB10CC20, BACB10CC4, BACB10CC7, BACB10CF10PP,  
BACB10CF12PP, BACB10CF14PP, BACB10CF17PP,  
BACB10CF21PP, BACB10CF33PP, BACB10CF37PP, BACB10CG4,  
BACB10CG4A, BACB10CG5, BACB10CJ16, BACB10CK5, BACB10CK6,  
BACB10C134H, BACB10C134HR, BACB10C135, BACB10C135H,  
BACB10C150H, BACB10C16H, BACB10C160GH, BACB10C161GH,  
BACB10C161H, BACB1026H, BACB10C34H, BACB10C79HR,  
BACB10C92H, BACB10C93H, BACB10C94H, BACB10EX16,  
BACB10EX23, BACB10FF03, BACB10FF04, BACB10FF06,  
BACB10FF07, BACB10FF10, BACB10FF14, BACB10FP04A,  
BACB10FP5, BACB10FP05A, BACB10FP06, BACB10FP06A,  
BACB10FR16, BACB10FR21, BACB10FR23, BACB10FR25,  
BACB10FR29, BACB10FR33, BACB10FS5, BACB10FS6, BACB10FS8,  
BACB10FT4, BACB10FU10, BACB10FU12, BACB10FU14,  
BACB10FU17, BACB10FU21, BACB10FU25, BACB10FU29,  
BACB10FU33, BACB10FV16, BACB10FV21, BACB10FV37,  
BACB10FY4, BACB10FY4A, BACB10FY5, BACB10F13, BACB10F14,  
BACB10F7, BACB10M12, BACB10M9, BACB10W13TM, BACB10W2,  
BACB10W2T, BACB10W3M, BACB10W3TM, BACB10W4TM,  
BACB10W5M, BACB10W5TM, BACB10X11M, BACB10X11MT,  
BACB10X3DT, BACB10X3MT, BACB10X3T,  
BACB10X4D, BACB10X4DT, BACB10X4M, BACB10X4MT, BACB10X5M,  
BACB10X5MT, BACB28AB4, BR10H, BR5, BR6, BR6H, BR8, BR8H,  
BSSR5280G1, B38DD, B540DD, DSRP5, DW4K, DW4K2, F212-1,  
KP3AL, MB543DDSD610, MKP5A, MKP6A, MKSP5A, MS14104-10,  
MS14104-14, MS14104-3, MS14104-4, MS14104-6, MS14104-7,  
MS20200KP4, MS20200KP5, MS20200K3L, MS20201KP5A,  
MS20201KP6A, MS20202KP23B, MS20202KP25B, MS20202KP33B,  
MS20206DSP4, MS20207DPP4, MS21233-10, MS21233-14, MS21233-3,  
MS21233-4, MS21233-6, MS21233-7, MS24461-10, MS24461-20,  
MS24461-24, MS27261KSP3L, MS27261KSP5A, MS27261KSP6,  
MS27261KSP6A, MS27645-5AR, MS27645-5ARG, S012T236-400,  
S012T236-401, ZB538DDLY498, ZB539DDLY498, ZB541DDLY498,  
10-60545-100, 10-60545-102, 10-60545-103, 10-60545-106,  
10-60545-108, 10-60545-110, 10-60545-134, 10-60545-149,  
10-60545-151, 60B00178-9, 60B00179-2, 60B00180-206, 60B00180-207,  
60B00180-209, 60B00180-212, 69B15036-1, 69B15036-2, 69B15036-3,  
and 78245.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST919 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST919 is a cylindrical steel block with a ring extension corresponding to

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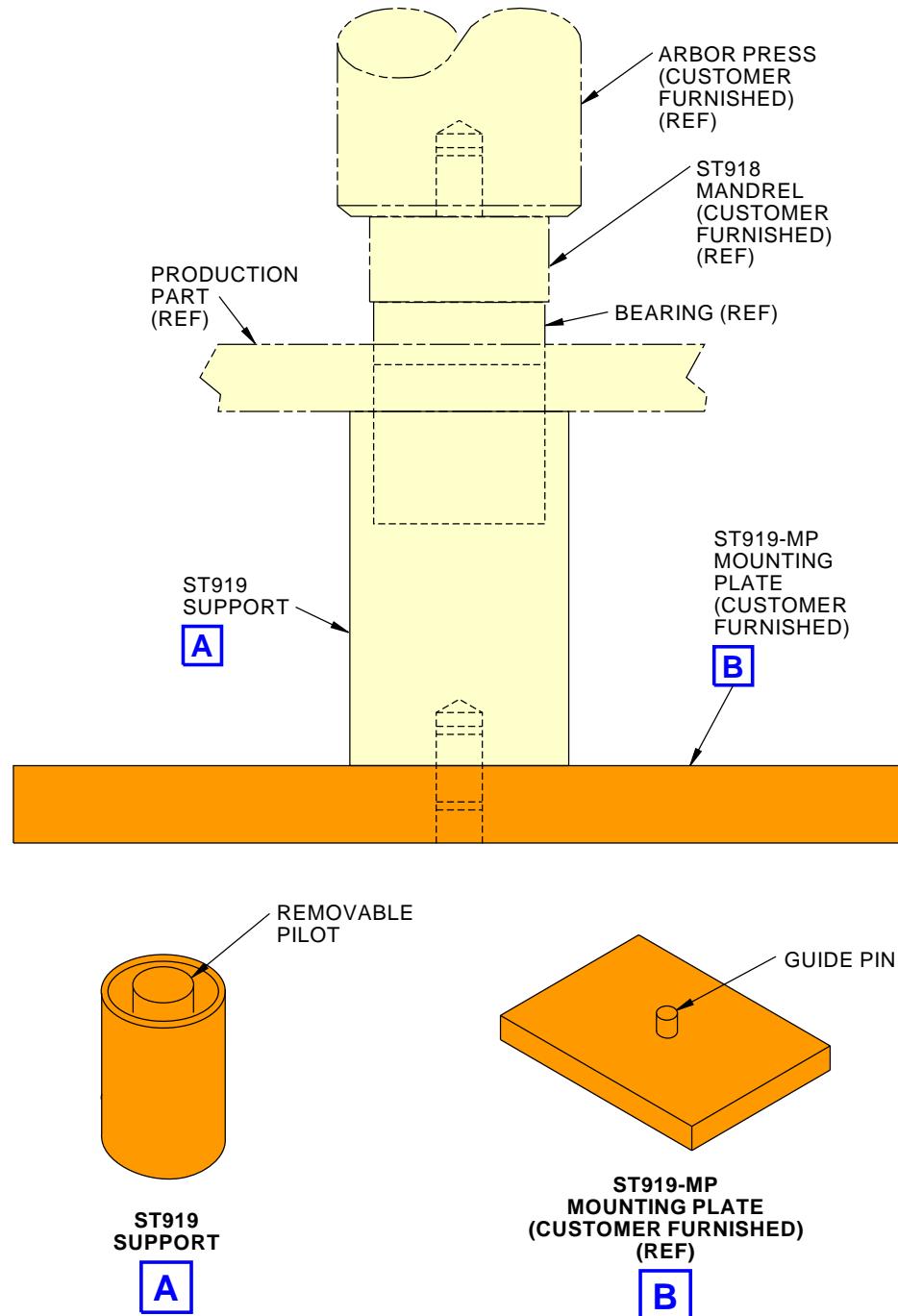


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the bearing outside diameter. A removable pilot engages the bearing bore during bearing removal.

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Bearing Installation Support  
Figure 1

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PART NUMBER: ST919-MP

NAME: MOUNTING PLATE - BEARING INSTALLATION

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The ST919-MP bearing installation mounting plate is used during component maintenance on all Boeing airplanes.

ST919-MP is used in conjunction with customer-furnished ST919 support and ST918 mandrels to support airplane parts while bearings are being installed or removed.

ST919-MP is used to press bearing part numbers: AN200KP4, AN200KP5, AN200KS3L, AN200KS6, AN201KP5, AN201KP5A, AN201KP6A, AN202KP23B, AN202KP25B, AN202KP33B, AN206DSP4, AN207DPP4, AS24461-10, AS24461-20, AS24461-24, BACB10AC3L, BACB10AC4A, BACB10AC5, BACB10AC5A, BACB10AC6, BACB10AC6A, BACB10AH3L, BACB10AH6, BACB10AN4, BACB10AP10, BACB10AP4, BACB10AP5, BACB10AP6, BACB10AP8, BACB10AR4, BACB10AR6, BACB10AS10, BACB10AS12, BACB10AS14, BACB10AS17, BACB10AS21, BACB10AS25, BACB10AS29, BACB10AS33, BACB10AT12PP, BACB10AU16, BACB10AU21, BACB10AU23, BACB10AU25, BACB10AU29, BACB10AU33, BACB10AW16, BACB10AW21, BACB10AW37, BACB10AZ17PP, BACB10AZ35PP, BACB10A103, BACB10A103H, BACB10A105H, BACB10A120, BACB10A127, BACB10A136, BACB10A136H, BACB10A141, BACB10A141H, BACB10A155GC, BACB10A170GC, BACB10A203GD, BACB10A203GM2, BACB10A204GM2, BACB10A208GM2, BACB10A212G, BACB10A235, BACB10A239, BACB10A240, BACB10A243GCM2, BACB10A252GCM2, BACB10A253GCM2, BACB10A27DD, BACB10A27DDH, BACB10A28DD, BACB10A28DDH, BACB10A29DD, BACB10A29DDH, BACB10A30DD, BACB10A30DDH, BACB10A32DD, BACB10A33DDH, BACB10A331, BACB10A35DD, BACB10A35DDH, BACB10A357GC, BACB10A38, BACB10A47, BACB10A519, BACB10A519H, BACB10A538, BACB10A543, BACB10A544, BACB10A553, BACB10A554, BACB10A561, BACB10A563, BACB10A581, BACB10A583, BACB10A629, BACB10A664, BACB10A666, BACB10A671, BACB10A672, BACB10A683, BACB10A689, BACB10A690, BACB10A694, BACB10A821, BACB10A822, BACB10A823, BACB10A824, BACB10A827, BACB10A828, BACB10A829, BACB10A830, BACB10BG1S, BACB10BG3D, BACB10BG3S, BACB10BG5S, BACB10BM28-16, BACB10BW16, BACB10BW21, BACB10BW23, BACB10BW25, BACB10BW29, BACB10BW33, BACB10BX5, BACB10BX6, BACB10BX8, BACB10BY3L, BACB10BY4, BACB10BY5, BACB10B101S, BACB10B104ZP, BACB10B112ZP,

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BACB10B114ZP, BACB10B115ZP, BACB10B28PLT, BACB10B70PLT,  
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BACB10CC20, BACB10CC4, BACB10CC7, BACB10CF10PP,  
BACB10CF12PP, BACB10CF14PP, BACB10CF17PP,  
  
BACB10CF21PP, BACB10CF33PP, BACB10CF37PP, BACB10CG4,  
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BACB10C150H, BACB10C16H, BACB10C160GH, BACB10C161GH,  
BACB10C161H, BACB1026H, BACB10C34H, BACB10C79HR,  
BACB10C92H, BACB10C93H, BACB10C94H, BACB10EX16,  
BACB10EX23, BACB10FF03, BACB10FF04, BACB10FF06,  
BACB10FF07, BACB10FF10, BACB10FF14, BACB10FP04A,  
BACB10FP5, BACB10FP05A, BACB10FP06, BACB10FP06A,  
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BACB10FR29, BACB10FR33, BACB10FS5, BACB10FS6, BACB10FS8,  
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BACB10FU17, BACB10FU21, BACB10FU25, BACB10FU29,  
BACB10FU33, BACB10FV16, BACB10FV21, BACB10FV37,  
BACB10FY4, BACB10FY4A, BACB10FY5, BACB10F13, BACB10F14,  
BACB10F7, BACB10M12, BACB10M9, BACB10W13TM, BACB10W2,  
BACB10W2T, BACB10W3M, BACB10W3TM, BACB10W4TM,  
BACB10W5M, BACB10W5TM, BACB10X11M, BACB10X11MT,  
BACB10X3DT, BACB10X3MT, BACB10X3T,  
  
BACB10X4D, BACB10X4DT, BACB10X4M, BACB10X4MT, BACB10X5M,  
BACB10X5MT, BACB28AB4, BR10H, BR5, BR6, BR6H, BR8, BR8H,  
BSSR5280G1, B38DD, B540DD, DSRP5, DW4K, DW4K2, F212-1,  
KP3AL, MB543DDSD610, MKP5A, MKP6A, MKSP5A, MS14104-10,  
MS14104-14, MS14104-3, MS14104-4, MS14104-6, MS14104-7,  
MS20200KP4, MS20200KP5, MS20200K3L, MS20201KP5A,  
MS20201KP6A, MS20202KP23B, MS20202KP25B, MS20202KP33B,  
MS20206DSP4, MS20207DPP4, MS21233-10, MS21233-14, MS21233-3,  
MS21233-4, MS21233-6, MS21233-7, MS24461-10, MS24461-20,  
MS24461-24, MS27261KSP3L, MS27261KSP5A, MS27261KSP6,  
MS27261KSP6A, MS27645-5AR, MS27645-5ARG, S012T236-400,  
S012T236-401, ZB538DDLY498, ZB539DDLY498, ZB541DDLY498,  
10-60545-100, 10-60545-102, 10-60545-103, 10-60545-106,  
10-60545-108, 10-60545-110, 10-60545-134, 10-60545-149,  
10-60545-151, 60B00178-9, 60B00179-2, 60B00180-206, 60B00180-207,  
60B00180-209, 60B00180-212, 69B15036-1, 69B15036-2, 69B15036-3,  
and 78245.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST919-MP drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

The ST919-MP mounting plate is used to hold the ST919 support. ST919-MP is an 8 x 10 inch (203 x 254 mm) steel plate provided with a 1/2-inch diameter steel dowel guide pin for securing the ST919 support.

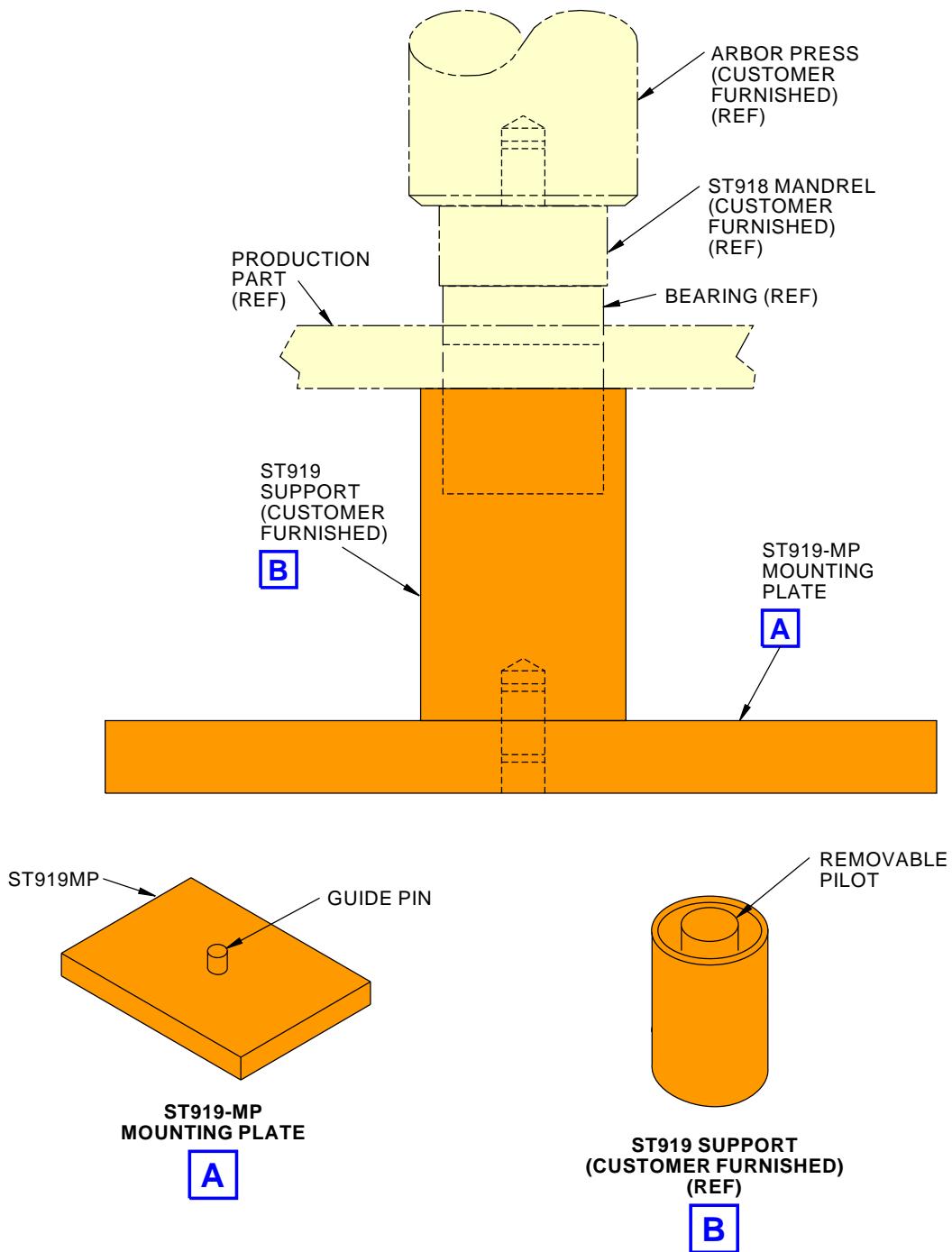
**20-50-66**

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**BOEING**  
737-600/700/800/900  
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



2268103 S0000509681\_V1

Bearing Installation Mounting Plate  
Figure 1

**20-50-66**



**737-600/700/800/900**  
**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER: ST920**

**NAME:** MANDREL - NAS PRESS FIT BUSHING INSTALLATION TOOL

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST920 mandrel is used during component maintenance on 707 airplanes.

ST920 is used in conjunction with a customer-furnished arbor press. Various sizes of ST920 are used to press bearings into NAS75, NAS76 and NAS77 bearing housings in preparation for bearing staking.

The ST920 tools are specified in the form: ST920-X. "X" dash numbers are 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 16, 18 and -20. The "X" dash numbers correspond directly to the NAS75, NAS76 and NAS77 dash numbers (for example, NAS76-3 corresponds to ST920-3).

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST920 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST920 are circular mandrels with appropriately sized flanges and pilots to fit inner and outer races of various bearings. A cylindrical shank provides a means of mounting the mandrel in an arbor press.

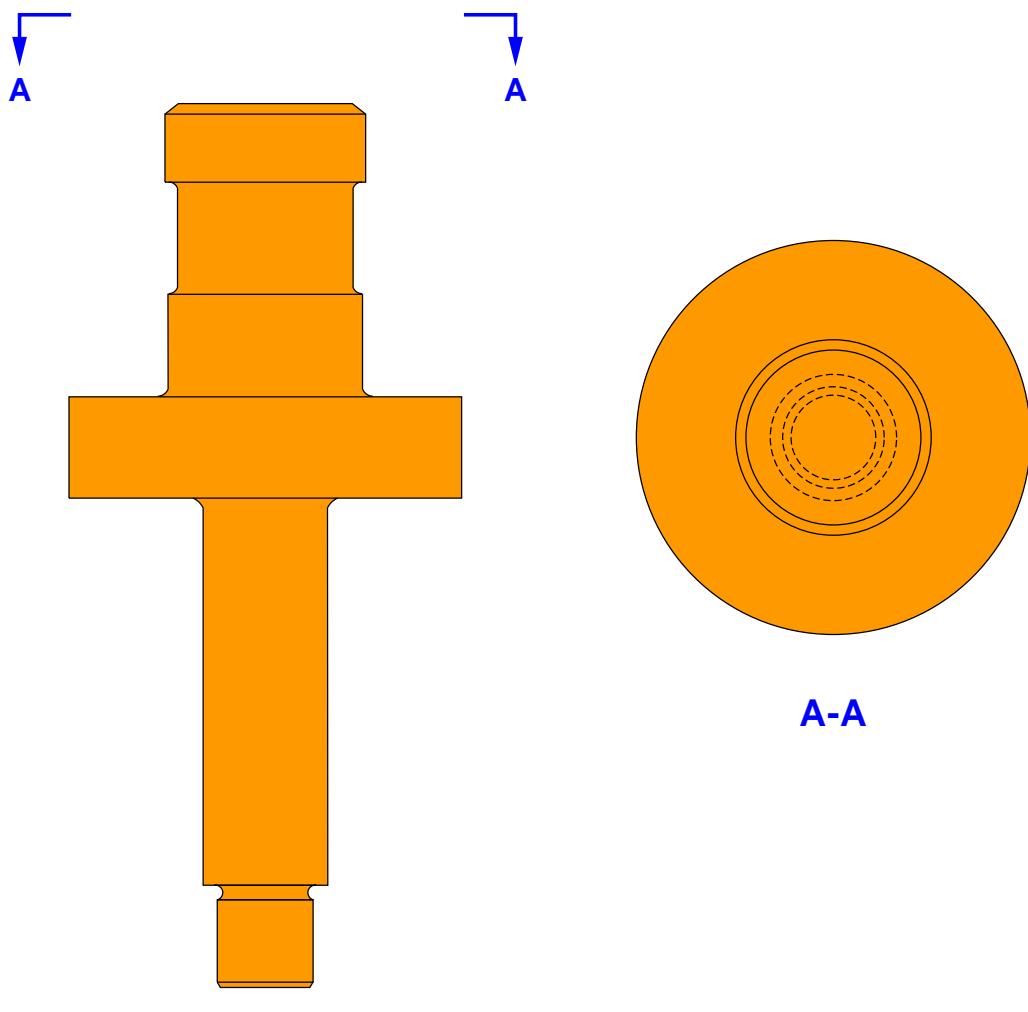
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**ST920 MANDREL**

2267956 S0000509718\_V1

**NAS Press Fit Bushing Installation Tool Mandrel**  
**Figure 1**

**20-50-67**



737-600/700/800/900  
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: ST920A

NAME: MANDREL - INSERTION TOOL, BUSHING

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The ST920A mandrel is used during component maintenance on 737 airplanes.

ST920A is used in conjunction with a customer-furnished arbor press. ST920A consists of two bushing press tools for a two-stage, press-fit of BACBCBX4B28 and BAC-B28X7B31 bushings into clevis part numbers 69-378817- 1, 69-37888-1, 69-37889-1 and 69-37890-1.

ST920A is designated as "ST920A-X". where:

"ST920" is the basic part number.

"A" is the variation.

"X" is the detail number.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST920A drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST920A are circular mandrels with appropriately sized flanges and pilots to fit inner and outer races of the bushings. A cylindrical shank provides a means of mounting the mandrel in an arbor press.

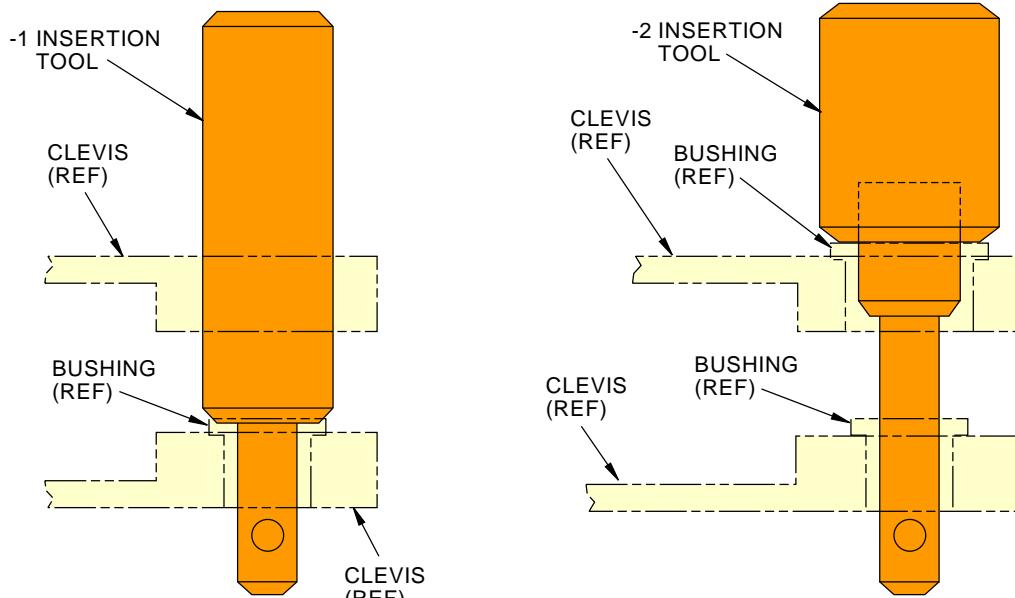
ST920A consists of:

ST920A		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	INSERTION TOOL	-1
1	INSERTION TOOL	-2

**20-50-68**



737-600/700/800/900  
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



ST920A-1  
INSERTION TOOL FIRST STAGE

ST920A-2  
INSERTION TOOL SECOND STAGE

2268400 S0000509721\_V1

Bushing Insertion Tool Mandrel  
Figure 1

**20-50-68**



737-600/700/800/900  
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: ST920B

NAME: INSTALLATION TOOL - PRESS BUSHING

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The ST920B installation tool is used during component maintenance on 747 airplanes.

ST920B is used to install the actuator mechanism arm bushings for the number 5 cargo door.

"ST920B" is defined as:

"ST920" is the basic tool number.

"B" is the variation.

ST920B is used to press bearing part numbers BACB28X8C32 and BACB28Y11B32.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST920B drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST920B consists of:

ST920B		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	ROD LOCATOR	-2
1	HEX WRENCH	-3
1	CAP SCREW	-4
1	WASHER	-5

20-50-69

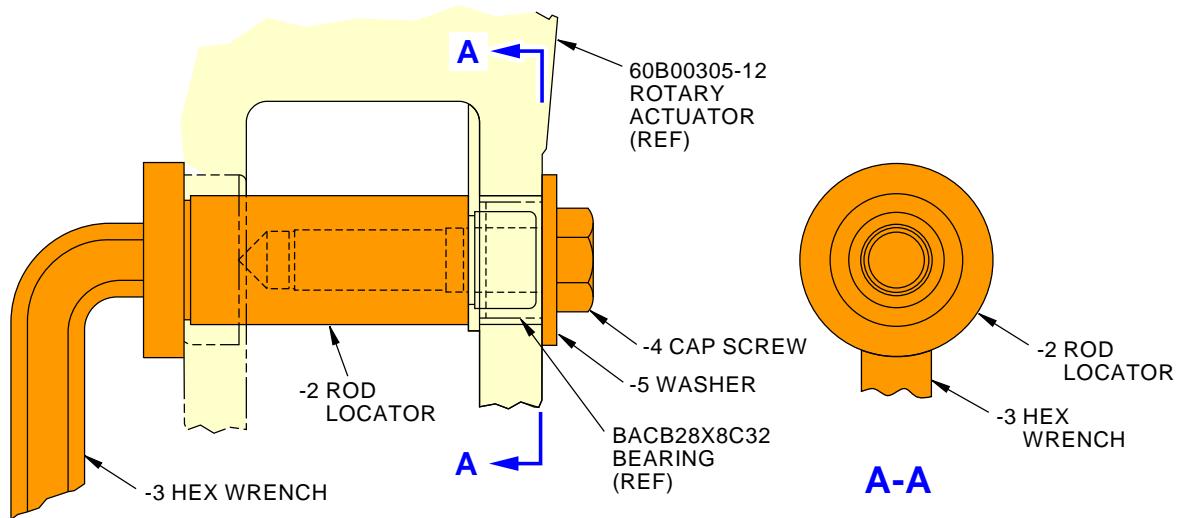
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ST920B INSTALLATION TOOL

2268395 S0000509735\_V1

Press Bushing Installation Tool  
Figure 1

**20-50-69**

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737-600/700/800/900  
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: ST921B

NAME: BUSHING PULLER

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The ST921B bushing puller is used on 707 airplanes.

ST921B removes press-fit bushings from bushing plate and removes blind bushings.

"ST921B" is defined as:

"ST921" is the basic tool number.

"B" is the variation.

ST921B is used to press bearing part number BACB10D and bushings NAS75, NAS77, NAS537, NAS538, and UT7000, UT7001, UT7004, and UT7005 with minimum inside diameter of 5/8-inch, maximum inside diameter of 2-inches, and a maximum length of 2-inches.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST921B drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST921B consists of:

ST921B		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	PLATE	-2
3	LEG	-3
1	FORCE STUD	-4
1	HEX NUT	-5
2	WASHER	-6
1	PULLER JAW ASSEMBLY	-7
1	COTTER PIN	-8

**20-50-70**

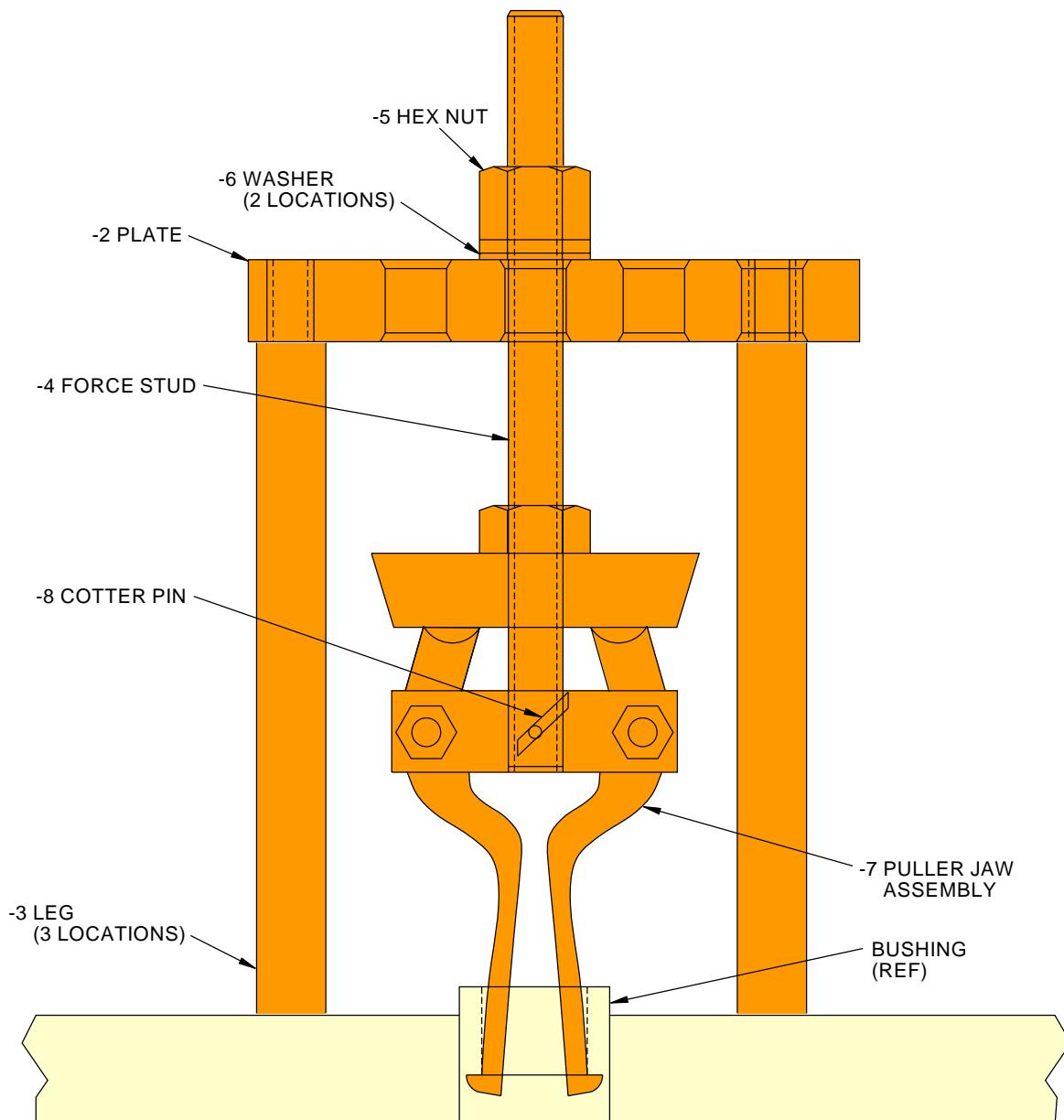
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**ST921B**  
**BUSHING PULLER**

2268227 S0000509747\_V1

**Bushing Puller**  
**Figure 1**

**20-50-70**



737-600/700/800/900  
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: ST921C

NAME: BUSHING REMOVAL TOOL

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The ST921C bushing puller is used on all airplanes.

Various sizes of ST921C are used to remove press-fit bushings. ST921C typical tool number is ST921C-2430-2210-28.

The ST921C tools are specified in the form: ST921C-XXXX-YYYY-ZZ where:

“ST921” is the basic tool number.

“C” is the series.

“XXXX” is the outside diameter of the bushing in 1/1000-inch increments (minus 0.005-inch).

“YYYY” is the inside diameter of the bushing in 1/1000-inch increments (minus 0.005-inch).

“ZZ” is the bushing length in 1/8-inch increments (plus 3/4-inch).

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST921C drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST921C consists of:

ST921C		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	END WASHER	-1
1	PLATE	-2
1	SPACER	-3
1	HEX HEAD BOLT	-4
1	HEX NUT	-5

**20-50-71**

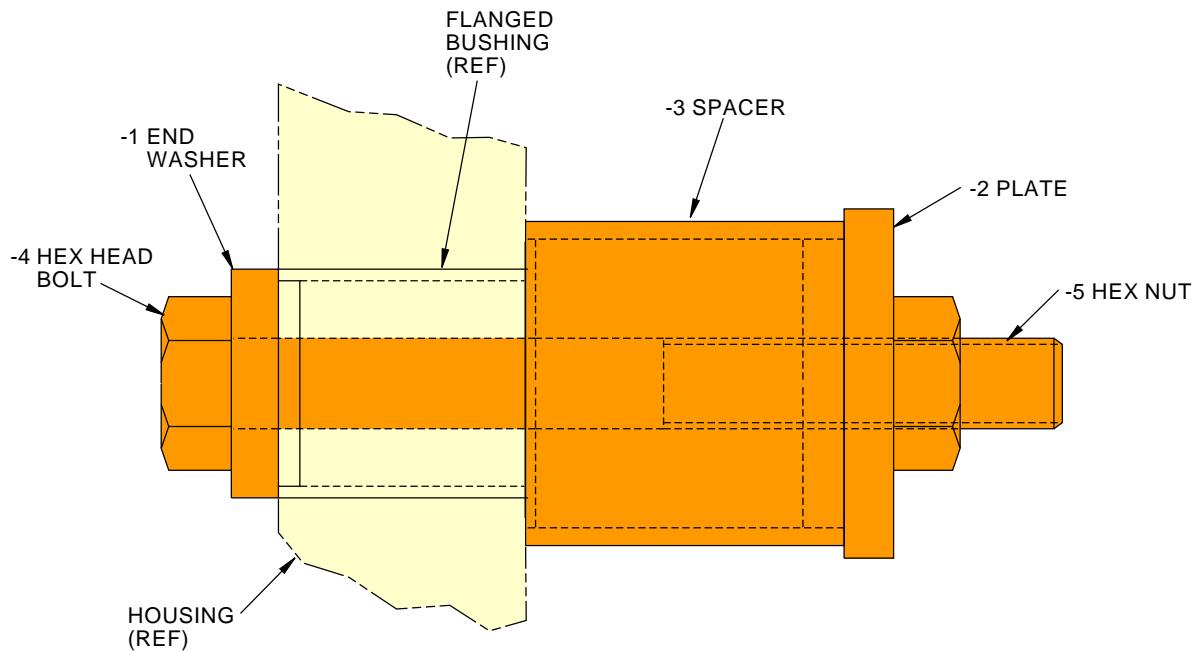
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**ST921C**  
**BUSHING REMOVAL TOOL**

2268201 S0000509782\_V1

**Bushing Removal Tool**  
**Figure 1**

**20-50-71**



**737-600/700/800/900**  
**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER: ST922**

**NAME:** STAKING TOOL - BUSHING

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST922 staking tool series is used during component maintenance on airplanes equipped with BACB28B series bushings.

ST922 series staking tools stake BACB28B bushings. The ST922 tool dash number is the same as the bushing dash number, which represents the bushing nominal inside diameter in 1/16-inch increments.

ST922 is designated as "ST922-X". where:

"ST922" is the basic part number.

"X" is the dash number (-2, -3, -4, -4A, -5, -6, -7, -8, -10, -12, -14 and -16).  
Each dash number has a tool drawing.

The ST922-5 staking tool is used on the 69B16554-1 bushing.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST922 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

Each ST922 staking tool includes an anvil, curling punch and a flattener.

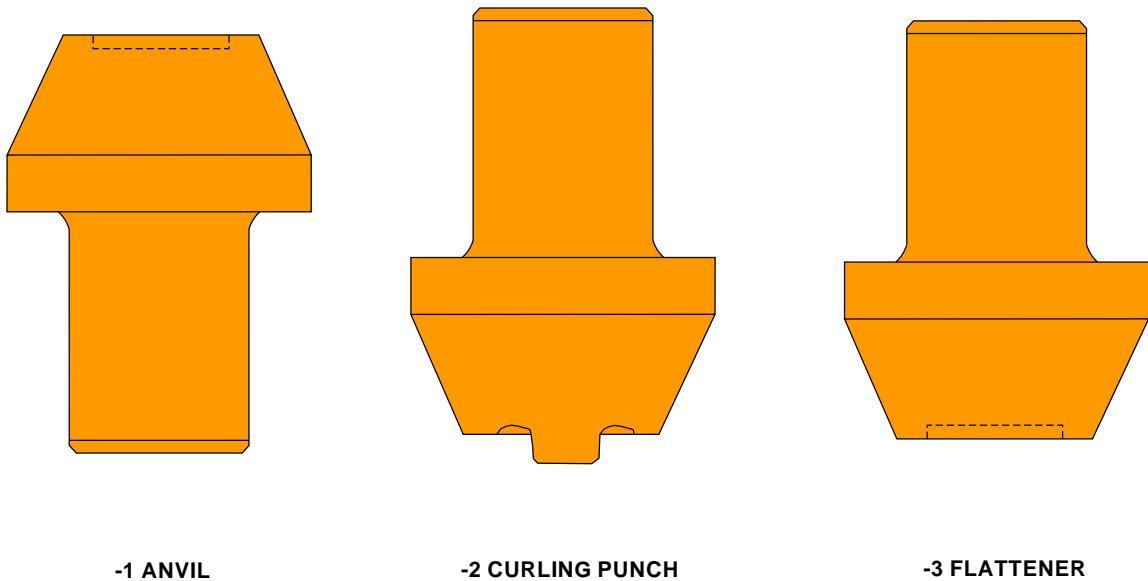
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**ST922-5 STAKING TOOL  
(EXAMPLE)**

2268276 S0000509816\_V1

**Bushing Staking Tool  
Figure 1**

**20-50-72**

 **BOEING**  
737-600/700/800/900  
**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER: ST922A-6**

**NAME:** STAKING TOOL - 3/8-INCH DIAMETER BUSHING

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST922A-6 staking tool is used during component maintenance on airplanes equipped with BACB28B-6 bushings.

ST922A-6 staking tools are used in conjunction with a customer-furnished, CP450 riveter, an ST1020-29 anvil and an ST1093-375 retainer spring.

ST922A-6 staking tools are used to stake BACB28B-6 bushings. The ST922A-6 tool dash number is the same as the bushing dash number, which represents the bushing nominal inside diameter in 1/16-inch increments.

ST922A-6 is designated as "ST922A-X" where:

"ST922" is the basic part number.

"A" is the variation.

"X" is the dash number. Each dash number has a tool drawing.

The ST922A-6 staking tool is used on the 69B16554-1 bushing.

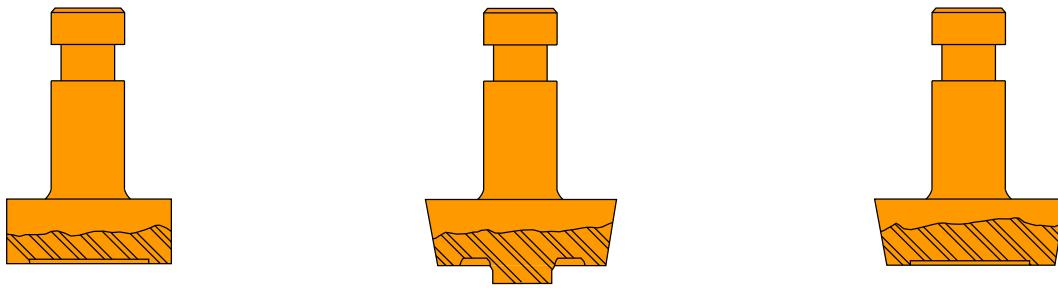
Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST922A-6 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST922A-6 consists of:

ST922A-6		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	ANVIL	-1
1	CURLING PUNCH	-2
1	FLATTENER	-3

**20-50-73**

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ILLUSTRATED TOOL AND EQUIPMENT MANUAL



-1 ANVIL

-2 CURLING PUNCH

-3 FLATTENER

**ST922A-6 STAKING TOOL**

2268247 S0000509823\_V1

**3/8-Inch Diameter Bushing Staking Tool**  
**Figure 1**

**20-50-73**

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**737-600/700/800/900**  
**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER: ST922C**

**NAME:** STAKING TOOL - (X/16) BUSHING, BACB28B-X

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST922C-X series staking tool is used on all airplanes equipped with BACB28B-X bushings.

ST922C is used in conjunction with a customer-furnished CP450 EA riveter. Various sizes of ST922C are used to stake bushings. The ST922C tool dash number is the bushing dash number which represents the bushing nominal inside diameter in 1/16-inch increments.

ST922C is designated as "ST922C-X". where:

"ST922" is the basic part number.

"C" is the variation.

"X" is the dash number (-2, -3, -4, -5, -6, -7, -8, -10, -12, -14 and -16). Each dash number has a tool drawing.

The ST922C-(X) staking tool is used on BACB28B(X) bushings. ST922C-3 is also used on 66-16933-1 bushings.

Staking bushings is a three-step process, using an anvil, a curling punch and a flattener. Typical tool numbers used are: ST922C-4, ST922C-5 and ST922C-6.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST922C-X drawings for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

Each ST922C-X includes an anvil, a curling punch and a flattener.

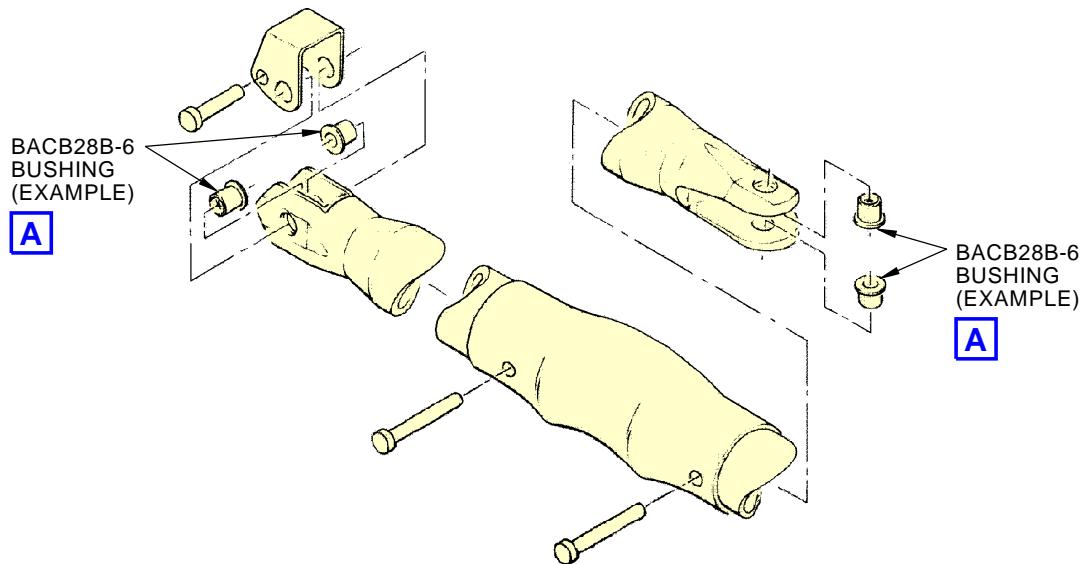
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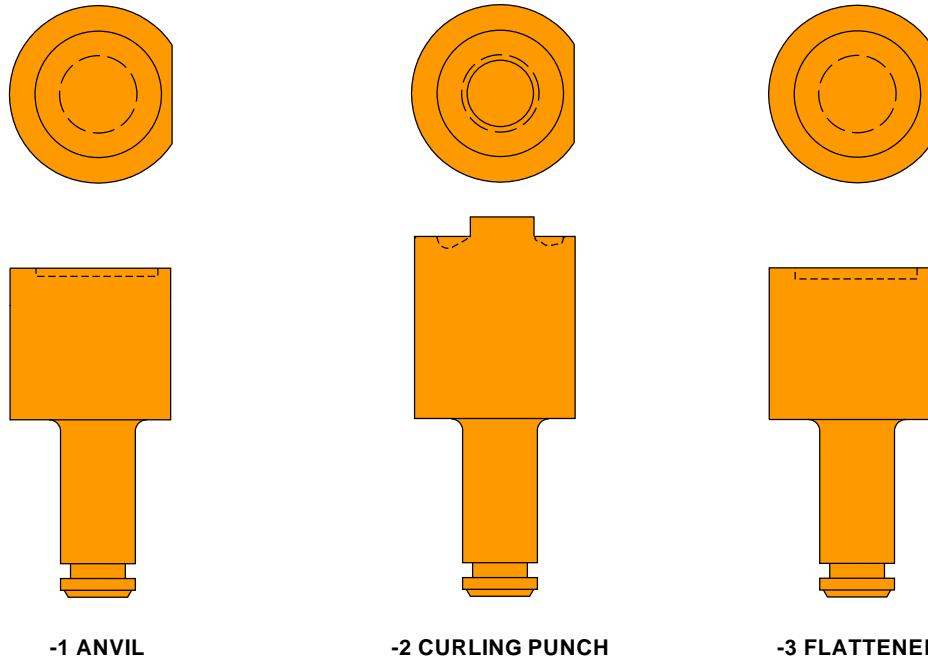
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747 AIRPLANE, 65B81011-509 ELEVATOR CONTROL ROD (EXAMPLE)



-1 ANVIL

-2 CURLING PUNCH

-3 FLATTENER

ST922C-6 STAKING TOOL (EXAMPLE)



2269653 S0000509992\_V1

BACB28B-X (X/16) Bushing Staking Tool  
Figure 1

**20-50-74**

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**737-600/700/800/900**  
**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER: ST922E**

**NAME:** STAKING TOOL - 1/4 BUSHING, BACB28B-4-239P

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST922E staking tool is used on 727 airplanes equipped with BACB28B-4-239P bushings.

ST922E is used in conjunction with a customer-furnished CP450 EA riveter, ST922B-4-4 flattener and ST922B-4-3 curling punch. ST922E is used to stake BACB28B-4-239P bushings.

ST922E is designated as "ST922E-X" where:

"ST922" is the basic part number.

"E" is the variation.

"X" is the dash number.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST922E drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST922E consists of a single, ST922E-1 anvil.

**20-50-75**

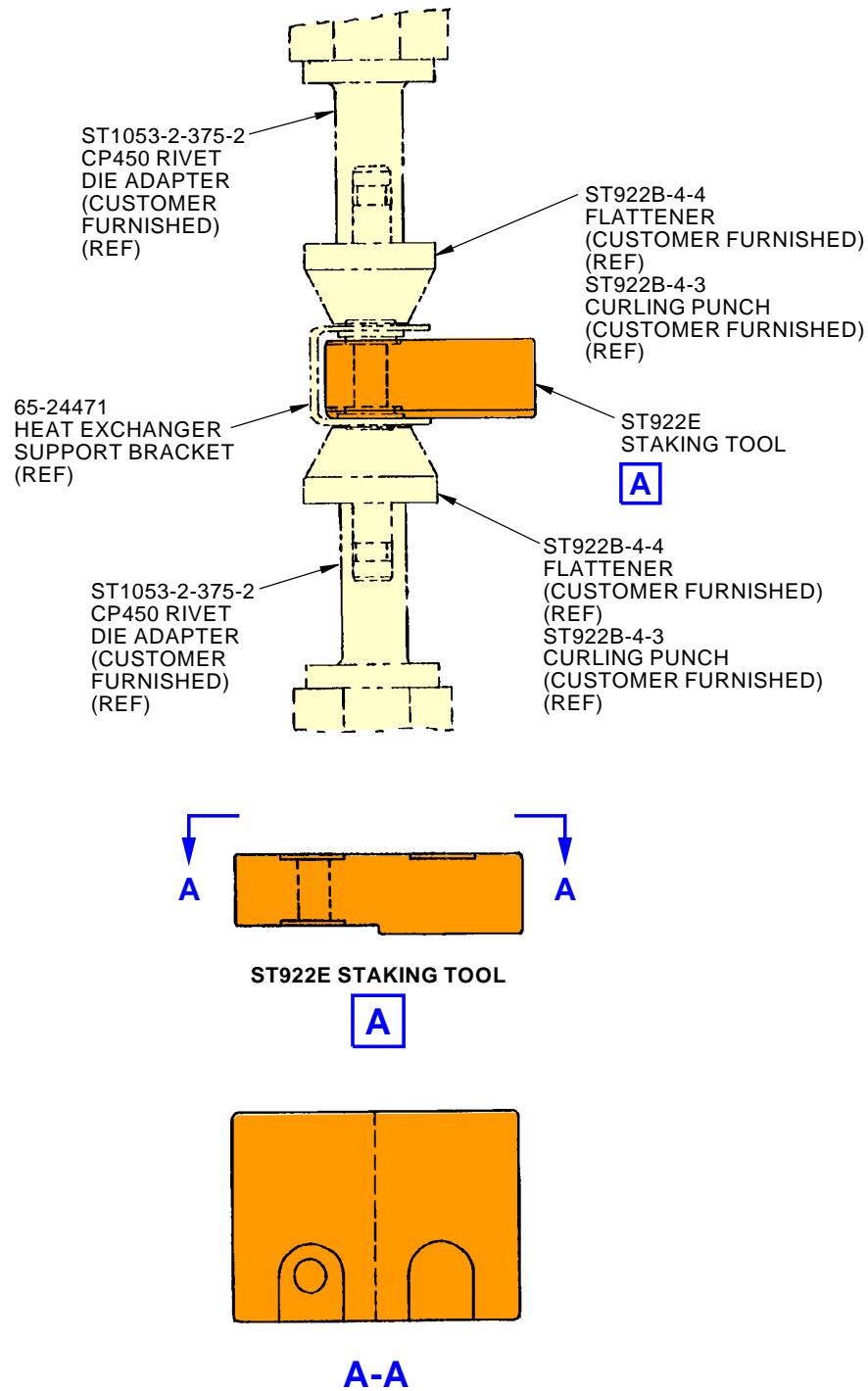
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2269610 S0000509997\_V1

BACB28B-4-239P 1/4 Bushing Staking Tool  
Figure 1

**20-50-75**

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737-600/700/800/900  
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: ST922F-4

NAME: STAKING TOOL - 1/4 DIAMETER BUSHING

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The ST922F-4 staking tool is used on airplanes equipped with BACB28B-4 bushings.

ST922F-4 is used in conjunction with a customer-furnished CP450 EA riveter and either a ST922-4A or ST922C-4 anvil. ST922F-4 is used to stake 1/4-inch diameter BACB28B-4 bushings.

ST922F-4 is designated as:

"ST922" is the basic part number.

"F" is the variation.

"4" is the dash number. "4" represents the bushing nominal inside diameter in 1/16-inch increments.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST922F-4 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST922F-4 consists of:

ST922F-4		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	CURLING PUNCH	-1
1	FLATTENER	-2
2	RETAINER SPRING	-3

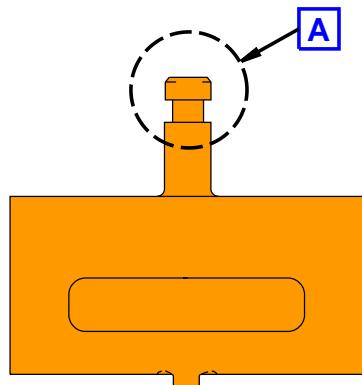
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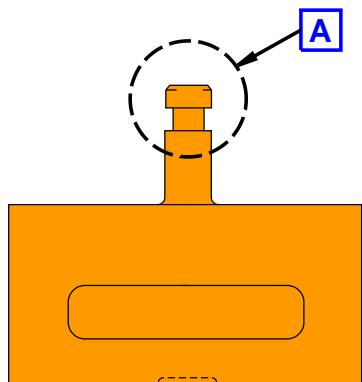
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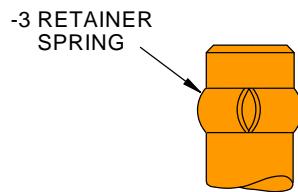
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-1 CURLING PUNCH



-2 FLATTENER



**ST922F-4 STAKING TOOL**

2269582 S0000510022\_V1

**1/4 Diameter Bushing Staking Tool**  
**Figure 1**

**20-50-76**



**737-600/700/800/900**  
**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER: ST923**

**NAME:** ADAPTOR FOR 0.374 SHANK TO 0.750

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST923 adaptor for 0.374 shank to 0.750 is used on all Boeing airplanes.

ST923 is used to adapt 0.374-inch shank tools to 0.750-inch shank for installation on presses.

ST923 is designated as "ST923". "ST923" is the basic part number.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST923 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST923 consists of a single ST923 adaptor.

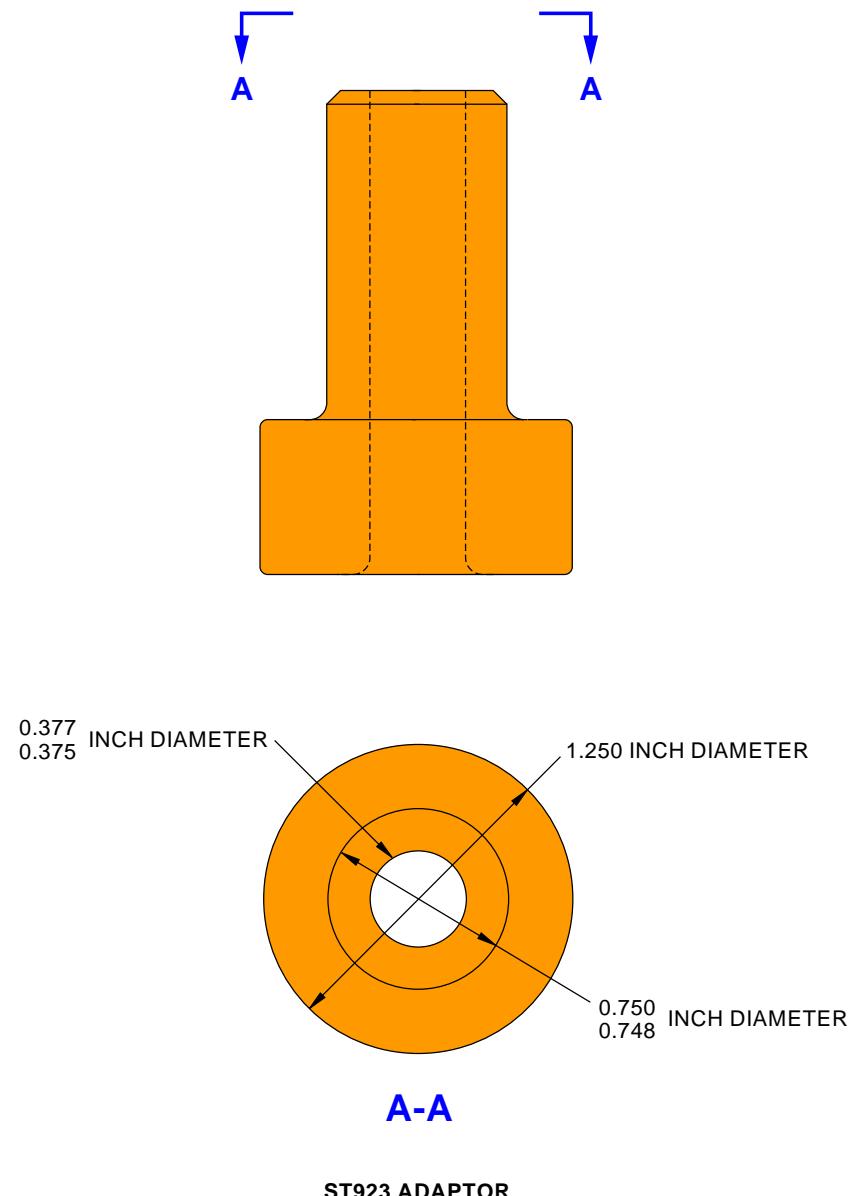
**20-50-77**

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**BOEING**  
737-600/700/800/900  
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



2268883 S0000510025\_V1

**Adaptor For 0.374 Shank To 0.750**  
**Figure 1**

**20-50-77**



**737-600/700/800/900**  
**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER: ST925**

**NAME:** POINT STAKING TOOL - BEARING RETENTION

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST925 series point staking tool is used during component maintenance on airplanes equipped with bearings in 140-210 ksi steel housings.

ST925 is used in conjunction with a customer-furnished drill press. The ST925 series uses carbide-steel points on the face of a cylindrical body to stake bearings in steel housings. ST925 staking tool is a cylindrical steel tool with a pilot which indexes to the bearing bore.

The ST925 tool code number is designated as: "ST925-XXXX-YYYY", where:

"ST925" is the basic tool number.

"XXXX" is the bearing bore in 1/1000-inch.

"YYYY" is the bearing outside diameter in 1/1000-inch.

The ST925 staking tool is used on: AN200KP37B, AN200KP5, AN201KP10A, AN201KP3A, AN201KP4, AN201KP4A, AN201KP8A, AN202KP37B, AN206DSP4, AN207DPP4, BACB10AC4A, BACB10AU37, BACB10AU72, BACB10A120, BACB10A137, BACB10A203GD, BACB10A211GM2, BACB10A213GM2, BACB10A214GM2, BACB10A220GM2, BACB10A27DD, BACB10A27DDH, BACB10A313, BACB10A32DD, BACB10A32DDH, BACB10A345, BACB10A346, BACB10A358GCM, BACB10A358GCM2, BACB10A359GCM2, BACB10A366GCM2, BACB10A396M3, BACB10A407, BACB10A445, BACB10A544, BACB10A561, BACB10A581, BACB10A620, BACB10A661, BACB10A671, BACB10A682, BACB10A690, BACB10A81, BACB10A821, BACB10A825, BACB10A90, BACB10BA25, BACB10BA45PP, BACB10BB25, BACB10BB30, BACB10BW37, BACB10BW72, BACB10BX3, BACB10BX4, BACB10BX8, BACB10BY5, BACB10B153, BACB10CA4, BACB10CB4, BACB10CE12, BACB10CF10PP, BACB10CG4A, BACB10C135H, BACB10C160H, BACB10C163, BACB10D124, BACB10FF05, BACB10FF06, BACB10FF07, BACB10FF08, BACB10FF09, BACB10FP04A, BACB10FR37, BACB10FR72, BACB10FS3, BACB10FS4, BACB10FS8, BACB10FY4A, BACB10F12, BACB10F16, BACB10F7, BACB10M11, BACB10M32, BACB10M34, BACB10M8, BACB10W1TM, BACB10W12M, BACB10W12TM, BACB10W3M, BACB10W3TM, BACB10W4TM, BACB10X4D, BACB10X4DT, BSSN3465G, BSSN6345G, B38DD, DW4K, MS14104-5, MS14104-6, MS14104-7, MS14104-8, MS14104-9, MS20200KP5,

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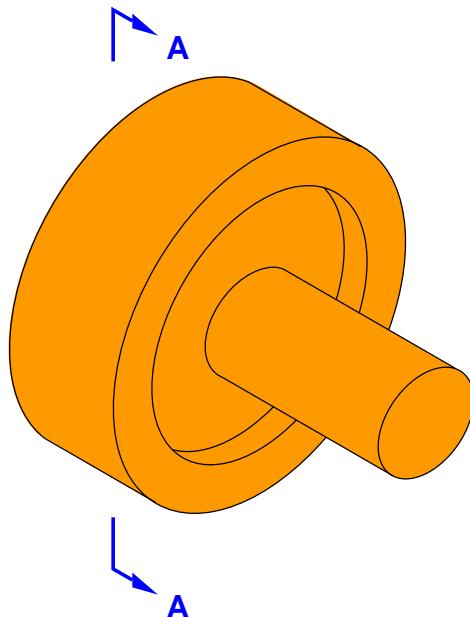
MS20201KP3A, MS20201KP4A, MS20201KP8A, MS20202KP37B,  
MS21233-5, MS21233-6, MS21233-7, MS21233-8, MS21233-9, M930EK,  
ZB538DDLY498, 10-60545-101, 10-60545-102, 10-60545-103,  
10-60545-104, 10-60545-105, 10-60545-127, 10-60545-150,  
10-60545-165 and 10-60545-57.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST925 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

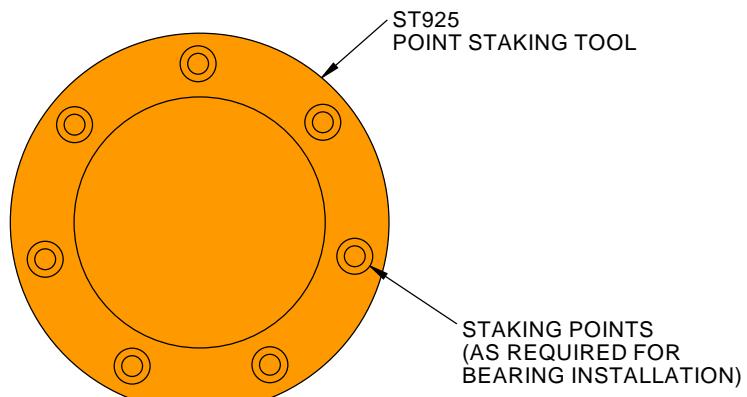
ST925 is a cylindrical steel tool mounting carbide-steel points, and a pilot that indexes to the bearing bore. Each ST925 is contained in a storage box.

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**ST925  
POINT STAKING TOOL**



**A-A**

2268687 S0000510126\_V1

**Bearing Retention Point Staking Tool  
Figure 1**

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ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: ST925A

NAME: STAKING TOOL - HINGE FLAP, FORWARD ENTRY DOOR

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The ST925A staking tool is used during component maintenance.

ST925A is used to point stake pin ends on each side of the 66-10905 hinge point of the forward entry door.

The ST925A staking tool is designated in the form "ST925A" where:

"ST925" is the basic tool number.

"A" is the variation.

ST925A is used to point stake bearings BACB10C79 and BACB10C79H.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST925A drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST925A consists of:

ST925A		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
2	STAKING TOOL BODY	-2
2	STAKING TOOL NOSE	-3
2	LOCATING SPRING PLUNGER	-4
2	FLOATING POINT SOCKET SET SCREW	-5
2	SPRING	-6
6	STAKING PIN	-7

20-50-79

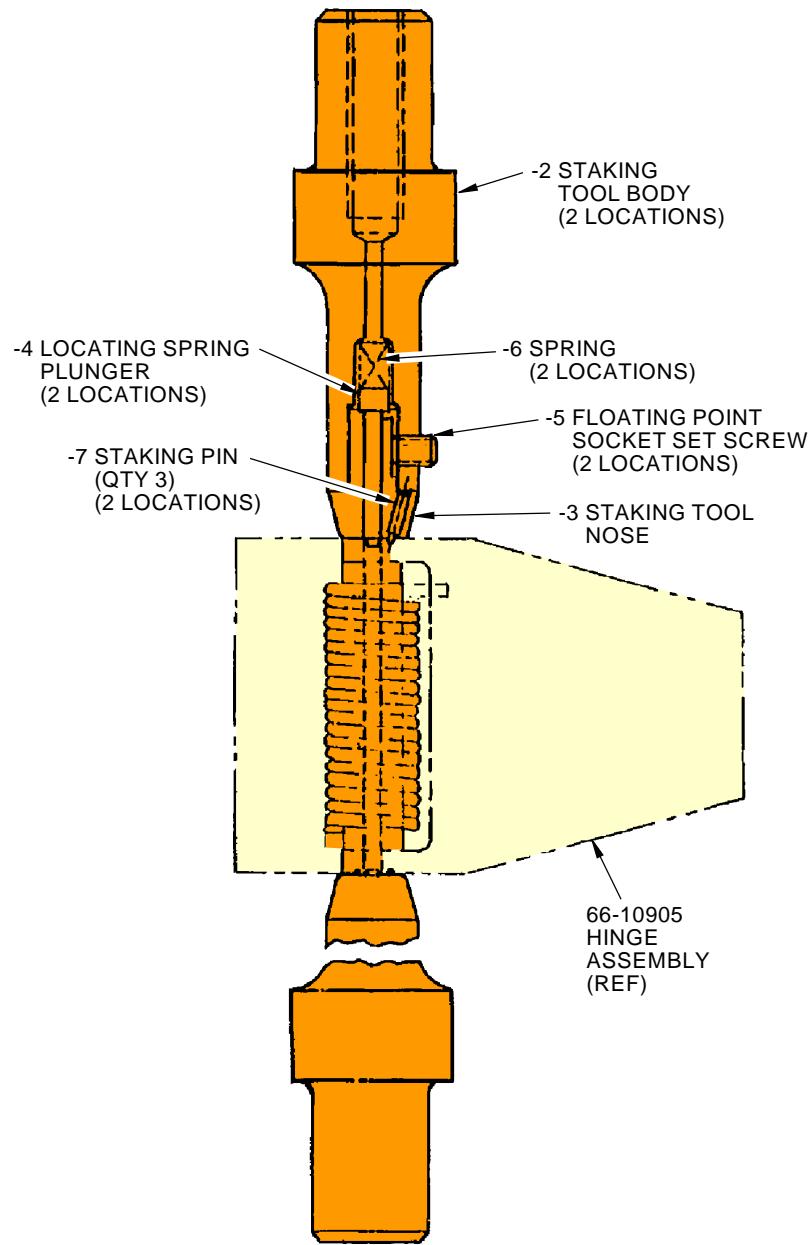
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**ST925A STAKING TOOL  
ASSEMBLY**

2272401 S0000511474\_V1

**Forward Entry Door Hinge Flap Staking Tool  
Figure 1**

**20-50-79**

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**PART NUMBER:** ST926-1, -2, -3, -4, -5, -6

**NAME:** ROLLER STAKING TOOL

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST926 series roller staking tools are used during component maintenance on airplanes equipped with BACB10M bearings.

ST926 series is used to roller stakes self-lubricating (Teflon lined) spherical bearings, such as the BACB10M series.

The ST926 tool code number is designated as: "ST926-X", where:

"ST926" is the basic tool number.

"X" is the dash number (1 thru 6).

ST926-1 stakes BACB10M bearings of 0.250, 0.312 and 0.375 inch inside diameter.

ST926-2 stakes BACB10M bearings of 0.437, 0.500, 0.562, and 0.625 inch inside diameter.

ST926-3 stakes BACB10M bearings of 0.750, 0.875, 1.000, and 1.250 inch inside diameter.

ST926-4 stakes BACB10M bearings of 2.500, inch inside diameter.

ST926-5 stakes 10-60545-1425 special bearing of 0.312 inch inside diameter.

ST926-6 stakes 10-60545-1415 special bearing of 0.562 inch inside diameter.

ST926 staking tools are also used on: BACB10AG4, KR4CNGV, KSBG8N3, P21920, P21920-1, VTB08550, 10-60545-207S, 10-60545-36, 12893 and 60B00180-332 bearings.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST926 drawings for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

Each ST926 staking tool includes a body, anvils, pilot bushings, rollers, shafts, spacer and connecting hardware.

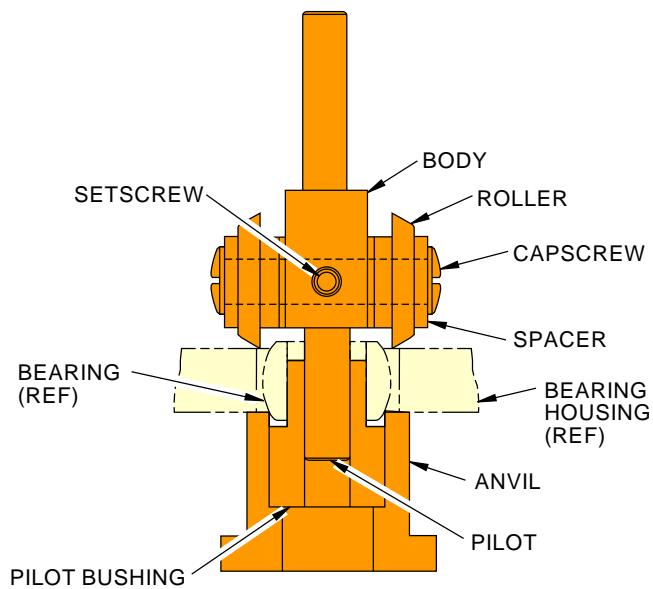
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**ST926**  
**ROLLER SWAGING TOOL (EXAMPLE)**

2268805 S0000510143\_V1

**Roller Staking Tool**  
**Figure 1**

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**PART NUMBER: ST926A**

**NAME:** ROLLER STAKING TOOL

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST926A roller staking tool is used during component maintenance on airplanes equipped with BACB10M or 10-60545 spherical bearings in limited clearance applications. For normal applications, use the ST926 series.

ST926A is used in conjunction with a customer-furnished drill . Various sizes of ST926A are used to roller swage BACB10M or 10-60545 spherical bearings for limited side clearance applications. Staking bearings is a two step process, using a roller assembly, an anvil and a secondary anvil. Two staking rollers are mounted on the body, opposite each other. Anvils are provided to back up the bearing during the staking operation. Pilot bushings center the tool on the bearing.

The ST926A tools are designated in the form "ST926A-X-Y" where:

"ST926" is the basic tool number.

"A" is the variation.

'X" is the drawing sheet number.

"Y" is the detail or assembly number.

ST926A staking tools are used on: BACB10AB10, BACB10AB6, BACB10AG4, BACB10AG7, BACB10CN3, BACB10FC10, BACB10FE05, BACB10FE06, BACB10FE08, BACB10FE10, BACB10FE16, BACB10FF16, BACB10M20, BHDR, KR4CNGV, KSBG10-9, KSBG14N25SSD3, KSBG14N3, KSBN12-18, KSB10-9, KSC111008V, KSC234708V, KSC277705B, KSSB2025, L3119, MS14101-10, MS14101-12, MS14101-14, MS14101-16, MS14101-4, MS14101-5, MS14101-5A, MS14101-6, MS14101-7, MS14101-8, MS14101-9, MS14103-10, MS14103-16, MS14103-5, MS14103-6, MS14103-8, MS14104-16, MS21230-10, MS21230-14, MS21230-5, MS21230-6, MS21230-8, MS21232-10, MS21232-12, MS21232-14, MS21232-16, MS21232-4, MS21232-5, MS21232-6, MS21232-7, MS21232-8, MS21232-9, MS21233-16, P21920, P21920-1, S302T001-200, S302T001-214, S302T001-232, S302T001-300, S302T001-301, S302T001-408, S302T001-410, USB6-107, VTB00050, VTB08550, VTB10200, YTA286, 10-60545-11, 10-60545-111S, 10-60545-112S, 10-60545-113S, 10-60545-114S, 10-60545-115S, 10-60545-116S, 10-60545-117S, 10-60545-118S, 10-60545-119S, 10-60545-120S, 10-60545-121S, 10-60545-140S, 10-60545-140SA, 10-60545-141S, 10-60545-141SA, 10-60545-142S, 10-60545-143S, 10-60545-145S, 10-60545-147S, 10-60545-149, 10-60545-149S,

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10-60545-157S, 10-60545-159S, 10-60545-164S, 10-60545-166S,  
10-60545-167S, 10-60545-200S, 10-60545-201S, 10-60545-202S,  
10-60545-203S, 10-60545-43, 10-60545-45, 10-60545-64, 10-60545-66,  
10-60545-71, 10-60545-82, 10-61846-1, 10-61905-1, 10-61905-2,  
10-61905-3, 10-61905-7, 55393, 60B00180-107, 60B00180-40,  
60B96213-1 and 69-57643-1.

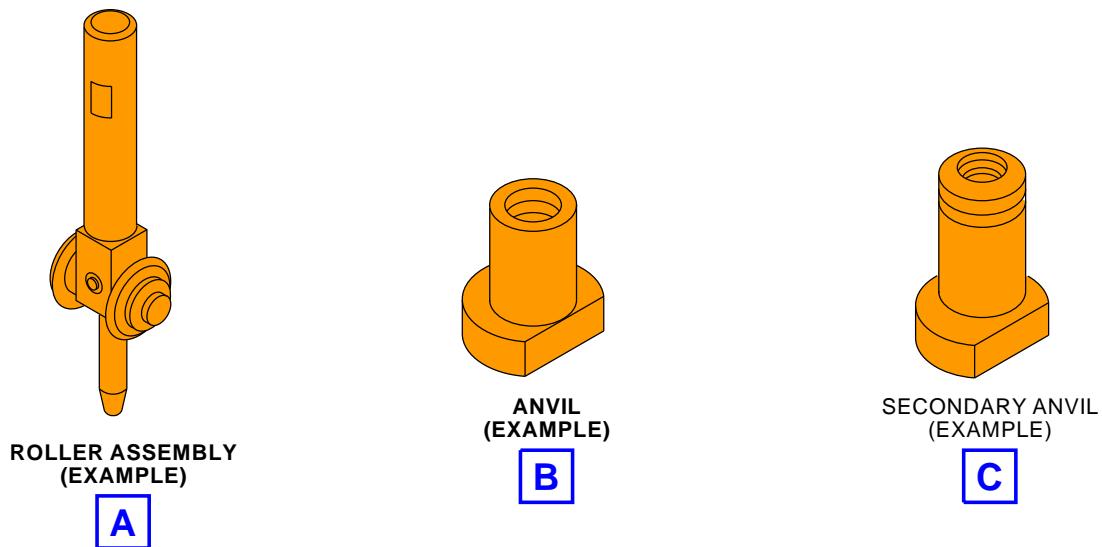
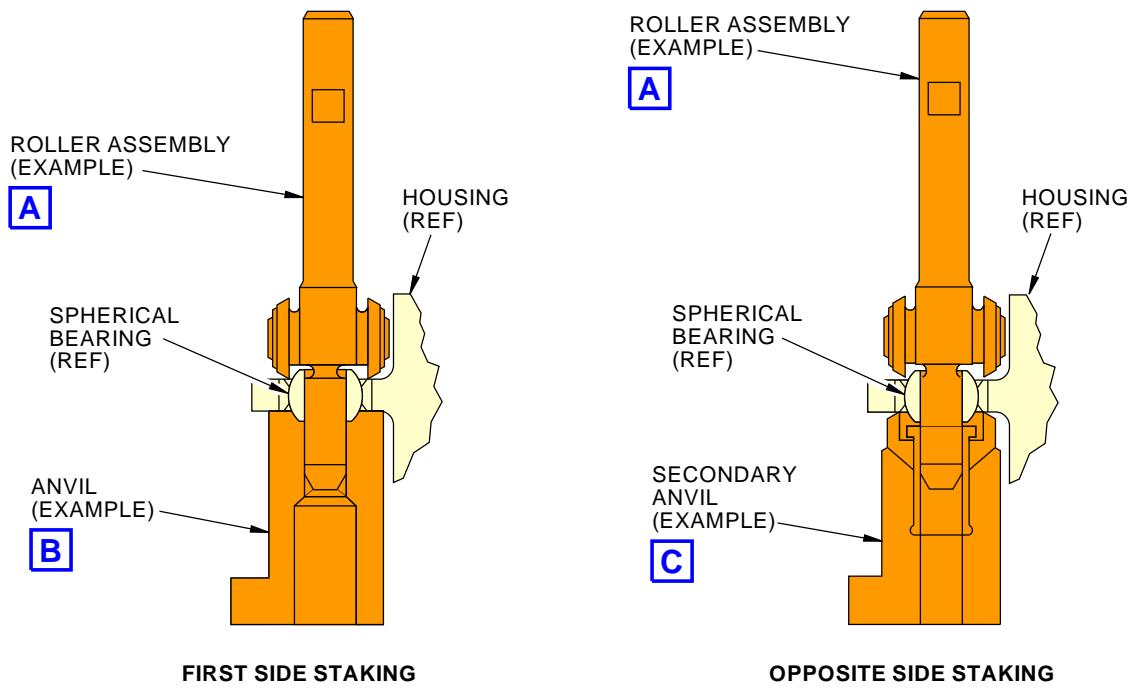
Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST926A drawings for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST926A-X-Y all include a roller assembly, an anvil and a secondary anvil

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ST926A POINT STAKING TOOL

2268905 S0000510157\_V1

Roller Staking Tool  
Figure 1

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**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER: ST926B**

**NAME:** ROLLER STAKING TOOL - PORTABLE, HAND OPERATED

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST926B roller staking tool series is used during component maintenance on 737, 747, 757, 767 and 777 airplanes equipped with 60B00180 and 69B13953-2 bearings.

ST926B is used in conjunction with a customer-furnished socket ratchet wrench. ST926B series is used to roller swage 60B00180 and 69B13953-2 bearings by use of hand power applied with a socket ratchet type wrench. An included spanner wrench assembly prevents rotation of the thrust bearing housing during the staking operation. For proper selection of swaging tool consult the ST926B drawing for bearing number to tool detail number application.

ST926B tool code number is listed as: "ST926B-X(B)", where:

"ST926" is the basic tool number.

"B" is the variation.

"X" is the code for the detail or assembly number.

"B" is the code for an included box. "B" is omitted if there is no box.

ST926B is used on bearings: M81936/1-24, 60B00180-1, 60B00180-12, 60B00180-2, 60B00180-251, 60B00180-3, 60B00180-39, 69B13953-2,

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST926B drawings for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST926B consists of a typical roller swaging assembly and a spanner wrench assembly.

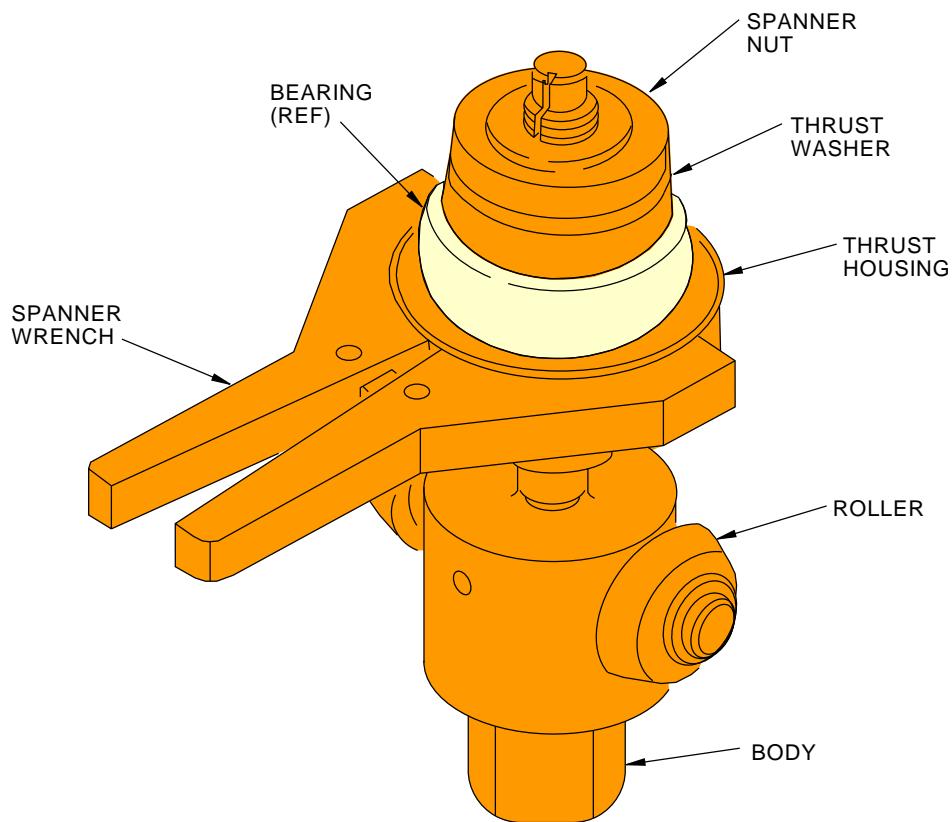
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**ST926B**  
**ROLLER STAKING TOOL**

2268909 S0000510177\_V1

**Hand Operated Portable Roller Staking Tool**  
**Figure 1**

**20-50-82**

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**737-600/700/800/900**  
**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER: ST926C**

**NAME:** ROLLER STAKING TOOL

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST926C roller staking tools are used on airplanes equipped with 60B80067 or similar spherical bearings.

The ST926C series are used in conjunction with a customer-furnished drill press. Various sizes of ST926C are used to stake 60B80067 or similar spherical bearings. Roller swaging 60B80067 bearings is a two-step process, using an anvil, a secondary anvil and a pilot shaft assembly.

The ST926C tools are designated in the form "ST926C-XXXX-YYY-ZZZ" where:

"ST926" is the basic tool number.

"C" is the series.

"XXXX" is the bearing inner diameter in 1/1000-inch.

"YYY" is the bearing outside diameter in 1/000-inch.

"ZZZ" is the staking groove diameter in 1/000-inch.

Typical tool numbers used are: ST926C-500, ST9226C-625 and ST9226C-1375.

ST926C staking tools are used on bearings: AMB22-1001, BACB10AG22, BACB10EP08G, BACB10EP10G, BACB10ES08G, BACB10ES10G, BACB10FA04G, BACB10FA05G, BACB10FA06G, BACB10FA07G, BACB10FA08G, BACB10FA09G, BACB10FA10G, BACB10FA12G, BACB10FJ08G, BACB10FJ10G, BACB10GC04G, BACB10GC05G, BACB10GC06G, BACB10GC07G, P21760, P22970, S012T236-701, S012T236-710, S302T001-219, S302T001-810, S302T001-813, S302T001-816, S302T001-817, S302T001-818, VTB01140, VTB08590, 251W2128-1, 251W2128-2, 60B00180-106, 60B80067-1, 60B80067-2, 60B80067-3, 60B80067-4 and 60B80067-5.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST926C drawings for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

The ST926C series consists of a pilot shaft assembly with a cylindrical shank, mounting two staking rollers. Two anvils are provided to back up the bearing during the staking operations.

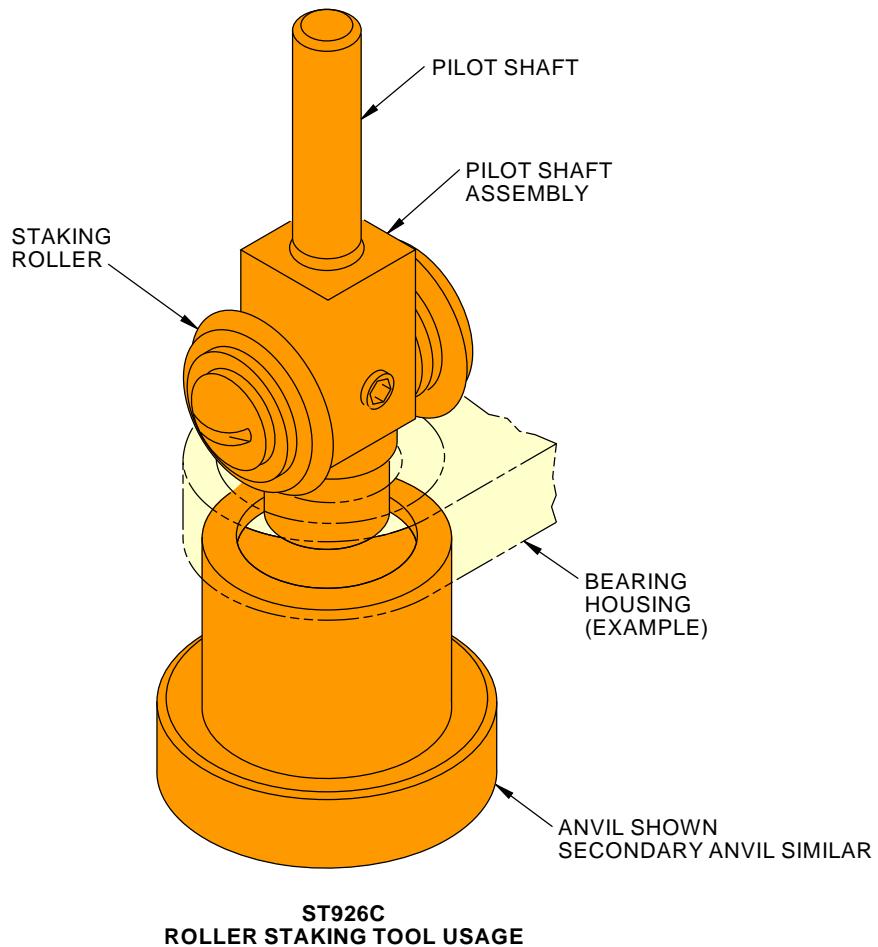
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**Roller Staking Tool**  
**Figure 1**

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ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: ST926D

NAME: STAKING TOOL - ROLLER BEARING

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The ST926D staking tool is used during component maintenance.

The ST926D is used in conjunction with a customer-furnished drill press. ST926D is used to roller swage MS21230-12 or similar spherical bearings. Roller swaging MS21230-12 bearings is a two-step process, using an anvil, a secondary anvil and a pilot shaft assembly.

The ST926D tool is designated in the form "ST926D" where:

"ST926" is the basic tool number.

"D" is the series.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST926D drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST926D consists of:

ST926D		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	STAKING ASSEMBLY	-1
1	ANVIL ASSEMBLY	-8
1	ANVIL ASSEMBLY	-11
1	STORAGE BOX	

20-50-84

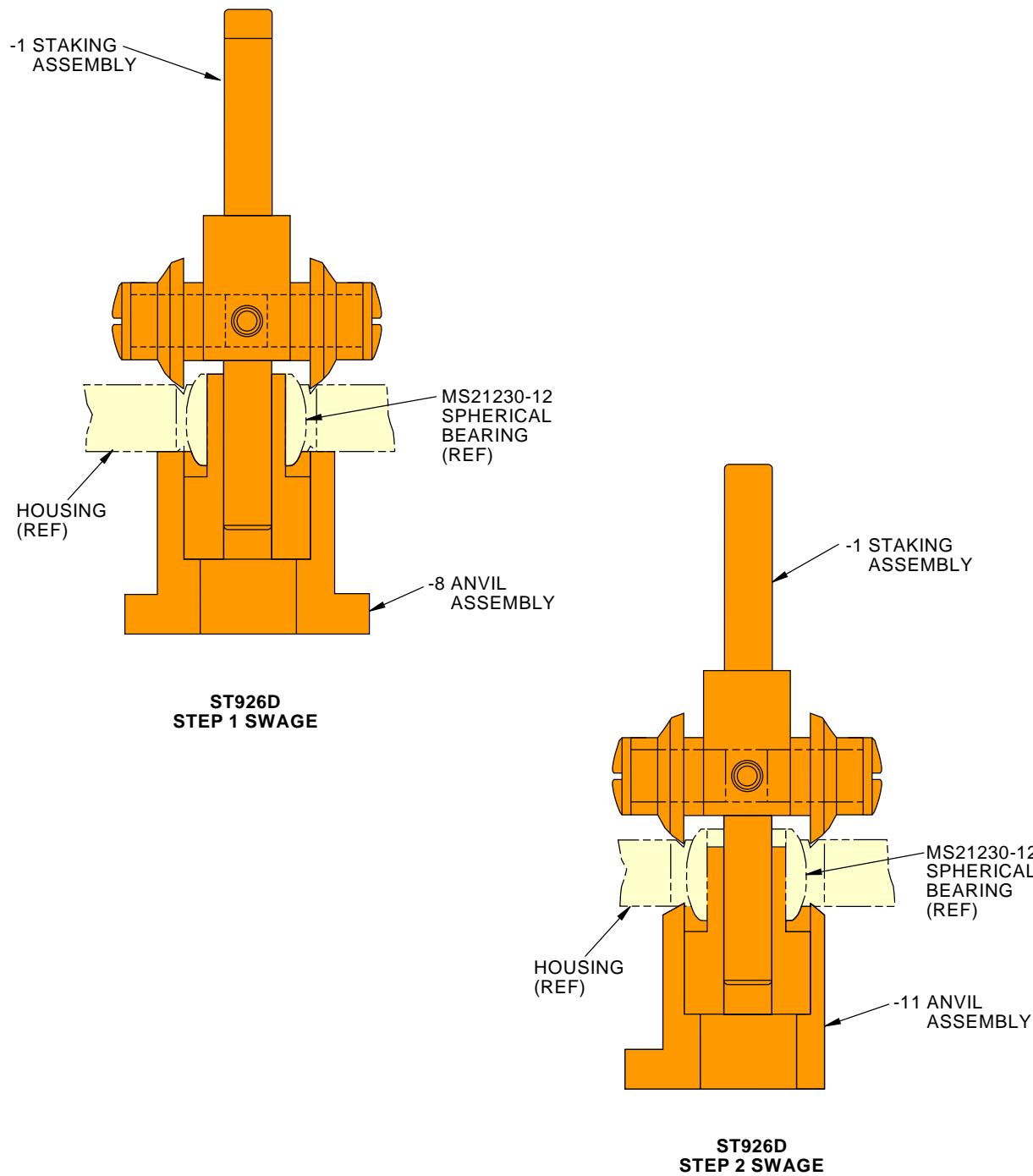
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Roller Bearing Staking Tool  
Figure 1

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ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: ST926E

NAME: ROLLER SWAGING TOOL - BEARING

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: YES

CMM 27-11-75

OTHER MANUALS: YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST926E roller swaging tools are used during component maintenance.

ST926E is used in conjunction with a customer-furnished drill press. Various sizes of ST926E are used to swage bearings.

The ST926E tools are designated in the form "ST926E-X" where:

"ST926" is the basic tool number.

"E" is the variation.

"X" is the tool dash number.

ST926E tools are used on bearings: AMB20-1001, BACB10AB4, BACB10AB4M, BACB10FE04, BACB10FE07H, BAN6798, BLFN48-027, BLR34016, HSP34-101, KSSN48-6, LHSSG6AJ, MS14103-4, MS14103-7, MS21230-4, MS21230-7, M81936/1-24, P20240, P20280, P20360, P22960, USB6-106, VTB00040, VTB00970, WG4B, YTA263, 10-60545-156S, 10-60545-161S, 10-60545-204S, 10-60545-206S, 10-60545-208S, 10-60545-59, 10-60545-60, 10-60545-63, 10-60545-66, 10-60545-71, 10-60545-72, 10-60545-78, 10-60545-87, 117R, 55510, 60B00180-100, 60B00180-102, 60B00180-20, 60B00180-203, 60B00180-205, 60B00180-208, 60B00180-212, 60B00180-25, 60B00180-27, 60B00180-29, 60B00180-300, 60B00180-303, 60B00180-304, 60B00180-39, 60B80067-17, 60B90021-1, 60B90143-1, 60B96203-1, 60B96215-1, 60B97202-1, 60B97203-1, 60B97204-1, 60B97206-1, 60B98100-1, 60B98101-1, 69-57619-1, 69B17663-2, 69B94365-1 and 69B94365-2.

Refer to CMM 27-11-75, the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST926E drawings for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST926E includes two different types of staking bearings; type I and type II.

ST926E, Type I tools include a roller assembly, pilot, a primary anvil and usually a secondary anvil.

ST926E, Type II tools include a roller assembly, bar, shaft bushing, a primary anvil and a secondary anvil.

**20-50-85**

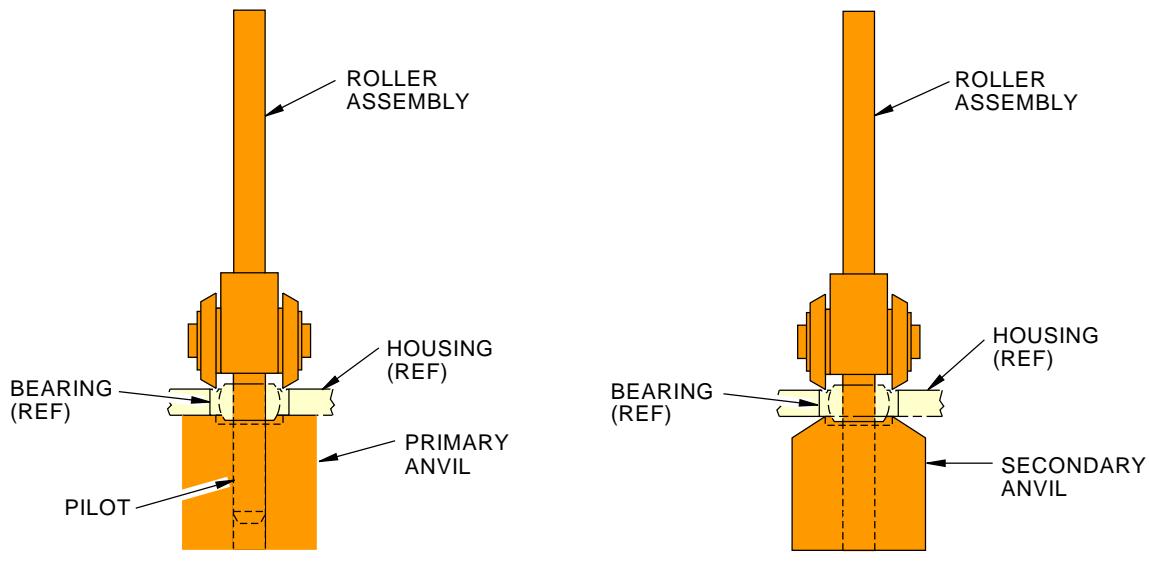
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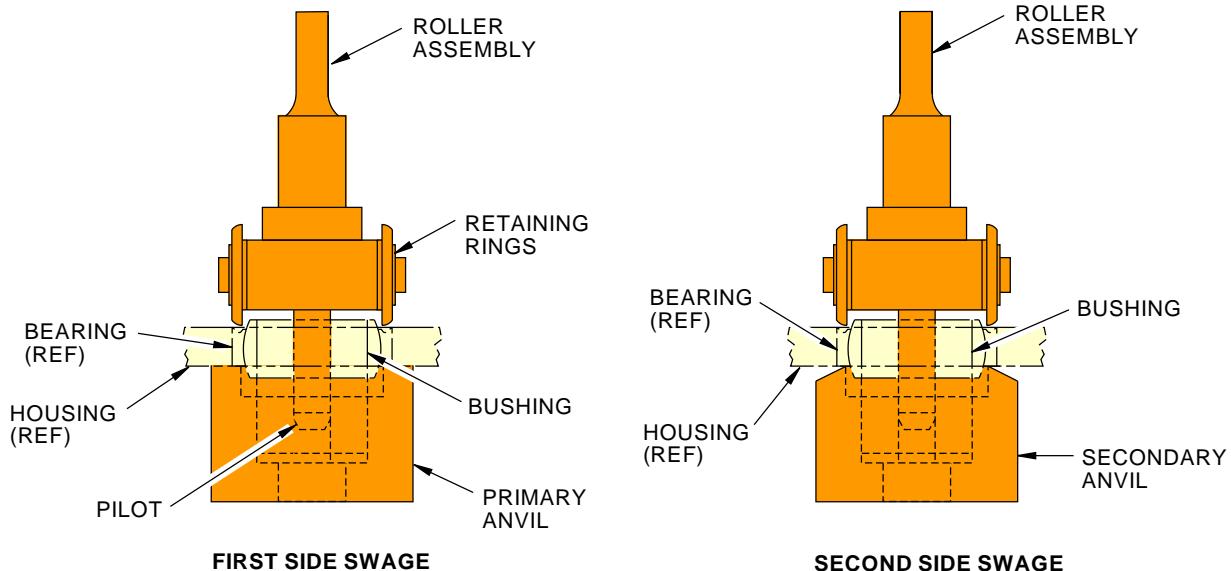
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FIRST SIDE SWAGE

SECOND SIDE SWAGE

ST926E  
TOOL TYPE 1 USAGE



FIRST SIDE SWAGE

SECOND SIDE SWAGE

ST926E  
TOOL TYPE 2 USAGE

2269055 S0000510222\_V1

Bearing Roller Swaging Tool  
Figure 1

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**PART NUMBER:** ST926F-1, -34

**NAME:** ROLLER SWAGE BEARING AND SLEEVE REPAIR KIT - BAC5435  
PROCESS

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** YES

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST926F-1 and -34 roller swage bearing and sleeve repair kits are used during component maintenance on 747 airplanes.

ST926F-1 and -34 are used to swage or replace bearings on airplanes. ST926F-1 and -34 are used to roller swage or remove bearings by hand with a spanner wrench. The ST926F kits are similar to kits from the F80113 roller swage kits.

The part number of the bearing must be known before the correct tools can be identified. ST926F is used on bearing part numbers: 10-60545-146S, 60B00180-246 and 60B00180-249.

ST926F-1 kits are used for swage diameters from 7/8 to 2 1/8-inch.

ST926F-34 kits are used for swage diameters from 7/8 to 2 3/8-inch.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST926F drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST926F kits consists of body assemblies, pilots, spacers, rollers, anvils, bolts, nuts, oil impregnated bronze thrust bearings, and retaining rings. Each ST926F-1 or -34 roller swage kit is contained in an individual storage box.

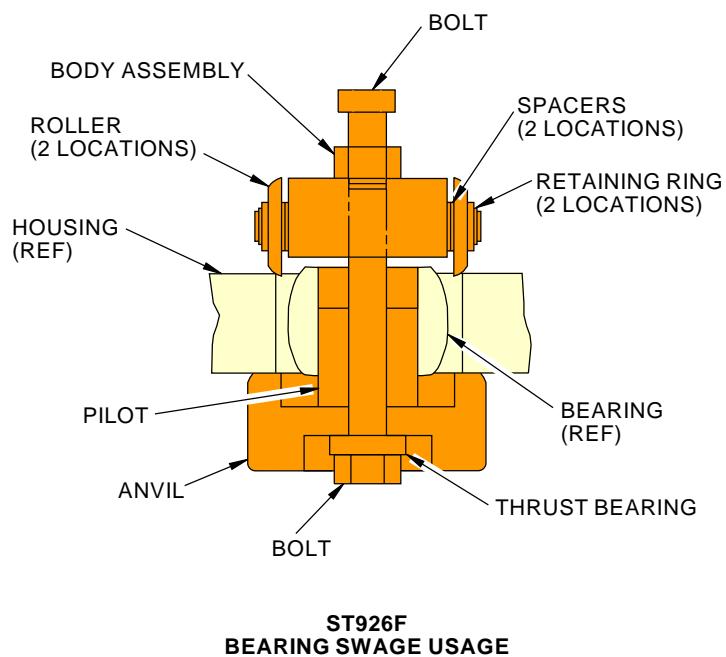
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2269202 S0000510235\_V1

**BAC5435 Process Roller Swage Bearing and Sleeve Repair Kit**  
**Figure 1**

**20-50-86**

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PART NUMBER: ST926G

**NAME:** STANDARD TOOL - BEARING REMOVE/INSTALL/SWAGE, BEARING WITH GROOVE 0.500 TO 1.250-INCH RACE SWAGE (TYPE III)

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** ST926G standard tools are used during component maintenance.

ST926G is used in conjunction with a customer-furnished drill press. Various sizes of ST926G are used to remove, install and swage Type III (race) bearings of 0.500- 4.000 inch outside diameter.

The ST926G tools are specified in the form ST926G-WWW-XXX-Y-ZZZZ where:

"ST926" is the basic tool number.

"G" is the variation.

"WWW" is the bearing outside diameter in 1/1000-inch.

"XXX" is the bearing inside diameter in 1/1000-inch.

"Y" is bearing thickness in 1/10-inch.

"ZZZ" is swaging groove centerline diameter in 1/1000-inch.

ST926G is used on bearings: BACB10JE05, KRP141608V, S302T001-206, S302T001-817, 293W2514-1, 293W2514-2, 93W2514-3,

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST926G drawings for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

A typical ST926G consists of:

ST926G		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	PILOT INSIDE DIAMETER SPACER	-2
1	MANDREL	-3
2	ROLLER	-4
2	SPACER	-5
1	HEX NUT	-6
1	LARGE ANVIL	-7
1	SMALL ANVIL	-8
1	SECOND SIDE ANVIL	-9
1	AXLE	-10

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(Continued)

ST926G		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	SNAP-RING	-11
2	TAKE-UP SPACER	-12
1	THRUST BEARING ASSEMBLY	-13
1	MODIFIED HOLE SAW	-14
1	INSERTION BOLT	-15
1	SPRING	-16
1	SPACER	-17
1	HEX NUT	-18

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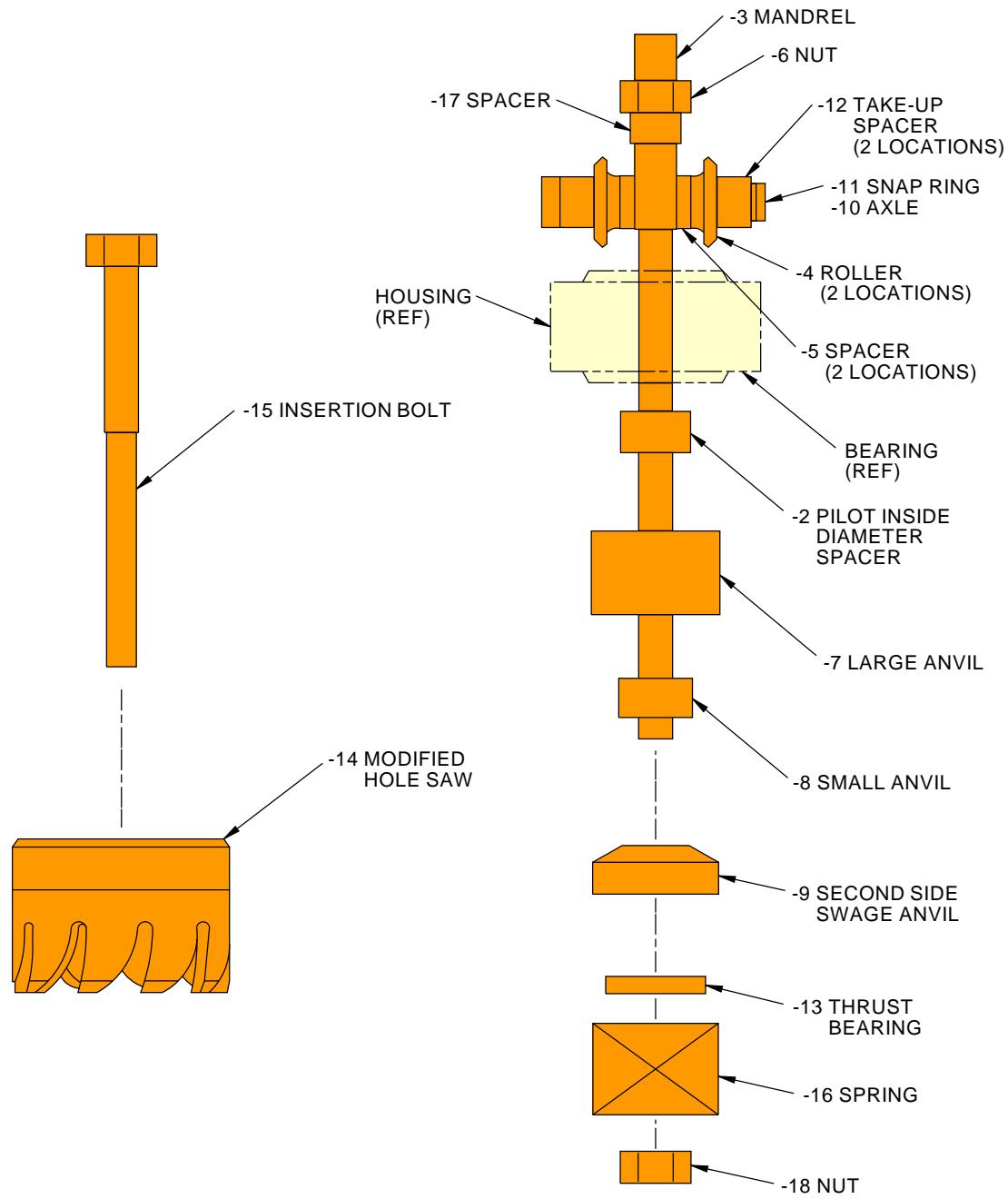
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**ST926G  
STANDARD TOOL USAGE**

2269301 S0000510246\_V1

**Bearing with Groove 0.500 to 1.250-Inch Race Swage (Type III) Remove/Install/Swage Standard Tool  
Figure 1**

**20-50-87**

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**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER: ST927**

**NAME:** BEARING REMOVAL TOOL

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST927 series bearing removal tool is used during component maintenance.

ST927 series tools are used in conjunction with a customer-furnished drill press. Various sizes of ST927 are used to remove selected BACB10M and 10-60545 specification bearings. Removing bushings is a two-step process, using an anvil, a cutting assembly and a punch assembly. An installed bearing is supported on the anvil. The cutter assembly is driven by a drill press to cut away the old staked flange. The punch assembly forces the bearing out of the housing after the old flange is removed.

The ST927 tools are designated in the form ST927-X-YYY where:

"ST927" is the basic tool number.

"X" is the dash number (-1 thru -13). Each dash number has a tool drawing.

"YYY" is the part number.

ST927 is used on bearings: AN201KP16A, BACB10AB10, BACB10AB5, BACB10AB6, BACB10AB8M, BACB10AG7, BACB10AG8, BACB10A686, BACB10A88, BACB10BX16, BACB10CL12, BACB10EN12G, BACB10FB04G, BACB10FC04, BACB10FC05, BACB10FC06, BACB10FC07, BACB10FC08, BACB10FC09, BACB10FC10, BACB10FC12, BACB10FC14, BACB10FC16, BACB10FE05, BACB10FE06, BACB10FE08, BACB10FE10, ACB10FE14, BACB10FE16, BACB10FS16, BACB10GB04G, BACB10GD04G, BACB10X3DT, BACB10X3MT, BACB10X3T, KSBG10-9, KSBG14N25SSD3, KSBG14N3, KSBG8N3, KSBN12-18, KSB10-9, KSC111008V, KSC234708V, KSC277705B, L3119, MS14101-10, MS14101-12, MS14101-14, MS14101-16, MS14101-4, MS14101-5, MS14101-5A, MS14101-6, MS14101-7, MS14101-8, MS14101-9, MS14103-10, MS14103-14, MS14103-16, MS14103-5, MS14103-6, MS14103-8, MS21230-10, MS21230-5, MS21230-6, MS21230-8, MS21232-10, MS21232-12, MS21232-14, MS21232-16, MS21232-4, MS21232-5, MS21232-6, MS21232-7, MS21232-8, MS21232-9, S302T001-200, S302T001-214, S302T001-223, S302T001-232, S302T001-303, S302T001-309, USB6-107,

VTB00050, VTB02240, VTB10200, YTA286, 10-60545-111S, 10-60545-112S, 10-60545-113S, 10-60545-114S, 10-60545-115S, 10-60545-116S, 10-60545-117S, 10-60545-118S, 10-60545-119S, 10-60545-120S, 10-60545-140S, 10-60545-140SA, 10-60545-141S,

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10-60545-141SA, 10-60545-142S, 10-60545-143S, 10-60545-144,  
10-60545-145S, 10-60545-147S, 10-60545-149, 10-60545-150S,  
10-60545-157S, 10-60545-164S, 10-60545-165, 10-60545-166S,  
10-60545-167S, 10-60545-200S, 10-60545-201S, 10-60545-202S,  
10-60545-203S, 10-60545-45, 10-60545-77, 10-60545-82, 10-61846-1,  
10-61905-1, 10-61905-2, 10-61905-3, 10-61905-5, 10-61905-7,  
60B00180-107, 60B80067-2, 60B80067-3, 60B96213-1 and 69-57643-1.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST927 drawings for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

Each ST927-(X) includes an anvil, a cutter assembly and a punch assembly. The anvil is a circular steel fixture, sized to clear the bearing outside diameter. The cutter assembly includes a hole saw and a circular shank for mounting in a drill press chuck. The punch has an adjustable pilot and a flat upper surface for applying the pressing force.

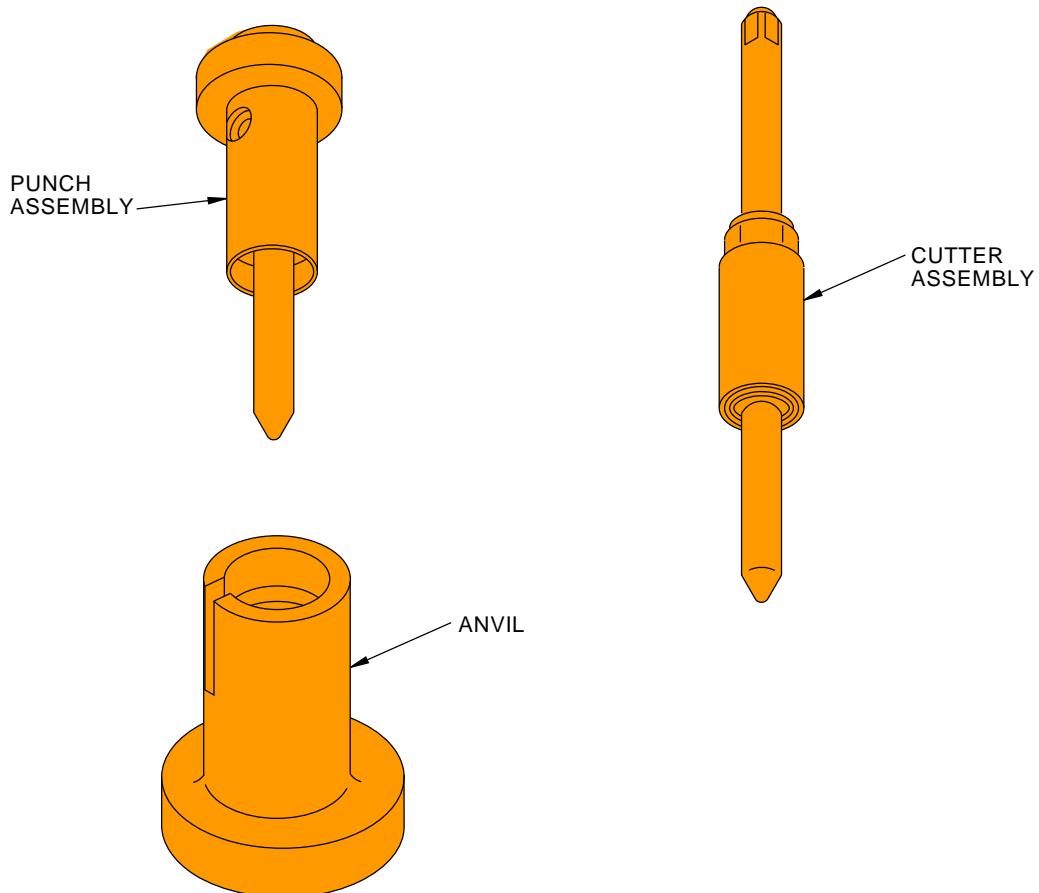
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**ST927**  
**BEARING REMOVAL TOOL**

2269303 S0000510255\_V1

**Bearing Removal Tool**  
**Figure 1**

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PART NUMBER: ST927A

NAME: BUSHING REMOVAL TOOL FOR 69B13953

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The ST927A bushing removal tool is used during component maintenance.

ST927A is used in conjunction with a customer-furnished, model 251-D2, Jiffy Air Motor and a Chicago Pneumatic CP 507A riveter and an ST1010-2 squeeze yoke. ST927A is used to remove the 69B13953 staked bushing from the 65B07794 wing panel lower link fitting assembly.

The ST927A tools are designated in the form "ST927A" where:

"ST927" is the basic tool number.

"A" is the variation.

ST927A is used on bearings: S302T001-702, S302T001-822 and 69B13953-2.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST927A drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST927A consists of:

ST927A		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	FLANGE CUTTING TOOL	-1
1	BUSHING REMOVAL TOOL	-2

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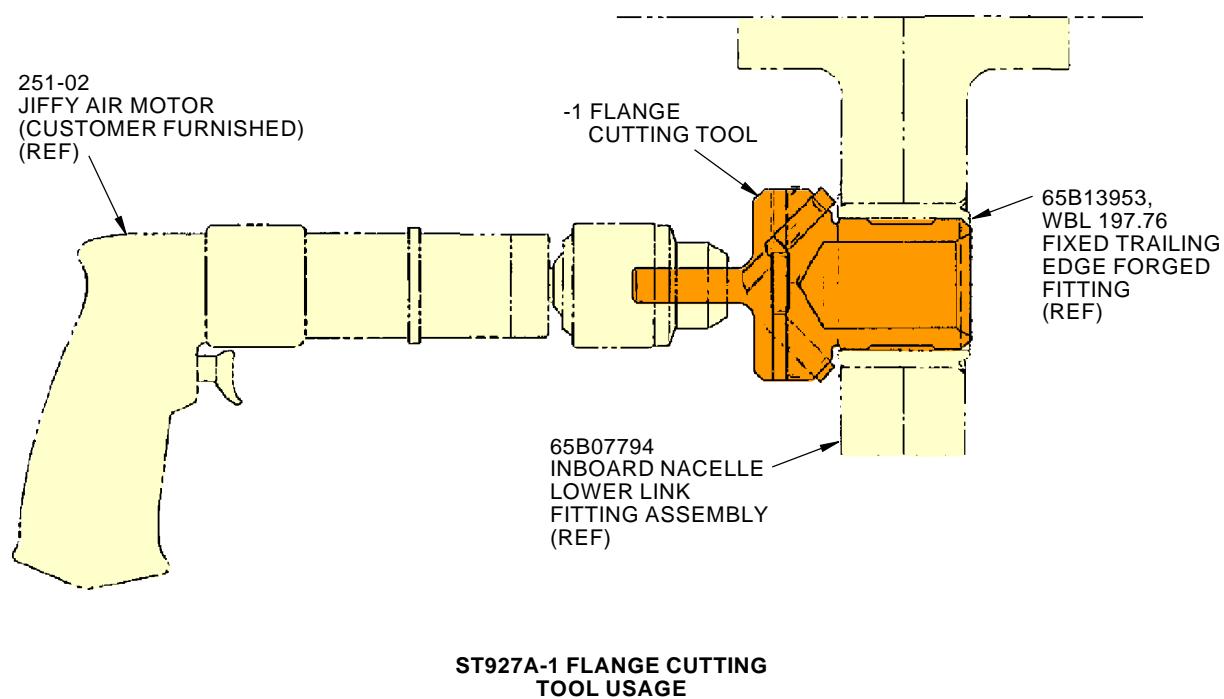
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2269902 S0000510515\_V1

Bushing Removal Tool for 69B13953  
Figure 1 (Sheet 1 of 2)

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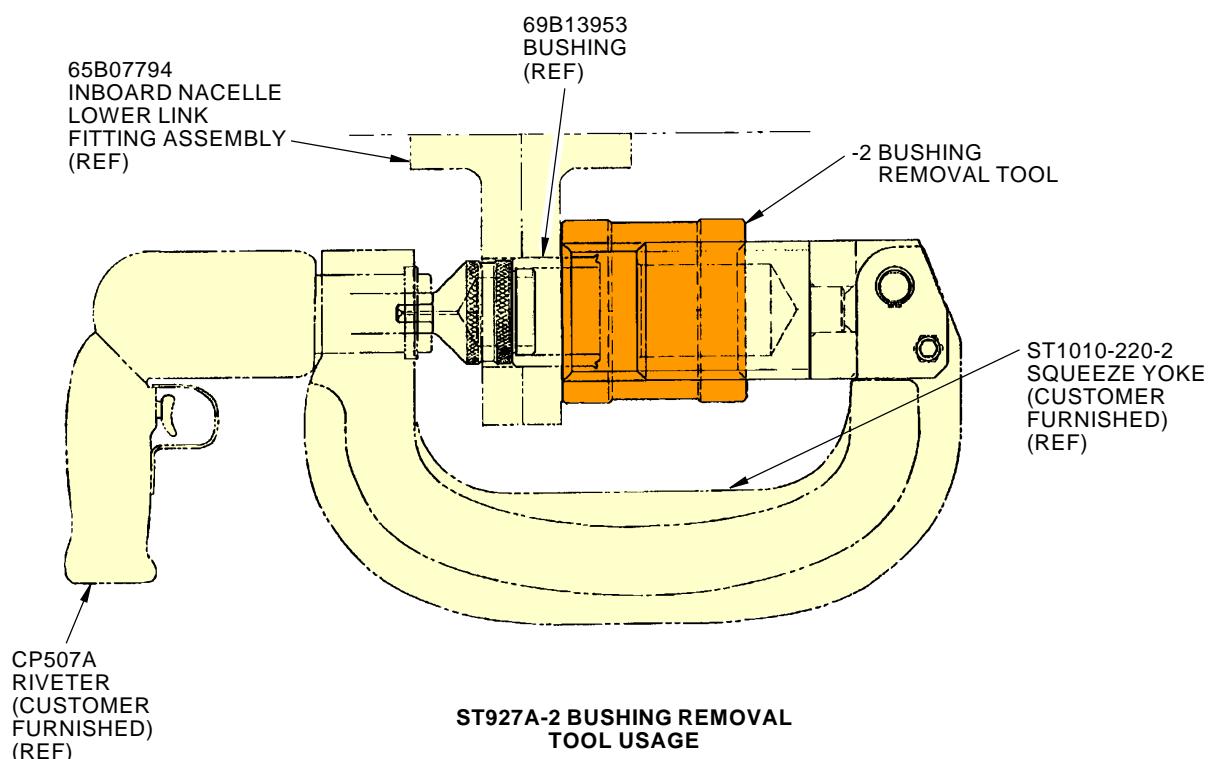
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2269904 S0000510516\_V1

Bushing Removal Tool for 69B13953  
Figure 1 (Sheet 2 of 2)

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**PART NUMBER: ST927AA-1**

**NAME:** STANDARD TOOL - BACB10CN3 BEARING REMOVAL TOOL

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST927AA-1 standard tool is used during component maintenance.

ST927AA-1 is used in conjunction with a customer-furnished drill press to remove BACB10CN3 bearings from the 253U5109 engine control link assembly.

The ST927AA-1 tools are designated in the form "ST927AA-1" where:

"ST927" is the basic tool number.

"AA" is the variation.

"1" is the dash number.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST927AA-1 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST927AA-1 consists of:

ST927AA-1		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	ANVIL	-2
1	CUTTER ASSEMBLY	-3
1	PUNCH ASSEMBLY	-4

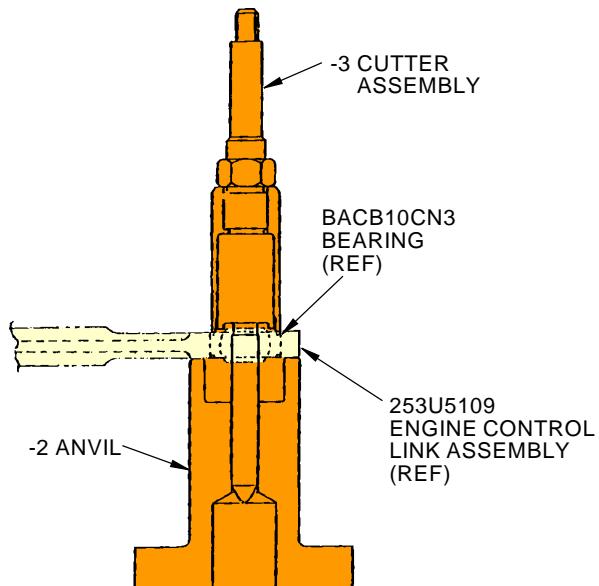
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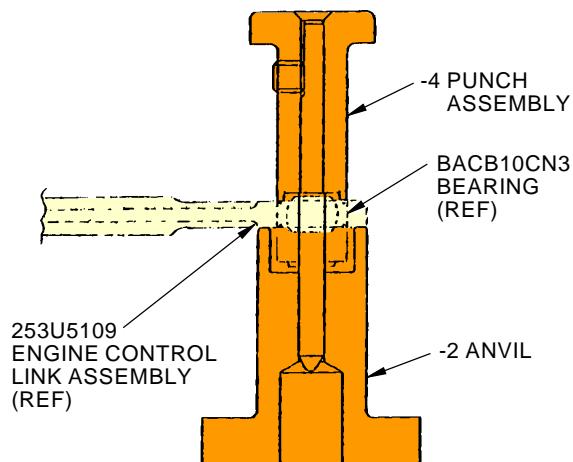
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**ST927AA-1, STEP 1,  
STAKING LIP REMOVAL**



**ST927AA-1, STEP 2,  
BEARING REMOVAL**

2269873 S0000510520\_V1

**BACB10CN3 Bearing Removal Standard Tool**  
**Figure 1**

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**PART NUMBER: ST927AA-2**

**NAME:** STANDARD TOOL - BACB10AG4MC BEARING REMOVAL TOOL

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST927AA-2 standard tool is used during component maintenance.

ST927AA-1 is used in conjunction with a customer-furnished drill press to remove BACB10AG4 bearings from the 253T7532 autothrottle brake housing assembly.

The ST927AA-2 tools are designated in the form "ST927AA-2" where:

"ST927" is the basic tool number.

"AA" is the variation.

"2" is the dash number.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST927AA-2 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST927AA-2 consists of:

ST927AA-2		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	ANVIL	-2
1	CUTTER ASSEMBLY	-3
1	PUNCH ASSEMBLY	-4

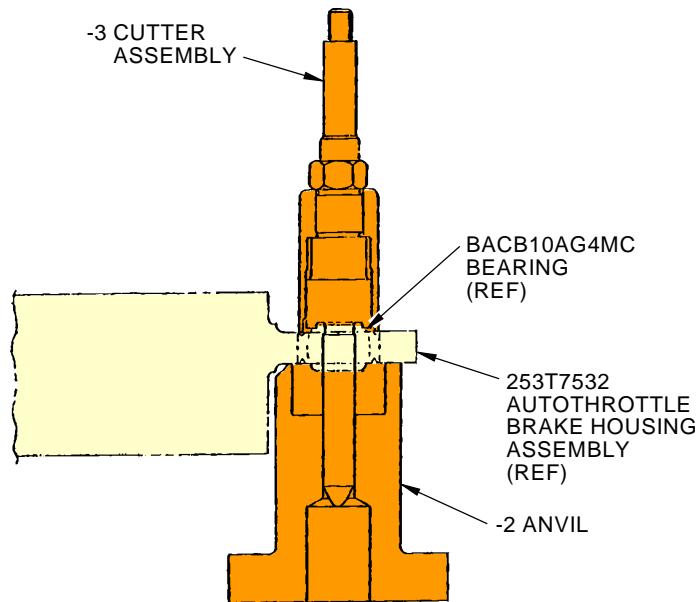
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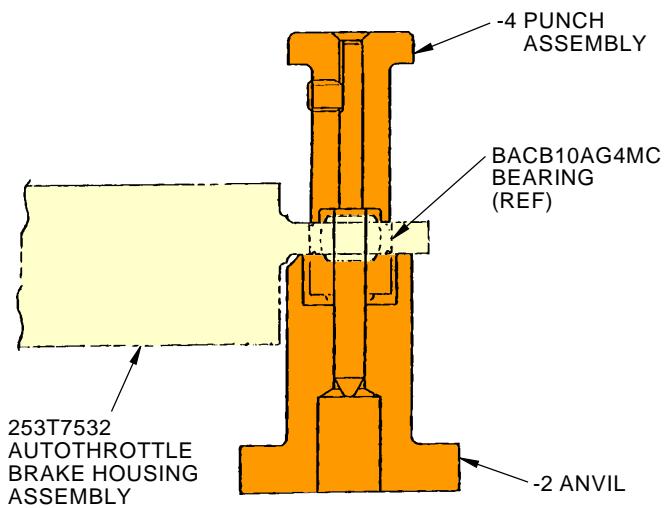
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**ST927AA-2, STEP 1  
STAKING LIP REMOVAL**



**ST927AA-2, STEP 2,  
BEARING REMOVAL**

2270077 S0000510531\_V1

**BACB10AG4MC Bearing Removal Standard Tool**  
**Figure 1**

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PART NUMBER: ST927B

NAME: BEARING REMOVAL TOOL

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The ST927B bearing removal tool is used during component maintenance.

ST927B is used in conjunction with a customer-furnished drill press to remove roller swaged bearings.

The ST927B tools are designated in the form "ST927B-X" where:

"ST927" is the basic tool number.

"B" is the variation.

"X" is the dash number (1 thru 10, 35, 36, 37, 45, 49, 50, 53, 56, ). All ST927B-X standard tools are found on the single ST927B drawing.

ST927B bearing removal tools are used on bearings: BACB10AB4, BACB10AB4M, BACB10ES06AG, BACB10FE04, BACB10FE07H, BACB28AB10, BACB28AB11, BACB28AB12, BACB28AB14, BACB28AB16, BACB28AB18, BACB28AB20, BACB28AB4, BACB28AB5, BACB28AB6, BACB28AB7, BACB28AB8, BACB28AB9, BAN6798, HBR286-041, HBR289-072, KSC111008V, KSC234708V, LHSSG4-8D, LHSSG4-8N, LHSSG6AJ, MS14103-4, MS14103-7, MS21230-4, MS21230-7, P20240, P20280, S302T001-302, USB6-106, VTB00040, VTB00970, WG4B, YTS828, 10-60545-151S, 10-60545-159S, 10-60545-206S, 10-60545-208S, 10-60545-45, 10-61905-6, 107-3306-041, 107-3309-072, 117R, 12893, 55510, 60B00180-100, 60B00180-102, 60B00180-212, 60B00180-303, 60B00180-304, 60B10024-7, 60B90143-1, 60B96203-1, 60B96215-1, 60B97202-1, 60B97203-1, 60B97204-1, 60B97206-1, 60B98100-1, 60B98101-1, 65B07347-26, 69-57619-1, 78910-06-041 and 78910-09-072

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST927B drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

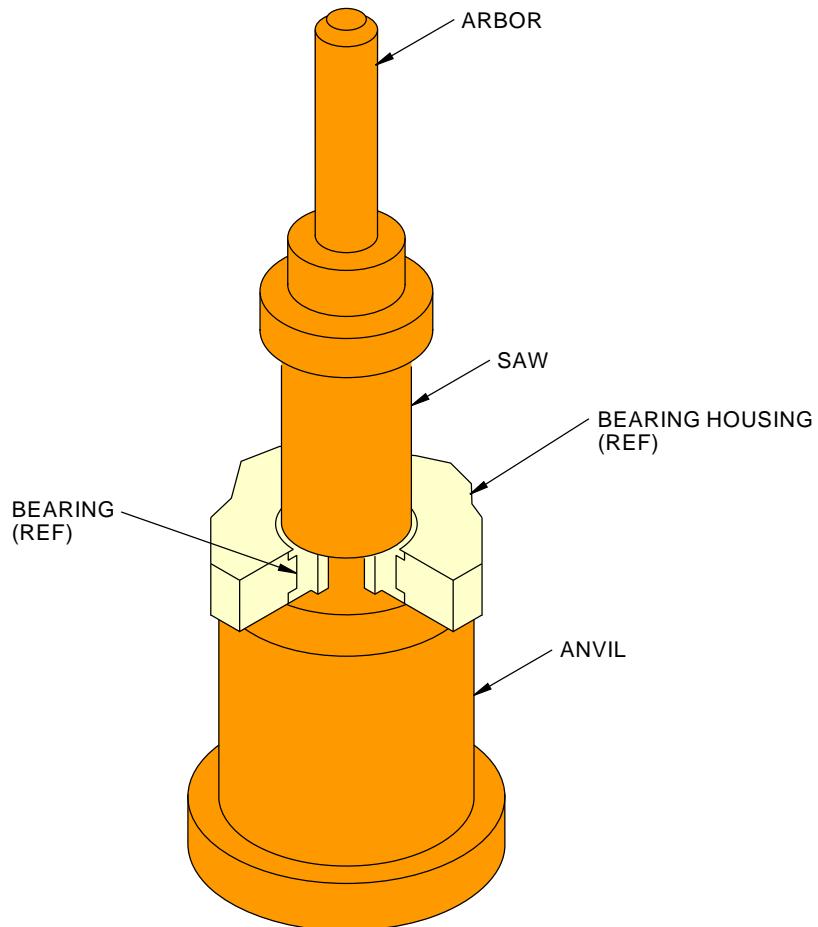
Each ST927B-X consists of saw, arbor, anvil and sometimes a sleeve.

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**ST927B  
BEARING REMOVAL TOOL USAGE**

2270011 S0000510542\_V1

**Bearing Removal Tool  
Figure 1**

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PART NUMBER: ST927C

NAME: STANDARD TOOL - BEARING REMOVAL TOOL

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The ST927C series bearing removal tools are used during component maintenance.

ST927C is used in conjunction with a customer-furnished drill press. Various sizes of ST927C are used to remove roller swaged bearings.

The ST927C tools are specified in the form "ST927C-X" where:

"ST927" is the basic tool number.

"C" is the variation.

"X" is the tool dash number. (1 thru 23, 80 thru 86, 108, -112 thru -114, -121, -125, -127, -134, -136, -137, -139 and -142)). All ST927C-X standard tools are found on the single ST927C drawing.

ST927C bearing removal tools are used on bearings: AMB20-1001, AMB22-1001, BACB10AB20, BACB10AG22, BACB10ES06G, BACB10FB10G, BACB10FC10, BACB10FE12, BACB10FH12G, BACB10GB10G, BACB10GD10G, BAN10696, BHDR, BLFN48-027, BLFR20-097, BLR34016, HSP34-101, HUDL24-101, KR8CNGV03, KSC135216B, KSC218124B, KSSB2025, LHSSG10AD, LHSSG10AE, LHSSG10AP, MS14103-12, MS21230-12, M81936/1-22, P20360, P20370, P22960, P22970, S302A006-3, S302T001-209, S302T001-215, S302T001-219, S302T001-227, S302T001-701, S302T001-703, S302T001-821, USB10-104, USB10-105, VTB00030, VTB01130, VTB01140, YTA261, YTA263, 10-60545-11, 10-60545-144S, 10-60545-146S, 10-60545-148, 10-60545-149S, 10-60545-151, 10-60545-154S, 10-60545-155S, 10-60545-156S, 10-60545-161S, 10-60545-163S, 10-60545-163SA, 10-60545-204S, 10-60545-205S, 10-60545-205SA, 10-60545-207S, 10-60545-40, 10-60545-43, 10-60545-44, 10-60545-60, 10-60545-63, 10-60545-64, 10-60545-66, 10-60545-71, 10-60545-72, 10-60545-87, 10-61846-2, 10-61846-3, 10-61903-5, 10-61970-2, 10-61970-3, 10-61970-4, 10-61970-5, 10-61970-6, 10-61970-7, 12897, 12903, 55393, 55530, 55562, 55699, 60B00180-1, 60B00180-103, 60B00180-105, 60B00180-106, 60B00180-12, 60B00180-2, 60B00180-20, 60B00180-203, 60B00180-204, 60B00180-205, 60B00180-208, 60B00180-227, 60B00180-228, 60B00180-246, 60B00180-249, 60B00180-25, 60B00180-250, 60B00180-251, 60B00180-27, 60B00180-29, 60B00180-3, 60B00180-300, 60B00180-301, 60B00180-43, 60B00180-48, 60B00180-49, 60B00180-50, 60B80067-17,

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60B90021-1, 69-57622-1, 69-57625-1, 69B13953-2, 69B17663-1 and  
69B17663-2.

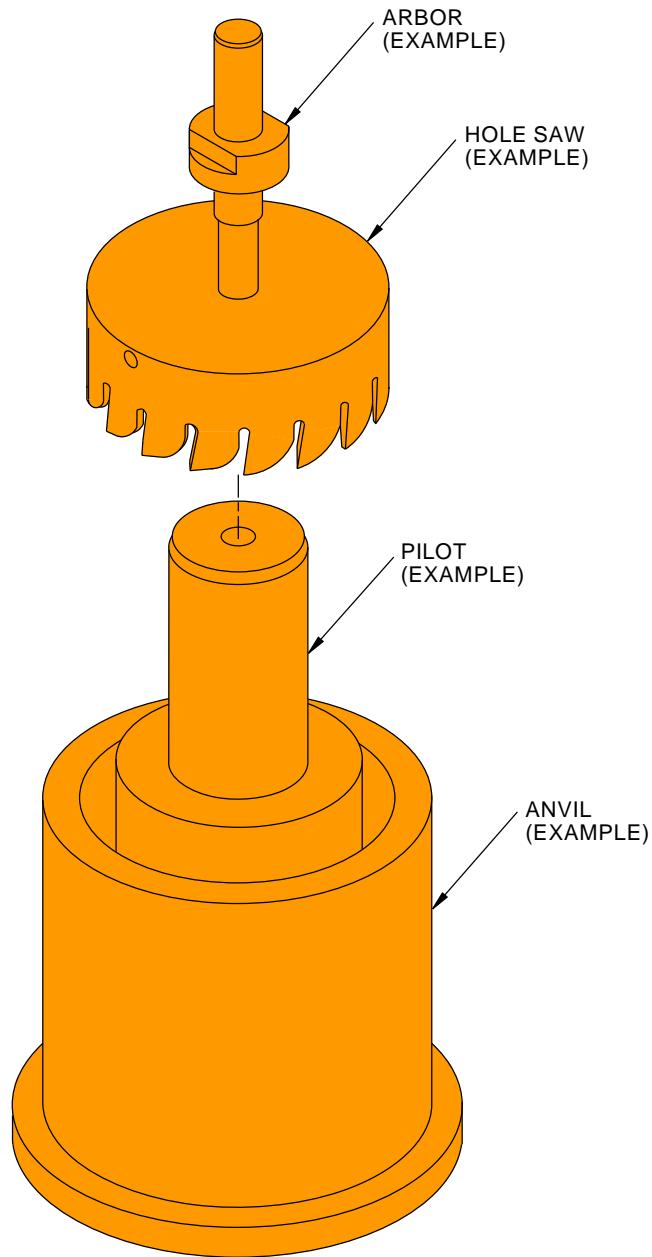
Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST927C drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

Each ST927C bearing removal tool includes a saw, an arbor, a pilot and a 4340 steel anvil.

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ILLUSTRATED TOOL AND EQUIPMENT MANUAL



**ST927C**  
**BEARING REMOVAL TOOL USAGE**  
**(EXAMPLE)**

2270001 S0000510560\_V1

**Bearing Removal Standard Tool**  
**Figure 1**

**20-50-93**



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ILLUSTRATED TOOL AND EQUIPMENT MANUAL

**PART NUMBER:** ST927J

**NAME:** STANDARD TOOL - HOLE SAW, BEARING REMOVAL

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST927J standard tool is used during component maintenance.

The ST927J hole saw is used in conjunction with customer-furnished regulated shop air. ST927J is used to cut a controlled, circular groove in the S012T236-700 bearing outer race for removal from the 183A4210 elevator hinge fitting.

The ST927J is designated in the form "ST927J-X" where:

"ST927" is the basic tool number.

"J" is the variation.

"X" is the detail or assembly number.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST927J drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST927J consists of a -1 bearing removal assembly contained in a storage box.

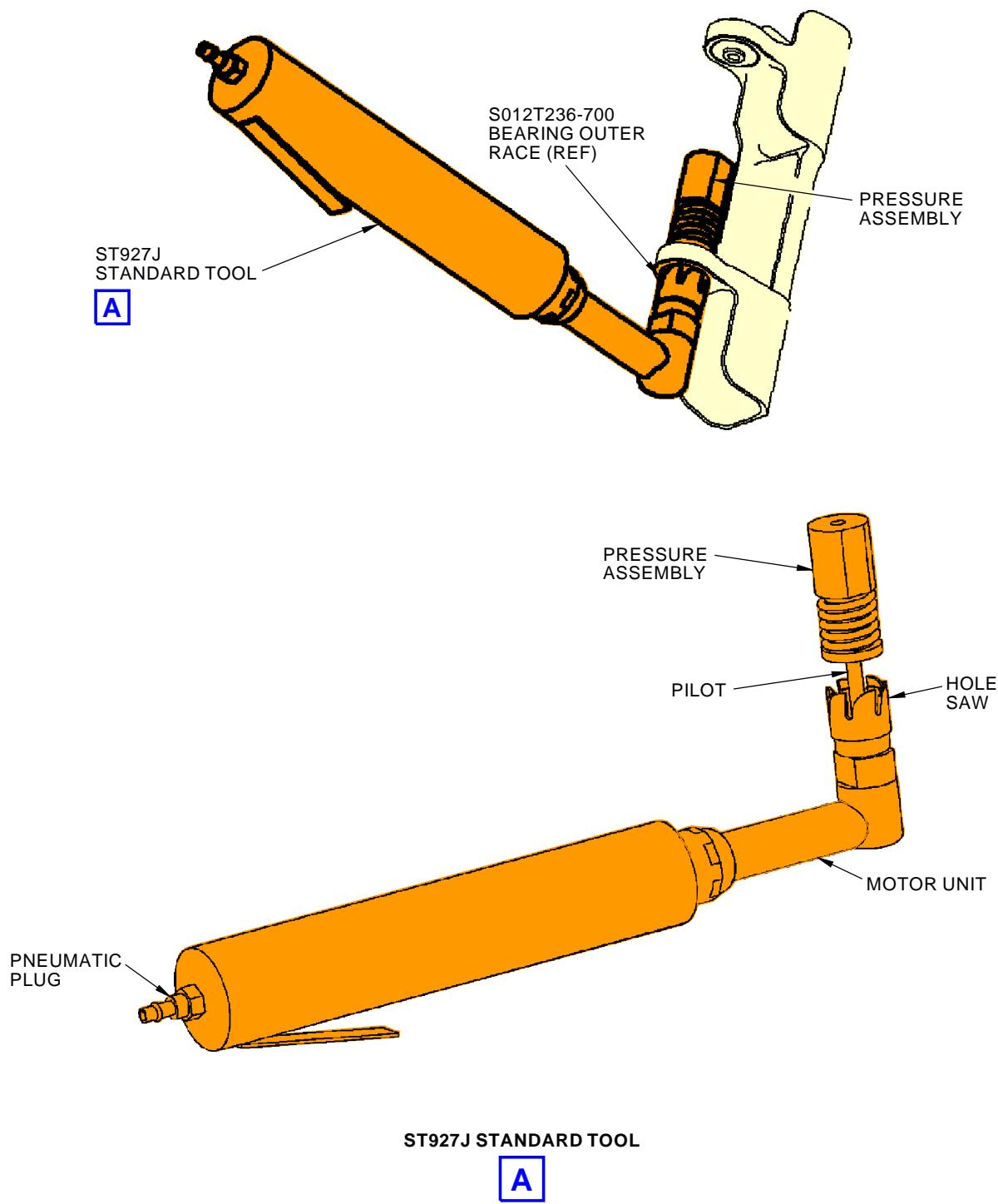
**20-50-94**

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ST927J STANDARD TOOL

A

2272260 S0000510583\_V1

Bearing Removal Hole Saw Standard Tool  
Figure 1

**20-50-94**

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**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER: ST928**

**NAME:** STANDARD TOOL - ROLLER STAKING TOOL, ALUMINUM SLEEVE

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** YES

CMM 27-34-02, CMM 27-34-03

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST928 series standard tools are used during component maintenance.

ST928 is used in conjunction with a customer-furnished drill press. Various sizes of ST928 are used to swage aluminum bearing sleeves. ST928 is only used on aluminum sleeves.

The ST928 tools are designated in the form "ST928-XXX-YYY-ZZ" where:

"ST928" is the basic tool number.

"XXX" is the outside diameter of the production bearing.

"YYY" is the inside diameter of the production bearing.

"ZZ" is the tool detail or assembly number.

ST928 tools are used on bearings: BACB10AC4, BACB10AC5A, BACB10A660, BACB10CK6, BACB10FP05A, BACB10FP06, BACB10GG10, DAS10-26A1-4, DAS10-26A1-501, DAS10-26B1-4, DAS10-26B1-502, DAS10-26B1-504, DAS10-26B1-7, DAS4-14A1-506, DAS4-14A1-508, DAS5-20A1-506, GDPP6WFS428, GDPP8WFS428, GDPP8WSD629, SA4-14A4, S012T236-400, S012T236-401, S251N214-4, S251N214-5, YD134, YD134A, YD134B and 60B00180-101.

Refer to CMM 27-34-02, CMM 27-34-03, the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST928 drawing for complete usage instructions. If the component overhaul instructions differ from the data in SOPM 20-50-03, use the component overhaul instructions.

Each ST928-XXX-YYY-ZZ consists of a roller assembly and an anvil contained in a storage box.

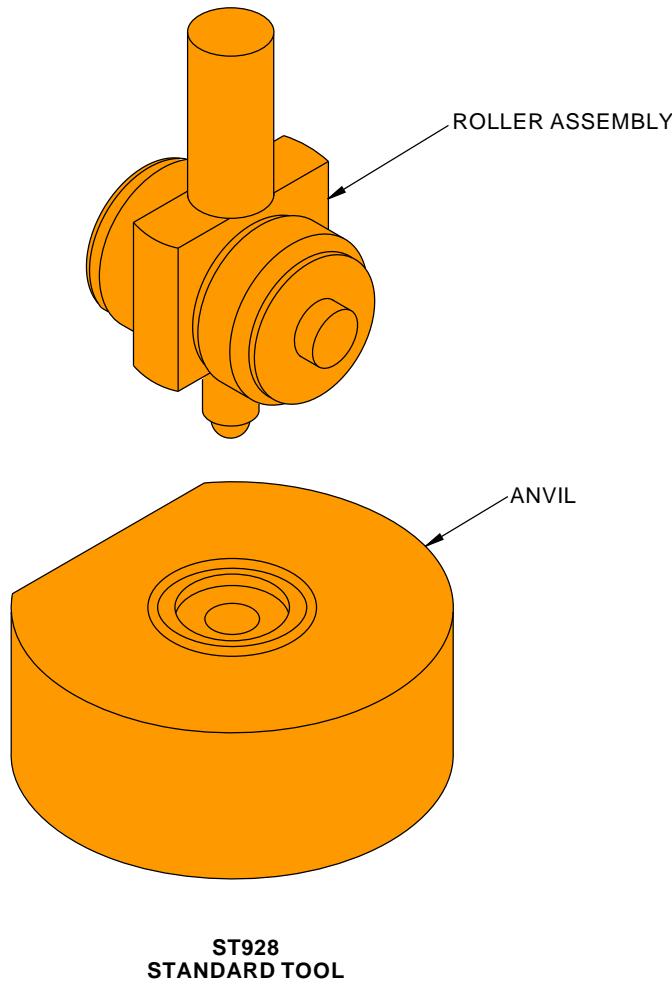
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2272271 S0000510593\_V1

**Aluminum Sleeve Roller Staking Standard Tool**  
**Figure 1**

**20-50-95**



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**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER: ST928-A**

**NAME:** STANDARD TOOL - ROLLER SWAGING, ALUMINUM SLEEVE 69-38919

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST928-A standard tool is used during component maintenance. ST928-A is a different tool than ST928A.

ST928-A is used in conjunction with a customer-furnished drill press. ST928-A is used on aluminum sleeves in a two-step swaging process to swage:

The 69-38919-23 sleeve using a -1 roller swage kit.

The 69-38919-19 sleeve using a -9 roller swage kit.

The 69-38919-28 sleeve using a -15 roller swage kit.

The 69-38919-29 sleeve using a -21 roller swage kit.

The 66-26136-2 sleeve using a -28 roller swage kit.

The ST928-A tools are designated in the form "ST928-A-X" where:

"ST928" is the basic tool number.

"A" is the variation.

"X" is the detail or assembly number (-1, -9, -15, -21 and -28). All ST928-A-X standard tools are found on the single ST928-A drawing.

ST928-A standard tools are used on bearings: BACB10AC3L, BACB10AC6A, BACB10AP10, BACB10FM33, BACB10FP03L and BACB10FP06A.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST928-A drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

Each ST928-A-X consists of roller assembly and an anvil. All kits are contained in a storage box.

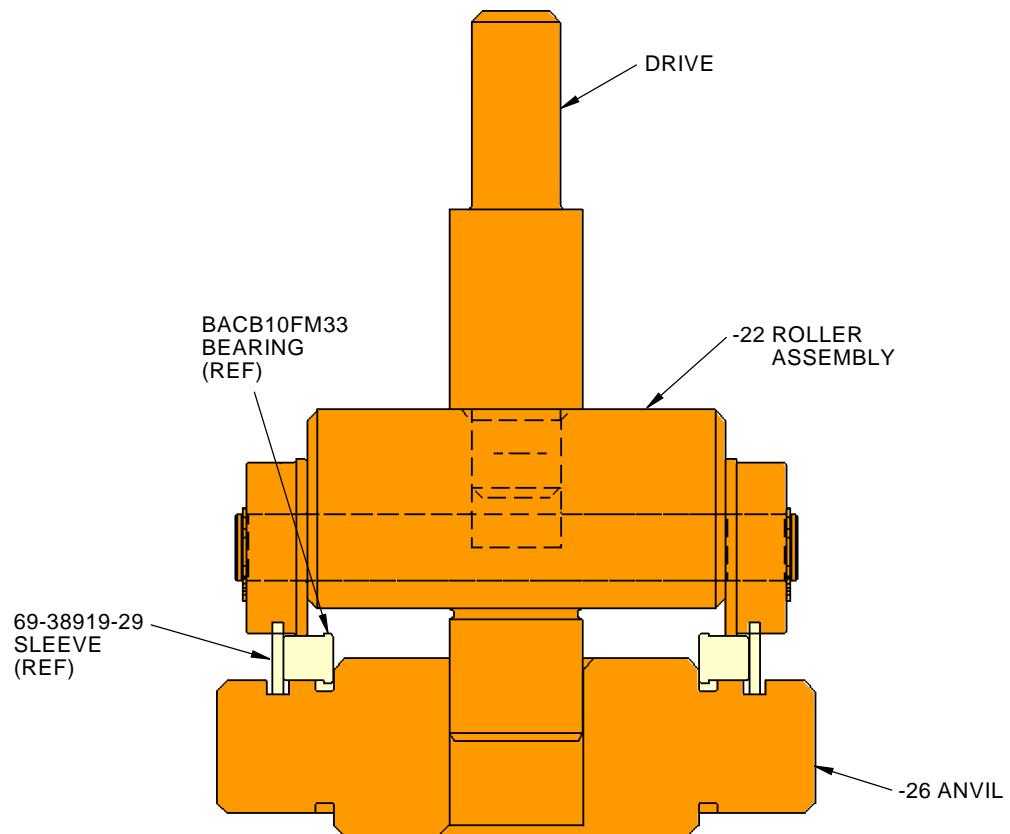
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**ST928-A-21 STANDARD  
TOOL USAGE  
(EXAMPLE)**

2271462 S0000510608\_V1

**Aluminum Sleeve 69-38919 Roller Swaging Standard Tool  
Figure 1**

**20-50-96**

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**737-600/700/800/900**  
**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER: ST928A**

**NAME:** ROLLER STAKING HAND TOOL - YD-134 BEARING

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST928A series roller staking hand tool is used during component maintenance. ST928A is a different tool than ST928-A.

ST928A is used to roller swage aluminum bearing sleeves. ST928A is used in a two-step swaging process.

A typical part number for ST928A is ST928A-1750-625. The ST928A tools are designated in the form "ST928A-XXXX-YYY" where:

"ST928" is the basic tool number.

"A" is the variation.

"XXXX" is the outside diameter of the sleeve in 1/1000-inch.

"YYY" is the inside diameter of the bearing in 1/000-inch.

ST928A standard tools are used on bearings: DAS10-26A1-4, DAS10-26A1-501, DAS10-26B1-4, DAS10-26B1-502, DAS10-26B1-504, DAS10-26B1-7, YD134, YD134A and YD134B.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST928A drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

Each ST928A consists of a -2 roller assembly and a -3 screw and barrel assembly, contained in a storage box.

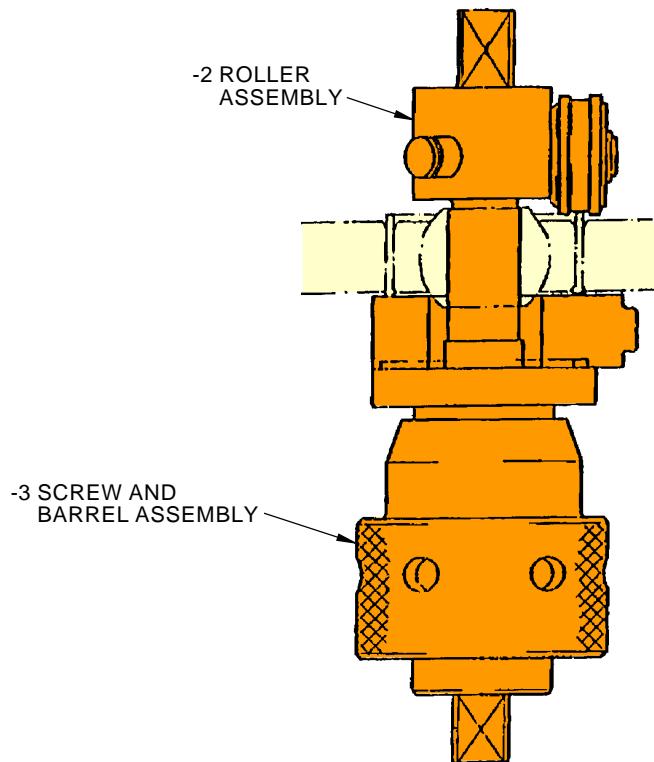
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**ST928A ROLLER STAKING  
HAND TOOL**

2271721 S0000510618\_V1

**YD-134 Bearing Roller Staking Hand Tool**  
**Figure 1**

**20-50-97**



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ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: ST928B

NAME: ROLLER SWAGING TOOL - BEARING SLEEVE

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The ST928B roller swaging tool is used during component maintenance.

ST928B is used to roller swage an aluminum bearing sleeve in the 65B05326 spindle assembly. ST928B is used in a two-step swaging process.

The complete ST928B part number is listed as ST928B-1 where:

“ST928” is the basic tool number.

“B” is the variation.

“1” is the dash number.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST928B drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST928B-1 standard tools are used on the 60B00180-211 bearing.

ST928B-1 consists of 4340 steel primary and secondary anvils, a pilot and a bushing; AISI D2 or 3 steel rollers, a drill rod pin and retaining rings, all contained in a storage box.

**20-50-98**

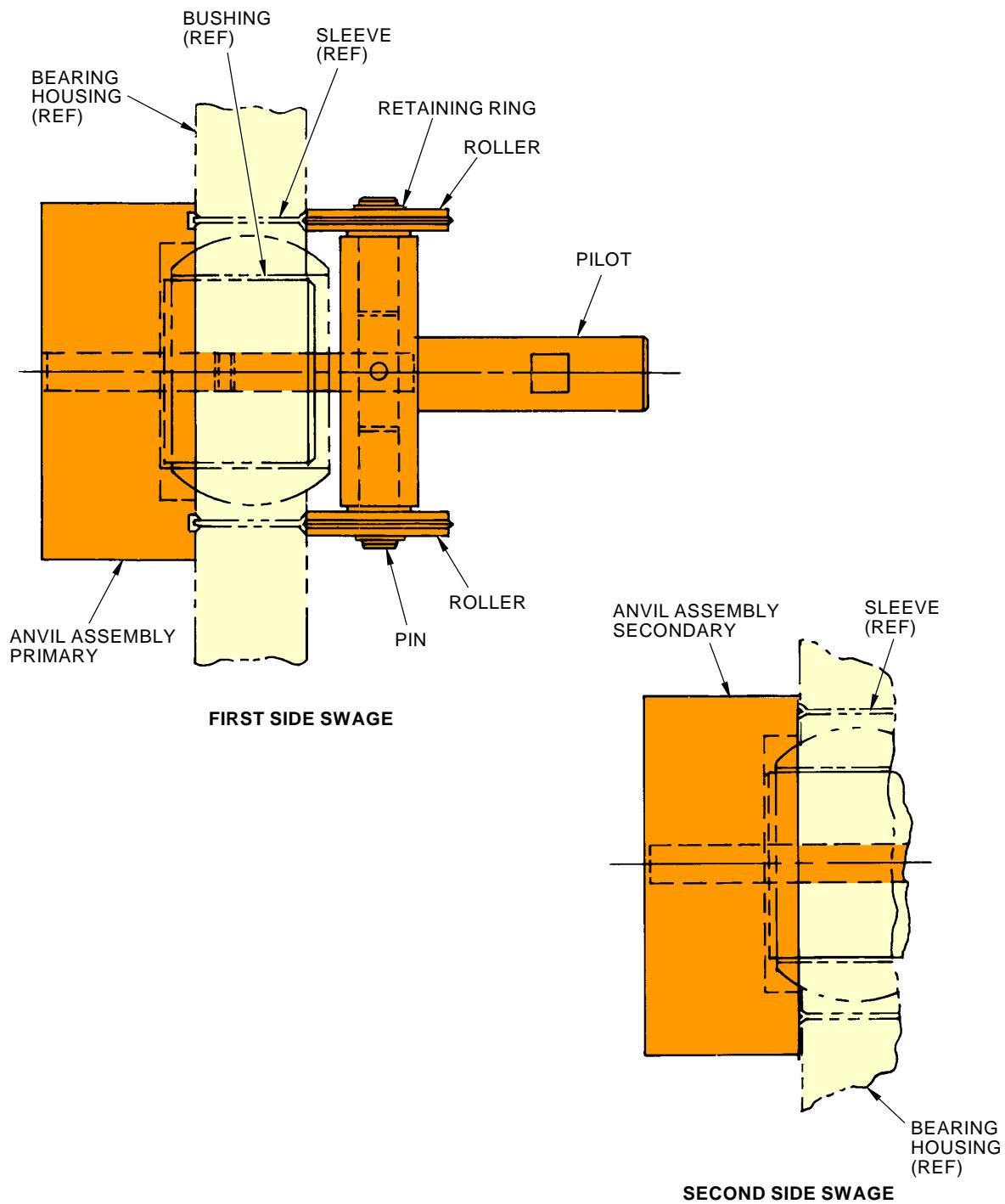
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**ST928B ROLLER SWAGING TOOL**

2271553 S0000510628\_V1

**Bearing Sleeve Roller Swaging Tool**  
**Figure 1**

**20-50-98**



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PART NUMBER: ST928C

NAME: ROLLER SWAGING TOOL - BEARING SLEEVE

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: YES

CMM 27-11-80, CMM 27-34-02, CMM 27-34-03

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The ST928C series roller swaging tools are used during component maintenance.

ST928C is used in conjunction with a customer-furnished drill press. Various sizes of ST928C are used to roller swage aluminum bearing sleeves. ST928C is used in a two-step swaging process.

The ST928C tools are specified in the form ST928C-X where:

"ST928" is the basic tool number.

"C" is the variation.

"X" is the tool dash number (-1 thru -25, -90 thru -93, -105, -107 and -114). All ST928C-X standard tools are found in the single ST928C drawing.

ST928C roller swaging tools are used on bearings: AN200KP5, AN200KP8, N200KS5, AN200KS6, AN201KP5A, AN202KP29B, AN201KP6A, AN207DPP4, AS24461-10, AS24461-20, AS24461-24, BACB10AC5, BACB10AC5A, BACB10AH5, BACB10AH6, BACB10AP10, BACB10AP5, BACB10AP6, BACB10AR4, BACB10AR6, BACB10AS10, BACB10AS21, BACB10AS25, BACB10AS33, BACB10AU29, BACB10A120, BACB10A208GM2, BACB10A243GCM2, BACB10A30DD, BACB10A30DDH, BACB10A300DD, BACB10A543, BACB10A553, BACB10A563, BACB10A581, BACB10A583, BACB10A660, BACB10A671, BACB10A683, BACB10A690, BACB10A692, BACB10BW29, BACB10BX5, BACB10BX6, BACB10BY5, BACB10BY8, BACB10B104ZP, BACB10B112ZP, BACB10B114ZP, BACB10B115ZP, BACB10CA6, BACB10CB4, BACB10CB6, BACB10CC16, BACB10CC20, BACB10CC7, BACB10CF21PP, BACB10CG4A, BACB10CH120, BACB10CK5, BACB10C134H, BACB10C134HR, BACB10C135, BACB10C135H, BACB10C136H, BACB10C34H, BACB10C93, BACB10C93H, BACB10C94H, BACB10FF06, BACB10FF07, BACB10FF14, BACB10FP5, BACB10FP05A, BACB10FR29, BACB10FS5, BACB10FS6, BACB10FU10,

BACB10FU21, BACB10FU25, BACB10FU33, BACB10FY4A, BACB10F13, BACB10F7, BACB10GG10, BACB10GX120J, BACB10M4, BACB10X11M, BACB10X11MT, BR10H, BR5, BR8, B542DD, DAS12-38A1-518, DW4K, F212-1, MB543DDSD610, MKP5A, MKP6A, MKSP4AFS428, MKSP5A, MS14104-14, MS14104-6, MS14104-7, MS20201KP5A, MS20201KP6A, MS20202KP29B, MS20207DPP4, MS21233-14, MS21233-6, MS21233-7, MS24461-10, MS24461-20,

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MS24461-24, MS27261KSP5, MS27261KSP5A, MS27261KSP6,  
MS27645-5AR, MS27645-5ARG, MS28913-12C, YS211B, 10-60545-102,  
10-60545-103, 10-60545-108, and 10-60545-124.

Refer to CMM 27-11-80, CMM 27-34-02, CMM 27-34-03, the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST928C drawing for complete usage instructions. If the component overhaul instructions differ from SOPM 20-50-03, use the component overhaul instructions.

Each ST928C-X roller swaging tool generally includes a body, bushing and a type 1 or 2 anvil, all contained in a storage box.

**20-50-99**

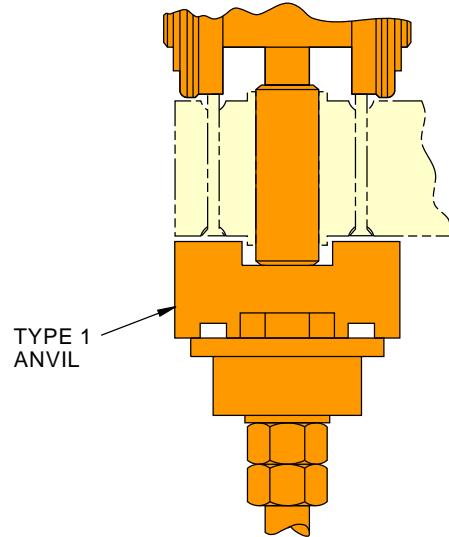
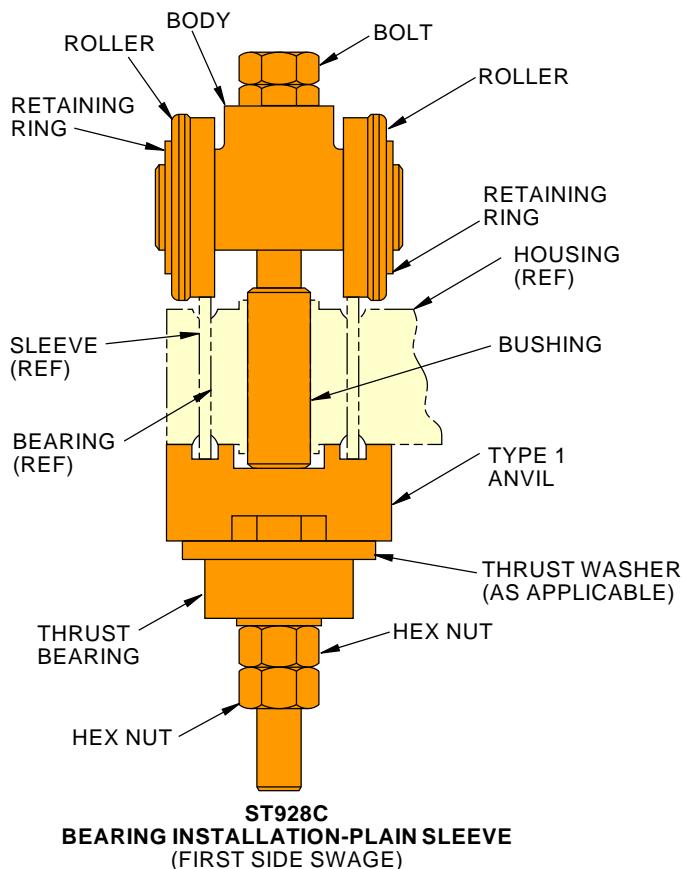
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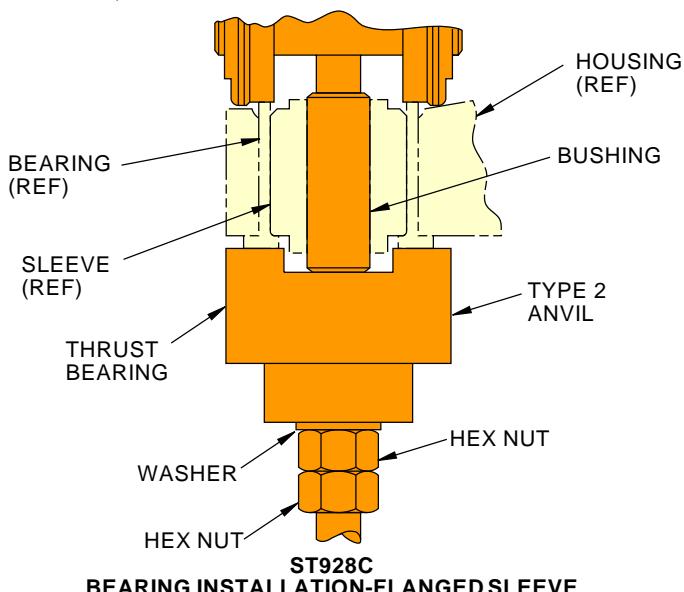
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**ST928C**  
**BEARING INSTALLATION-PLAIN SLEEVE**  
(SECOND SIDE SWAGE)



2271299 S0000510654\_V1

Bearing Sleeve Roller Swaging Tool  
Figure 1

**20-50-99**

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PART NUMBER: ST928D

NAME: ROLLER SWAGING TOOL FOR BACB10C94H

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The ST928D roller swaging tool is used during component maintenance.

ST928D is used in conjunction with a customer-furnished drill press.

ST928D is used to roller swage the 69-47811-2 aluminum sleeve to hold the BACB10C94H bearing on the 65-60515 aft airstair program cam.

ST928D is used in a two-step swaging process.

The ST928D tools are designated in the form "ST928D" where:

"ST928" is the basic tool number.

"D" is the variation.

ST928D standard tools are used on bearings: BACB10C94H and BR10H.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST928D drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST928D consists of:

ST928D		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	ROLLER ASSEMBLY	-1
1	ANVIL	-7
1	LUBRICATION FITTING	-9
1	STORAGE BOX	

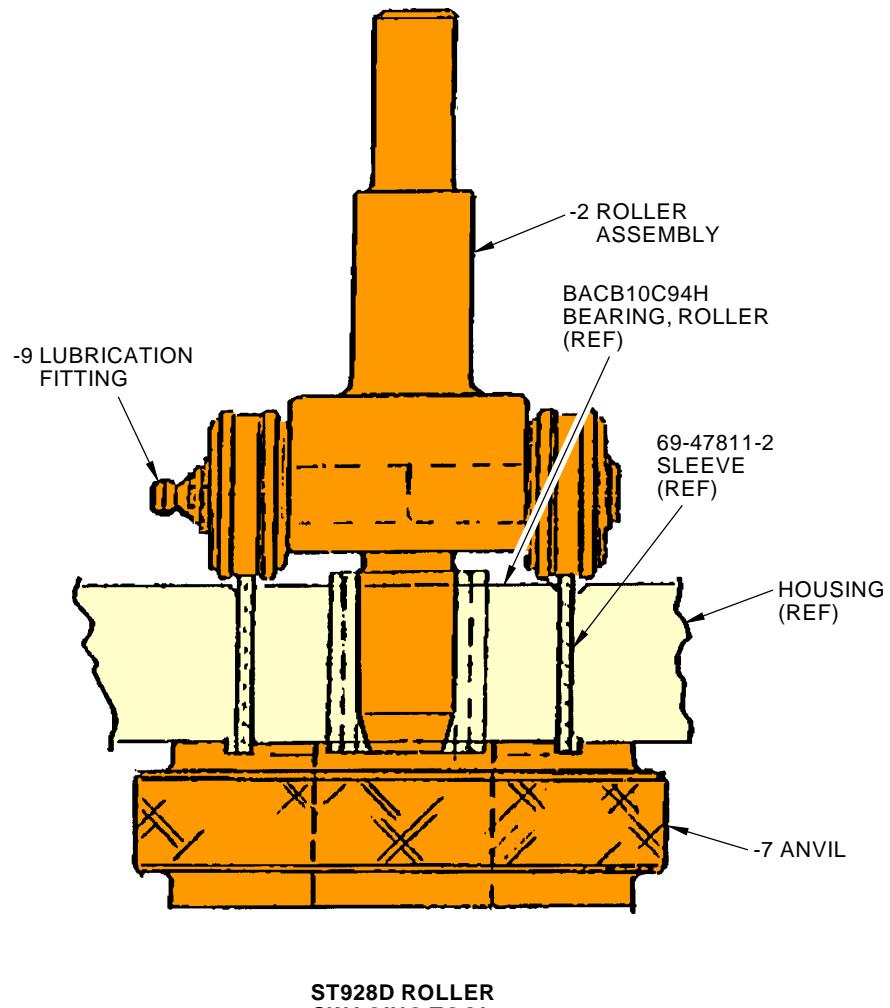
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2271245 S0000510667\_V1

**Roller Swaging Tool for BACB10C94H**  
**Figure 1**

**20-51-01**

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PART NUMBER: ST928E

NAME: ROLLER SWAGING TOOL - ALUMINUM SLEEVE, 69-38919-2

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The ST928E roller swaging tool is used during component maintenance.

ST928E is used in conjunction with a customer-furnished drill press.

ST928E is used to roller swage the 69-38919-2 aluminum sleeve to hold the 10-60545-102 bearing. ST928E is used in a two-step swaging process.

The ST928E tools are designated in the form "ST928E" where:

"ST928" is the basic tool number.

"E" is the variation.

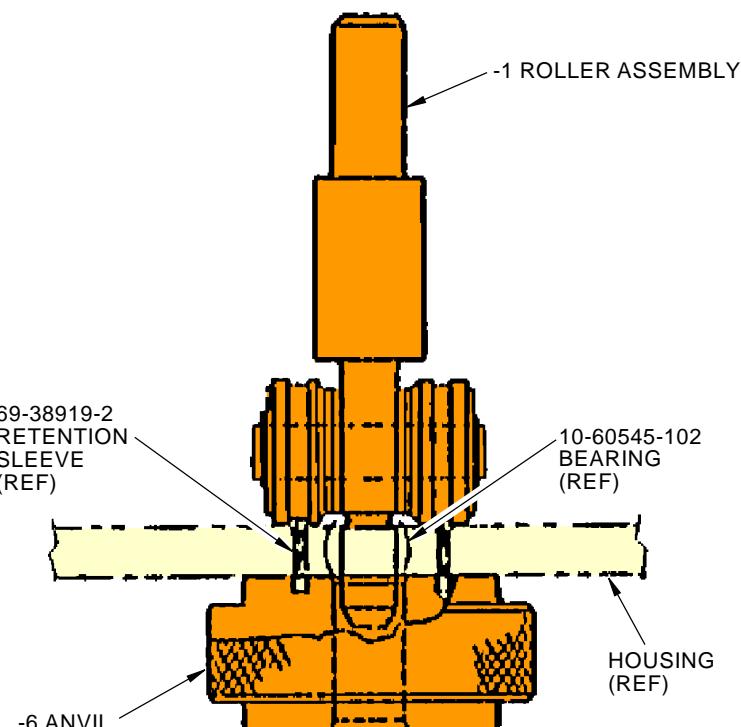
Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST928E drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST928E consists of:

ST928E		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	ROLLER ASSEMBLY	-1
1	ANVIL	-6
1	STORAGE BOX	

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**ST928E ROLLER  
SWAGING TOOL**

2270379 S0000510672\_V1

**69-38919-2 Aluminum Sleeve Roller Swaging Tool**  
**Figure 1**

**20-51-02**



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ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: ST928F

**NAME:** ROLLER STAKING TOOL - ALUMINUM SLEEVE

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST928F roller swaging tool is used during component maintenance.

ST928F is used in conjunction with a customer-furnished drill press.

ST928F is used to roller swage the 69-38919-1 and the 69-38919-20 aluminum sleeves to hold the BACB10AR4 and BACB10AR5 bearings.

ST928F is used in a two-step swaging process.

The ST928F tools are designated in the form "ST928F-X" where:

"ST928" is the basic tool number.

"F" is the variation.

"X" is the dash number of the BACB10AR bearing.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST928F drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST928F consists of:

ST928F		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	ANVIL	-6
1	ROLLER ASSEMBLY	-10
1	STORAGE BOX	

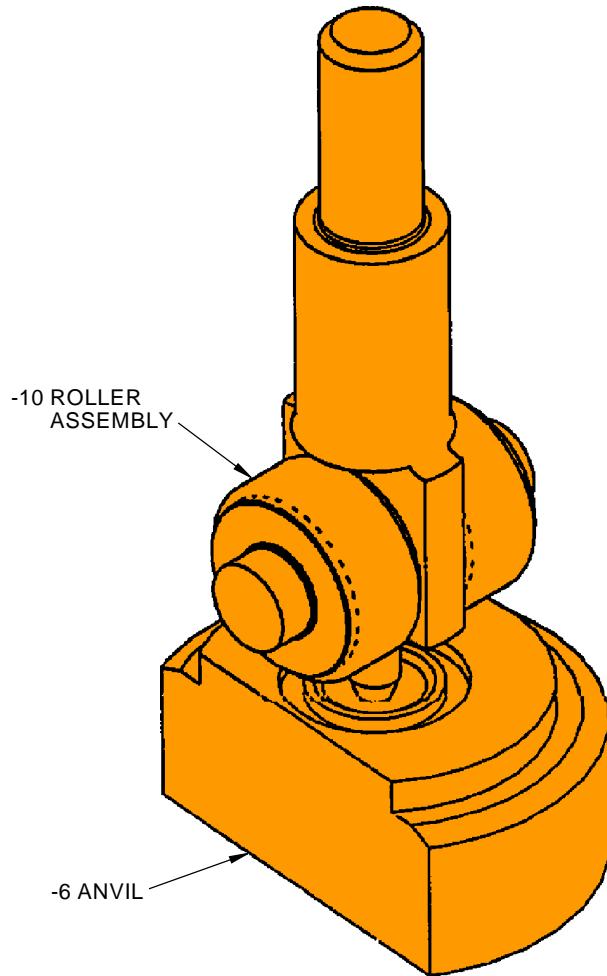
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**ST928F STAKING TOOL**

2270372 S0000510711\_V1

**Aluminum Sleeve Roller Staking Tool**  
**Figure 1**

**20-51-03**



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PART NUMBER: ST928G

NAME: STANDARD TOOL - ROLLER SWAGING ACCESSORIES FOR ST928

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The ST928G standard tool is used during component maintenance.

ST928G is used in conjunction with a customer-furnished arbor press. ST928G is a mandrel and press (roller swaging accessories) used with customer-furnished ST928 tools.

The ST928G tools are designated in the form "ST928G-X" where:

"ST928" is the basic tool number.

"G" is the variation.

"X" is the detail or assembly number.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST928G drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST928G consists of:

ST928G		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	PRESS ASSEMBLY	-1
1	MANDREL	-6

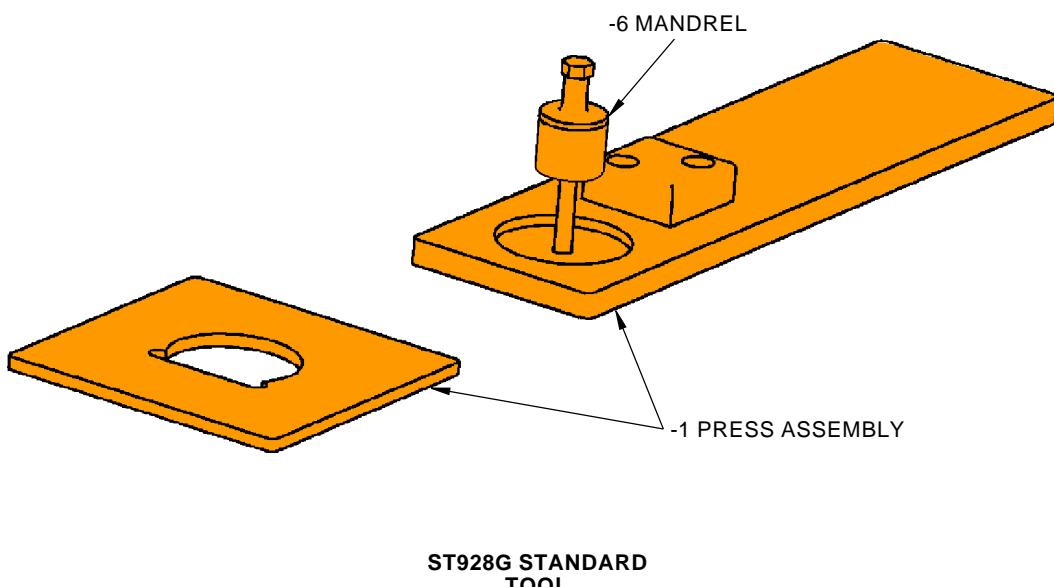
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2270362 S0000510716\_V1

**Roller Swaging Accessories for ST928 Standard Tool**  
**Figure 1**

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**737-600/700/800/900**  
**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER: ST928H**

**NAME:** STANDARD TOOL - BEARING REMOVE/INSTALL/SWAGE, SLEEVE  
OUTSIDE DIAMETER 1.33 THRU 2.25-INCH SLEEVE TYPE

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** ST928H series standard tools are used during component maintenance.

ST928H is used in conjunction with a customer-furnished drill press. Various sizes of ST928H are used to remove, install and swage, roller swage sleeve bearings of 1.33 - 2.25-inch outside diameter, minimum inside diameter of 0.500-inch and maximum thickness of 1.3-inch.

The ST928H tools are designated in the form ST928H-WWW-XXX-Y-ZZZ where

"ST928" is the basic tool number.

"H" is the variation.

"WWW" is the bearing outside diameter in 1/1000-inch.

"XXX" is the bearing inside diameter in 1/1000-inch.

"Y" is bearing thickness in 1/10-inch.

"ZZZ" is the detail or assembly number.

ST928H is used on bearings: DAS10-26A1-4, DAS10-26A1-501, DAS10-26B1-4, DAS10-26B1-502, DAS10-26B1-504 and DAS10-26B1-7.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST928H drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

A typical ST928H standard tool consists of:

ST928H		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	PILOT INSIDE DIAMETER SPACER	-2
1	MANDREL	-3
2	ROLLER	-4
2	SPACER	-5
2	HEX NUT	-6
1	LARGE ANVIL	-7
1	SMALL ANVIL	-8
1	MID ANVIL	-9

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(Continued)

ST928H		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	AXLE	-10
1	SNAP-RING	-11
2	TAKE-UP SPACER	-12
1	THRUST BEARING ASSEMBLY	-13
1	MODIFIED HOLE SAW	-14
1	INSERTION BOLT	-15
1	SPRING	-16
1	SPACER	-17

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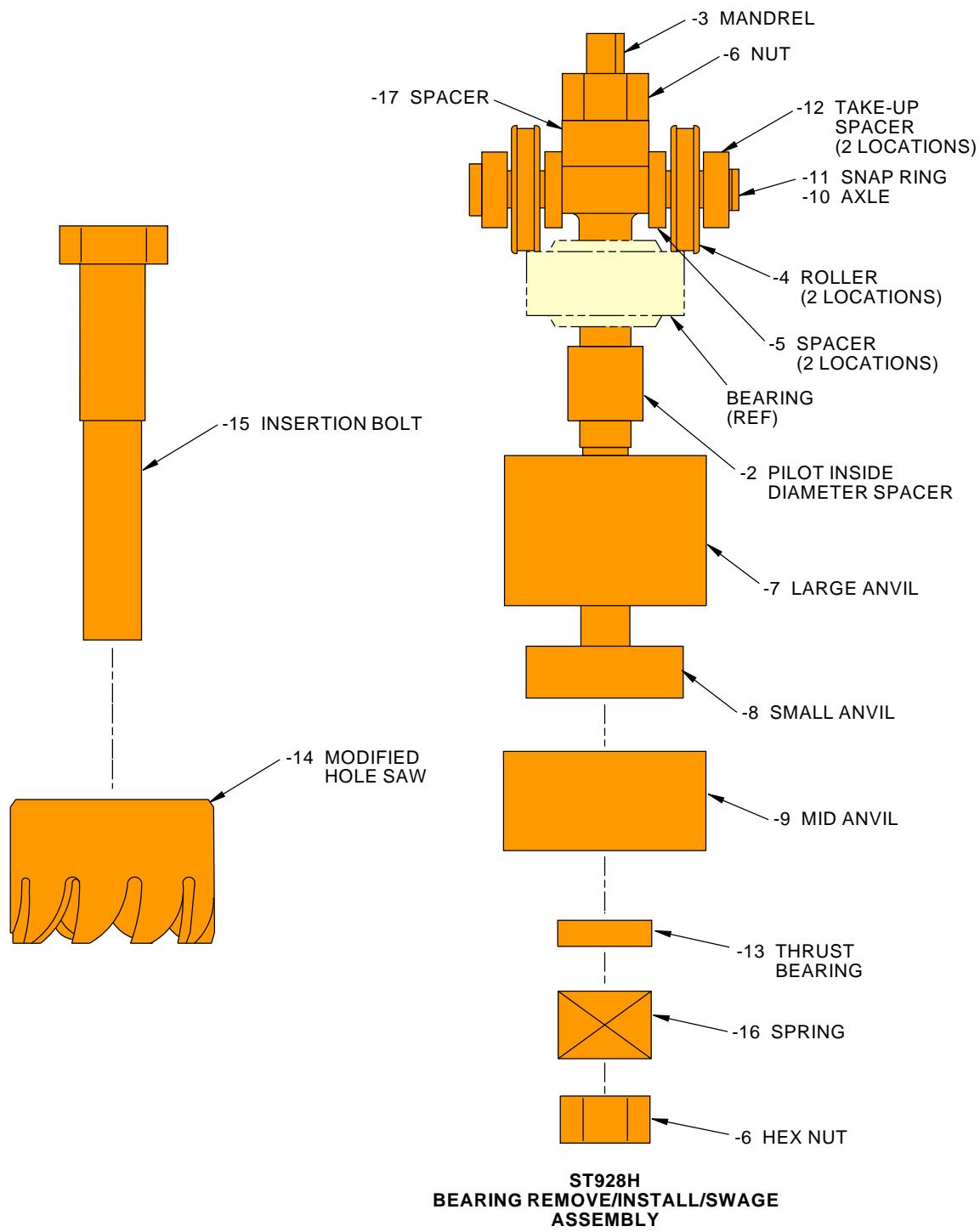
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ILLUSTRATED TOOL AND EQUIPMENT MANUAL



2270349 S0000510719\_V1

Bearing Remove/Install/Swage, Sleeve Outside Diameter 1.33 thru 2.25-Inch Sleeve Type Standard Tool  
Figure 1

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**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER: ST929-1**

**NAME:** BEARING ROLLER SWAGING TOOL

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST929-1 series bearing roller swaging tool is used during component maintenance.

ST929-1 is used to roller swage CRES bearing retaining sleeves into matching chamfers on bearings and housings.

ST929-1 tools are designated in the form "ST929-1-X-Y" where:

"ST929" is the basic tool number.

"1" is a roller swaging tool type. ("2" is press staking).

"X" is design sequence.

"Y" is assembly or detail number.

ST929-1 is used to roller swage bearings: AN202KP21B, BACB10AU21, BACB10A822, BACB10BW21, BACB10FR21, MS20202KP21B and 3TWF37-465.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST929-1 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

A typical ST929-1 consists of:

ST929-1		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	BODY	-2
1	SHAFT	-3
1	RETAINING RING	-4
1	ROLLER NEEDLE BEARING	-5
1	ANVIL	-6
1	STORAGE BOX	

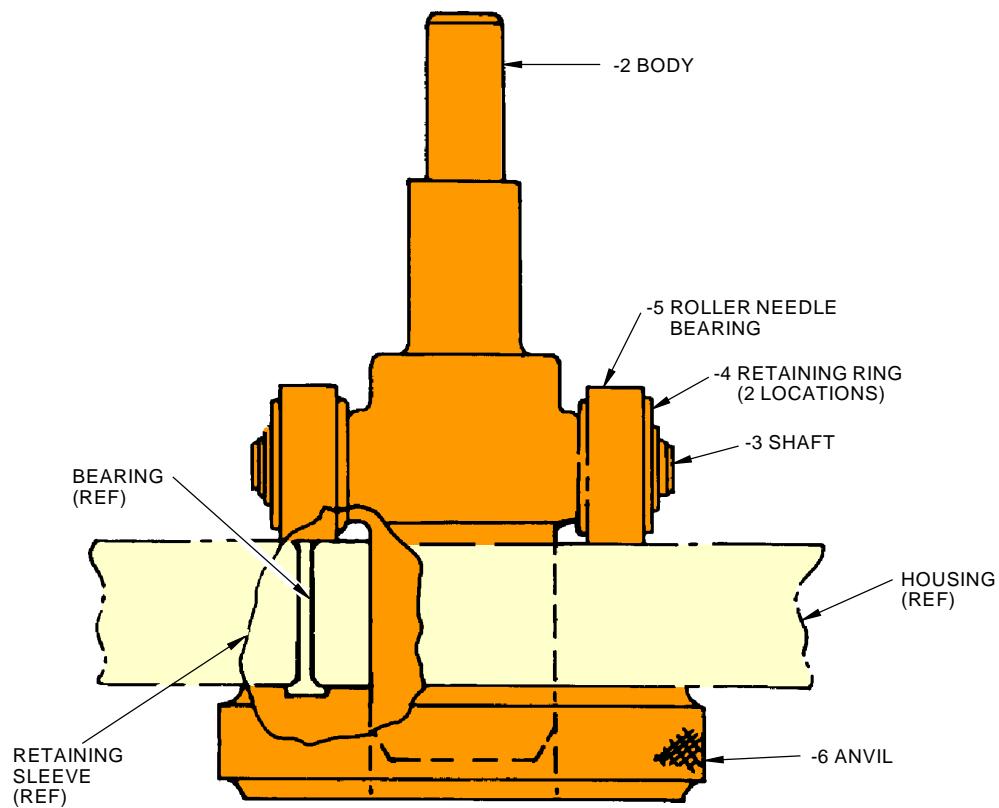
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**ST929-1 BEARING ROLLER  
SWAGING TOOL**

2270342 S0000510730\_V1

**Bearing Roller Swaging Tool**  
**Figure 1**

**20-51-06**



**737-600/700/800/900**  
**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER:** ST929-1A

**NAME:** STANDARD TOOL - ROLLER SWAGING SLEEVE BEARING

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST929-1A series roller swaging tool is used during component maintenance.

ST929-1A is used in conjunction with a customer-furnished drill press. ST929-1A roller swages steel sleeves for bearing retention per the BAC5435 specification.

ST929-1A tools are designated in the form "ST929-1A-XXX-YYY" where:

"ST929" is the basic tool number.

"1A" is the variation.

"XXX" is the bearing inside diameter in 1/1000-inch.

"YYY" is the bearing outside diameter in 1/1000-inch.

ST929-1A is used to roller swage bearings: BACB10A649, BACB10CH40, BACB10CH53, BACB10FF03, BACB10F14, BACB10GX40J, BACB10GX53J, BACB10M12, MS14104-3, MS21233-3, 10-60545-110 and 60B00180-31.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST929-1A drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

The ST929-1A standard tool includes an anvil and a body with a 3/8-inch diameter shank, a cross hole for mounting the swaging rollers and a 3/16-inch diameter pilot.

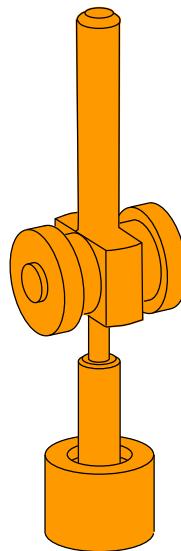
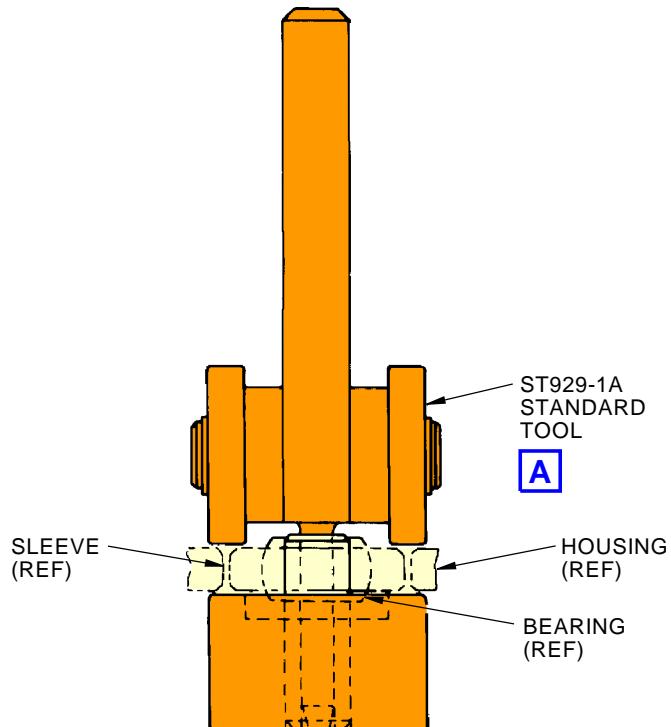
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**ST929-1A STANDARD TOOL**

**A**

2271967 S0000510741\_V1

**Roller Swaging Sleeve Bearing Standard Tool**  
**Figure 1**

**20-51-07**

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PART NUMBER: ST929-1B

NAME: ROLLER SWAGING TOOL - ROD END

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The ST929-1B roller swaging tool is used during component maintenance.

ST929-1B is used in conjunction with a customer-furnished drill press.

ST929-1B roller swages the 412T2050-2 ball bearing into the 412T2051-5 or -6 rod end steel sleeves to make the 412T2051-3 or -4 assembly or similar applications..

ST929-1B tools are designated in the form "ST929-1B-X" where:

"ST929" is the basic tool number.

"1B" is the variation.

"X" is the detail or assembly number.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST929-1B drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST929-1B consists of:

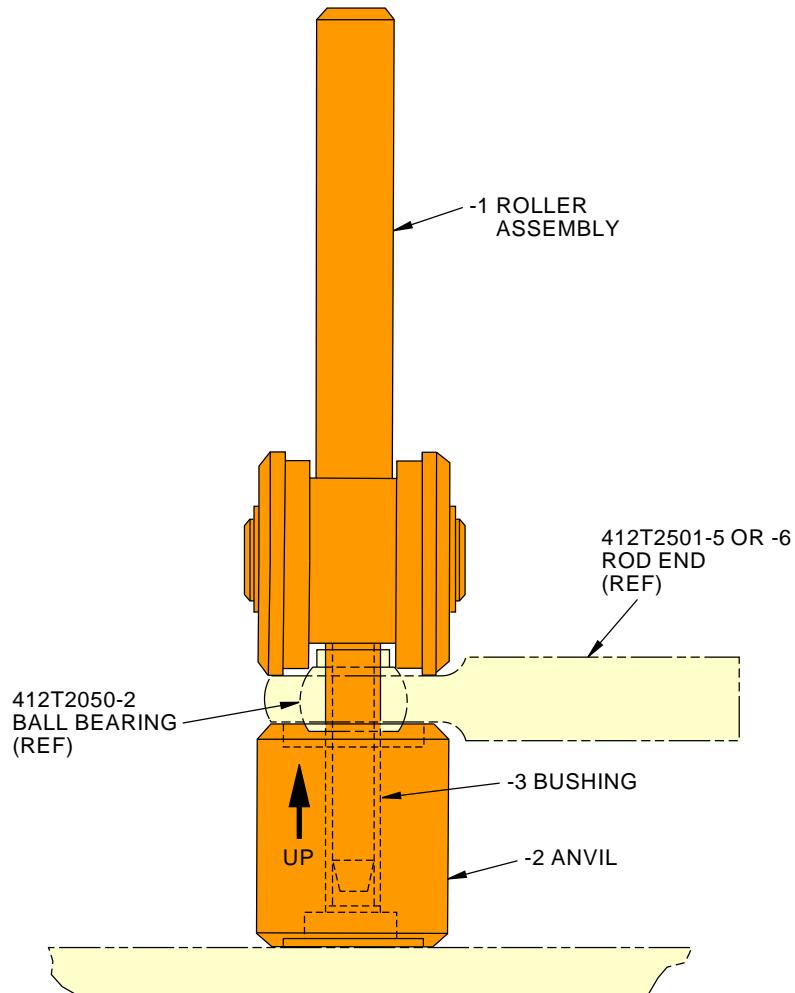
ST929-1B		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	ROLLER ASSEMBLY	-1
1	ANVIL	-2
1	BUSHING	-3
1	STORAGE BOX	

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**ST929-1B ROLLER SWAGING TOOL**

2271921 S0000510768\_V1

**Rod End Roller Swaging Tool**  
**Figure 1**

**20-51-08**



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ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: ST929-2A

NAME: BEARING SLEEVE STAKING TOOL - 3 POINT

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The ST929-2A bearing sleeve staking tool is used during component maintenance.

ST929-2A is used in conjunction with a customer-furnished arbor press. ST929-2A line stakes steel sleeves for bearing retention per the BAC5435 specification.

ST929-2A tools are designated in the form "ST929-2A-XXX-YYY-Z" where:

"ST929" is the basic tool number.

"2A" is the variation.

"XXX" is the bearing outside diameter in 1/1000-inch.

"YYY" is the bearing inside diameter in 1/1000-inch.

"Z" is the sleeve length in the nearest 1/10-inch.

ST929-2A is used to line stake bearings: AN200KS3L, BACB10AC3L, BACB10AH3L, BACB10A47, BACB10A694, BACB10BY3L, BACB10B147, BACB10CE5, BACB10FF06, BACB10M8, MS14104-6, MS20200K3L, MS21233-6, MS27261KSP3L, 10-60545-102, 60B00178-10, 60B00178-4 and 60B00180-31.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST929-2A drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

Each ST929-2A consists of:

ST929-2A		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	BASE	-1
1	STAKING PUNCH	-2
1	PILOT	-3

NOTE: ST929-2A replaces the cancelled ST929-2 for future procurement.

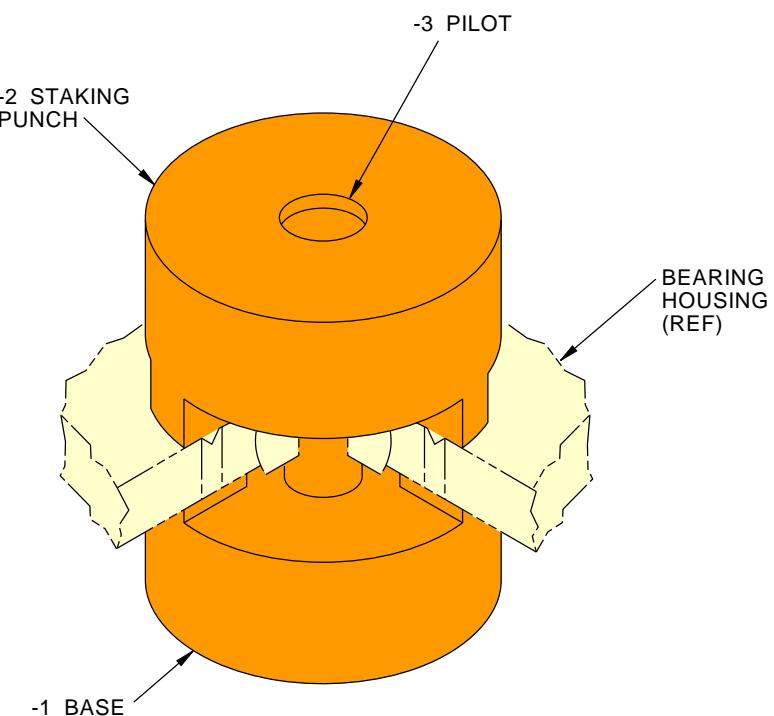
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**ST929-2A**  
**BEARING SLEEVE STAKING TOOL**

2271346 S0000510822\_V1

**3 Point Bearing Sleeve Staking Tool**  
**Figure 1**

**20-51-09**



737-600/700/800/900  
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

**PART NUMBER:** ST929-2B

**NAME:** 12 POINT STAKING TOOL

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST929-2B bearing sleeve staking tool is used during component maintenance.

ST929-2B is used in conjunction with a customer-furnished arbor press. ST929-2B swages the steel, 69B80028 bearing retainer sleeve in place in the wing main landing gear hydraulic actuator, 65B01520 head end assembly per the BAC5435 specification.

ST929-2B tools are designated in the form "ST929-2B" where:

"ST929" is the basic tool number.

"2B" is the variation.

ST929-2B is used to line stake bearings 60B00178-5 and 69B80027-1.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST929-2B drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST929-2B consists of:

ST929-2B		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	STAKING ANVIL	-2
1	STAKING PUNCH	-3
1	STORAGE BOX	

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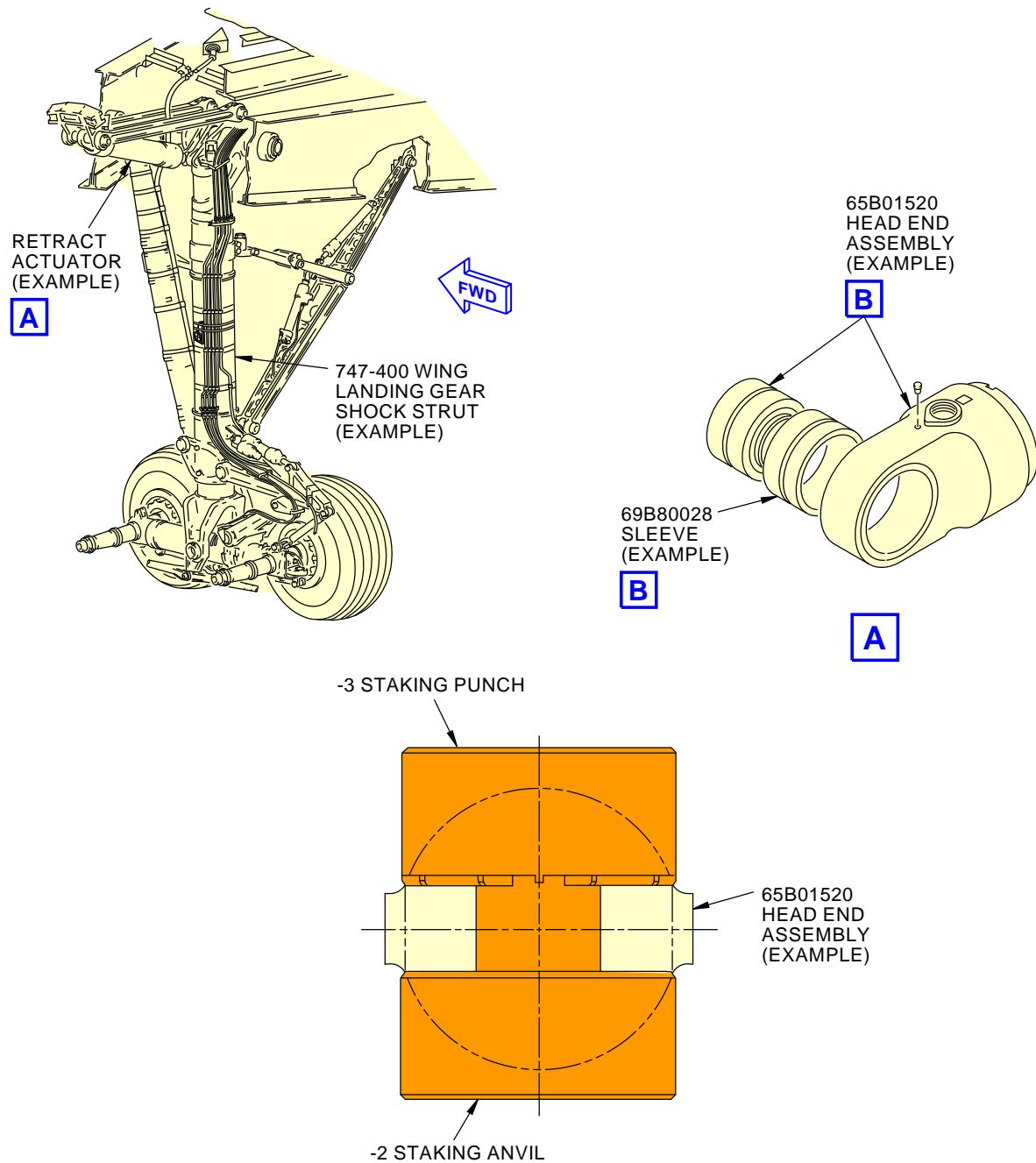
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ST929-2B 12 POINT STAKING TOOL USAGE



2271513 S0000510862\_V1

12 Point Staking Tool  
Figure 1

**20-51-10**

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**737-600/700/800/900**  
**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER: ST929-2C**

**NAME:** STAKING TOOL - BEARING SLEEVE, 6 POINT

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** ST929-2C staking tools are used during component maintenance.

ST929-2C is used in conjunction with a customer-furnished arbor press. Various sizes of ST929-2C, 6-point staking tools are used to line swage BACB10CA bearings.

The ST929-2C tools are designated in the form "ST929-2C-XXX-YYY-ZZZ" where:

"ST929" is the basic tool number.

"2C" is the variation.

"XXX" is the bearing inside diameter in 1/1000-inch.

"YYY" is the bearing outside diameter in 1/1000-inch.

"ZZZ" is the sleeve length (bearing width) in 1/1000-inch.

ST929-2C is used to line stake bearings: BACB10AC4A, BACB10CC6, BACB10FP04A, BACB10X3DT, BACB10X3MT, BACB10X3T, MKSP5AFS428, MKSP5AFS464, MS27645-5AR and MS27645-5ARG.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST929-2C drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

Each ST929-2C consists of:

ST929-2C		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	ANVIL	-2
1	PILOT	-3
1	PUNCH	-4

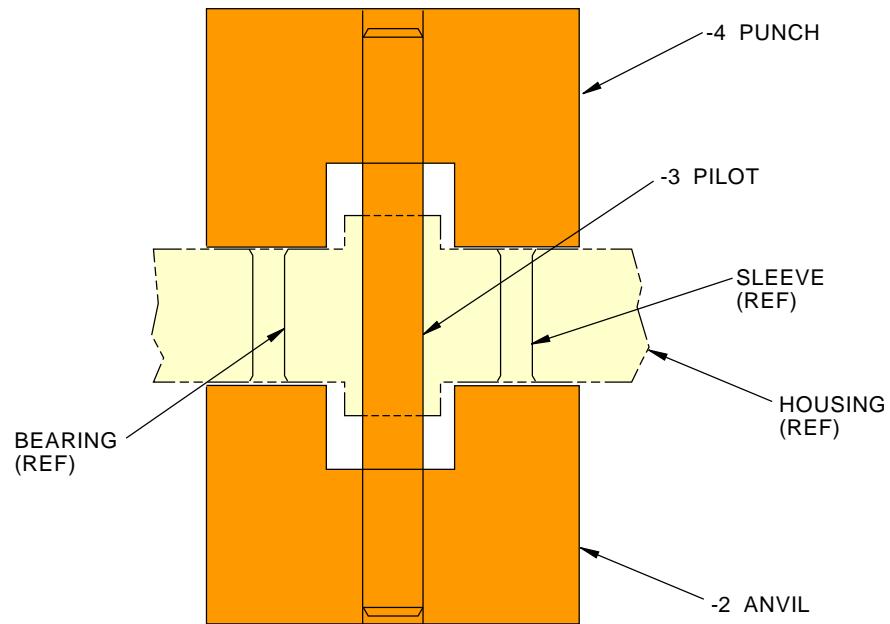
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**PLAN VIEW**

**ST929-2C**  
**STAKING TOOL**

2271350 S0000510865\_V1

**6 Point Bearing Sleeve Staking Tool**  
**Figure 1**

**20-51-11**

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PART NUMBER: ST929-3A

NAME: STAKING TOOL - BEARING SLEEVE, 3 POINT

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The ST929-3A staking tools are used during component maintenance.

ST929-3A-1 is used in conjunction with a customer-furnished arbor press to line stake steel sleeves, to hold bearing BACB10B105ZP.

ST929-3A-5 is used in conjunction with a customer-furnished arbor press to line stake steel sleeves, to hold bearing BACB10B106ZP.

The ST929-3A staking tools are designated in the form "ST929-3A-X" where:

"ST929" is the basic tool number.

"3A" is the variation.

"X" is the tool dash number.

ST929-3A is used to line stake bearings: AS24461-12, AS24461-24, BACB10B105J, BACB10B105ZP, BACB10B108ZP, BACB10CC12, BACB10CC8, MS24461-12 and MS24461-8.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST929-3A drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST929-3A-1 and ST929-3A-5 consist of:

ST929-3A-1 AND -5		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	PILOT	-2*[1]
1	ANVIL	-3*[1]
1	STAKING PUNCH	-4*[1]
1	PILOT	-6*[2]
1	ANVIL	-7*[2]
1	STAKING PUNCH	-8*[2]
1	STORAGE BOX	

\*[1] PART OF ST929-3A-1

\*[2] PART OF ST929-3A-5

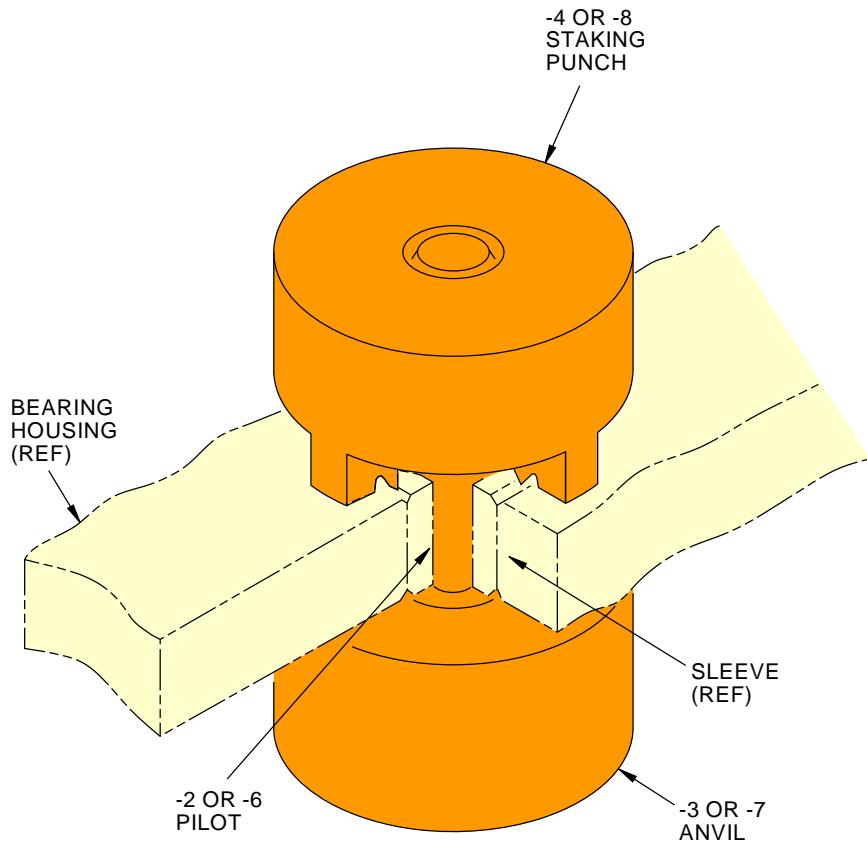
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**ST929-3A STAKING TOOL**

2271358 S0000510876\_V1

**3 Point Bearing Sleeve Staking Tool**  
**Figure 1**

**20-51-12**



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**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER: ST929-4**

**NAME:** LINE STAKING TOOL - BEARING

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** ST929-4 line staking tools are used during component maintenance.

ST929-4 is used in conjunction with a customer-furnished arbor press. Various sizes of ST929-4, 4-point line staking tools are used to line stake bearings.

The ST929-4 tools are designated in the form "ST929-4-XXX-YYYY" where:

"ST929" is the basic tool number.

"4" is the variation.

"XXX" is the bearing inside diameter in 1/1000-inch.

"YYYY" is the bearing outside diameter in 1/1000-inch.

ST929-4 is used to line stake bearings: 22075-78, 568A and 594.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST929-4 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

A typical ST929-4 consists of:

ST929-4		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	BODY	-2
1	PILOT	-3
1	STORAGE BOX	

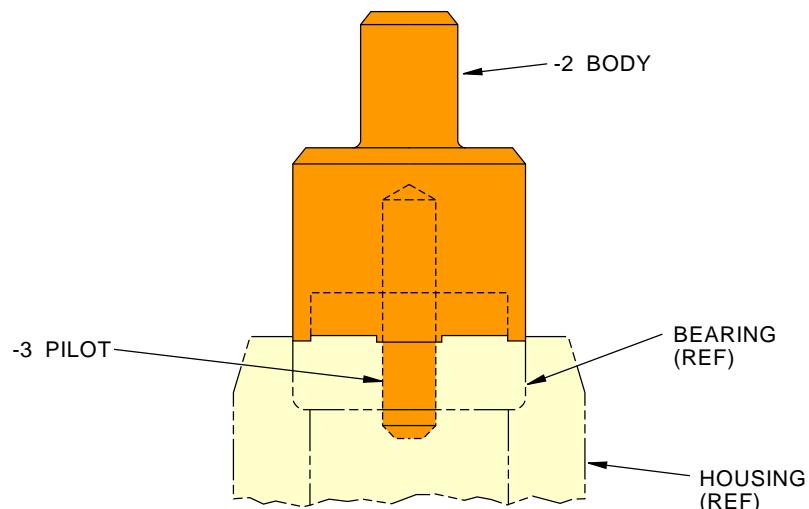
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**ST929-4**  
**BEARING LINE STAKING TOOL**

2271354 S0000510895\_V1

**Bearing Line Staking Tool**  
**Figure 1**

**20-51-13**



737-600/700/800/900  
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

**PART NUMBER:** ST930

**NAME:** BUSHING STAKING TOOL

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST930 bushing staking tools are used during component maintenance.

ST930 is used in conjunction with a customer-furnished arbor press to line stake BACB28AB bushings.

The ST930 bushing staking tools are designated in the form "ST930-X" where:

"ST930" is the basic tool number.

"X" is the tool dash number, either "4" or "10". The dash number is the same as the BACB28AB bushing dash number, which is the bushing nominal inside diameter in 1/16-inch.

ST930 is used to line stake bearings: BACB10FE03, KR3CNGB11, MS14101-3 and MS14103-3.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST930 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

Each ST930-4 or -10 consist of:

ST930-4 OR-10		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	LOWER ANVIL	-2
1	PILOT PIN	-3
1	PLATE	-4
3	DOWEL	-5
1	UPPER ANVIL	-7
1	STORAGE BOX	

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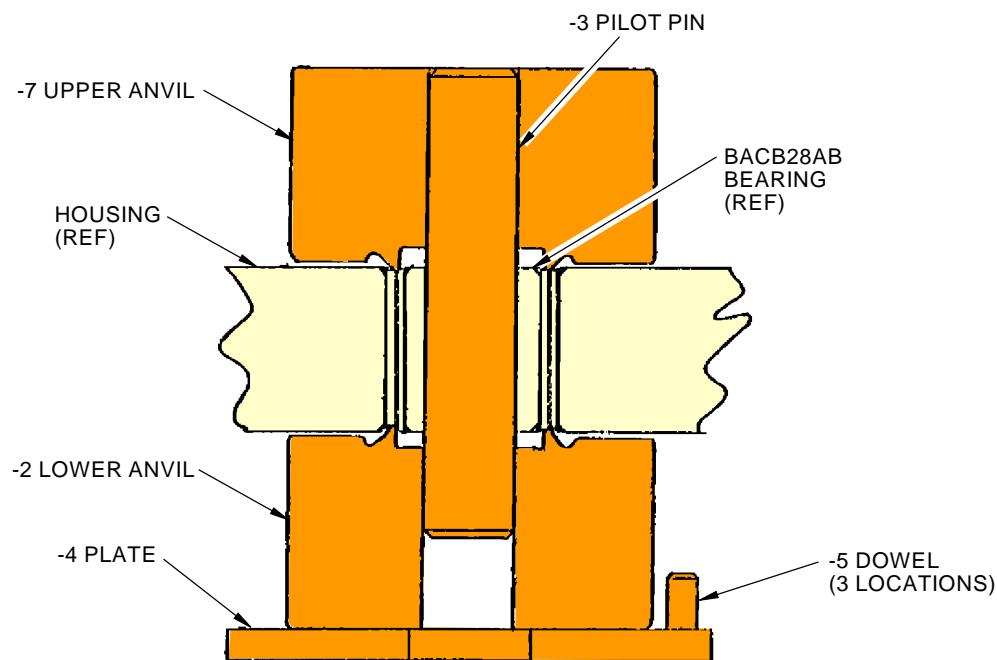
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**ST930 BUSHING STAKING TOOL**

2271356 S0000510893\_V1

**Bushing Staking Tool**  
**Figure 1**

**20-51-14**

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ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: ST930B

NAME: STAKING TOOL - PRESSURE

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The ST930B staking tool is used during component maintenance.

ST930B is used in conjunction with a customer-furnished hydraulic press to pressure stake a Heim WSSG8A bearing into a 65-37863 thrust reverser link. The hydraulic press is required to measure and develop a force of 32,000 to 37,000 lbs. A typical tool number is ST930B-500 where -500 is the bearing inside diameter in 1/1000-inch.

The ST930B staking tools are designated in the form "ST930B-XXX" where:

"ST930" is the basic tool number.

"B" is the variation.

"XXX" is the bearing inside diameter in 1/1000-inch..

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST930B drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST930B consists of:

ST930B		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	STAKING PRESS	-2
1	ANVIL	-3
1	MANDREL	-4

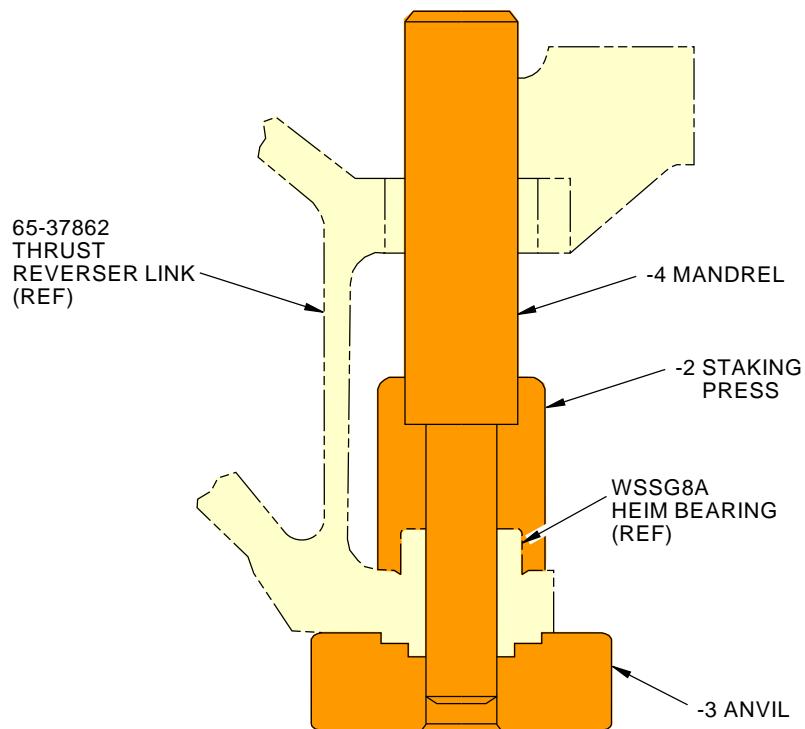
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**ST930B STAKING TOOL**

2271320 S0000510917\_V1

**Pressure Staking Tool**  
**Figure 1**

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ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: ST930C

NAME: STANDARD TOOL - ANVIL SWAGING TOOL

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The ST930C series standard tools are used during component maintenance.

ST930C is used in conjunction with a customer-furnished pressure head. Various sizes of ST930C anvil swaging tools are used to swage bearings.

The ST930C tools are designated in the form "ST930C-XXX-YYY-Z" where:

"ST930" is the basic tool number.

"C" is the variation.

"XXX" is the bearing inside diameter in 1/1000-inch.

"YYY" is the bearing outside diameter in 1/1000-inch.

"Z" is the bearing groove type, per BAC 5435, "I", "II" or "III" (sometimes shown as a numeric 1, 2 or 3).

ST930C is used to anvil stake bearings: BACB10FB04G, BACB10FC04, BACB10GB04G, BACB10GD04G, BACB28AB10, BACB28AB11, BACB28AB12, BACB28AB14, BACB28AB16, BACB28AB18, BACB28AB20, BACB28AB4, BACB28AB5, BACB28AB6, BACB28AB7, BACB28AB8, BACB28AB9, HBR286-041, F72975, KSSB4-13D, LHSSG4-11A, LHSSG4-8D, LHSSG4-8N, MS14101-4, MS21232-4, NC4DG3, YTA286, YTS828, YTS829, 10-60545-111S, 10-60545-143S, 10-60545-166S, 10-60545-167S, 107-3306-041, 107-3309-072, 65B07347-26, 65B07347-27, 78910-06-041 and 78910-09-072.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST930C drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

Each ST930C consists of:

ST930C		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	UPPER ANVIL ASSEMBLY	-2
1	LOWER ANVIL	-4*[1]
1	LOWER ANVIL (SWAGED)	-8*[2]
1	LOWER ANVIL	-9*[3]

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(Continued)

ST930C		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	STORAGE BOX	

\*[1] REVERSE LOWER ANVIL WHEN NECESSARY TO ALIGN BEARING WITH HOUSING.

\*[2] -8 LOWER ANVIL USED TO SUPPORT SWAGED FLANGE OF BUSHING AND TO PREVENT DEFORMATION DURING SECOND SWAGE.

\*[3] -9 LOWER ANVIL USED FOR 148A2665 BUSHING UPPER ANVIL.

**NOTE:** ST930C-250-656-I replaces the cancelled ST930C-1 anvil swaging tool for future procurement.

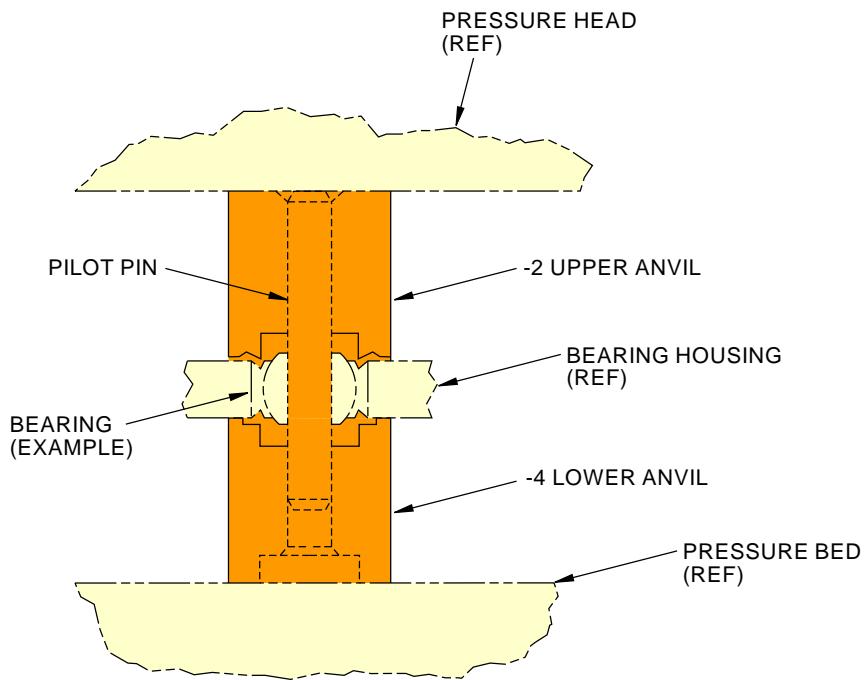
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**ST930C ANVIL SWAGING TOOL**

2271338 S0000511071\_V1

**Anvil Swaging Standard Tool**  
**Figure 1**

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PART NUMBER: ST930-LT

NAME: LOAD TEST - BEARING BAC 5435

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03, BAC 5435

USAGE & DESCRIPTION: The ST930-LT load test is used during component maintenance on specific bearings.

ST930-LT is used to accomplish proof load tests on bearings after installation and swaging. A typical tool number is ST930-LT-375-906-801.

The ST930-LT tools are designated in the form "ST930LT-XXX-YYY-ZZZ" where:

"LT" (load test) is the variation.

"XXX" is the bearing inside diameter in 1/1000-inch.

"YYY" is the bearing outside diameter in 1/1000-inch.

"ZZZ" is the swaging diameter in 1/1000-inch.

ST930-LT is used to proof load test bearings: BACB10ES06AG and S302T001-302.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03, Boeing Process Specification BAC 5435 and the current ST930-LT drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

Each ST930-LT consists of:

ST930-LT		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	ANVIL	-1
1	DOWEL PIN	-2
1	PUNCH	-3

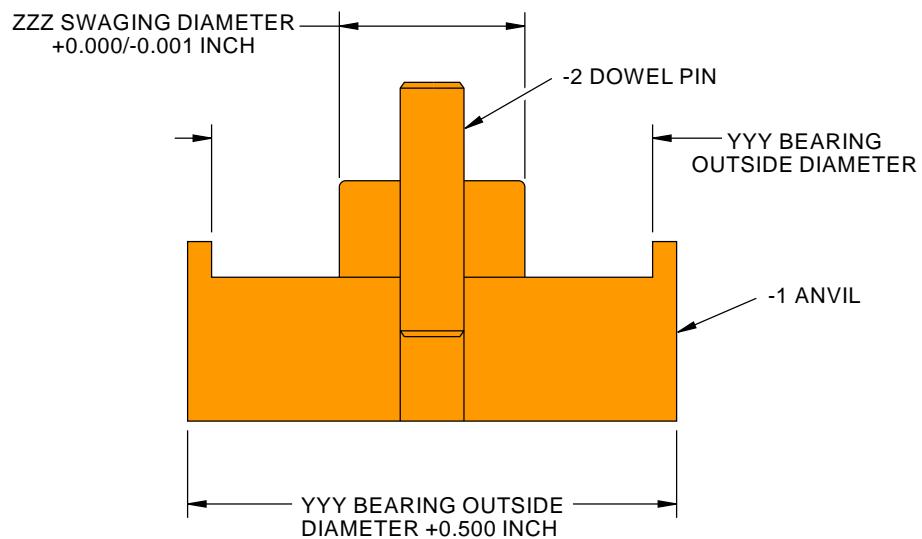
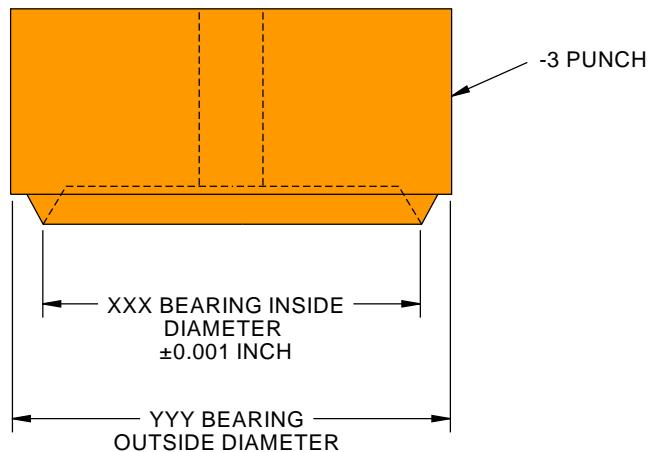
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**ST930-LT LOAD TEST**

2271791 S0000511082\_V1

**Bearing BAC 5435 Load Test**  
**Figure 1**

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PART NUMBER: ST931

**NAME:** BALL POINT MULTIPLE - BEARING STAKING TOOL

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** ST931 bearing staking tools are used during component maintenance.

ST931 is used in conjunction with a customer-furnished ST918 mandrel and drill press. Various sizes of ST931 series bearing staking tools are used to ball swage bearings in a housing. ST931 series stakes bearings with one or more steel ball bearings. ST931 carries a specific number of stake points for a specific diameter. A typical ST931 tool number is ST931-750-1375.

The ST931 tools are designated in the form "ST931-XXX-YYYY" where:

"ST931" is the basic tool number.

"XXX" is the bearing bore in 1/1000th-inch.

"YYYY" is the bearing outside diameter in 1/1000th-inch.

ST931 is used to ball stake bearings: AN200KP4, AN200KS3L, AN200KS4, AN200KS5, AN200KS6, AN201KP3A, AN201KP4A, AN201KP6A, AN206DSP4, AN206DSP8, BACB10AC10, BACB10AC3L, BACB10AC4, BACB10AC4A, BACB10AC6, BACB10AC8, BACB10AH10, BACB10AH3L, BACB10AH6, BACB10AP4, BACB10AP5, BACB10AU16, BACB10A122, BACB10A122A, BACB10A127, BACB10A131H, BACB10A180M2, BACB10A201, BACB10A201G, BACB10A203GM2, BACB10A204GM2, BACB10A208GM2, BACB10A214GM2, BACB10A217GM2, BACB10A252GC, BACB10A252GCM2, BACB10A253GCM2, BACB10A29DD, BACB10A30DD, BACB10A30DDH, BACB10A314, BACB10A322, BACB10A338, BACB10A346, BACB10A357GCM2, BACB10A358GCM2, BACB10A445, BACB10A446, BACB10A47, BACB10A543, BACB10A564, BACB10A574, BACB10A610, BACB10A629, BACB10A659, BACB10A659A, BACB10A660, BACB10A682, BACB10A689, BACB10A694, BACB10A821, BACB10A95H, BACB10BB30, BACB10BF30, BACB10BG1M, BACB10BW16, BACB10BX3, BACB10BX6, BACB10BY3L, BACB10BY4, BACB10B132, BACB10B147, BACB10CA8, BACB10CF21PP, BACB10CG4, BACB10CK4, BACB10C134R, BACB10C135, BACB10C135H, BACB10C182, BACB10C201, BACD10C207H, BACB10C79, BACB10C79H, BACB10C85R, BACB10C85Y, BACB10C92H, BACB10C93, BACB10C93H, BACB10C94H, BACB10FF03, BACB10FF04, BACB10FF05, BACB10FP04A, BACB10FP06, BACB10FP08, BACB10FR16, BACB10FS3, BACB10FS6, BACB10FY4, BACB10F12, BACB10F14, BACB10F2, BACB10GN1MJ, BACB10M11,

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BACB10M12, BACB10M8, BACB10W3M, BACB10X4M, BACB10X4MT, BR10H, BR5, BR6, BR6H, BR8, BR8H, BSR4673, BSSR5280G1, B4H, B542DD, DSP8, DW4K2, DW4K2-15-6531, F212-1, HHDSP8, MKP5A, MKP6A, MKSP5A, MS14104-3, MS14104-4, MS14104-5, MS20200KP4, MS20200K3L, MS20201KP3A, MS20201KP4A, MS20201KP6A, MS20206DSP8, MS21233-3, MS21233-4, MS21233-5, MS27261KSP10, MS27261KSP3L, MS27261KSP6, MS27261KSP8, MS27645-5AR, MS27645-5ARG, M930EK, YD170A, 10-60545-100, 10-60545-101, 10-60545-110, 10-60545-150, 10-61345-1, 60B00179-1, 60B00179-2 and 78245.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST931 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

Each ST931 bearing staking tool consists of a cylindrical steel block with spherical stake points mounted in the face. A pilot centers the tool in the bearing. Each ST931 is contained in a storage box.

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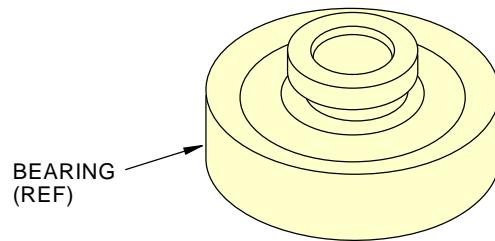
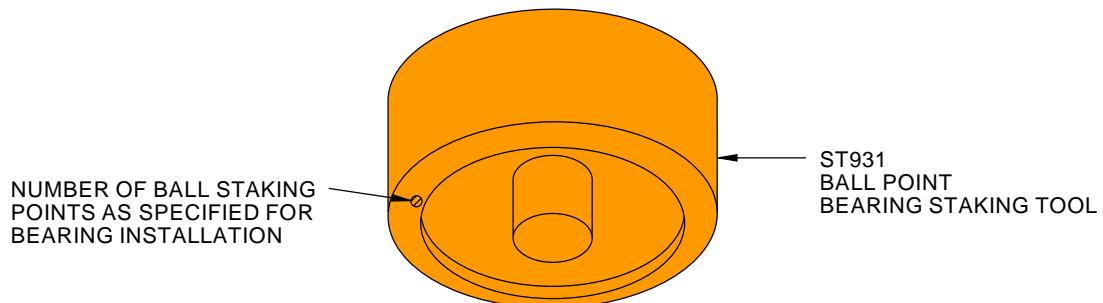
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**ST931  
BEARING BALL POINT STAKING TOOL**

2271340 S0000511089\_V1

**Bearing Staking Tool Ball Point Multiple Figure 1  
Figure 1**

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PART NUMBER: ST931A

NAME: BEARING STAKING TOOL - ADJUSTABLE BALL POINT

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The ST931A staking tools are used during component maintenance.

ST931A series bearing staking tools are used in conjunction with a customer-furnished ST932P pilot guide and a drill press. The ST931A series stakes with one point on an adjustable radius, for staking in areas of limited access (normal applications use ST931). ST931A uses different spindle assemblies for different drawing specifications (types I, II and III, sometimes noted as numeric 1, 2 or 3).

ST931A type I spindle assemblies are used on 1.000-inch minimum staking diameter and 2.625-inch maximum outside diameter bearings.

ST931A type II spindle assemblies are used on 0.500-inch minimum staking diameter and 1.625-inch maximum outside diameter bearings.

ST931A type III spindle assemblies are used on 1.500-inch minimum staking diameter and 4.625-inch maximum outside diameter bearings.

ST931A is used to ball point stake bearings: BACB10A29DD, BACB10A29DDH, BACB10B103ZP, BACB10B145, BACB10B151, BACB10B45, BACB10CC6, BACB10CF17PP and ZB541DDLY498.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST931A drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

Each ST931A staking tool consists of a single spherical stake point mounted on an adjustable arm assembly, all contained in a storage box. Each type of ST931A is to be separately boxed and labeled.

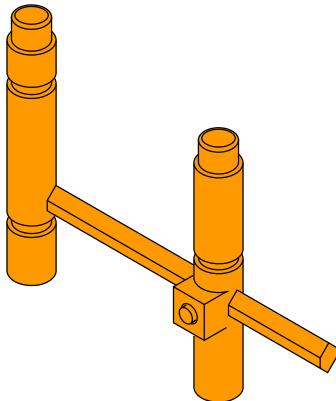
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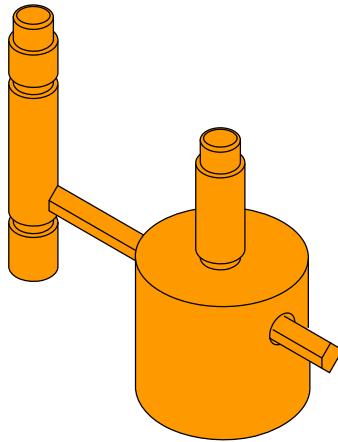
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**TYPE I ST931A  
BEARING STAKING TOOL  
(EXAMPLE)**



**TYPE II AND III ST931A  
BEARING STAKING TOOLS  
(EXAMPLE)**

2271341 S0000511098\_V1

**Adjustable Ball Point Bearing Staking Tool  
Figure 1**

**20-51-19**

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**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER: ST931B**

**NAME:** YOKE BALL POINT - BEARING STAKING

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST931B yoke ball point tools are used during component maintenance.

ST931B tools are used in conjunction with a customer-furnished CP505 pneudraulic cylinder. There are two drawings of ST931B tools: ST931B-190-562 and ST931B-375-812.

ST931B-190-562 is used to stake BACB10A-211G bearings in an area of limited access. ST931B-375-812 is used to stake BACB10A-214G bearings in an area of limited access.

The ST931B bushing staking tools are designated in the form "ST931B-XXX-YYY" where:

"ST931" is the basic tool number.

"B" is the variation.

"XXX" is the bearing inside diameter in 1/1000-inch.

"YYY" is the bearing outside diameter in 1/1000-inch.

ST931B-190-562 is used to ball stake bearings: BACB10A211GM2, BACB10A356GCM2, BACB10W1TM and BSSN3465G.

ST931B-375-812 is used to ball stake bearings: BACB10A214GM2, BACB10A359GCM2, BACB10W4TM and BSSN6345G.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST931B drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST931B consists of a yoke assembly and an outer staking assembly

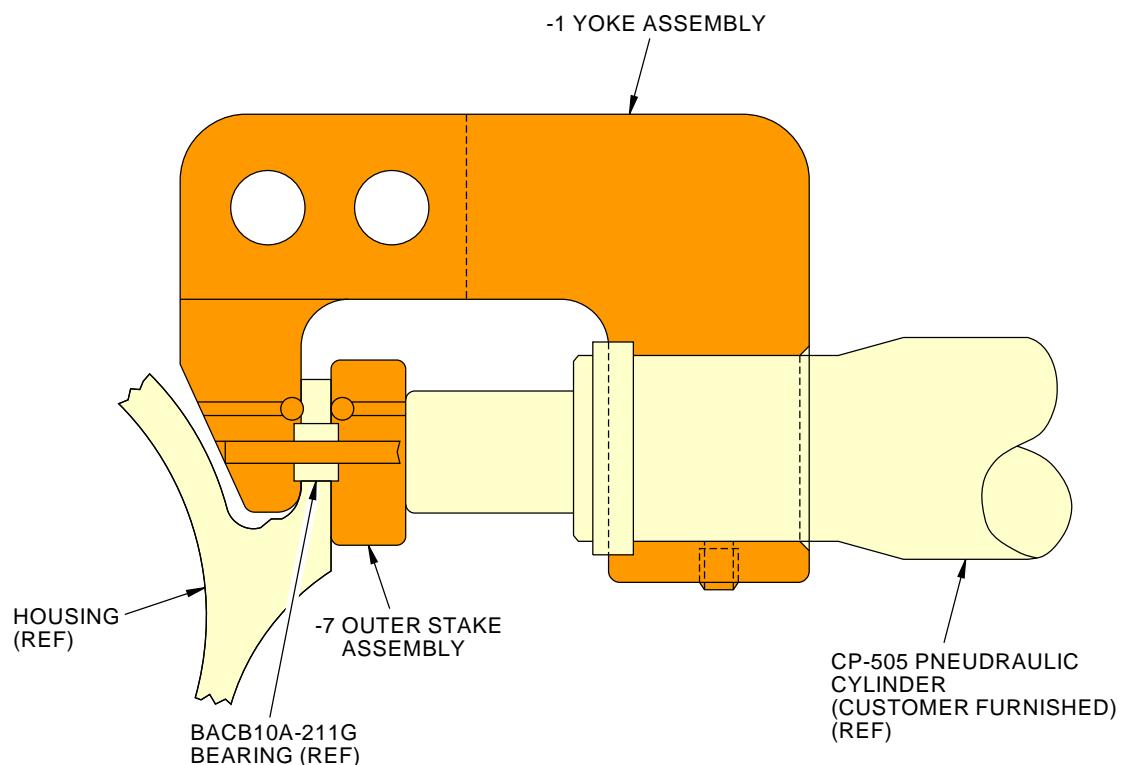
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**ST931B YOKE BALL POINT USAGE  
(EXAMPLE)**

2271610 S0000511121\_V1

**Bearing Staking Yoke Ball Point  
Figure 1**

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PART NUMBER: ST931D

NAME: BALL STAKING TOOL - BEARING

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The ST931D ball staking tools are used during component maintenance.

ST931D series ball staking tools are used in conjunction with a customer-furnished drill motor. The ST931D series are used for staking in areas of limited access (normal access applications use ST931).

The ST931D tools are designated in the form "ST931D-XXX-YYYY-Z" where:

"ST931" is the basic tool number.

"D" is the variation.

"XXX" is the bearing inside diameter in 1/1000-inch.

"YYYY" is the bearing outside diameter in 1/1000-inch.

"Z" is the minimum number of inserts to provide required number of stakes.

ST931D is used to ball stake bearings: A-6Y, BACB10A127, BACB10A346, BACB10A629, BACB10A90, BACB10BA25, BACB10BB30, BACB10B145, BACB10CE3, BACB10CG4, BACB10C135, BACB10C135H, BACB10C161, BACB10C161GH, BACB10C161H, BACB10C85R, BACB10C85Y, BACB10C92, BACB10C92H, BACB10FY4, BACB10F2, BR5, BR6, BR6H, DSRP5, DW4K2, DW4K2-15-6531, M930EK, 10-60516-104, 10-60545-150, 3NBE514ZP and 78245.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST931D drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

A typical ST931D consists of:

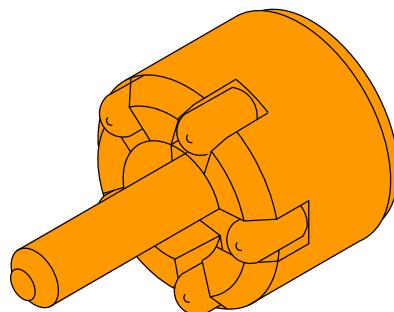
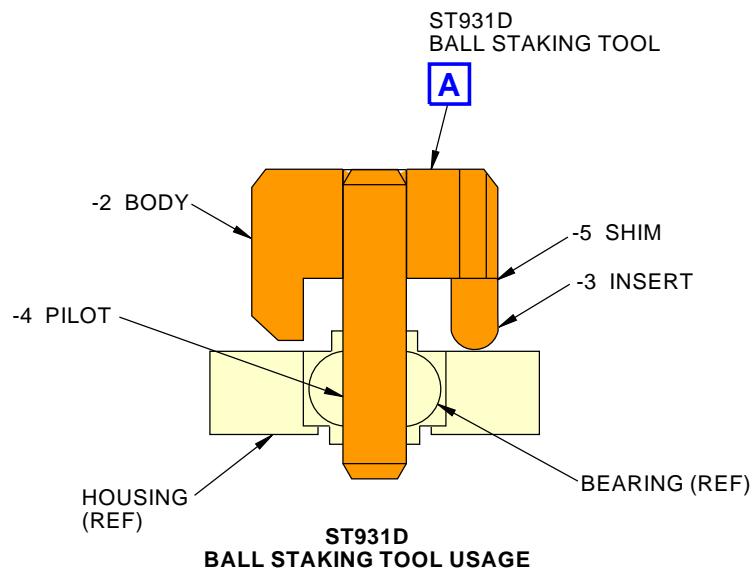
ST931D		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	BODY	-2
AS REQUIRED	INSERT	-3
1	PILOT	-4
AS REQUIRED	SHIM	-5
1	STORAGE BOX	

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ST931D BALL STAKING TOOL

**A**

2271617 S0000511184\_V1

Bearing Ball Staking Tool  
Figure 1

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**PART NUMBER:** ST931E-500-1000

**NAME:** SWAGING TOOL - THRUST LINK FITTING, FORWARD ENGINE MOUNT

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST931E-500-1000 swaging tool is used during component maintenance.

ST931E-500-1000 is not a swaging tool but is used to install the S302T001-303 bearing onto the 310A1036 thrust fitting assembly.

ST931E-500-1000 is also used to install the BACB10A88 bearing onto the 113N8133 landing gear fitting assembly. ST931E-500-1000 is a set of mandrels with an installed dowel pin for installation of spherical bearings.

The ST931E installation tools are designated in the form "ST931E-XXX-YYYY" where:

"ST931" is the basic tool number.

"E" is the series.

"XXX" is bearing inside diameter in 1/1000-inch.

"YYYY" is bearing outside diameter in 1/1000-inch.

ST931E-500-1000 is used to install bearings: S302T001-303 and S302T001-309.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST931E-500-1000 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST931E-500-1000 consists of:

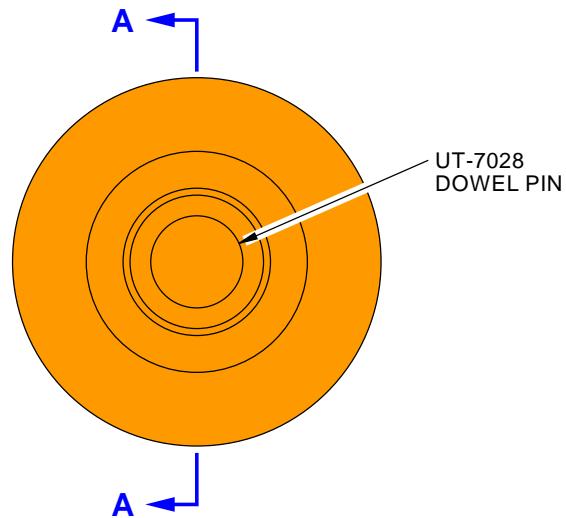
ST931E		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	SWAGING TOOL ASSEMBLY	-1
1	SWAGING TOOL ASSEMBLY	-3
1	SWAGING TOOL ASSEMBLY	-5
3	DOWEL PIN	UT-7028
1	STORAGE BOX	

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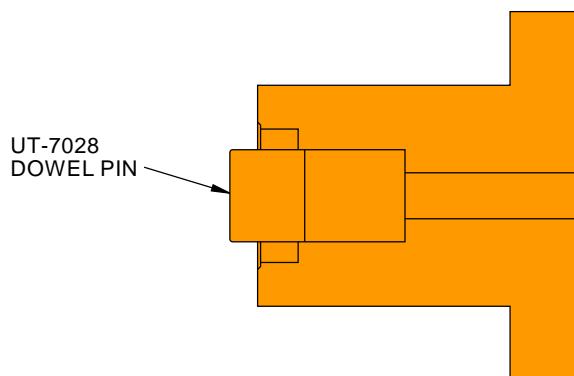
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**ST931E-1 SWAGING TOOL ASSEMBLY  
(MANDREL) SHOWN -2 AND -3 SIMILAR**



**A-A**

2271749 S0000511193\_V1

**Forward Engine Mount Thrust Link Fitting Swaging Tool  
Figure 1**

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**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER: ST932**

**NAME:** ROLLER SWAGE TOOL HOUSING - BEARING RETENTION

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** ST932 series roller swage tool housing tools are used during component maintenance.

ST932 is used in conjunction with a customer-furnished drill press and ST918A mandrel. Various sizes of ST932 tools are used to retain self-aligning bearings. Components of the ST932 roller swage housing assembly are combined in various arrangements with other tool components (see ST932-P, ST932-S, ST932A-R and ST932-R drawings) to cover a wide range of bearing sizes and housing materials. All parts of the swaging tool are manufactured from steel. For proper selection of ST932 swaging tools, refer to the ST932 drawing and the Standard Overhaul Practices Manual (SOPM) 20-50-03.

All spindles (see ST932-S drawing) have a cylindrical shank for mounting in a drill press. The pilot attaches to the spindle and centers the tool by indexing to the bore of the bearing. There are two basic designs of spindles and pilots, depending upon the size of the bearing to be staked.

The pilot (see ST932-P drawing) attaches to the spindle and centers the tool by indexing to the bore of the bearing. There are two basic designs of spindles and pilots, depending upon the size of the bearing to be staked.

There are two types of rollers, depending on the metal of the housing to be staked. Rollers (see ST932-R drawing for steel bearings, ST932A-R drawing for aluminum bearings) are mounted on a through-bolt on the spindle.

Selected collar lengths (from the ST932 drawing) determine the swaging diameter.

The current ST932 tools are designated in the form "ST932-WWW-XXX-Y-Z" where:

"ST932" is the basic tool number.

"WWW" is the bearing inside diameter in 1/1000-inch.

"XXX" is the bearing outside diameter in 1/1000-inch.

"Y" is a letter code for roller type. 'R' is the code for aluminum or softer metal, bearing roller staking. 'A-R' is the code for steel of 140 ksi or less, bearing roller staking.

"Z" is the dash number, coded '1' for steel and coded '2' for aluminum.

Older ST932 tools included a drawing for an ST932-C collar. The ST932-C tools have been replaced for future procurement by the ST932 drawing.

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The ST932-C collar is related to the bearing outside diameter, noted in Table 10 of the Standard Overhaul Practices Manual (SOPM) 20-50-03.

ST932 is used to roller stake bearings: A-6Y, A-8F, AN200KP10, AN200KP4, AN200KP6, AN200KP8, AN200KS10, AN200KS3, AN200KS3L, AN200KS4, AN200KS5, AN200KS6, AN200K3L, AN201KP10A, AN201KP12A, AN201KP16A, AN201KP16B5, AN201KP20A, AN201KP3, AN201KP3A, AN201KP4, AN201KP4A, AN201KP5, AN201KP5A, AN201KP5A, AN201KP6A, AN201KP8, AN201KP8A, AN202KP21B, AN202KP23B, AN202KP25B, AN202KP29B, AN202KP33B, AN202KP37B, AN202KP49B, AN206DSP4, AN206DSP6, AN206DSP8, AN207DPP4, A10, A10Y, BACB10AC10, BACB10AC3L, BACB10AC4, BACB10AC4A, BACB10AC5, BACB10AC6A, BACB10AH10, BACB10AH3L, BACB10AH5, BACB10AH6, BACB10AN4, BACB10AP10, BACB10AP12, BACB10AP16, BACB10AP3, BACB10AP4, BACB10AP8, BACB10AR5, BACB10AS10, BACB10AS12, BACB10AS14, BACB10AS17, BACB10AS21, BACB10AS25, BACB10AS29, BACB10AT12PP, BACB10AT3MM, BACB10AT4, BACB10AT4MM, BACB10AT8, BACB10AU16, BACB10AU21, BACB10AU23, BACB10AU25, BACB10AU29, BACB10AU33, BACB10AU37, BACB10AU47, BACB10AU49, BACB10AU72, BACB10AW16, BACB10AW21, BACB10AZ17PP, BACB10AZ35PP, BACB10A102, BACB10A103, BACB10A103H, BACB10A105H, BACB10A117H, BACB10A119, BACB10A120, BACB10A127, BACB10A130, BACB10A136, BACB10A136H, BACB10A141, BACB10A141H, BACB10A147, BACB10A151, BACB10A151GC, BACB10A153, BACB10A155GC, BACB10A156GC, BACB10A163GC, BACB10A170GC, BACB10A174, BACB10A174GC, BACB10A176GC, BACB10A177, BACB10A177GC, BACB10A19, BACB10A203GCM2, BACB10A203GD, BACB10A203GM2, BACB10A204GM2, BACB10A21, BACB10A212G, BACB10A214GM2, BACB10A215GM2, BACB10A220GM2, BACB10A235, BACB10A236, BACB10A237, BACB10A238, BACB10A239, BACB10A240, BACB10A242, BACB10A252GCM2, BACB10A253GC, BACB10A253GCM2, BACB10A27DD, BACB10A27DDH, BACB10A28, BACB10A28DD, BACB10A28DDH, BACB10A29DD, BACB10A29DDH, BACB10A30DD, BACB10A30DDH, BACB10A300, BACB10A300DD, BACB10A300DDH, BACB10A31DD, BACB10A31DDH, BACB10A313, BACB10A314, BACB10A32DD, BACB10A32DDH, BACB10A322, BACB10A324, BACB10A327, BACB10A33DDH, BACB10A331, BACB10A35DD, BACB10A35DDH, BACB10A357GC, BACB10A359GCM2, BACB10A360GCM2, BACB10A363GCM2, BACB10A366GCM2, BACB10A38, BACB10A396M3, BACB10A397GCM, BACB10A397GCM2, BACB10A398GCM, BACB10A40, BACB10A47, BACB10A516, BACB10A518, BACB10A519, BACB10A519H, BACB10A522, BACB10A523, BACB10A525, BACB10A533, BACB10A538, BACB10A539, BACB10A543, BACB10A544, BACB10A553, BACB10A554, BACB10A557, BACB10A558, BACB10A559, BACB10A560, BACB10A561, BACB10A564, BACB10A610, BACB10A620, BACB10A629, BACB10A630, BACB10A649, BACB10A651, BACB10A652, BACB10A659, BACB10A659A,

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BACB10CF14PP, BACB10CF17PP, BACB10CF21PP, BACB10CF29PP,  
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BACB10FS6, BACB10FS8, BACB10FT4, BACB10FU10, BACB10FU12,  
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BACB10FU29, BACB10FV16, BACB10FV21, BACB10FW6, BACB10FY4,  
BACB10FY4A, BACB10FY5, BACB10F12, BACB10F13, BACB10F2,

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MS14104-7, MS14104-8, MS20200KP4, MS20200KP5, MS20200K3L, MS20201KP10A, MS20201KP12A, MS20201KP20A, MS20201KP3A, MS20201KP4A, MS20201KP5A, MS20201KP6A, MS20201KP8A, MS20202KP10A, MS20202KP12A, MS20202KP20A, MS20202KP21B, MS20202KP23B, MS20202KP25B, MS20202KP29B, MS20202KP33B, MS20202KP37B, MS20202KP49B, MS20206DSP4, MS20206DSP8, MS21233-10, MS21233-12, MS21233-14, MS21233-4, MS21233-5, MS21233-6, MS21233-7, MS21233-8, MS27261KSP10, MS27261KSP3L, MS27261KSP5, MS27261KSP6, MS27261KSP6A, PD5FS428, S012T236-401, YN55WOPP2FTA1144, YN56WOPP2CRA1144, YS211B, ZB538DDLY498, ZB539DDLY498, ZB541DDLY498, 10-60545-100, 10-60545-101, 10-60545-102, 10-60545-103, 10-60545-106, 10-60545-108, 10-60545-110, 10-60545-123, 10-60545-144, 10-60545-145, 10-60545-149, 10-60545-150, 10-60545-42, 10-60545-50, 10-60545-76, 254W2002-5, 55656, 594, 6-61581, 60B00179-100, 60B00179-2, 60B00179-3, 60B00180-206, 60B00180-207, 60B00180-244, 60B10024-6, 69-35551-1, 69-35552-1, 69-35553-1, 69B15036-1 and 78245.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST932 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

A single ST932 roller swage assembly tool includes a roller swage housing (see drawing ST932, including collars), a spindle (see drawing ST932-S), pilot (see drawing ST932-P) and rollers (see drawing ST932-R or ST932A-R) all contained in a storage box.

**NOTE:** The cancelled ST932-C collar drawing has been replaced for future procurement by the ST932 roller swage tool housing drawing.

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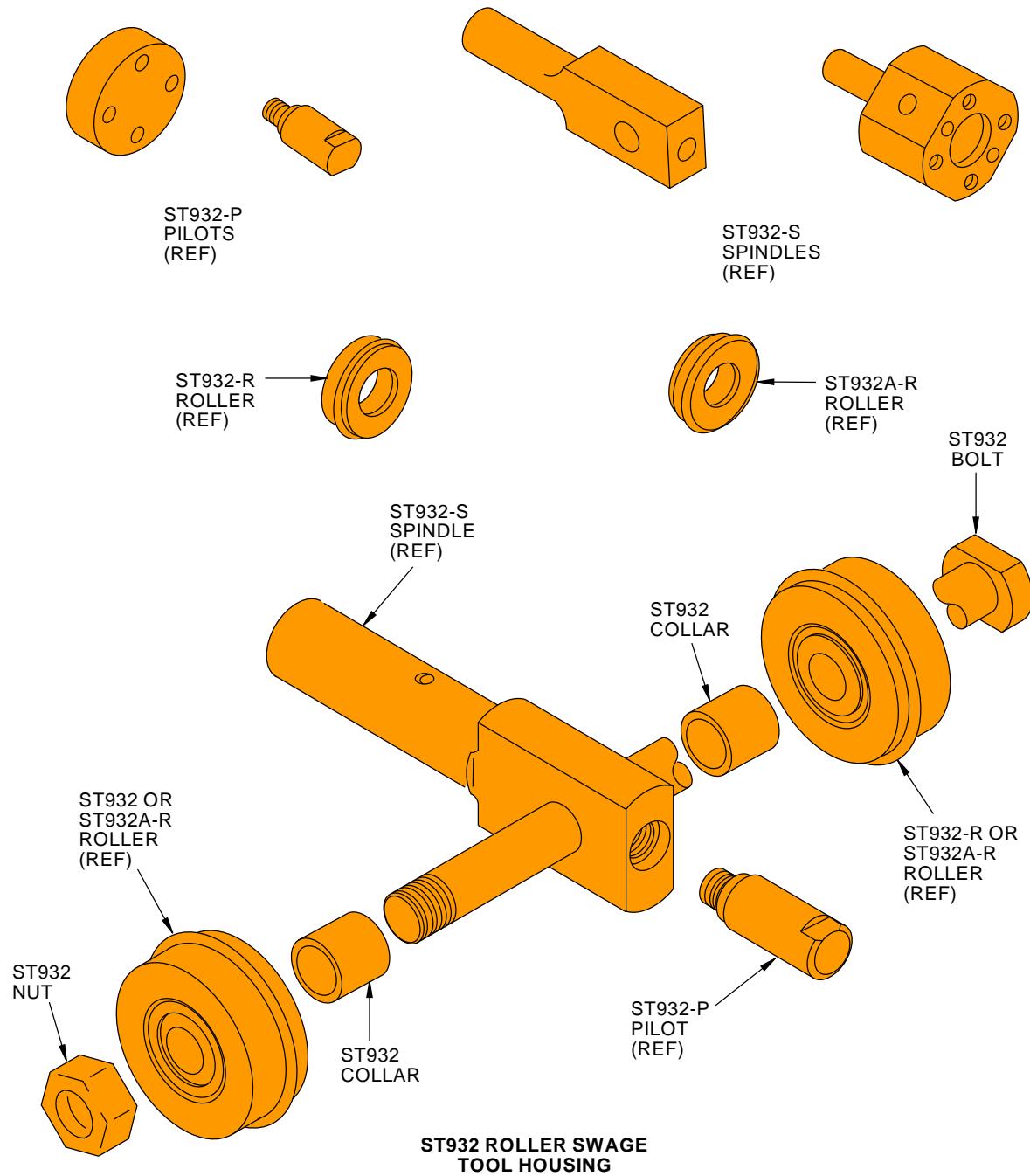
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Bearing Retention Roller Swage Tool Housing  
Figure 1

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PART NUMBER: ST932-P

NAME: PILOT - ROLLER SWAGING TOOL, BEARING RETENTION

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The ST932-P pilot is used during component maintenance.

The ST932-P pilot is a component of the ST932 roller swage tool housing. ST932-P is combined in various arrangements to cover a wide range of bearing sizes and housing materials. For proper selection of swaging tool consult the ST932 drawing for bearing number to tool dash number application.

The pilot attaches to the spindle and centers the tool by indexing to the bore of the bearing. There are two basic designs of pilots, depending upon the size of the bearing to be staked.

ST932-P tool code number is designated as "ST932-P-X-YYY", where:

"ST932" is the basic tool number.

"P" is the variation (pilot).

"X" is the tool dash number (-1 thru -7).

"YYY" is the bearing inside diameter in 1/1000-inch.

ST932-P is used to roller stake bearings: A-6Y, A-8F, AN200KP10, AN200KP4, AN200KP6, AN200KP8, AN200KS10, AN200KS3, AN200KS3L, AN200KS4, AN200KS5, AN200KS6, AN200K3L, AN201KP10A, AN201KP12A, AN201KP16A, AN201KP16B5, AN201KP20A, AN201KP3, AN201KP3A, AN201KP4, AN201KP4A, AN201KP5, AN201KP5A, AN201KP5A, AN201KP6A, AN201KP8, AN201KP8A, AN202KP21B, AN202KP23B, AN202KP25B, AN202KP29B, AN202KP33B, AN202KP37B, AN202KP49B, AN206DSP4, AN206DSP6, AN206DSP8, AN207DPP4, A10, A10Y, BACB10AC10, BACB10AC3L, BACB10AC4, BACB10AC4A, BACB10AC5, BACB10AC6A, BACB10AH10, BACB10AH3L, BACB10AH5, BACB10AH6, BACB10AN4, BACB10AP10, BACB10AP12, BACB10AP16, BACB10AP3, BACB10AP4, BACB10AP8, BACB10AR5, BACB10AS10, BACB10AS12, BACB10AS14, BACB10AS17, BACB10AS21, BACB10AS25, BACB10AS29, BACB10AT12PP, BACB10AT3MM, BACB10AT4, BACB10AT4MM, BACB10AT8, BACB10AU16, BACB10AU21, BACB10AU23, BACB10AU25, BACB10AU29, BACB10AU33, BACB10AU37, BACB10AU47, BACB10AU49, BACB10AU72, BACB10AW16, BACB10AW21, BACB10AZ17PP,

BACB10AZ35PP, BACB10A102, BACB10A103, BACB10A103H, BACB10A105H, BACB10A117H, BACB10A119, BACB10A120, BACB10A127, BACB10A130, BACB10A136, BACB10A136H,

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BACB10A237, BACB10A238, BACB10A239, BACB10A240,  
BACB10A242, BACB10A252GCM2, BACB10A253GC,  
BACB10A253GCM2, BACB10A27DD, BACB10A27DDH, BACB10A28,  
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BACB10FR72, BACB10FS10, BACB10FS12, BACB10FS16,  
BACB10FS20, BACB10FS3, BACB10FS4, BACB10FS5,  
  
BACB10FS6, BACB10FS8, BACB10FT4, BACB10FU10, BACB10FU12,  
BACB10FU14, BACB10FU17, BACB10FU21, BACB10FU25,  
BACB10FU29, BACB10FV16, BACB10FV21, BACB10FW6, BACB10FY4,  
BACB10FY4A, BACB10FY5, BACB10F12, BACB10F13, BACB10F2,  
BACB10F6, BACB10F7, BACB10F8, BACB10GX100J, BACB10GX120J,  
BACB10GX122J, BACB10GX14J, BACB10GX40J, BACB10GX50J,  
BACB10GX53J, BACB10GX55J, BACB10CGX63J, BACB10GX65J,  
BACB10GX80J, BACB10GX85J, BACB10M11, BACB10M28, BACB10M9,  
BACB10W12M, BACB10W12TM, BACB10W2, BACB10W2T,  
BACB10W4TM, BACB10W5M, BACB10W5TM, BACB10X4D,  
BACB10X4DT, BACB10X4M, BACB10X4MT, BACB10X5M,  
BACB10X5MT, BR10H, BR5, BR6, BR6H, BR8, BR8H, BSSN6345G,  
BSSR5280G1, B38DD, B4H, B540DD, B542DD, B543DD,  
B5538WZZFS464, B5539WZZFS428, DSP8, DSRP5, DW4K, DW4K2,  
DW4K2-15-6531, F212-1, HHDSP8, KSBN8, LA3624A, LHSS3R,  
MB538DDE9595, MB538DDFS428, MB538E9595, MB538FS428,  
MB540ZZ, MB543DDSD610, MKP4A, MKSP4AFS428, MKSP5E9104,  
MS14104-10, MS14104-12, MS14104-14, MS14104-4, MS14104-5,  
MS14104-6,  
  
MS14104-7, MS14104-8, MS20200KP4, MS20200KP5, MS20200K3L,  
MS20201KP10A, MS20201KP12A, MS20201KP20A, MS20201KP3A,  
MS20201KP4A, MS20201KP5A, MS20201KP6A, MS20201KP8A,  
MS20202KP10A, MS20202KP12A, MS20202KP20A, MS20202KP21B,  
MS20202KP23B, MS20202KP25B, MS20202KP29B, MS20202KP33B,  
MS20202KP37B, MS20202KP49B, MS20206DSP4, MS20206DSP8,  
MS21233-10, MS21233-12, MS21233-14, MS21233-4, MS21233-5,  
MS21233-6, MS21233-7, MS21233-8, MS27261KSP10, MS27261KSP3L,  
MS27261KSP5, MS27261KSP6, MS27261KSP6A, PD5FS428,

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S012T236-401, YN55WOPP2FTA1144, YN56WOPP2CRA1144, YS211B,  
ZB538DDLY498, ZB539DDLY498, ZB541DDLY498, 10-60545-100,  
10-60545-101, 10-60545-102, 10-60545-103, 10-60545-106,  
10-60545-108, 10-60545-110, 10-60545-123, 10-60545-144,  
10-60545-145, 10-60545-149, 10-60545-150, 10-60545-42, 10-60545-50,  
10-60545-76, 254W2002-5, 55656, 594, 6-61581, 60B00179-100,  
60B00179-2, 60B00179-3, 60B00180-206, 60B00180-207,  
60B00180-244, 60B10024-6, 69-35551-1, 69-35552-1, 69-35553-1,  
69B15036-1 and 78245.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST932 and ST932-P drawings for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

A single ST932 roller swage assembly tool includes a roller swage housing (see drawing ST932, including collars), a spindle (see drawing ST932-S), pilot (see drawing ST932-P) and rollers (see drawing ST932-R or ST932A-R) all contained in a storage box.

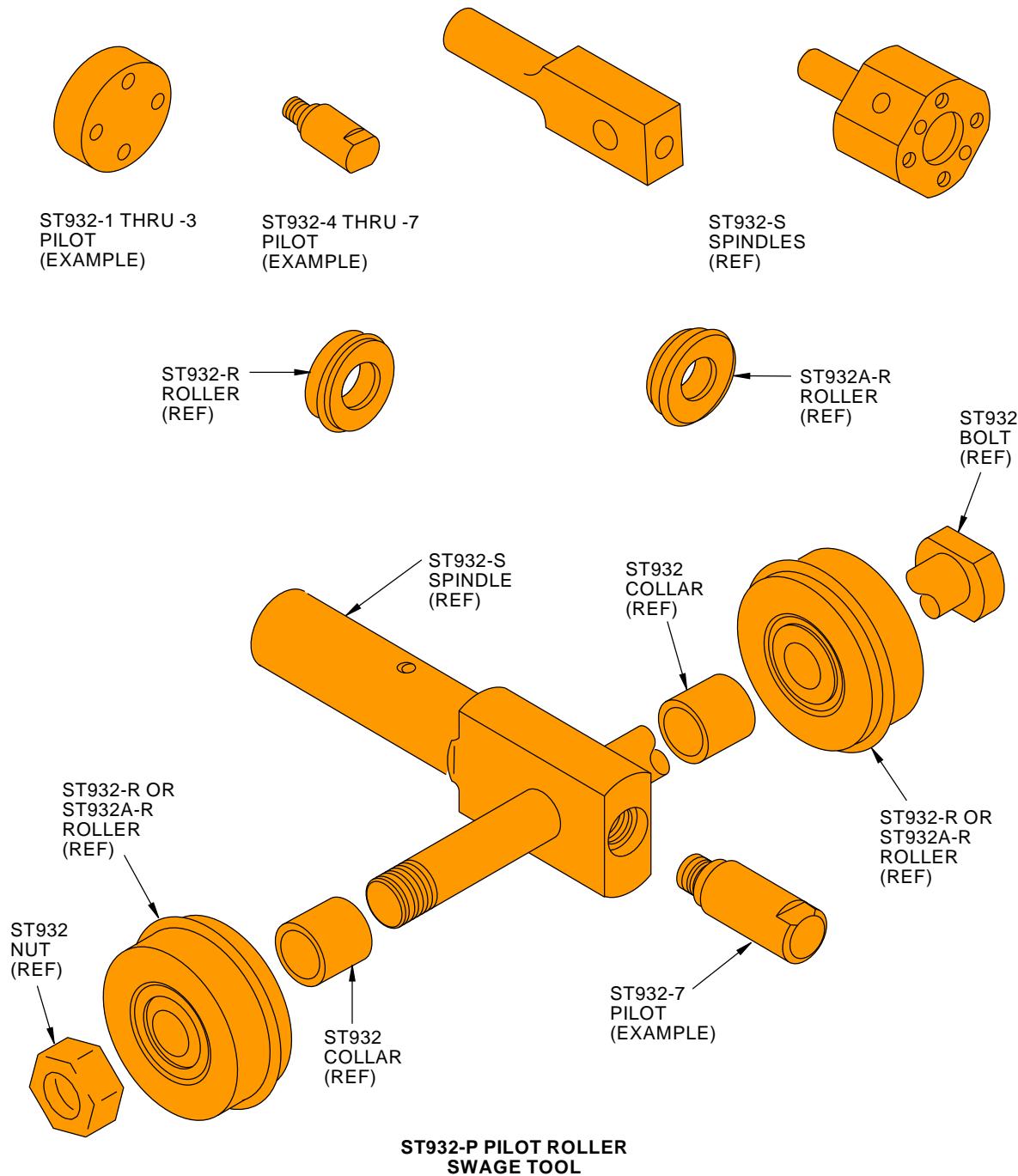
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**Bearing Retention Roller Swaging Tool Pilot  
Figure 1**

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PART NUMBER: ST932-S

NAME: SPINDLE - ROLLER SWAGE TOOL HOUSING, BEARING RETENTION

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The ST932-S spindle is used during component maintenance.

The ST932-S spindle is a component of the ST932 roller swage tool housing. ST932-S is combined in various arrangements to cover a wide range of bearing sizes and housing materials. For proper selection of swaging tool consult the ST932 drawing for bearing number to tool dash number application.

All spindles have a cylindrical shank for mounting in a drill press. The pilot attaches to the spindle and centers the tool by indexing to the bore of the bearing. There are two basic designs of spindles and pilots, depending upon the size of the bearing to be staked.

ST932-S tool code number is designated as "ST932-S-X", where:

"ST932" is the basic tool number.

"S" is the variation.

"X" is the tool dash number (-1 thru -4).

ST932-S is used to roller stake bearings: A-6Y, A-8F, AN200KP10, AN200KP4, AN200KP6, AN200KP8, AN200KS10, AN200KS3, AN200KS3L, AN200KS4, AN200KS5, AN200KS6, AN200K3L, AN201KP10A, AN201KP12A, AN201KP16A, AN201KP16B5, AN201KP20A, AN201KP3, AN201KP3A, AN201KP4, AN201KP4A, AN201KP5, AN201KP5A, AN201KP5A, AN201KP6A, AN201KP8, AN201KP8A, AN202KP21B, AN202KP23B, AN202KP25B, AN202KP29B, AN202KP33B, AN202KP37B, AN202KP49B, AN206DSP4, AN206DSP6, AN206DSP8, AN207DPP4, A10, A10Y, BACB10AC10, BACB10AC3L, BACB10AC4, BACB10AC4A, BACB10AC5, BACB10AC6A, BACB10AH10, BACB10AH3L, BACB10AH5, BACB10AH6, BACB10AN4, BACB10AP10, BACB10AP12, BACB10AP16, BACB10AP3, BACB10AP4, BACB10AP8, BACB10AR5, BACB10AS10, BACB10AS12, BACB10AS14, BACB10AS17, BACB10AS21, BACB10AS25, BACB10AS29, BACB10AT12PP, BACB10AT3MM, BACB10AT4, BACB10AT4MM, BACB10AT8, BACB10AU16, BACB10AU21, BACB10AU23, BACB10AU25, BACB10AU29, BACB10AU33, BACB10AU37, BACB10AU47, BACB10AU49, BACB10AU72, BACB10AW16, BACB10AW21, BACB10AZ17PP, BACB10AZ35PP, BACB10A102, BACB10A103, BACB10A103H, BACB10A105H, BACB10A117H, BACB10A119, BACB10A120, BACB10A127, BACB10A130, BACB10A136, BACB10A136H, BACB10A141, BACB10A141H, BACB10A147, BACB10A151,

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BACB10A151GC, BACB10A153, BACB10A155GC, BACB10A156GC,  
BACB10A163GC, BACB10A170GC, BACB10A174, BACB10A174GC,  
BACB10A176GC, BACB10A177, BACB10A177GC, BACB10A19,  
BACB10A203GCM2, BACB10A203GD, BACB10A203GM2,  
BACB10A204GM2, BACB10A21, BACB10A212G, BACB10A214GM2,  
BACB10A215GM2, BACB10A220GM2, BACB10A235, BACB10A236,  
BACB10A237, BACB10A238, BACB10A239, BACB10A240,  
BACB10A242, BACB10A252GCM2, BACB10A253GC,  
BACB10A253GCM2, BACB10A27DD, BACB10A27DDH, BACB10A28,  
BACB10A28DD, BACB10A28DDH, BACB10A29DD, BACB10A29DDH,  
BACB10A30DD, BACB10A30DDH, BACB10A300, BACB10A300DD,  
BACB10A300DDH, BACB10A31DD, BACB10A31DDH, BACB10A313,  
BACB10A314, BACB10A32DD, BACB10A32DDH, BACB10A322,  
BACB10A324, BACB10A327, BACB10A33DDH, BACB10A331,  
BACB10A35DD, BACB10A35DDH,  
  
BACB10A357GC, BACB10A359GCM2, BACB10A360GCM2,  
BACB10A363GCM2, BACB10A366GCM2, BACB10A38,  
BACB10A396M3, BACB10A397GCM, BACB10A397GCM2,  
BACB10A398GCM, BACB10A40, BACB10A47, BACB10A516,  
BACB10A518, BACB10A519, BACB10A519H, BACB10A522,  
BACB10A523, BACB10A525, BACB10A533, BACB10A538,  
BACB10A539, BACB10A543, BACB10A544, BACB10A553,  
BACB10A554, BACB10A557, BACB10A558, BACB10A559,  
BACB10A560, BACB10A561, BACB10A564, BACB10A610,  
BACB10A620, BACB10A629, BACB10A630, BACB10A649,  
BACB10A651, BACB10A652, BACB10A659, BACB10A659A,  
BACB10A660, BACB10A661, BACB10A664, BACB10A665,  
BACB10A666, BACB10A667, BACB10A669, BACB10A671,  
BACB10A672, BACB10A682, BACB10A683, BACB10A684,  
BACB10A685, BACB10A686, BACB10A687, BACB10A689,  
BACB10A690, BACB10A691, BACB10A692, BACB10A694, BACB10A70,  
BACB10A79H, BACB10A821, BACB10A822, BACB10A823,  
BACB10A824, BACB10A825, BACB10A826, BACB10A827,  
BACB10A828, BACB10A829, BACB10A830, BACB10A832,  
BACB10A833, BACB10A90, BACB10BA25,  
  
BACB10BA25PP, BACB10BA40, BACB10BG1S, BACB10BG3D,  
BACB10BG3S, BACB10BH59, BACB10BW16, BACB10BW21,  
BACB10BW23, BACB10BW25, BACB10BW29, BACB10BW33,  
BACB10BW37, BACB10BW47, BACB10BW49, BACB10BW72,  
BACB10BX10, BACB10BX12, BACB10BX16, BACB10BX20,  
BACB10BX3, BACB10BX4, BACB10BX5, BACB10BX6, BACB10BX8,  
BACB10BY3L, BACB10BY4, BACB10BY5, BACB10BY6, BACB10BY8,  
BACB10B103ZP, BACB10B130, BACB10B131, BACB10B135,  
BACB10B136, BACB10B146, BACB10B147, BACB10B148,  
BACB10B149, BACB10B150, BACB10B154, BACB10B158,  
BACB10B162, BACB10B262R, BACB10B317, BACB10B45,  
BACB10CA4, BACB10CA6, BACB10CA8, BACB10CB4, BACB10CE14,  
BACB10CE32, BACB10CF10PP, BACB10CF12PP, BACB10CF14,  
BACB10CF14PP, BACB10CF17PP, BACB10CF21PP, BACB10CF29PP,  
BACB10CF33PP, BACB10CF37PP, BACB10CG4, BACB10CG4A,  
BACB10CG5, BACB10CH10, BACB10CH100, BACB10CH12,

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BACB10CH120, BACB10CH14, BACB10CH4, BACB10CH40,  
BACB10CH5, BACB10CH50, BACB10CH53, BACB10CH55,  
BACB10CH6, BACB10CH60, BACB10CH65,  
  
BACB10CH650, BACB10CH7, BACB10CH8, BACB10CH80,  
BACB10CH85, BACB10CH9, BACB10CJ16, BACB10CK4, BACB10CK8,  
BACB10CL10, BACB10CL12, BACB10CL7, BACB10C130H,  
BACB10C134H, BACB10C134HR, BACB10C134R, BACB10C135,  
BACB10C135H, BACB10C150H, BACB10C153, BACB10C16H,  
BACB10C160H, BACB10C161, BACB10C161GH, BACB10C161H,  
BACB10C162, BACB10C163, BACB10C196, BACB10C226,  
BACB10C228, BACB10C23Y, BACB1026H, BACB10C78Y, BACB10C79,  
BACB10C79H, BACB10C79HR, BACB10C85, BACB10C85R,  
BACB10C85Y, BACB10C92, BACB10C92H, BACB10C93, BACB10C93H,  
BACB10C93R, BACB10C94H, BACB10C95, BACB10C95Y, BACB10C97,  
BACB10C97Y, BACB10EX16, BACB10EX23, BACB10FF04,  
BACB10FF05, BACB10FF06, BACB10FF07, BACB10FF08,  
BACB10FF10, BACB10FF12, BACB10FF14, BACB10FP04A,  
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BACB10FR72, BACB10FS10, BACB10FS12, BACB10FS16,  
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BACB10GX122J, BACB10GX14J, BACB10GX40J, BACB10GX50J,  
BACB10GX53J, BACB10GX55J, BACB10CGX63J, BACB10GX65J,  
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MS14104-10, MS14104-12, MS14104-14, MS14104-4, MS14104-5,  
MS14104-6,  
  
MS14104-7, MS14104-8, MS20200KP4, MS20200KP5, MS20200K3L,  
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MS20201KP4A, MS20201KP5A, MS20201KP6A, MS20201KP8A,  
MS20202KP10A, MS20202KP12A, MS20202KP20A, MS20202KP21B,  
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MS20202KP37B, MS20202KP49B, MS20206DSP4, MS20206DSP8,  
MS21233-10, MS21233-12, MS21233-14, MS21233-4, MS21233-5,  
MS21233-6, MS21233-7, MS21233-8, MS27261KSP10, MS27261KSP3L,  
MS27261KSP5, MS27261KSP6, MS27261KSP6A, PD5FS428,  
S012T236-401, YN55WOPP2FTA1144, YN56WOPP2CRA1144, YS211B,

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ZB538DDLY498, ZB539DDLY498, ZB541DDLY498, 10-60545-100,  
10-60545-101, 10-60545-102, 10-60545-103, 10-60545-106,  
10-60545-108, 10-60545-110, 10-60545-123, 10-60545-144,  
10-60545-145, 10-60545-149, 10-60545-150, 10-60545-42, 10-60545-50,  
10-60545-76, 254W2002-5, 55656, 594, 6-61581, 60B00179-100,  
60B00179-2, 60B00179-3, 60B00180-206, 60B00180-207,  
60B00180-244, 60B10024-6, 69-35551-1, 69-35552-1, 69-35553-1,  
69B15036-1 and 78245.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST932 and ST932-S drawings for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

A single ST932 roller swage assembly tool includes a roller swage housing (see drawing ST932, including collars), a spindle (see drawing ST932-S), pilot (see drawing ST932-P) and rollers (see drawing ST932-R or ST932A-R) all contained in a storage box.

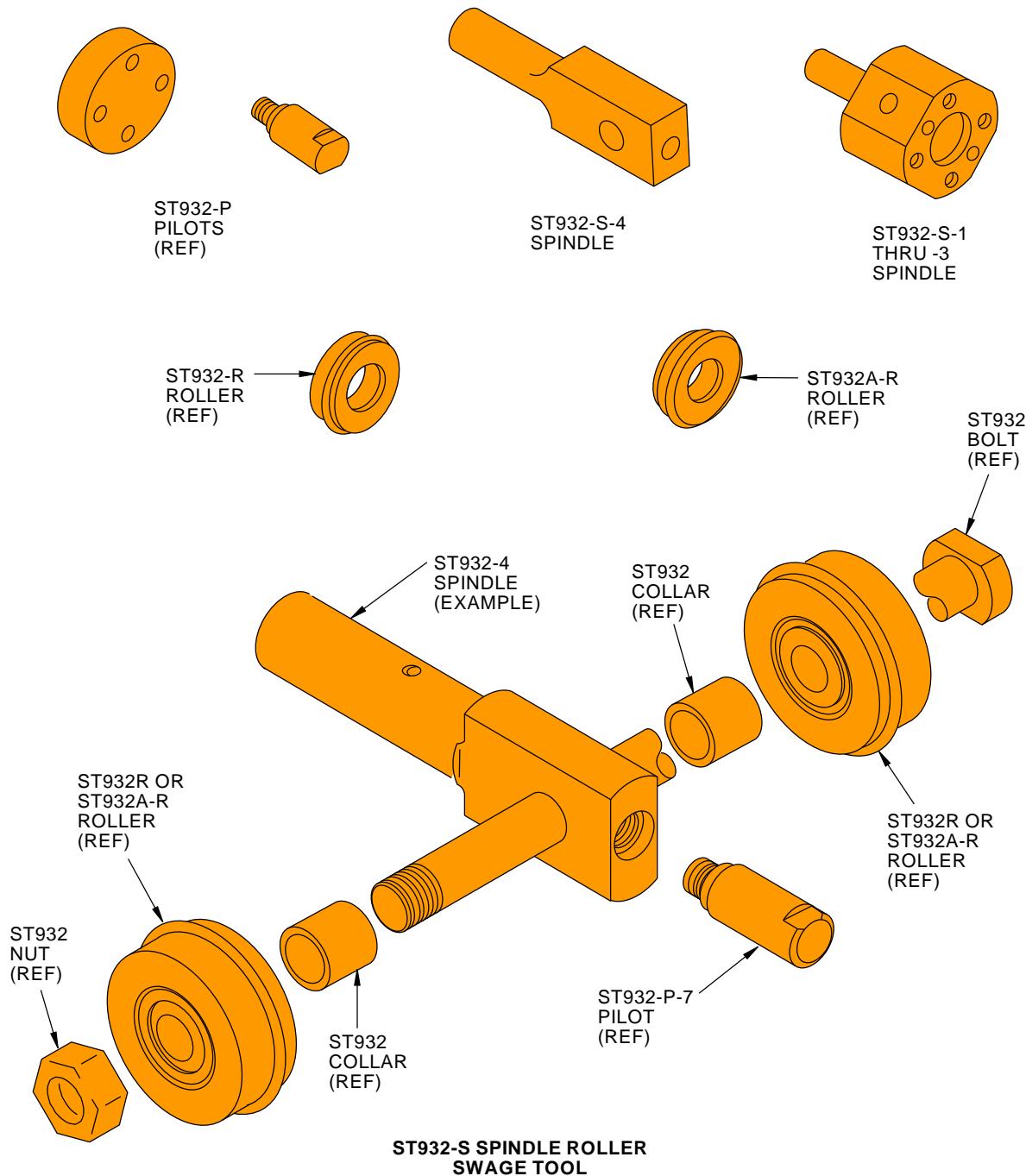
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**Bearing Retention Roller Swage Tool Housing Spindle**  
**Figure 1**

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**PART NUMBER: ST932-R**

**NAME:** ROLLER - STAKING TOOL, BEARING RETENTION

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST932-R roller is used during component maintenance.

The ST932-R roller is a component of the ST932 roller swage tool housing. ST932-R is combined in various arrangements to cover a wide range of bearing sizes and housing materials. For proper selection of swaging tool consult the ST932 drawing for bearing number to tool dash number application.

Rollers are mounted on a through-bolt on the spindle. There are two types of rollers, depending on the metal of the housing to be staked. The ST932-R series of rollers are used on aluminum or other soft metal housings. The ST932A-R series of rollers are used on steel housings.

ST932-R tool code number is designated as: "ST932-R-X-YYY", where:

"ST932" is the basic tool number.

"R" is the variation.

"X" is the tool dash number (-1 thru -4).

"YYY" is the staking depth in 1/1000-inch.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST932 and ST932-R drawings for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

A single ST932 roller swage assembly tool includes a roller swage housing (see drawing ST932, including collars), a spindle (see drawing ST932-S), pilot (see drawing ST932-P) and rollers (see drawing ST932-R or ST932A-R) all contained in a storage box.

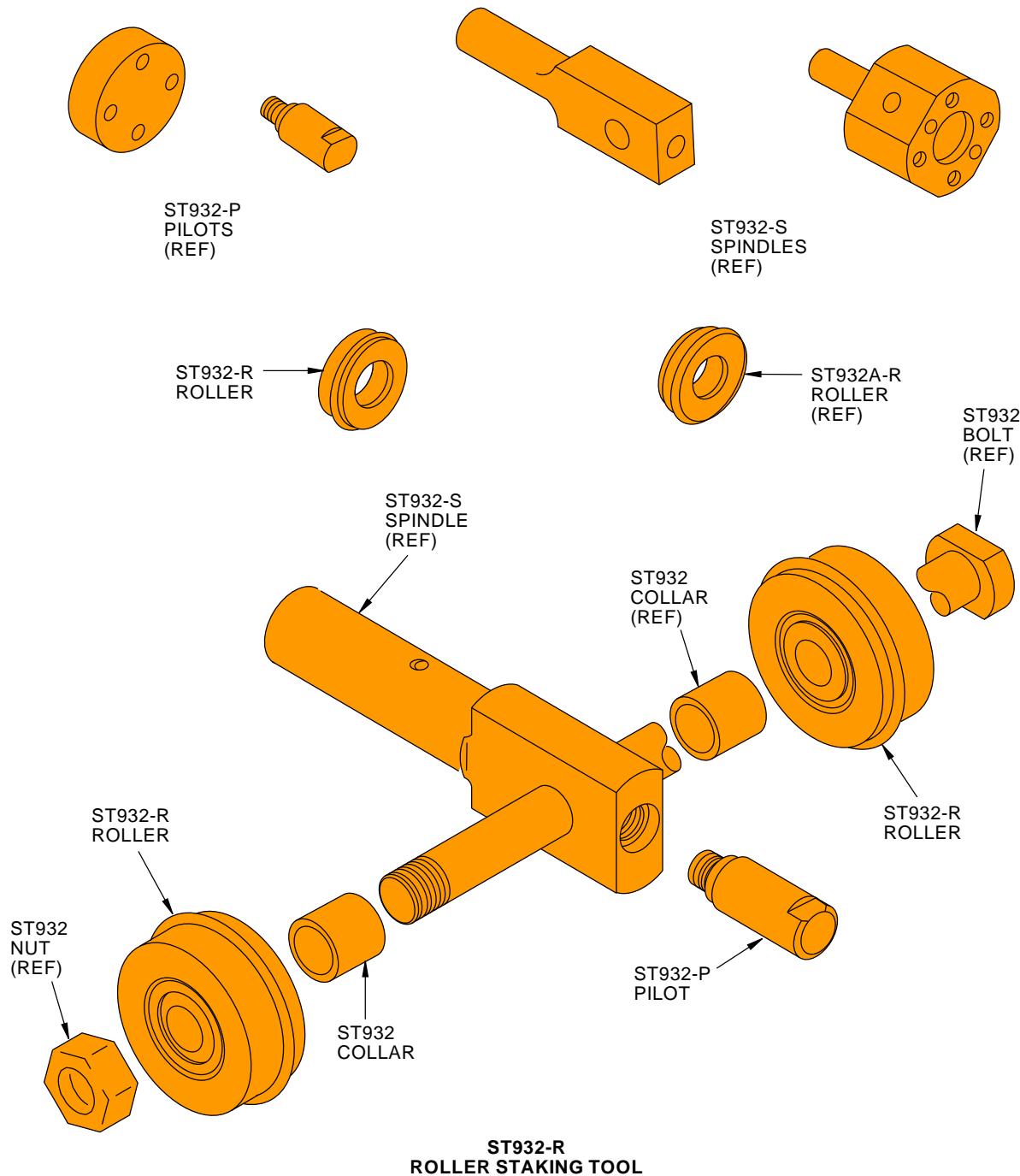
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Bearing Retention Staking Tool Roller  
Figure 1

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**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER: ST932A-R**

**NAME:** ROLLER STAKING TOOL - BEARING RETENTION

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST932A-R roller staking tool is used during component maintenance.

The ST932A-R roller staking tool is a component of the ST932 roller swage tool housing. ST932A-R is combined in various arrangements to cover a wide range of bearing sizes and housing materials. For proper selection of swaging tool consult the ST932 drawing for bearing number to tool dash number application.

Rollers are mounted on a through-bolt on the spindle. There are two types of rollers, depending on the metal of the housing to be staked. The ST932A-R series of rollers are used on steel housings. The ST932-R series of rollers are used on aluminum or other soft metal housings.

ST932A-R tool code number is designated as: "ST932A-R-X-YYY", where:  
"ST932A" is the basic tool number.

"R" is the variation.

"X" is the tool dash number (-1 or -2).

"YYY" is the staking depth in 1/1000-inch.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST932 and ST932A-R drawings for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

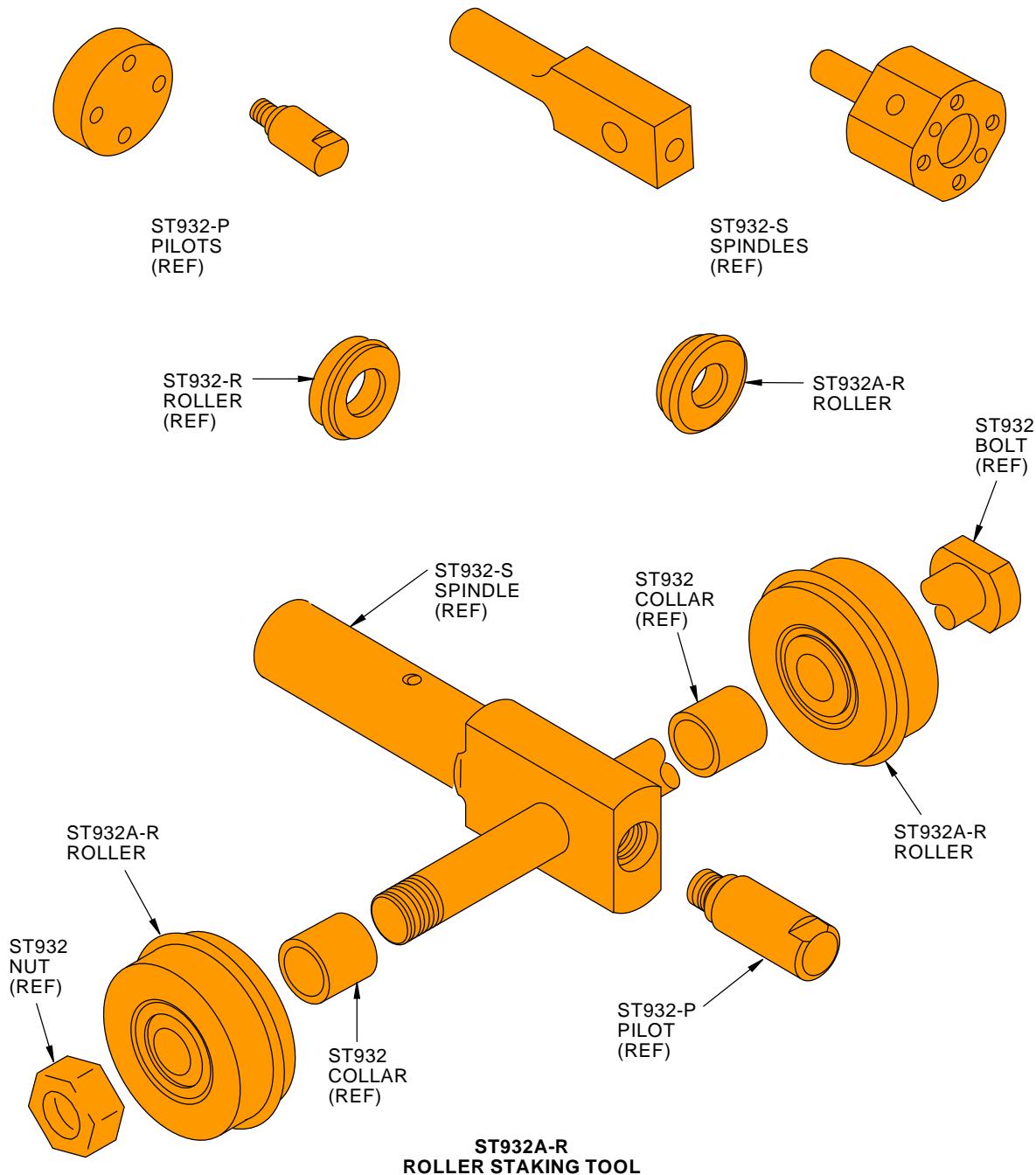
A single ST932 roller swage assembly tool includes a roller swage housing (see drawing ST932, including collars), a spindle (see drawing ST932-S), pilot (see drawing ST932-P) and rollers (see drawing ST932A-R or ST932-R) all contained in a storage box.

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2271994 S0000511291\_V1

**Bearing Retention Roller Staking Tool**  
**Figure 1**

**20-51-27**

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PART NUMBER: ST932B

NAME: ROLLER SWAGING TOOL - HOUSING, BEARING

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: ST932B roller swaging tools are used during component maintenance.

ST932B series roller swaging tools are used in conjunction with a customer-furnished drill press. The ST932B is used for swaging bearings of 0.361-inch, inside diameter maximum, especially in areas of restricted access (normal applications use ST932).

The ST932B tools are designated in the form "ST932B-XXX-YYY" where:

"ST932" is the basic tool number.

"B" is the variation.

"XXX" is the bearing inside diameter in 1/1000-inch.

"YYY" is the bearing outside diameter in 1/1000-inch.

ST932B is used to roller swage bearings: AN200KS4, BACB10AC4, BACB10A122, BACB10A122A, BACB10BG1M, BACB10FF04, BACB10FS4, BACB10F14, BACB10GN1MJ, DAS4-14A1-506, DAS4-14A1-508, DAS5-20A1-506, KP3AL, MS14104-4, MS21231-7, MS21233-3, MS21233-4, P29820P60, SA4-14A4, S251N214-4, S251N214-5 and 10-60545-110.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST932B drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

A typical ST932B consists of:

ST932B		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	BODY	-2
2	ROLLER	-3
1	SHAFT	-4
2	COLLAR	-5
2	RETAINING RING	-6
1	STORAGE BOX	

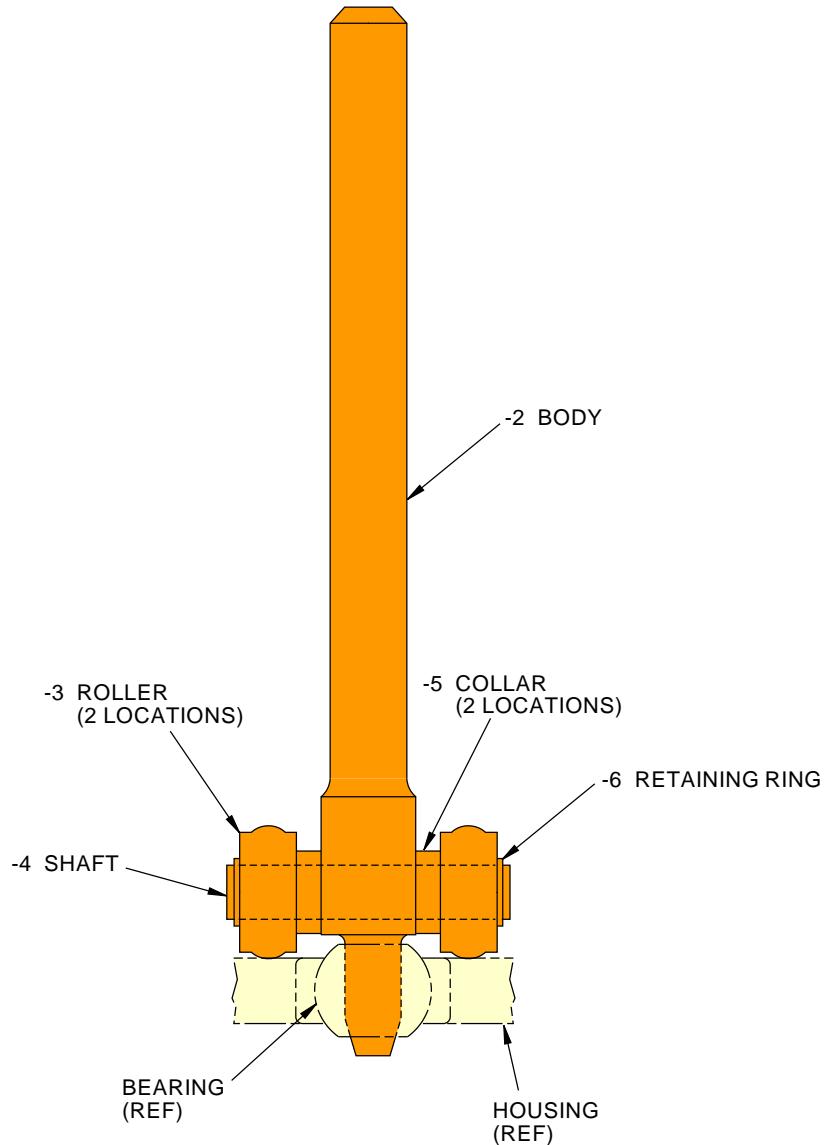
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**ST932B  
ROLLER SWAGING TOOL**

2272262 S0000511295\_V1

**Bearing Housing Roller Swaging Tool  
Figure 1**

**20-51-28**



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PART NUMBER: ST932C

NAME: ROLLER SWAGING TOOL FOR BACB10A-38 BEARING

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The ST932C roller swaging tool is used during component maintenance.

ST932C is used in conjunction with a customer-furnished drill press to roller swage BACB10A38 bearings into the 69-36450 lever in a two step process. ST932C is not the same tool as the cancelled ST932-C.

The ST930 bushing staking tools are designated in the form "ST932C-X" where:

"ST932" is the basic tool number.

"C" is the variation.

"X" is the detail or assembly number.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST932C drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST932C consists of:

ST932C		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	BODY	-2
2	ROLLER	-3
1	SHAFT	-4
1	PRIMARY ANVIL	-5
1	SECONDARY ANVIL	-6-
2	RETAINING CLIP	-7
1	STORAGE BOX	

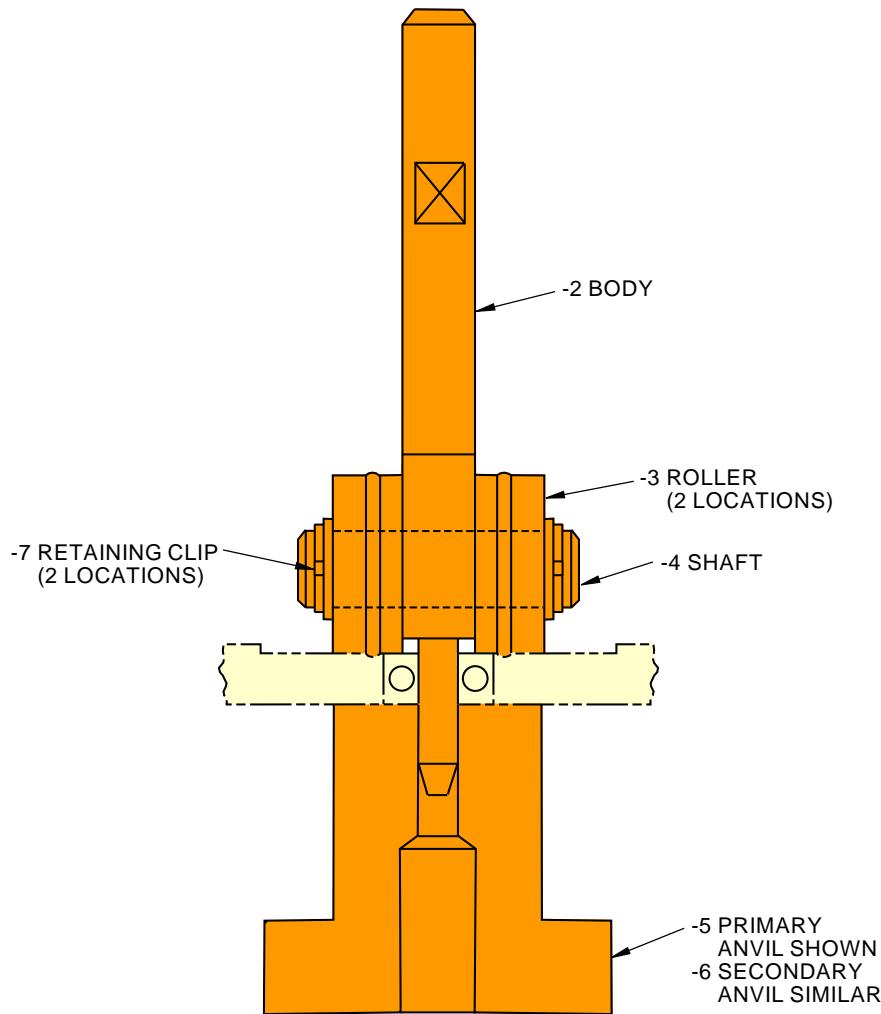
NOTE: ST932C replaces ST932-1875-500 for future procurement.

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**ST932C ROLLER SWAGING TOOL  
FOR BACB10A BEARING**

2272244 S0000511306\_V1

**Roller Swaging Tool for BACB10A-38 Bearing  
Figure 1**

**20-51-29**

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PART NUMBER: ST932E

NAME: ROLLER SWAGING AUTO THROTTLE, BRACKET ASSEMBLY

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: ST932E roller swaging autothrottle tools is used during component maintenance.

ST932E series roller swaging autothrottle tools are used in conjunction with a customer-furnished drill motor. ST932E roller swages the B5538WZZFS428 bearing into the 253T7511 auto throttle bracket assembly.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST932E drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST932E consists of:

ST930		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	ROLLER SWAGE ANVIL ASSEMBLY	-1
1	ROLLER SWAGE ASSEMBLY	-6
1	ROLLER BODY	-8
1	STORAGE BOX	

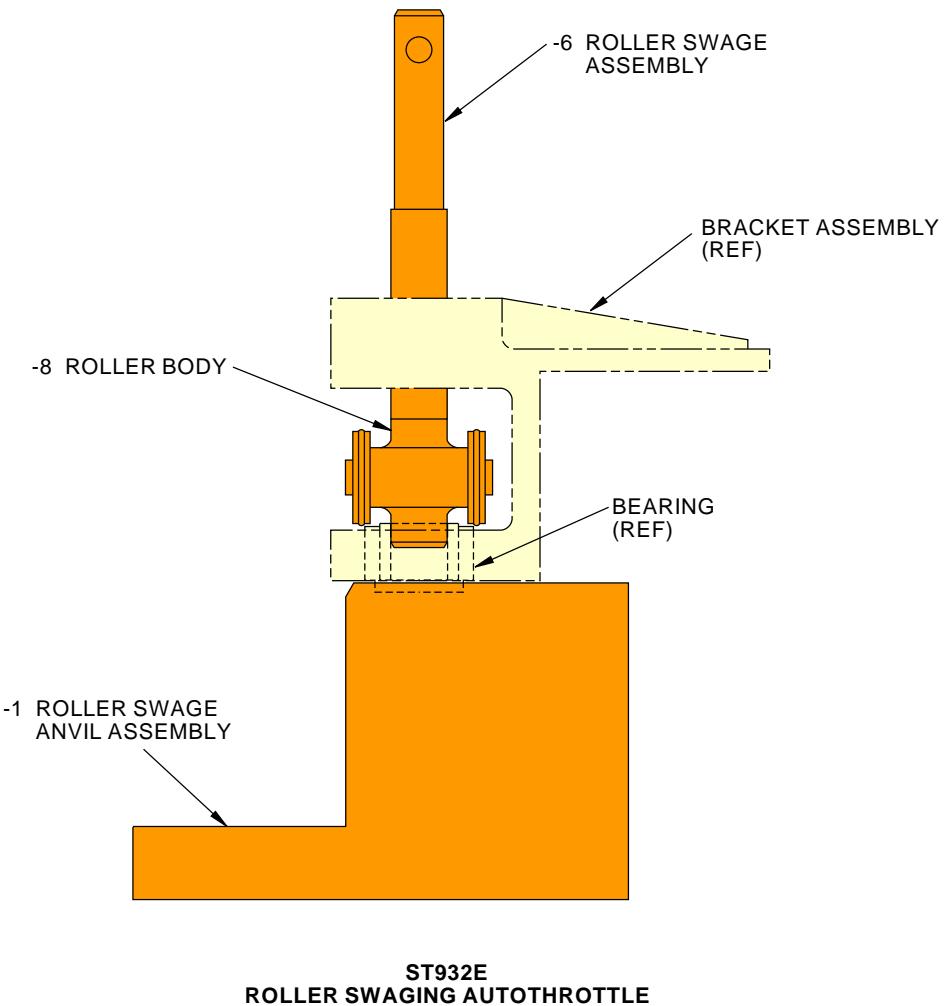
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2272230 S0000511313\_V1

**Bracket Assembly Roller Swaging Autothrottle**  
**Figure 1**

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**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER: ST933**

**NAME:** SWAGING TOOL - HOUSING BEARING RING LOCK

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** ST933 swaging tools are used during component maintenance.

ST933 series swaging tools are used in conjunction with a customer-furnished arbor press. The ST933 series roller swages staking ring BACR12Y to retain the bearing in a housing.

Currently, the ST933 tools are designated in the form "ST933-XXX-YYY" where:

"ST933" is the basic tool number.

"XXX" is the bearing outside diameter in 1/1000-inch.

"YYY" is the bearing bore in 1/1000-inch.

ST933 also has an obsolete numbering system. A typical obsolete tool number is "ST933-XX-Y", where:

"XX" is the bearing outside diameter to the nearest 1/16-inch.

"Y" is the bearing bore to the nearest 1/16-inch.

ST933 is used to ring swage bearings: AN201KP16A, AN201KP20A, BACB10AS10, BACB10AS21, BACB10A29DD, BACB10A29DDH, BACB10A30DD, BACB10A30DDH, BACB10A666, BACB10A686, BACB10A687, BACB10BX16, BACB10BX20, BACB10CF17PP, BACB10CF21PP, BACB10FS16, BACB10FS20, BACB10FU10, BACB10FU21, BACR12Y( ), B542DD, MS20201KP20A, MS20202KP20A and ZB541DDLY498.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST933 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

Each ST933 consists of:

ST933		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	PILOT	-1
1	COLLAR	-2
1	PUNCH	-3
1	STORAGE BOX	

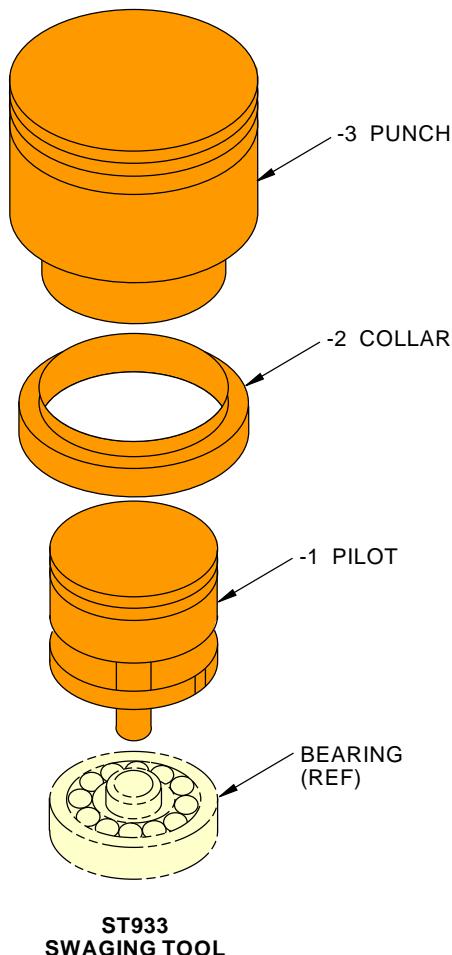
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2272109 S0000511322\_V1

**Housing Bearing Ring Lock Swaging Tool**  
**Figure 1**

**20-51-31**



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PART NUMBER: ST933-100

NAME: SWAGING TOOL - SHAFT BEARING RING LOCK

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: YES

CMM 22-32-31, CMM 22-32-32, CMM 22-32-33, CMM 22-35-02

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: ST933-100 series swaging tools are used during component maintenance.

ST933-100 series swaging tools are used in conjunction with a customer-furnished arbor press. The ST933-100 series roller swages staking ring BACR12Y to a shaft to retain a bearing in a housing.

Currently, the ST933-100 tools are designated in the form "ST933-100-XXX", where:

"ST933" is the basic tool number.

"100" is a code for bearing to shaft type tool.

"XXX" is the bearing inside diameter in 1/1000-inch

ST933-100 also has an obsolete numbering system. A typical obsolete tool number is "ST933-100-X", where "X" is the bearing inside diameter to the nearest 1/16-inch.

ST933-100 ring swages bearings: AN201KP10A, AN201KP12A, BACB10AS17, BACB10AT6PP, BACB10A516, BACB10A684, BACB10A685, BACB10BX10, BACB10BX12, BACB10FS10, BACB10FS12, BACB10FU17, BACR12Y( ), MS20201KP10A, MS20201KP12A, MS20202KP10A and S20202KP12A.

Refer to CMM 22-32-31, CMM 22-32-32, CMM 22-32-33, CMM 22-35-02, the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST933-100 drawing for complete usage instructions. If component overhaul instructions differ from the data in SOPM 20-50-03, use the component overhaul instructions.

Each ST933-100 consists of:

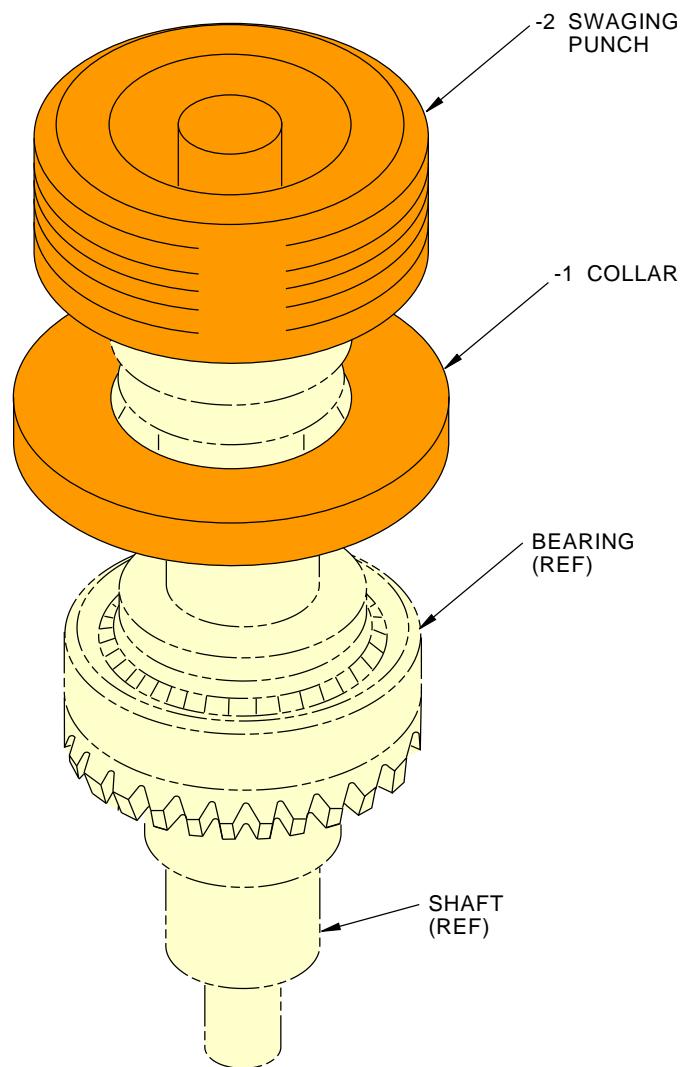
ST933-100		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	COLLAR	-1
1	SWAGING PUNCH	-2
1	STORAGE BOX	

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**ST933-100  
SWAGING TOOL**

2272212 S0000511319\_V1

**Shaft Bearing Ring Lock Swaging Tool  
Figure 1**

**20-51-32**



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PART NUMBER: ST934

**NAME:** BEARING ROLLER SWAGING TOOL

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** YES

CMM 32-22-08, CMM 32-22-09, CMM 54-50-03

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The ST934 bearing roller swaging tool is used during component maintenance.

ST934 is used for staking aluminum-bronze bearings.

Refer to CMM 32-22-08, CMM 32-22-09, CMM 54-50-03, the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST934 drawing for complete usage instructions. If the component overhaul instructions differ from the data in SOPM 20-50-03, use the component overhaul instructions.

ST934 consists of:

ST934		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	BODY	-2
2	ROLLER	-3
1	ANVIL	-4
1	SHAFT	-5
1	PILOT BUSHING	-6
2	RETAINING RING	-7
1	STORAGE BOX	

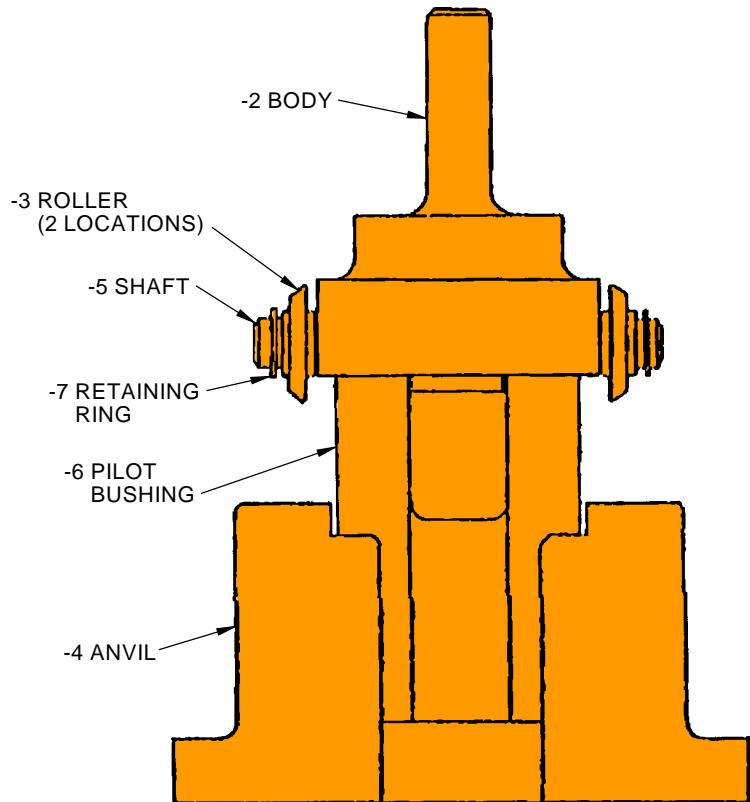
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**ST934 ROLLER STAKING  
ASSEMBLY**

2272140 S0000511328\_V1

**Bearing Roller Swaging Tool  
Figure 1**

**20-51-33**



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**PART NUMBER:** 2MIT65B02661

**NAME:** ROLLER SWAGE - BEARING RETAINING RING

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The 2MIT65B02661 roller swage is used during component maintenance.

2MIT65B02661 is used to sleeve swage the BACB10X11M or BACB10X11MT bearings with the 69B18958 retaining ring.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current 2MIT65B02661 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

2MIT65B02661 consists of:

2MIT65B02661		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	ROLLER ASSEMBLY	-2
1	PILOT	-6
1	ANVIL	-7
1	THRUST BEARING	-11
1	WASHER	-13
1	BOLT	-14
1	BOLT	-15
1	STORAGE BOX	

**NOTE:** 2MIT65B02661 replaces MIT65B02661 for future procurement.

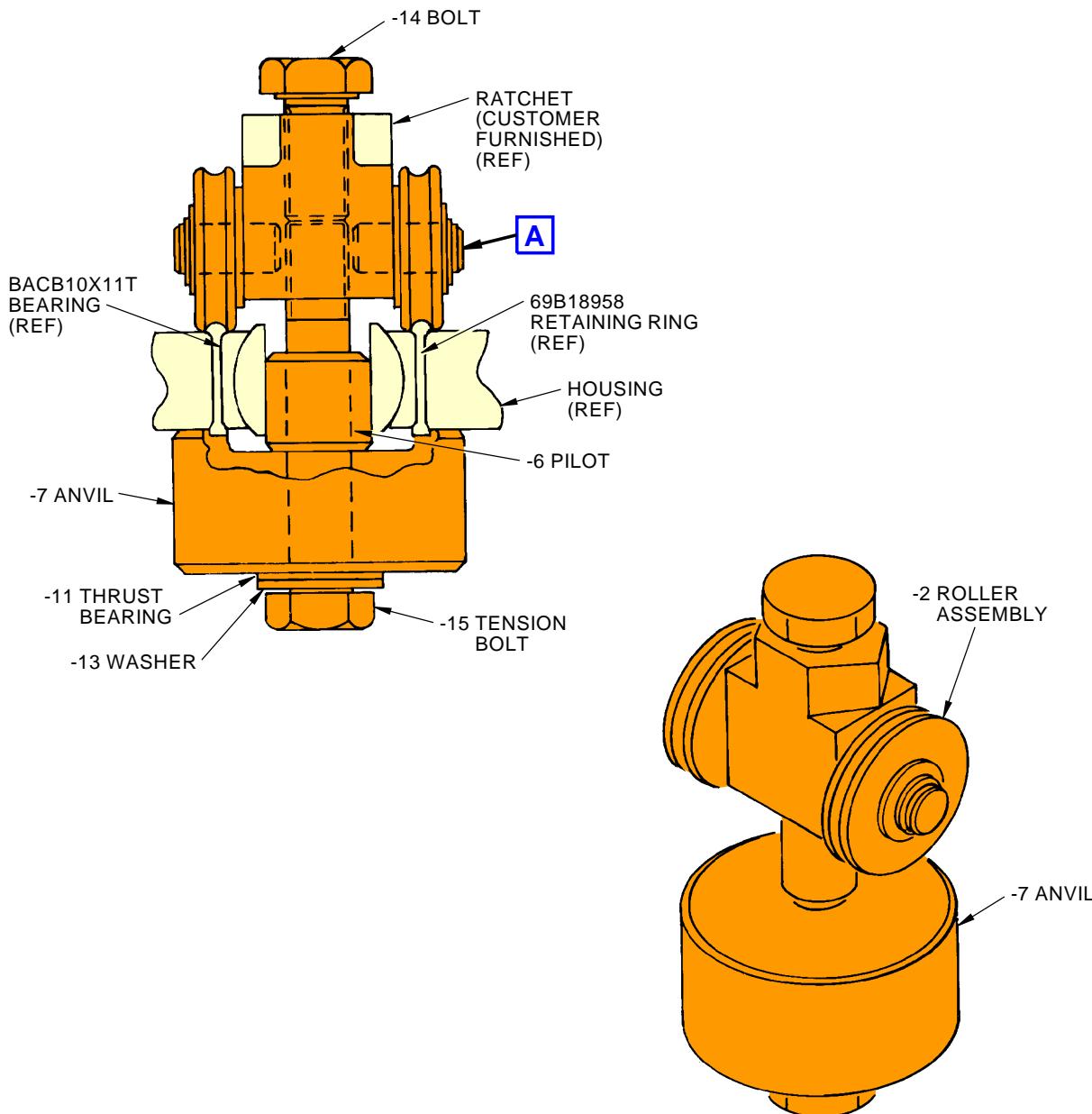
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**2MIT65B02661 ROLLER SWAGE**

**A**

2273197 S0000511618\_V1

**Bearing Retaining Ring Roller Swage**  
**Figure 1**

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**ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

**PART NUMBER:** 2MIT65B02070

**NAME:** INSTALLATION AND REMOVAL TOOL - ROLLER SWAGED BEARING

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The 2MIT65B02070 installation and removal tool is used during component maintenance on 747-100 thru -300 airplanes except the 747SP.

2MIT65B02070 is used to remove or roller swage bearing 10-60545-158S in the yoke fitting of the inboard trailing edge aft flap front spar.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current 2MIT65B02070 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

2MIT65B02070 is a cup shaped puller approximately 3-inches (76 mm) in diameter machined of 4340 steel.

**20-51-35**

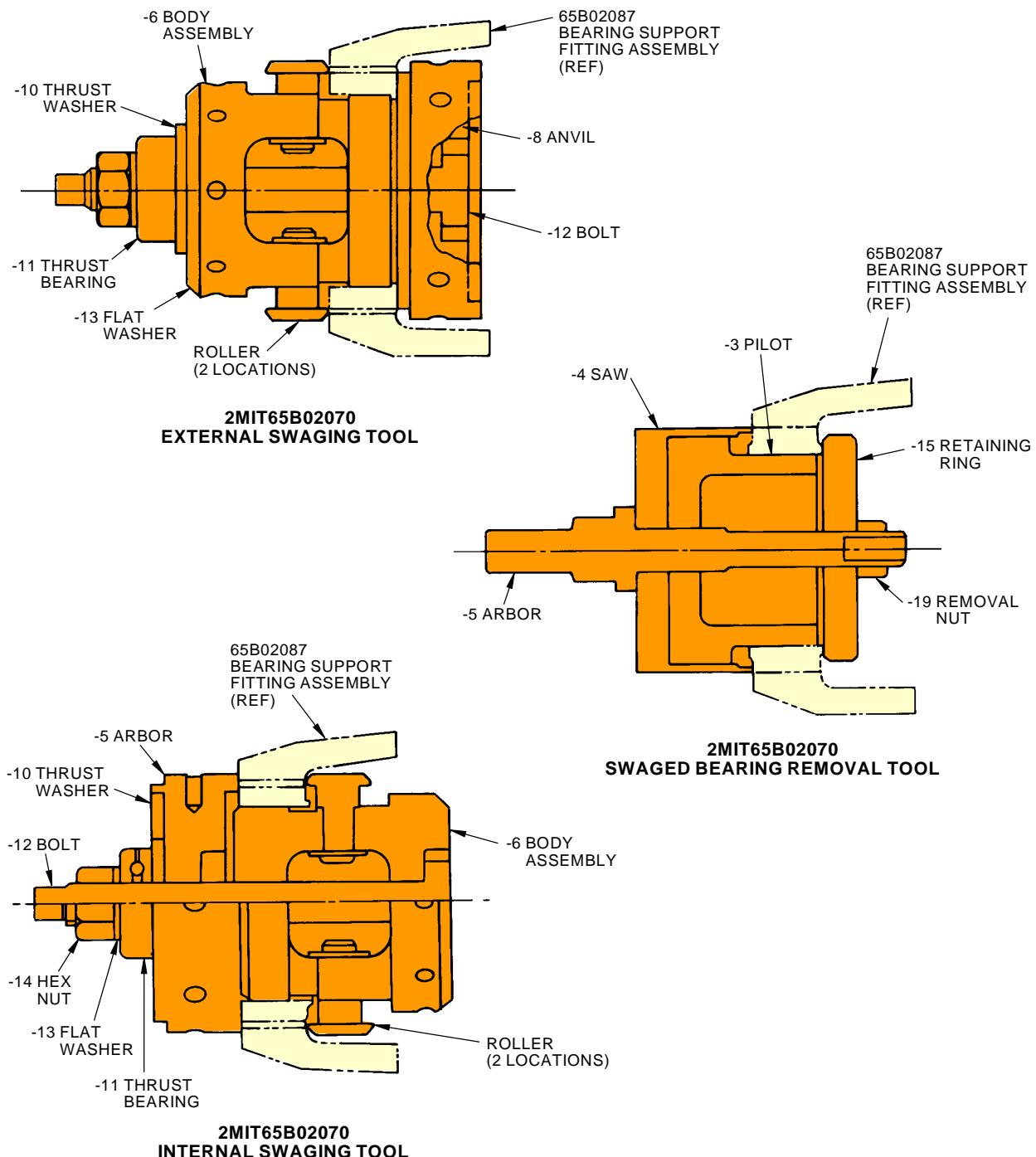
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2MIT65B02070  
INSTALLATION AND REMOVAL TOOL USAGE

2266345 S0000508868\_V1

Roller Swaged Bearing Installation And Removal Tool  
Figure 1

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PART NUMBER: 2MIT65B05370

**NAME:** SWAGE TOOL - UPPER AND LOWER JURY STRUT, BODY LANDING GEAR

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** YES

CMM 32-13-51, CMM 32-13-52

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The 2MIT65B05370 swage tool is used during component maintenance on all 747 airplanes.

2MIT65B05370 is used to swage replacement bushing in the upper and lower jury struts. 2MIT65B05370 swages the bushing by compressing and rotating mandrels with a through bolt and nut until the end of the bushings bend over around the edges of the holes in the jury strut.

Refer to CMM 32-13-51, CMM 32-13-52, the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current 2MIT65B05370 drawing for complete usage instructions. If the component overhaul instructions differ from the data in SOPM 20-50-03, use the component overhaul instructions.

2MIT65B05370 consists of:

2MIT65B05370		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	MANDREL	-2
1	MANDREL	-3
1	MANDREL	-4
1	BASE	-5
1	SPACER	-6
1	BASE	-7
1	BOLT	-8
2	WASHER	-9
1	NUT	-10
1	STORAGE BOX	

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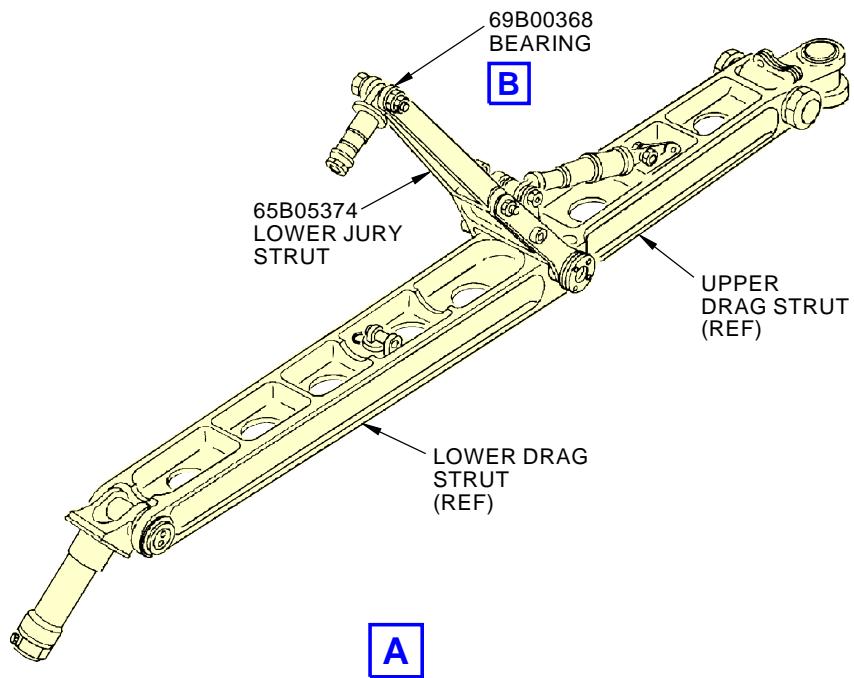
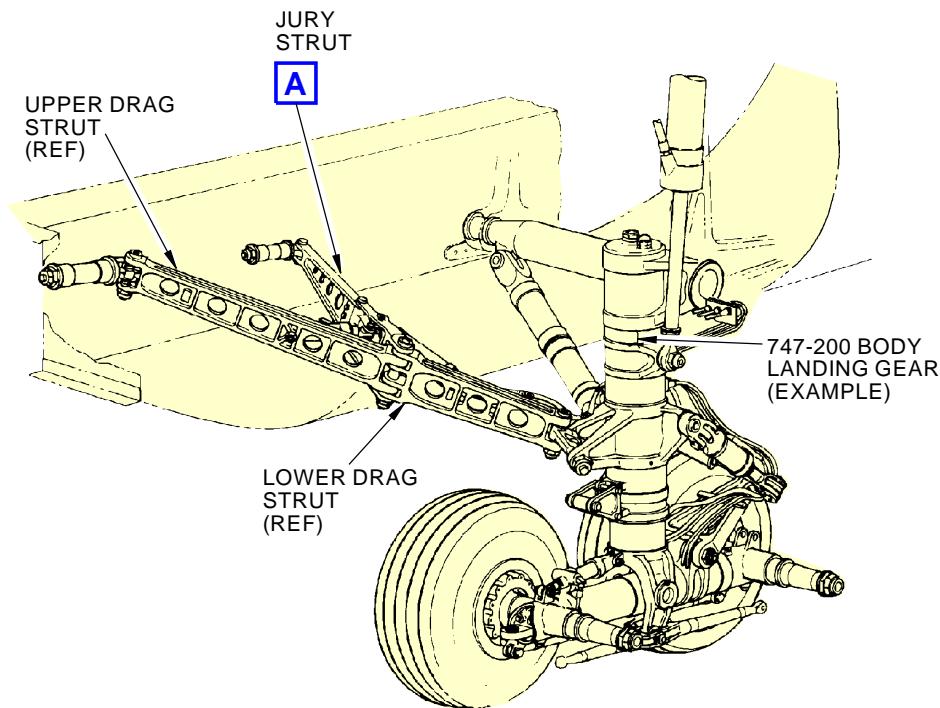
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2273724 S0000512120\_V1

Body Landing Gear Upper and Lower Jury Strut Swage Tool  
Figure 1 (Sheet 1 of 2)

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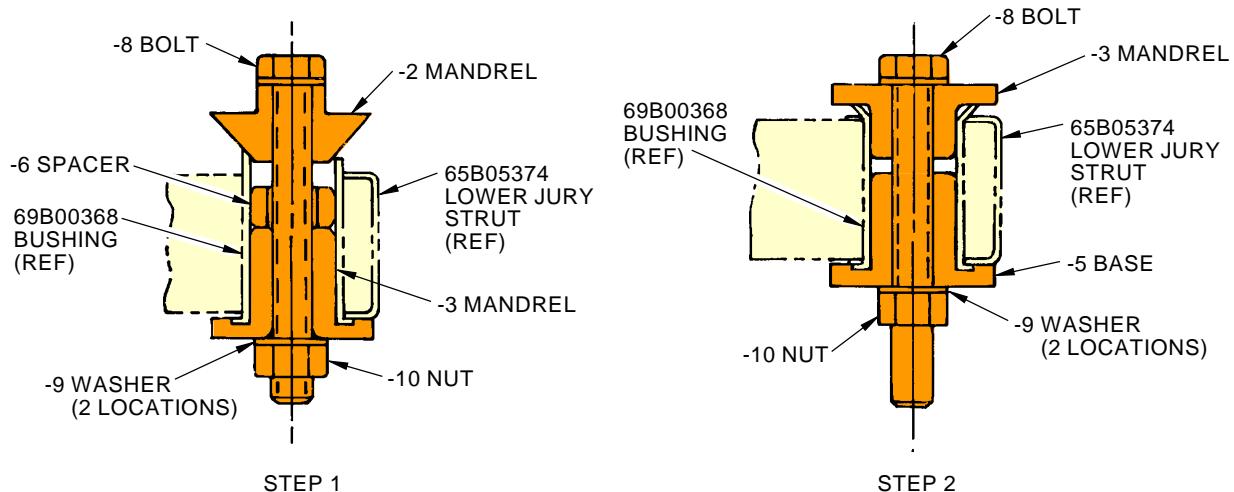
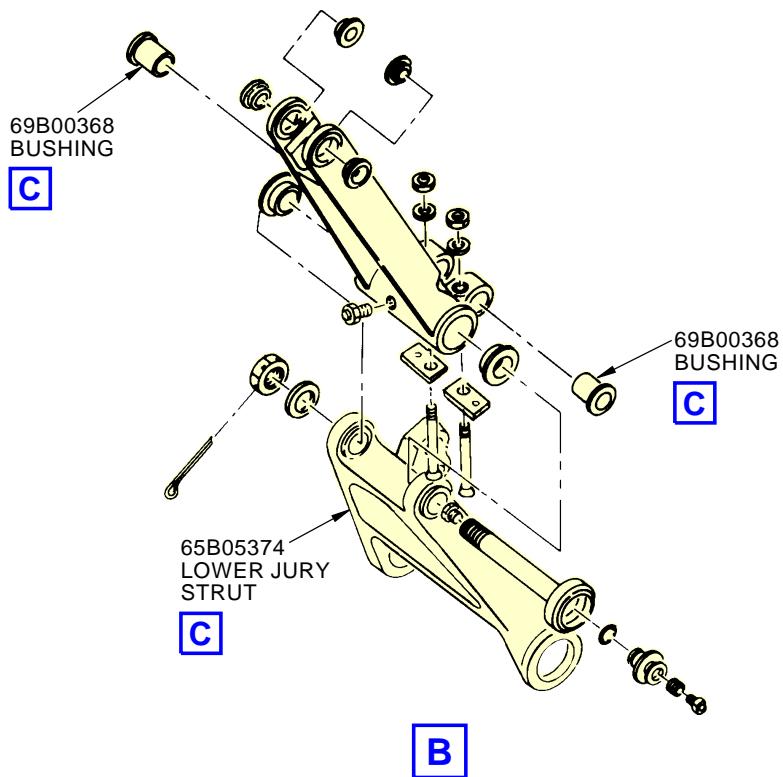
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ILLUSTRATED TOOL AND EQUIPMENT MANUAL



2MIT65B05370  
SWAGING FOR LOWER JURY STRUT BUSHINGS

2273830 S0000512121\_V1

Body Landing Gear Upper and Lower Jury Strut Swage Tool  
Figure 1 (Sheet 2 of 2)

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ILLUSTRATED TOOL AND EQUIPMENT MANUAL

**PART NUMBER:** 2MIT65B90361

**NAME:** TOOL - REMOVAL, 60B00180-302 BEARING

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** NO

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The 2MIT65B90361 tool is used during component maintenance on all 747- 100 and -200 airplanes equipped with JT9D engines.

2MIT65B90361 is used to remove 60B00180-302 and 60B00180-305 bearing from the 65B90361 engine mount link.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current 2MIT65B90361 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

2MIT65B90361 consists of:

2MIT65B90361		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	CUTTER ASSEMBLY	-1
1	PUNCH ASSEMBLY	-2
1	BUSHING	-3
1	ANVIL	-4
1	STORAGE BOX	

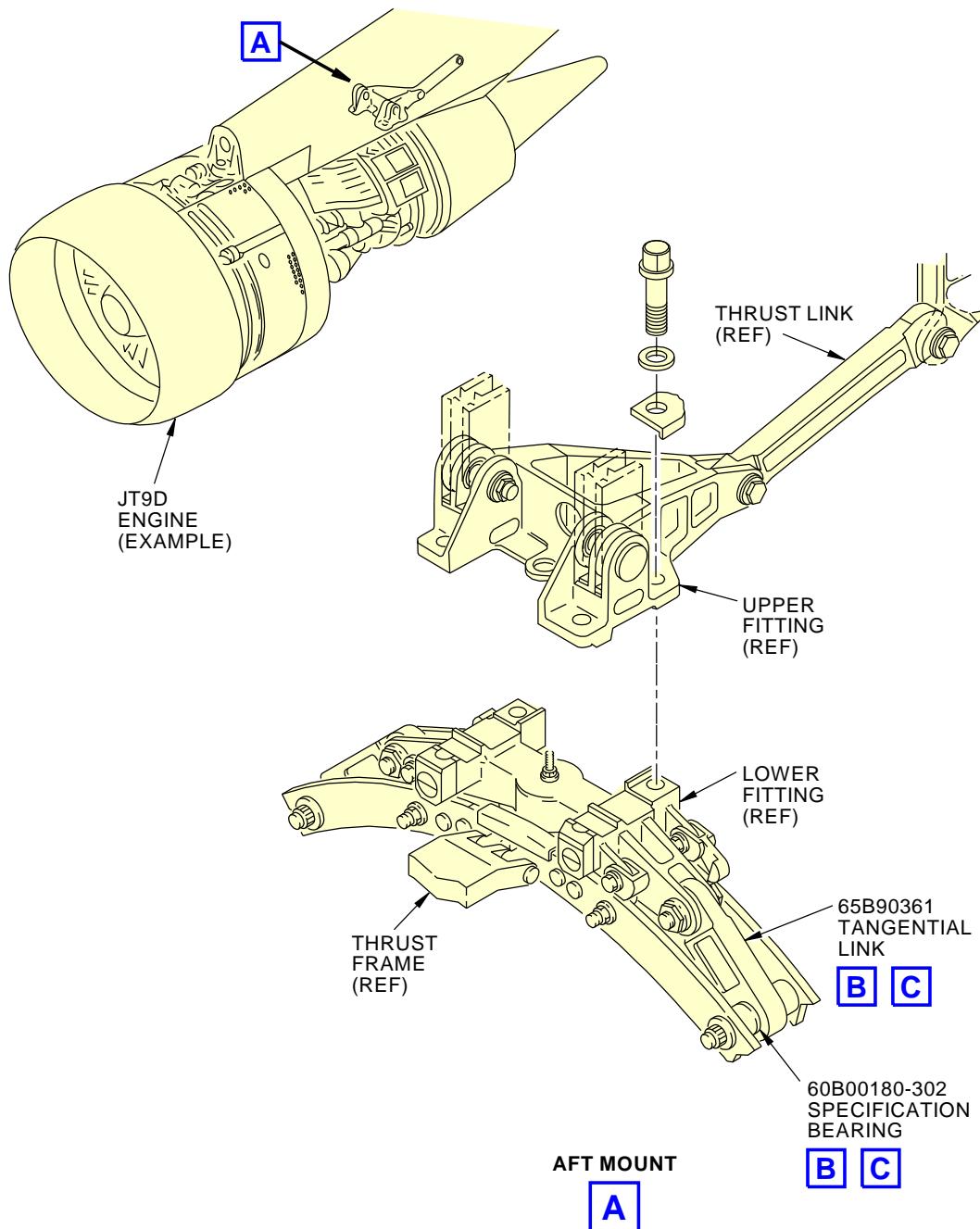
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2266349 S0000508922\_V1

**60B00180-302 Bearing Removal Tool**  
**Figure 1 (Sheet 1 of 2)**

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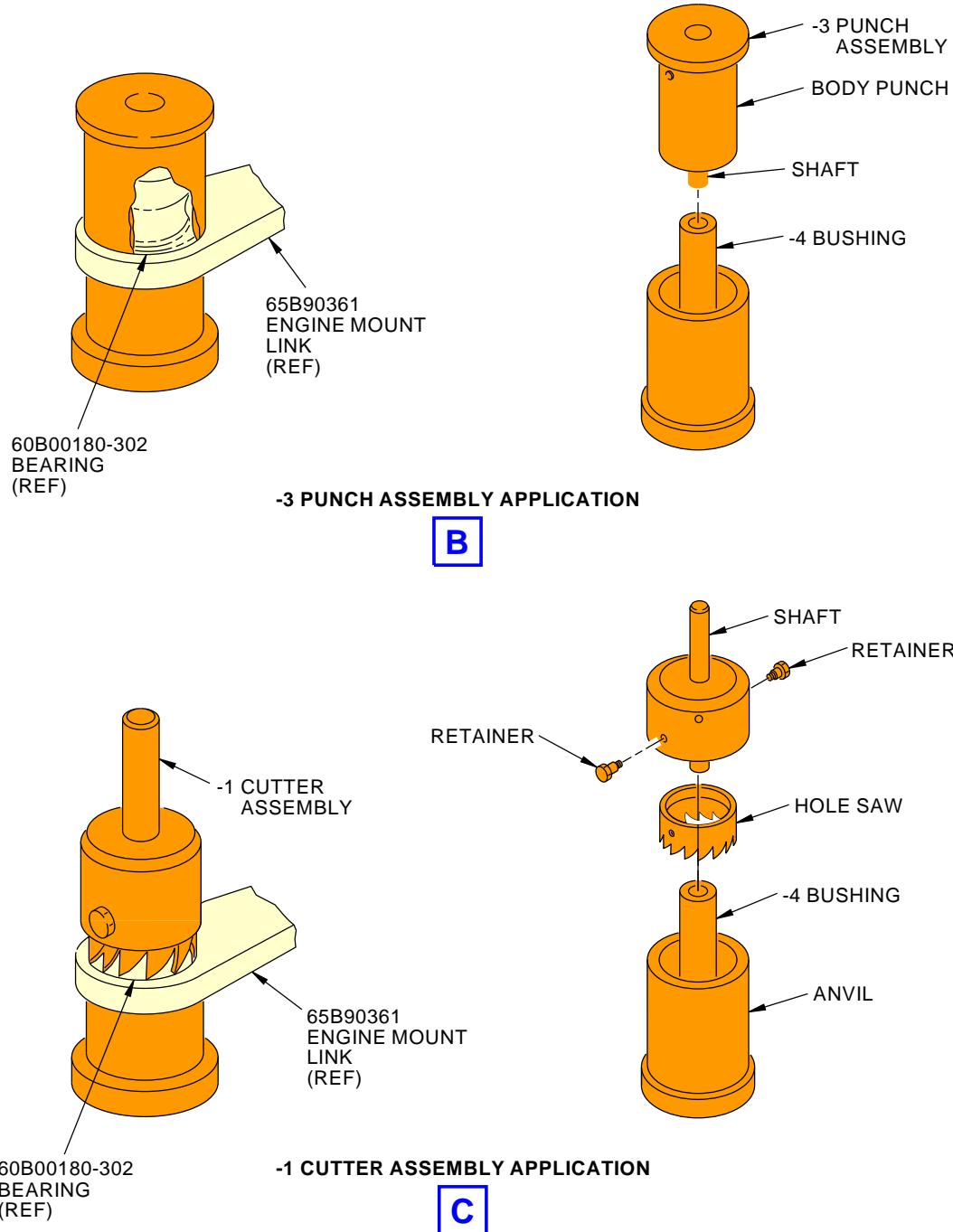
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2MIT65B90361 TOOL USAGE

2266351 S0000508923\_V1

60B00180-302 Bearing Removal Tool  
Figure 1 (Sheet 2 of 2)

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**PART NUMBER:** 4MIT65B01501

**NAME:** DIE - BEARING STAKE, ROD END ASSEMBLY, 65B01521 AND 65B01537

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** YES

CMM 32-32-11, CMM 32-32-12, CMM 32-33-11

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The 4MIT65B01501 die is used during component maintenance.

4MIT65B01501 is used to retain 60B00178-4 specification bearing into 65B01521 and 65B01537 rod ends.

Refer to CMM 32-32-11, CMM 32-32-12, CMM 32-33-11, the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current 4MIT65B01501 drawing for complete usage instructions. If the component overhaul instructions differ from the data in SOPM 20-50-03, use the component overhaul instructions.

4MIT65B01501 consists of a commercial die set, customized to accommodate a staking punch, pressure pads, indexing pin, angle indexing stops, and miscellaneous assembly bolts and springs.

**20-51-38**

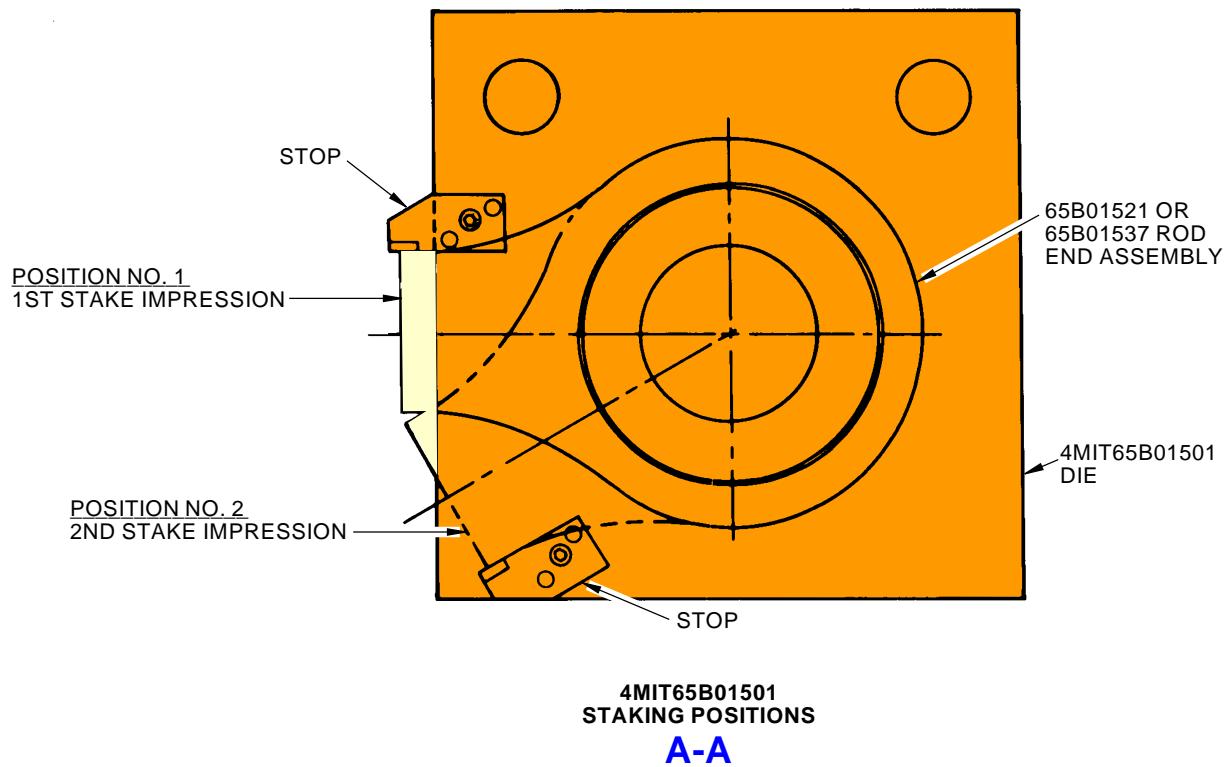
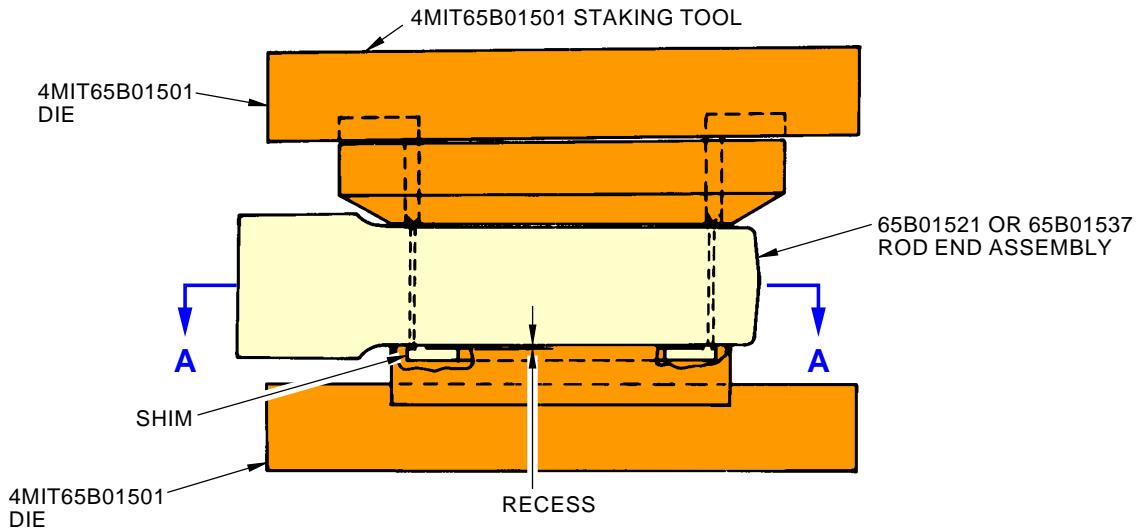
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2274063 S0000512080\_V1

65B01521 and 65B01537 Rod End Assembly Bearing Stake Die  
Figure 1

**20-51-38**

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**PART NUMBER:** 7MIT65B01500

**NAME:** DIE - BEARING STAKE, ROD END ASSEMBLY 65B01513-1 AND -6

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** YES

CMM 32-34-11, CMM 32-34-12

**OTHER MANUALS:** YES

SOPM 20-50-03

**USAGE & DESCRIPTION:** The 7MIT65B01500 die is used during component maintenance on 747-100 thru -400 airplanes.

7MIT65B01500 is used to retain 60B00178 specification bearing into 65B01513 rod ends.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current 7MIT65B01500 drawing for complete usage instructions. If there are component overhaul instructions that differ from the data in SOPM 20-50-03, use the component overhaul instructions.

7MIT65B01500 consists of a commercial die set, customized to accommodate a staking punch, pressure pads, indexing pin, angle indexing stops, and miscellaneous assembly bolts and springs.

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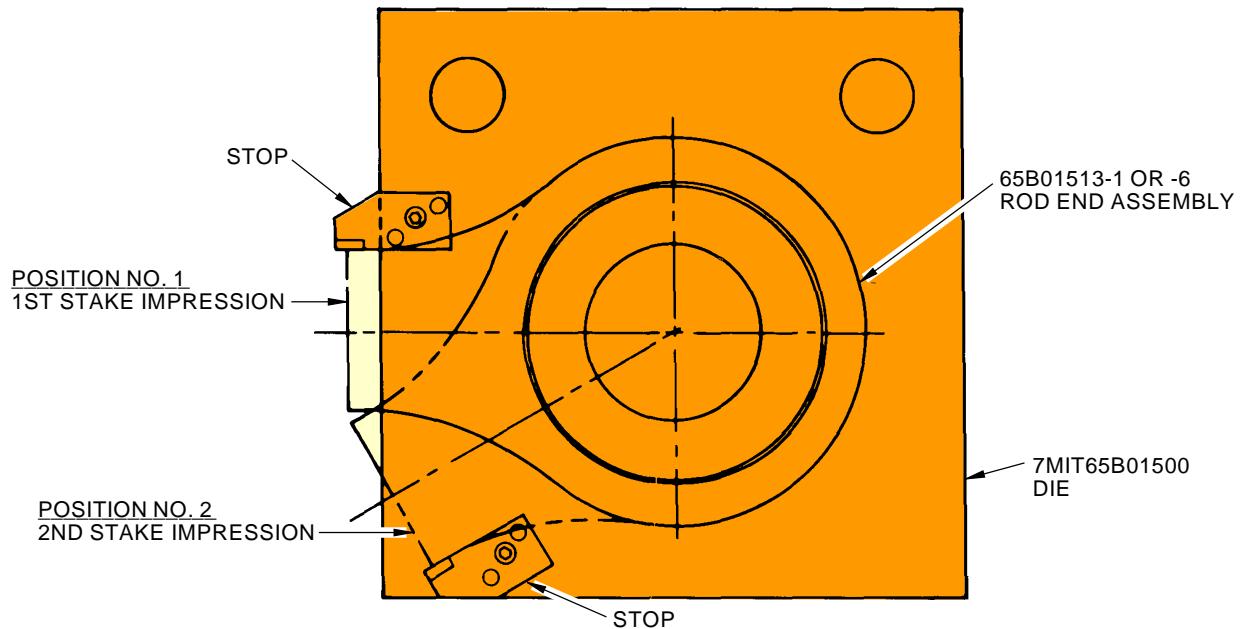
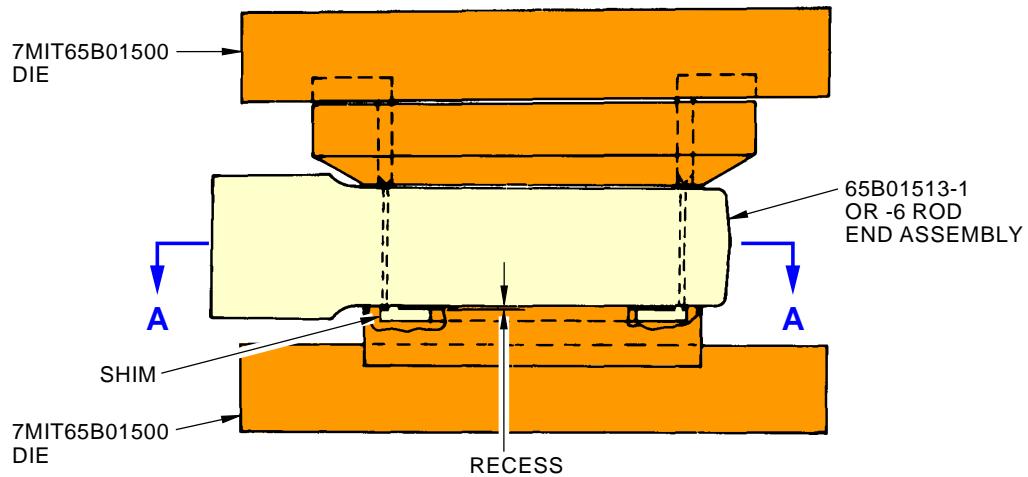
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STAKING POSITIONS

A-A

2274077 S0000512031\_V1

65B01513-1 and -6, Rod End Assembly Bearing Stake Die  
Figure 1

**20-51-39**

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PART NUMBER: ST937D-1

NAME: STANDARD TOOL - ANVIL SWAGE NACELLE SUPPORT FITTINGS

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

SOPM 20-50-03

USAGE & DESCRIPTION: The ST937D-1 standard tool is used during component maintenance on engine strut nacelle support fittings.

ST937D-1 anvil swages 112W7123 bushings into the nacelle support fittings per BAC5435. ST937D includes various sized anvil pairs and a hydraulic pump assembly.

ST937D-1 tools are designated in the form "ST937D-X" where:

"ST937" is the basic tool number.

"D" is the variation.

"X" is the detail or assembly number.

Refer to the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current ST937D-1 drawing for complete pressures, dimensions, codes and usage instructions.

ST937D-1 consists of:

ST937D-1		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
1	PUMP ASSEMBLY	-2
1	DRAW BOLT	-9
2	NUT	-10
2	ANVIL	-11
2	ANVIL	-12
2	ANVIL	-13
2	ANVIL	-14
2	ANVIL	-15
2	ANVIL	-16
2	ANVIL	-17
2	ANVIL	-18
2	ANVIL	-20
2	ANVIL	-21
2	ANVIL	-22
2	ANVIL	-23
2	ANVIL	-24

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(Continued)

ST937D-1		
QUANTITY	NOMENCLATURE	DETAIL NUMBER
2	ANVIL	-25
2	ANVIL	-26
2	ANVIL	-28A
2	ANVIL	-29
2	ANVIL	-30A
2	ANVIL	-31
2	ANVIL	-32
1	STORAGE BOX	UT8511

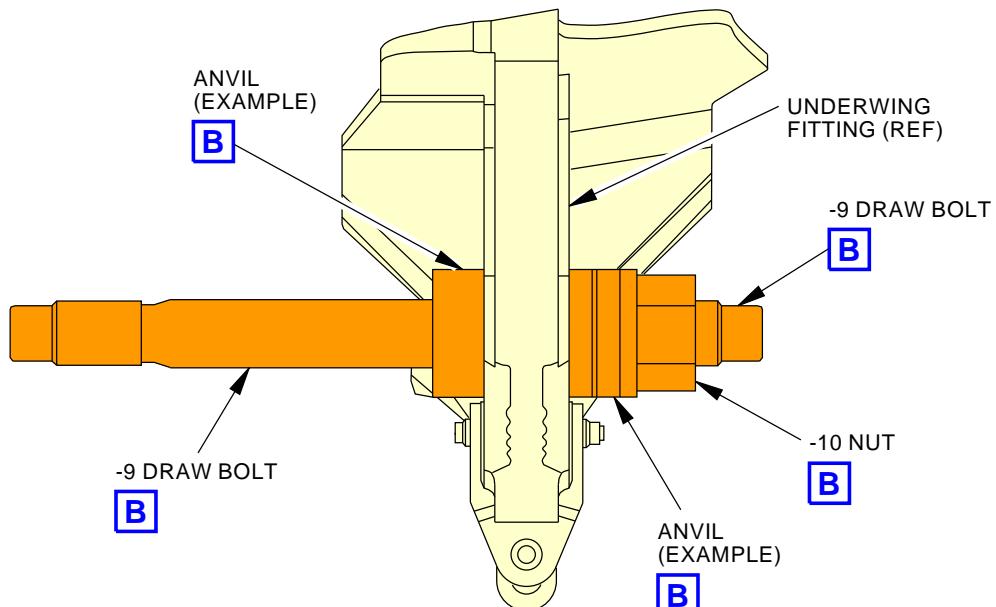
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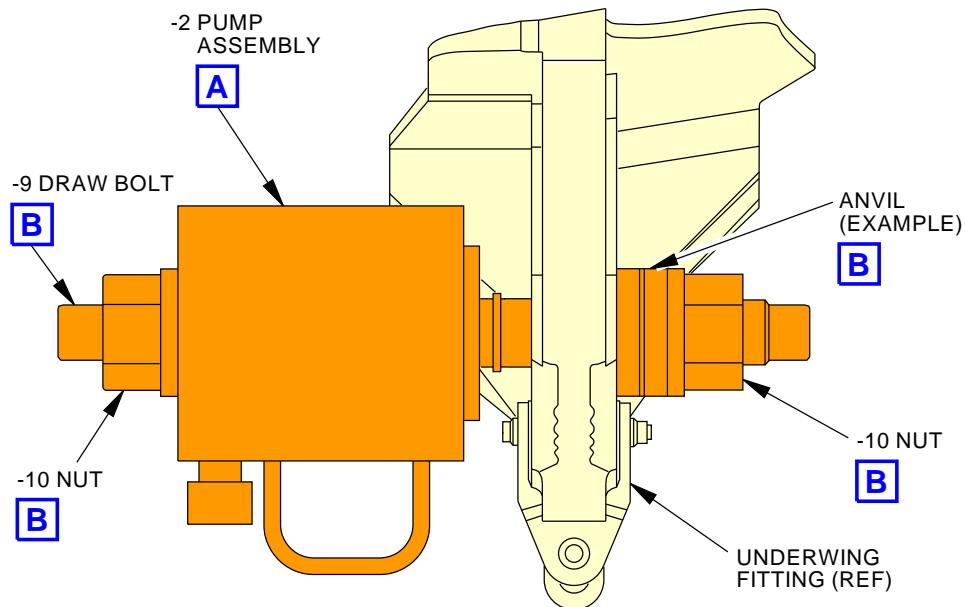
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**ST937D-1 SWAGE SETUP**



**ST937D-1 SWAGE**

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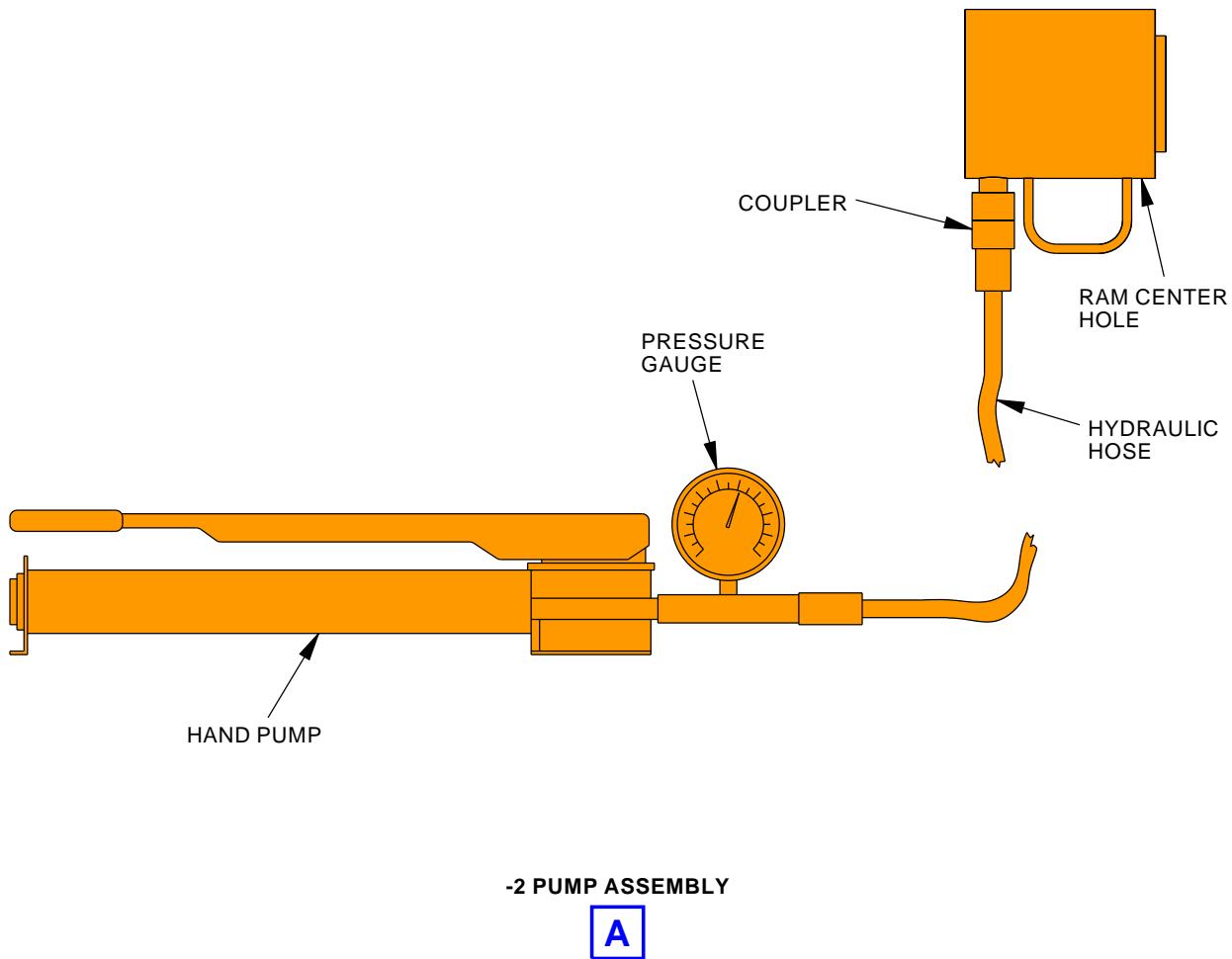
Anvil Swage Nacelle Support Fittings Standard Tool  
 Figure 1 (Sheet 1 of 3)

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2314349 S0000526335\_V1

Anvil Swage Nacelle Support Fittings Standard Tool  
Figure 1 (Sheet 2 of 3)

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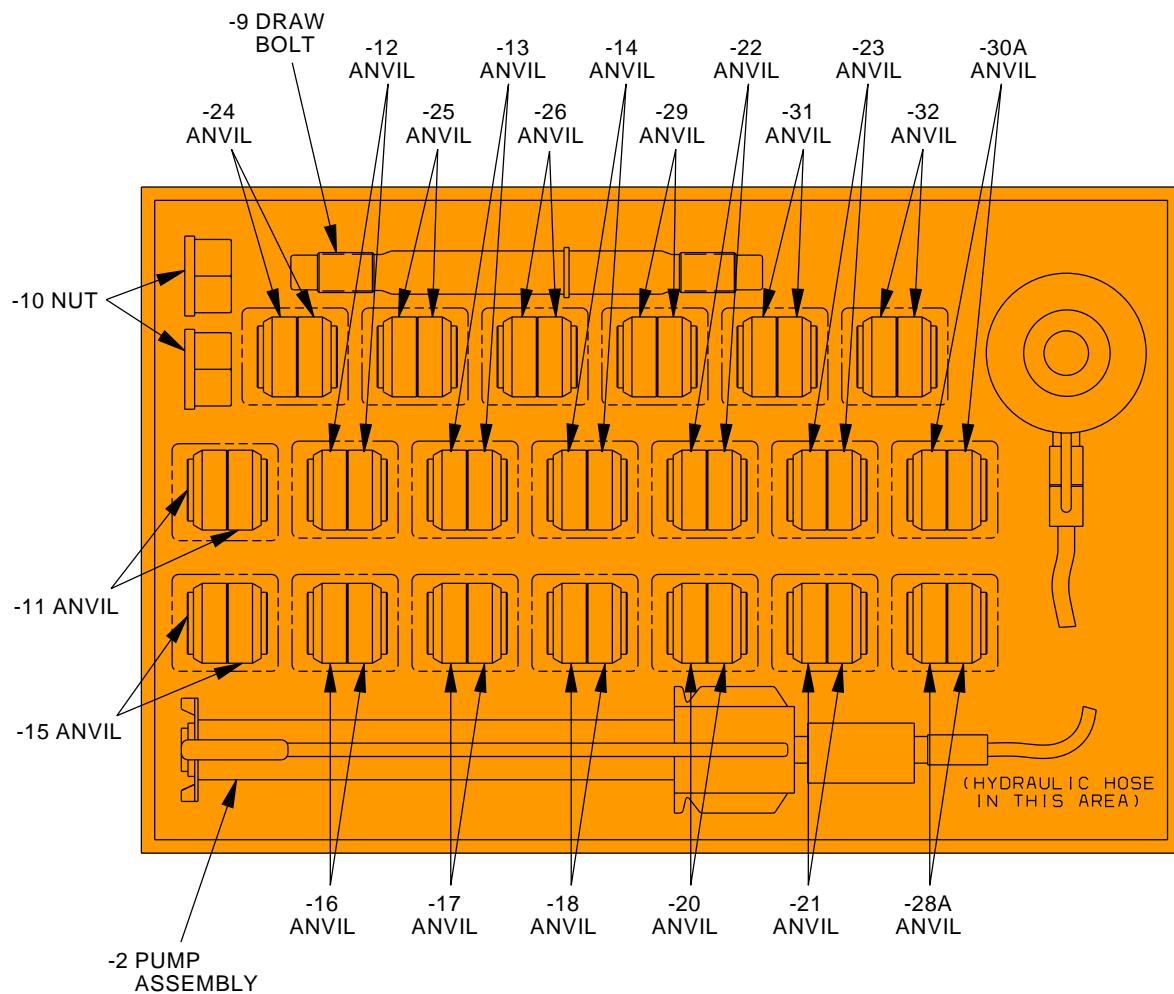
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UT8511 STORAGE BOX AND CONTENTS

B

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Anvil Swage Nacelle Support Fittings Standard Tool  
Figure 1 (Sheet 3 of 3)

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**PART NUMBER: A20008-1**

**NAME:** SOCKET SET - SPHERICAL BEARING

**AIRPLANE MAINTENANCE:** NO

**COMPONENT MAINTENANCE:** YES

CMM 71-11-42

**OTHER MANUALS:** YES

SOPM 20-50-03, A20008 Drawing

**USAGE & DESCRIPTION:** The A20008-1 socket set is used during component maintenance.

A20008 sockets are used in pairs. The two A20008 sockets are used in conjunction with a customer-furnished torque wrench and breaker bar. A20008 sockets are used to hold the outer race and tighten the retainer ring to the required torque on S302T001 bearings. A20008 sockets are used on S302T001-202, -211, -213, -217, -221, -224, -225, -226, -306, -307, -406, -409 and -411 bearings.

Refer to CMM 71-11-42, the Standard Overhaul Practices Manual (SOPM) 20-50-03 and the current A20008 drawing for complete usage instructions.

A20008-1 consists of:

A20008-1		
QUANTITY	NOMENCLATURE	PART NUMBER
2	SOCKET	A20008-3
2	SOCKET	A20008-4
2	SOCKET	A20008-5
2	SOCKET	A20008-6
2	SOCKET	A20008-7
1	STORAGE BOX	

**WEIGHT:** 3 lbs (1.4 kg)

**DIMENSIONS:** 1 x 4 x 10 inches (25 x 102 x 254 mm)

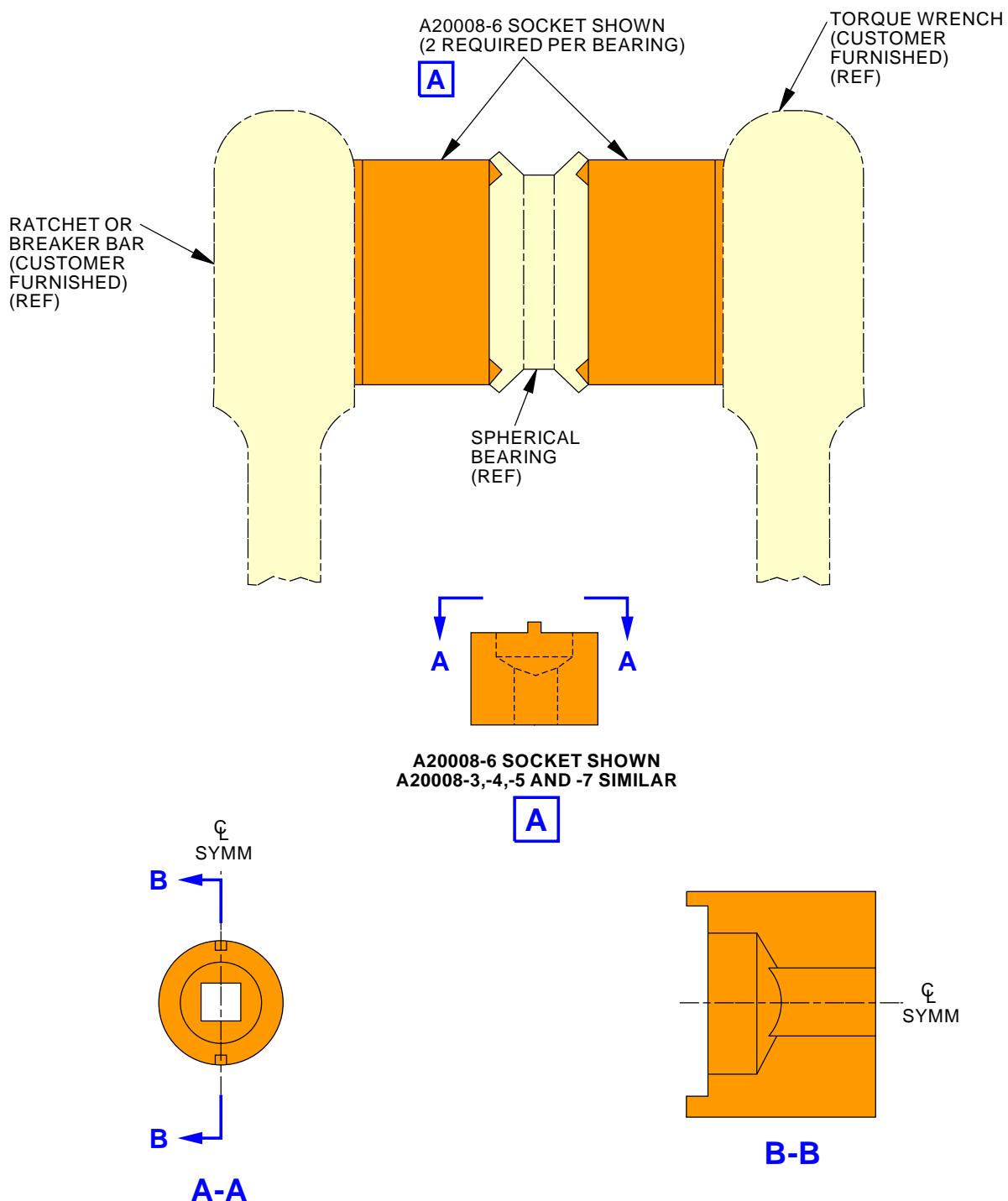
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2343944 S0000534524\_V1

**Spherical Bearing Socket Set**  
**Figure 1**

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