

# TORQUE-HUB<sup>®</sup>

## Final Drives

### ASSEMBLY-DISASSEMBLY MANUAL

FOR THE



UNITS

(NOTE: This manual is not for units with a locknut on the hub-shaft sub-assembly.)



**Fairfield**  
Manufacturing Company, Inc.

Value: \$3.00

This manual is for S10A's that do **NOT** have a locknut on the hub-shaft sub-assembly.  
**NOTE: There is a separate manual for the S10AC units.**

## INTRODUCTION to S10A

This manual is a step-by-step guide to assembly and disassembly of Torque-Hub® units. It is designed for the customer or shop mechanic who is repairing a particular model of Torque-Hub® final drive.

An identification number enclosed in parentheses follows each part mentioned in this manual. The identification number refers to a part in the Parts List of this manual and in the Cross-Sectional View of the unit.

The Tool List contains any specialized tools normally used to assemble this unit, and the Tool Print pages contain diagrams of the tools in the Tool List. However, you do not have to use these tools to assemble this unit. You can press in bearing cups and cones using a punch and hammer along their top edges. You can press seals in by laying a board flat on top of the seal and then hammering the board down until it meets the hub. You can hammer studs into stud holes. If you use these methods, be very careful not to damage the parts while using the punch and/or hammer.

Familiarize yourself with the procedures for roll and leak testing and bolt tightening and ~~torquing~~ before getting started.

## SAFETY

Follow standard safety practices during the disassembly and assembly procedures described. Wear safety glasses and safety shoes. Wear heavy, heat resistant gloves when handling heated components.

Be especially alert when you see the word **CAUTION**. This indicates that a particular operation could cause personal injury if you don't perform it properly or if you don't follow certain safety procedures.

**NOTE:** At the time of printing, this manual was complete for the specific Torque-Hub® model(s) designated. Fairfield Manufacturing, Inc., reserves the right to update and improve its products at any time. All specifications and procedures are therefore subject to change without notice.

## CONTENTS

<b>Introduction / Safety</b> .....	<b>I</b>
<b>Roll and Leak Testing</b> .....	<b>III</b>
<b>Tightening and Torquing Bolts</b> .....	<b>III</b>
<b>Oil Information</b> .....	<b>III</b>
<hr/>	
<b>Main Disassembly for "A" Drive Unit</b> .....	<b>1</b>
<b>Main Disassembly for "B" Drive Unit</b> .....	<b>1</b>
<b>Hub-Shaft Disassembly</b> .....	<b>3</b>
<b>Carrier Disassembly</b> .....	<b>3</b>
<hr/>	
<b>Carrier Sub-Assembly</b> .....	<b>5</b>
<b>Hub-Shaft Sub-Assembly</b> .....	<b>8</b>
<b>Main Assembly for "A" Drive Unit</b> .....	<b>11</b>
<b>Main Assembly for "B" Drive Unit</b> .....	<b>17</b>
<hr/>	
<b>Tool List</b> .....	<b>23</b>
<b>Tool Prints</b> .....	<b>24</b>
<b>Parts List for "A" Drive Unit</b> .....	<b>28</b>
<b>Cross-Sectional View of "A" Drive Unit</b> .....	<b>29</b>
<b>Parts List for "B" Drive Unit</b> .....	<b>30</b>
<b>Cross-Sectional View of "B" Drive Unit</b> .....	<b>31</b>

# ROLL AND LEAK TESTING

Always roll and leak test Torque-Hubs after assembly to make sure that the unit's gears and sealants are working properly. The following information briefly outlines what to look for when performing these tests.

## The Roll Test

The purpose of a roll test is to determine if the unit's gears are rotating freely and properly. You should be able to rotate the gears in your unit by applying a constant force to the roll checker. If you feel more drag in the gears only at certain points, then the gears are not rolling freely and should be examined for improper installation or defects. Some gear packages roll with more difficulty than others. Do not be concerned if the gears in your unit seem to roll hard as long as they roll with consistency.

## The Leak Test

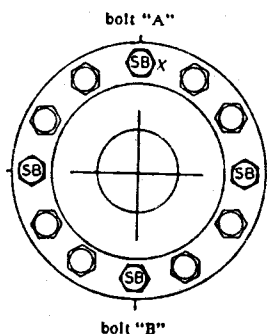
The purpose of a leak test is to make sure the unit is air tight. You can tell if your unit has a leak if the pressure gauge reading on your air checker starts to fall once the unit has been pressurized. Leaks will most likely occur at the main seal or wherever "O" rings or gaskets are located. The exact location of a leak can usually be detected by brushing a soap and water solution around the main seal (and where "O" rings or gaskets meet the exterior of the unit), then checking for air bubbles. If you detect a leak in a seal, "O" ring, or gasket, you must replace the part.

## TIGHTENING/TORQUING BOLTS

If you use an air impact wrench to tighten bolts, take extreme care to insure that you don't tighten bolts beyond their indicated torque specification. Never use an impact wrench to tighten shoulder bolts. Tighten all shoulder bolts by hand.

The following steps describe the proper procedure for tightening and torquing bolts or socket head cap screws in a bolt circle.

1. Tighten (but do not torque) bolt "A" until snug.
2. Go to the opposite side of the bolt circle and tighten bolt "B" until equally snug.
3. Continue around the bolt circle and tighten the remaining bolts.
4. Now use a torque wrench to apply the specified torque to bolt "A".
5. Continue around the bolt circle and apply an equal torque to the remaining bolts.



## OIL INFORMATION

### 1. TYPE - EP 90

On normal applications, use EP 90. On applications where the lubricant must meet special requirements the O.E.M. should be able to recommend a suitable substitute.

### 2. OIL TEMPERATURE

Continuous - 160°F [70°C]

Intermittent - 200°F [95°C]

### 3. OIL CHANGE

Initial -- After 50 hours or 50,000 revolutions of operation.

Subsequent -- After 1000 hours or (1) year, whichever comes first.

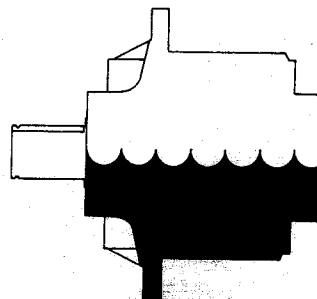
NOTE: Higher temperatures make it necessary to change oil more frequently.

### 4. OIL FILL LEVEL AND VOLUME

Unit mounted horizontal - half full.

Approximate volume 132 oz. [3.9 ltr.]

Note: Oil level and type may vary with specific model and application.



To start, you need to know if you have an "A" Drive or "B" Drive:

- If the last two digits in your model number are 44, 59, or 99, you have an "A" Drive; follow the steps in "Main Disassembly for A Drives."

- If the last two digits in your model number are 70 or 81, or the last three digits are 124, you have a "B" Drive; follow the steps in "Main Disassembly for B Drives."

## MAIN DISASSEMBLY

### for "A" DRIVES

1. Remove the two magnetic pipe plugs (6I) from cover (6), and drain the oil from the unit.
2. Using chalk or marker, mark the location of shoulder bolt holes on the outside of hub (1G).
3. Remove the four shoulder bolts (18) and sixteen bolts (17) from cover (6).
4. Remove the four lockwashers (22) and the sixteen lockwashers (23) from cover (6).
5. Lift cover (6) off of ring gear (4)/hub (1G). Lay cover (6) on table, interior side up.

**CAUTION:** Beware sharp edges in counterbore when you remove "O" ring.

6. Remove "O" ring (5) from the counterbore in rim of cover (6). Discard the "O" ring.

**NOTE:** If "O" ring is not in the counterbore of cover, it is in the rim of ring gear. Remove and discard the "O" ring.

7. Remove thrust washer (8) from the counterbore in the center of cover (6).

8. Remove thrust washer (15), thrust bearing (16), and thrust washer (15) from around the raised circular edge in the center of cover (6).

**NOTE:** If these parts are not on the cover, they are in the counterbore in the top of carrier housing. Remove the parts from carrier housing.

9. Remove coupling (19) from on the end of input shaft (11) in hub (1G).

**CAUTION:** Wear safety glasses during this step:

10. Using retaining ring pliers, remove retaining ring (20) from the groove inside coupling (19).

*[Main Disassembly for "A" Drives continued  
on next page]*

## MAIN DISASSEMBLY

### for "B" DRIVES

1. Remove the two magnetic pipe plugs (6I) from cover (6), and drain the oil from the unit.
2. Using chalk or marker, mark the location of shoulder bolt holes on the outside of hub (1G).
3. Remove the four shoulder bolts (18) and sixteen bolts (17) from cover (6).
4. Remove the four lockwashers (22) and the sixteen lockwashers (23) from cover (6).
5. Lift cover (6) off of ring gear (4)/hub (1G). Lay cover (6) on table, interior side up.

**CAUTION:** Beware sharp edges in counterbore when you remove "O" ring.

6. Remove "O" ring (5) from the counterbore in rim of cover (6). Discard the "O" ring.

**NOTE:** If "O" ring is not in the counterbore of cover, it is in the rim of ring gear. Remove and discard the "O" ring.

7. Remove thrust washer (8) from the counterbore in the center of cover (6).

8. Remove thrust washer (15), thrust bearing (16), and thrust washer (15) from around the raised circular edge in the center of cover (6).

**NOTE:** If these parts are not on the cover, they are in the counterbore in the top of carrier housing. Remove the parts from carrier housing.

9. Lift ring gear (4) off of hub (1G) and set it aside.

10. Lift carrier sub-assembly (3) out of hub (1G), and set it aside.

11. Remove input gear (13) from hub (1G), and set it aside.

*[Main Disassembly for "B" Drives continued  
on next page]*

### Main Disassembly for "A" Drives -continued

11. Lift ring gear (4) off of hub (1G) and set it aside.
12. Lift carrier sub-assembly (3) out of hub (1G), and set it aside.
13. Remove input shaft (11) from hub (1G).

**CAUTION: Wear safety glasses during this step:**

14. Using retaining ring pliers, remove retaining ring (10) from around input shaft (11).
15. Lift input gear (13) off of input shaft (11).
16. Remove washer (7) from around input shaft (11).

**CAUTION: Wear safety glasses during this step:**

17. Remove other retaining ring (10) from the groove around input shaft (11).

**CAUTION: Beware sharp edges in counterbore when you install "O" ring.**

18. Remove "O" ring (5) from the counterbore of hub (1G). Discard the "O" ring.
19. Remove thrust washer (15), thrust bearing (16), and thrust washer (15), from around output shaft (1A).
20. Lift internal gear (2) out of hub (1G), and set it aside.
21. At this point, the main disassembly for "A" drives is complete.

### Main Disassembly for "B" Drives - continued

**CAUTION: Beware sharp edges in counterbore when you install "O" ring.**

12. Remove "O" ring (5) from the counterbore of hub (1G). Discard the "O" ring.
13. Remove thrust washer (15), thrust bearing (16), and thrust washer (15), from around output shaft (1A).
14. Lift internal gear (2) out of hub (1G), and set it aside.
15. At this point, the main disassembly for "B" drives is complete.

## HUB-SHAFT DISASSEMBLY

**CAUTION:** Wear safety glasses during this step:

1. Set hub (1G) so its small end faces down. Remove retaining ring (1F) from the groove around output shaft (1A).
2. Remove bearing shim/washer (1E) from the wide end of hub (1G).
3. Set hub (1G), small end facing down, on something that will support the flange and keep shaft off the floor. Using a punch and hammer, carefully drive output shaft (1A) down out of hub (1G).
4. If seal did not come out of the small end of hub when you removed the shaft, remove seal (1B) from the small end of hub (1G). Discard the seal.
5. One bearing cone (1D) should be around output shaft (1A). Remove this bearing cone from around the output shaft.
6. One more bearing cone (1D) should be loose in the wide end of hub (1G). Remove the bearing cone from the wide end of the hub.
7. Using a punch and hammer, drive one bearing cup (1C) out of the counterbore in the small end of the hub.
8. Set hub (1G) on its wide end. Using a punch and hammer, drive one bearing cup (1C) out of the counterbore in the wide end of the hub.

**NOTE:** Your unit may not have needed this shim set. If it is not there, go on to step 10.

9. Remove shim set (1R) that was under bearing cup (1C) in the wide end of hub (1G).
10. Set hub (1G) on its wide diameter end. Remove two magnetic pipe plugs (1P) from the holes in the slope of hub (1G) near flange.
11. Remove one pipe plug (1L) from the hole near the small end of hub.
12. Remove pipe plug (1K) from the hole in the side of hub (1G).
13. At this point, the hub-shaft disassembly is complete.

## CARRIER DISASSEMBLY

If you have one damaged cluster gear, DO NOT use a gear from another unit (even if it seems the same) as a replacement! Order a "replacement cluster gear kit." Never mix old and new cluster gears because using gears that do not match could cause gear teeth failure.

1. Set carrier housing (3A), splined end down, onto work surface with one set of holes hanging over the edge of the work surface. Use an alignment punch or similar tool to drive roll pin (3B) completely into hole in planet shaft (3E).

**CAUTION:** Wear safety glasses during this step:

2. Using retaining ring pliers, remove retaining ring (3H) from the groove around the top of planet shaft (3E).
3. Remove spacer (3G) from around the top end of planet shaft (3E).
4. Starting from the top of carrier housing (3A), drive planet shaft (3E) down out of planet shaft hole in carrier.
5. Remove assembled cluster gear (3F) from carrier housing (3A).
6. Remove one bearing cone (3D) from inside each bearing cup (3C) in cluster gear (3F).
7. Using a punch and hammer, carefully remove one bearing cup (3C) from each end of cluster gear (3F).
8. Repeat steps 1 to 7 to remove and disassemble the two remaining cluster gears.
9. At this point, the carrier disassembly is complete.

## CARRIER SUB-ASSEMBLY

---

---

If you have one damaged cluster gear, DO NOT use a gear from another unit (even if it seems the same) as a replacement ! Order a "replacement cluster gear kit." Never mix old and new cluster gears because using gears that do not match could cause gear teeth failure.

When you order a "replacement cluster gear kit," you will receive three (3) pre-assembled cluster gears with the correct spacer already installed. Before you install the cluster gears in the carrier housing, disassemble and clean the parts, then reassemble the parts according to procedure below. DO NOT mix the parts of each cluster gear -- keep them separate!



1. Using a bearing cup pressing tool, press one bearing cup (3C) into each end of cluster gear (3F).



2. Place one bearing cone (3D) into each bearing cup (3C) in cluster gear (3F).



3. Place carrier housing (3A), dowel pin hole facing down, onto work surface with one set of holes hanging over the edge of the work surface. Place assembled cluster gear (3F), large gear end facing up, into carrier housing (3A).



4. Spray threads on planet shaft (3E) with Primer T. Allow 2-3 minutes' drying time.



5. Starting from underneath the carrier housing (3A), slide planet shaft (3E), end with roll pin hole last, up into planet shaft holes in carrier.



6. Place spacer (3G) around the top end of planet shaft (3E) and slide spacer down into the carrier housing.



**CAUTION:** Wear safety glasses during this step:

7. Using retaining ring pliers, insert retaining ring (3H) into the groove on planet shaft (3E).



8. Use an alignment punch or similar tool to align the roll pin holes in planet shaft (3E) and carrier housing (3A). Drive roll pin (3B) into the aligned holes until it is flush to the carrier surface.

9. Repeat steps 1 to 8 to assemble and install remaining cluster gears.



10. Place a dial indicator on top of one cluster gear (3F). Pry up on bottom of cluster gear with a screwdriver to get a reading between 0 and .003 (three thousandths). If the reading exceeds .003, contact the manufacturer.

11. Stamp reading on top of carrier near cluster gear: stamp "0" for 0, "1" for .001, "2" for .002, or "3" for .003 .

12. Repeat steps 10 and 11 for remaining two cluster gears.

13. At this point, the carrier sub-assembly is complete.

**HUB-SHAFT SUB-ASSEMBLY**

1. Set hub (1G) on its wide diameter end. Apply a light coat of "Sealant" to two magnetic pipe plugs (1P) and tighten the two magnetic pipe plugs (1P) into the two pipe plug holes in the slope of hub (1G) near flange.



2. Apply a light coat of "Sealant" to one pipe plug (1L) and tighten the one pipe plug (1L) into the pipe plug hole near the small end of hub.



**NOTE:** Make sure the cup sits square with the counterbore before pressing.

3. Using a bearing cup pressing tool, press one bearing cup (1C) into the counterbore in the small end of hub (1G).



4. Apply a light coat of "Sealant" to pipe plug (1K) and install it into the pipe plug hole in the side of hub (1G).

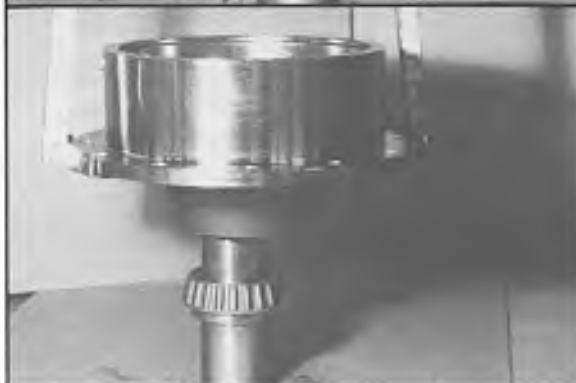


NOTE: Make sure the cup sits square with the counterbore before pressing.

5. Set hub (1G) on its small diameter end. Using a bearing cup pressing tool, press one bearing cup (1C) into the counterbore in the wide end of the hub.



6. Stand output shaft (1A) up on its large smooth end. Using a bearing cone pressing tool, press one bearing cone (1D) onto output shaft (1A). Oil bearing cone and output shaft.



7. Lower hub (1G), small end down, onto output shaft (1A).



8. Set hub (1G) on its shaft. Press or carefully hammer the other bearing cone (1D) down around output shaft (1A) and into bearing cup (1C).



9. Place bearing shim (1E) around output shaft (1A).



**CAUTION:** Wear safety glasses during this step:

10. Place retaining ring (1F) into groove around output shaft (1A). Now tap the end of output shaft (1A) with a soft hammer or rod to release the pre-load on the bearings.

11. Check endplay: Place hub (1G), open end facing down, on table. Put a magnetic indicator on the flange of hub with the needle on the end of output shaft (1A). Jack up or pry up on shaft from the internal side of hub (1G).

- If the reading on the indicator is .008 or more (without shims), you need a .007 or .008 shim set (1R); go on to step 12.
- If reading is less than .008 (without shims), go on to step 13.
- If you have installed shims, the endplay should now be .000-.001 ; go on to step 13.

12. If the reading is over .008 without shims, hub has too much endplay. Remove retaining ring (1F) and bearing shim (1E). Press shaft (1A) out of hub (1G). Use a punch and hammer to carefully remove bearing cone (1D) and bearing cup (1C) from the wide end of hub (1G). Install shim set (1R) into the wide end of hub (1G) and press bearing cup (1C) onto shim set in the wide end of hub. Now repeat steps 7 to 11.



13. Using a seal pressing tool, press seal (1B), closed end up, into small end of hub (1G).

14. At this point, the hub-shaft sub-assembly is complete.

At this point, you need to know if you have an "A" drive or "B" drive:

- If the last two digits in your model number are 44, 59, or 99, you have an "A" drive; follow the steps in "Main Assembly for A Drives."

- If the last two digits in your model number are 70 or 81, or the last three digits are 124, you have a "B" drive; turn to page 17 and follow the steps in "Main Assembly for B Drives."

## MAIN ASSEMBLY for "A" DRIVES



1. Lower internal gear (2), small closed end down, into hub (1G), placing internal gear around the end of output shaft (1A).



2. Grease and place thrust washer (15), thrust bearing (16), and thrust washer (15), in that order, around output shaft (1A).



**CAUTION:** Beware sharp edges in counterbore when you install "O" ring.

3. Grease "O" ring (5) and place it in the counterbore of hub (1G).

NOTE: "O" ring can be made to fit the counterbore exactly by stretching it or by pinching it together bit by bit (if it is too large) as you place it in the counterbore.



4. Using chalk or marker, mark the location of shoulder bolt holes on the outside of hub (1G).



**CAUTION:** Wear safety glasses during this step:

5. Stand input shaft (11) on its end with retaining ring grooves facing up. Place retaining ring (10) into the groove near the top end of input shaft.

6. Turn input shaft (11) over so the retaining ring faces down. Place washer (7) onto input shaft (11) until it rests on retaining ring (10).



7. Slide input gear (13), counterbored side facing down, onto input shaft (11).

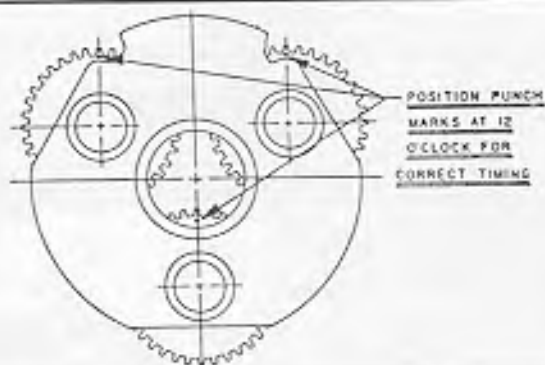


**CAUTION:** Wear safety glasses during this step:

8. Place another retaining ring (10) on top of input gear (13) onto input shaft (11).



9. Place input shaft (11), gear end facing down, into hub (1G).



**CAUTION:** Wear safety glasses during this step:

10. Time the carrier gears: Set carrier sub-assembly (3) on table, large gear ends facing up, and move the punch marks on the gear teeth to the 12 o'clock position as shown in the diagram next to this paragraph. Place a timing fixture on carrier to keep gear teeth in position.

11. Lower carrier sub-assembly (3) into hub (1G).

12. Using retaining ring pliers, place retaining ring (20) into the groove inside coupling (19).



13. Set coupling (19) down into mesh with input shaft (11).



14. Place ring gear (4), side marked "X" facing up, onto hub (1G), aligning the "X"-marked shoulder bolt hole of ring gear with any of the four shoulder bolt holes in the hub.



## 14 Main Assembly for "A" Drives



**CAUTION:** Beware sharp edges in counterbore when you install "O" ring.

15. Lay cover (6) on table, interior side up. Grease "O" ring (5) and place it in the counterbore in rim of cover (6).

**NOTE:** Make "O" ring fit the counterbore exactly stretching it or by pinching it together bit by bit (if it is too large) as you place it in the counterbore.



16. Grease and place thrust washer (8) into the counterbore of the center of cover (6).



17. Place thrust washer (15), thrust bearing (16), and thrust washer (15), in that order, around the raised circular edge in the center of cover (6).

18. Lift cover (6) and place it on ring gear (4), aligning the cover's "X"-marked shoulder bolt hole over any one of the marked shoulder bolt holes on ring gear. See Diagram 1 below for a sample pipe plug alignment, but check an assembly print of your unit for the correct timing for your unit.

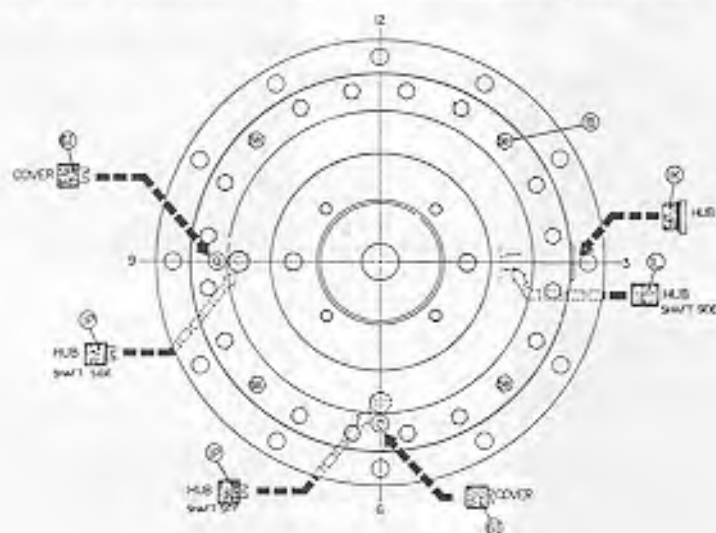


Diagram 1: Pipe Plug Alignment



19. Place the four lockwashers (22) over the shoulder bolt holes on cover (6).



20. Insert four shoulder bolts (18) into the marked bolt holes in cover (6) and tighten by hand.



21. Place the 16 lockwashers (23) over the bolt holes in cover.



22. Insert the 16 bolts (17) into the other holes in cover and tighten.



23. Torque all four shoulder bolts (18) to 100-110 ft.-lbs. [135-148 N-m]. Then torque bolts (17) to 100-110 ft.-lbs. [135-148 N-m].

## 16 Main Assembly for "A" Drives



24. Apply a light coat of "Sealant" to two magnetic pipe plugs (6I) and tighten them into the pipe plug holes in cover (6).



25. Roll test the unit in both clockwise and counterclockwise directions. Perform the same number of turns in each direction as the ratio of the unit. The ratio is the same as the last two digits of the model number on the unit's ID tag. For example, if the model number is S10A14459, then roll the unit 59 times in both directions.




26. Leak test the unit at a pressure of 5 psi for 2-3 minutes.

27. At this point, the main assembly for "A" drives is complete.

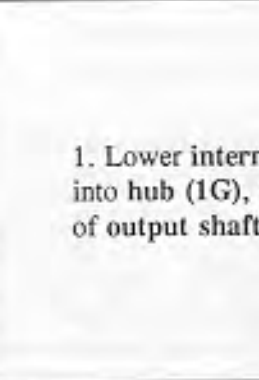
At this point, you need to know if you have an "A" drive or "B" drive:

- If the last two digits in your model number are 44, 59, or 99, you have an "A" drive; turn to page 11 and follow the steps in "Main Assembly for A Drives."
- If the last two digits in your model number are 70 or 81, or the last three digits are 124, you have a "B" drive; follow the steps in "Main Disassembly for B Drives."

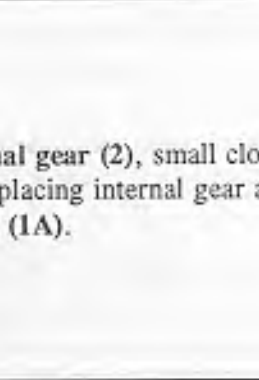
## MAIN ASSEMBLY for "B" DRIVES



1. Lower internal gear (2), small closed end down, into hub (1G), placing internal gear around the end of output shaft (1A).



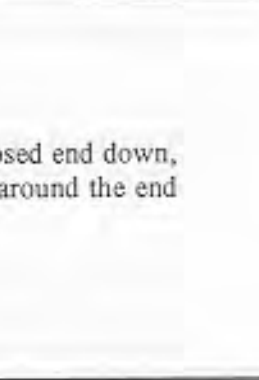
2. Grease and place thrust washer (15), thrust bearing (16), and thrust washer (15), in that order, around output shaft (1A).



**CAUTION:** Beware sharp edges in counterbore when you install "O" ring.

3. Grease "O" ring (5) and place it in the counterbore of hub (1G).

NOTE: "O" ring can be made to fit the counterbore exactly stretching it or by pinching it together bit by bit (if it is too large) as you place it in the counterbore.



4. Using chalk or marker, mark the location of shoulder bolt holes on the outside of hub (1G).



5. Time the carrier gears: Set carrier sub-assembly (3) on table, large gear ends facing up, and move the punch marks on the gear teeth to the 12 o'clock position as shown in Diagram 2. Place a timing fixture on carrier to keep gear teeth in position.

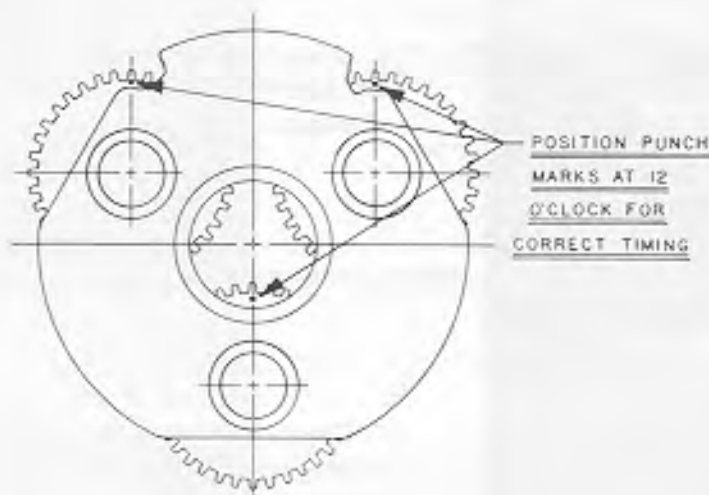


Diagram 2 : Timing the Planet Gears



6. Lift carrier sub-assembly (3) up, and, starting from underneath the carrier, insert input gear (13) into mesh with small ends of cluster gears in carrier.

7. Holding onto input gear (13) from the top, set carrier sub-assembly (3) into hub (1G).



8. Place ring gear (4), side marked "X" facing up, onto hub (1G), aligning the "X"-marked shoulder bolt hole of ring gear with any of the four shoulder bolt holes in the hub.



**CAUTION:** Beware sharp edges in counterbore when you install "O" ring.

9. Lay cover (6) on table, interior side up. Grease "O" ring (5) and place it in the counterbore in rim of cover (6).

**NOTE:** Make "O" ring fit the counterbore exactly by stretching it or by pinching it together bit by bit (if it is too large) as you place it in the counterbore.



10. Grease and place thrust washer (8) into the counterbore of the center of cover (6).



11. Place thrust washer (15), thrust bearing (16), and thrust washer (15), in that order, around the raised circular edge in the center of cover (6).

12. Lift cover (6) and place it on ring gear (4), aligning the cover's "X"-marked shoulder bolt hole over any one of the marked shoulder bolt holes on ring gear. See Diagram 3 on the top of the next page for a sample pipe plug alignment, but check an assembly print of your unit for the correct timing for your unit.

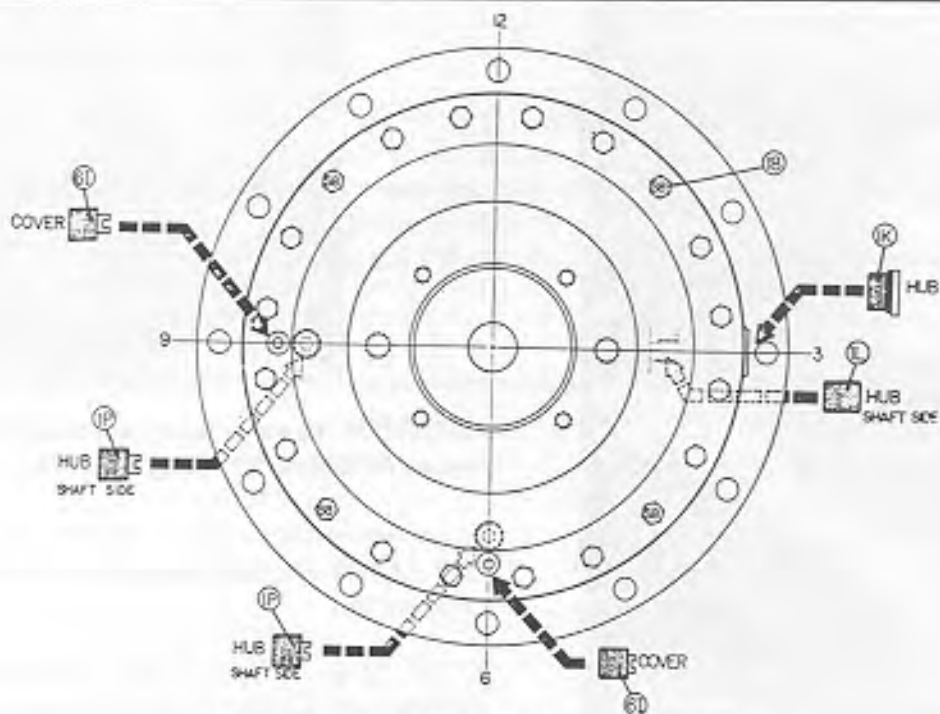


Diagram 3: Pipe Plug Timing (Alignment)



13. Place the four lockwashers (22) over the shoulder bolt holes on cover (6).



14. Insert four shoulder bolts (18) into the marked bolt holes in cover (6) and tighten by hand.



15. Place the 16 lockwashers (23) over the bolt holes in cover.



16. Insert the 16 bolts (17) into the other holes in cover and tighten.



17. Torque shoulder bolts (18) to 100-110 ft.-lbs. [135-148 N-m].

18. Torque bolts (17) to 100-110 ft.-lbs. [135-148 N-m].



19. Apply a light coat of "Sealant" to two magnetic pipe plugs (6I) and tighten them into the pipe plug holes in cover (6).



20. Roll test the unit in both clockwise and counterclockwise directions. Perform the same number of turns in each direction as the ratio of the unit. The ratio is the same as the last two digits of the model number on the unit's ID tag. For example, if the model number is S10A14470, then roll the unit 70 times in both directions. (NOTE: model number S10A144124 should be rolled 124 times in each direction.)



21. Leak test the unit at a pressure of 5 psi for 2-3 minutes.



## **22 Main Assembly for "B" Drives**

---

**22. At this point, the main assembly for "B" drives is complete.**

## **TOOL LIST**

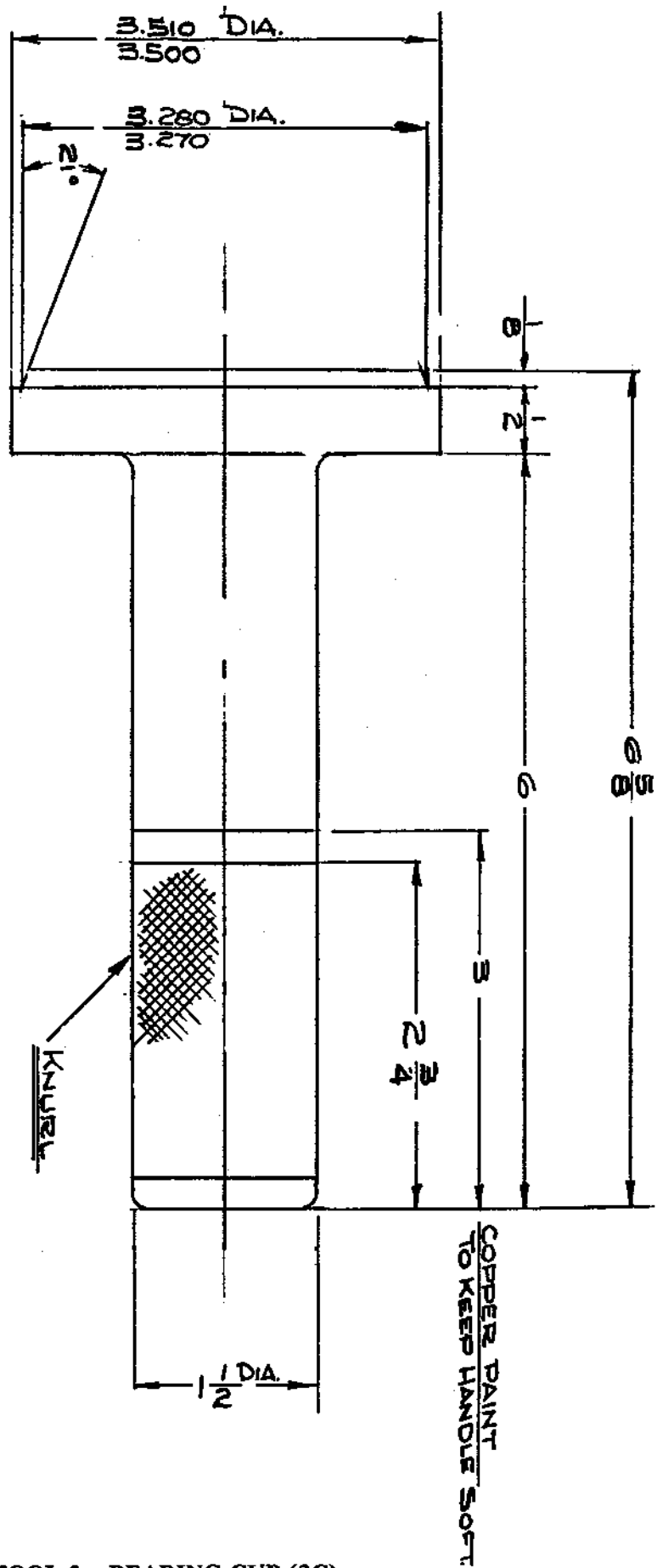
---

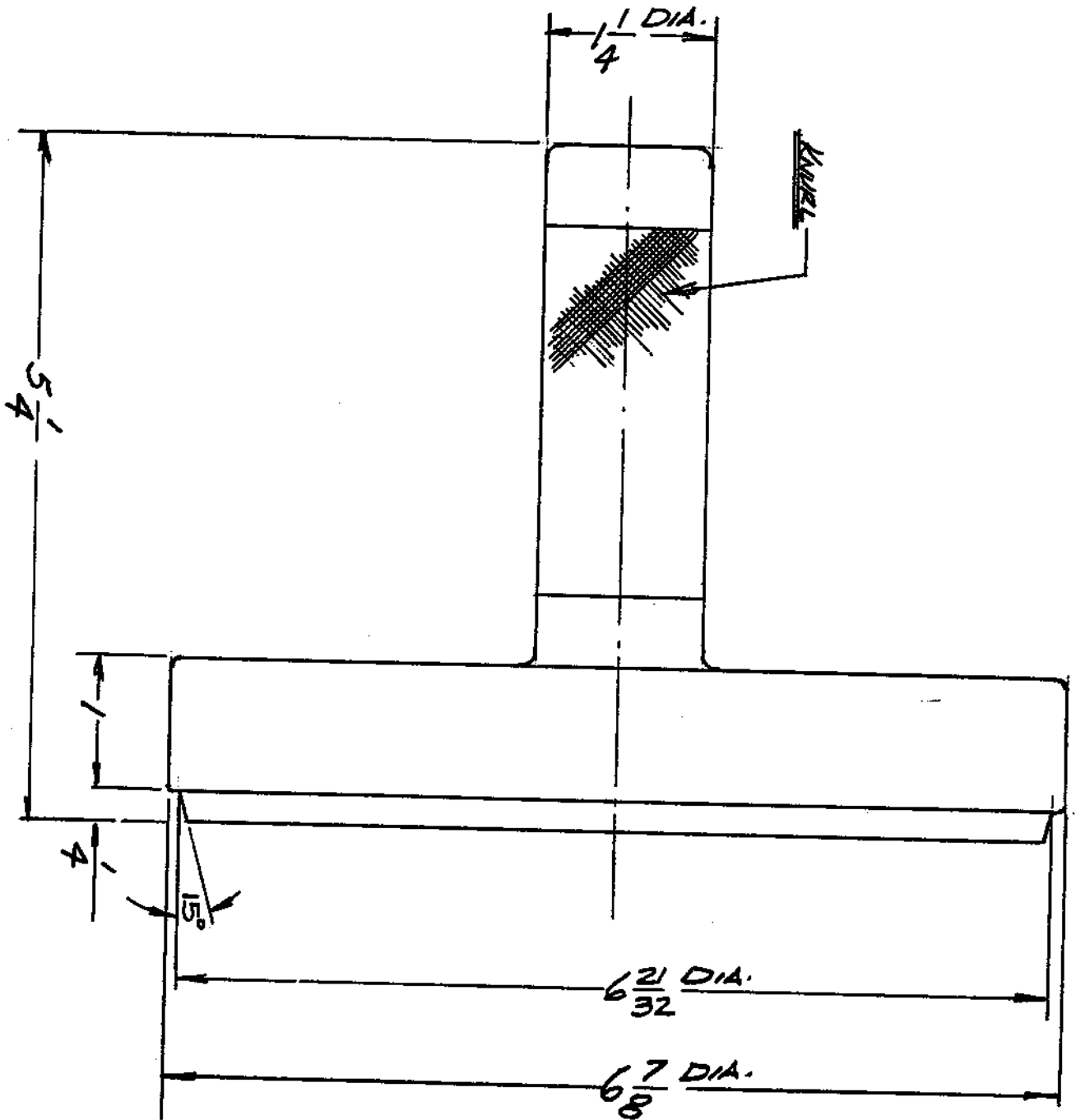
---

The following specialized tools may be used to assemble this unit. The tool diagrams included in this manual are for the customer who wishes to have a tool made. All tools exist as one piece and must be made from mild steel. All dimensions are given in inches.

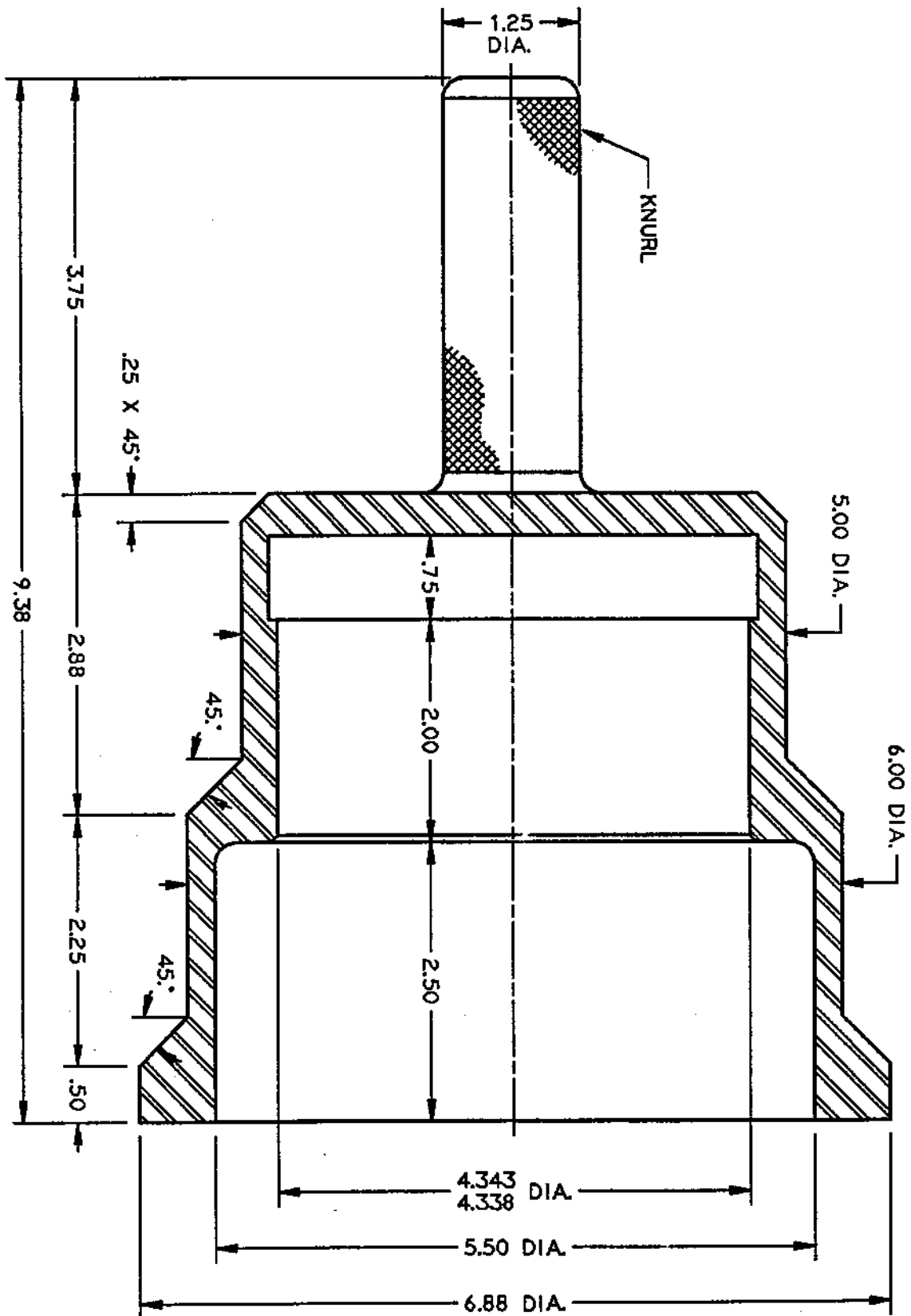
**OPTIONAL:** In order to improve tool life, tools may be carburized and hardened. If this is done, however, the tools must be ground on all surfaces labeled with a "G" on the tool diagram.

- 1.) T-140433  
ASSEMBLY PRESSING TOOL for BEARING CUP (3C)
  
- 2.) T-158045  
ASSEMBLY PRESSING TOOL for BEARING CUP (1C)
  
- 3.) T-160766  
ASSEMBLY PRESSING TOOL for SEAL (1B)
  
- 4.) T-161038  
ASSEMBLY PRESSING TOOL for SEAL (1B)

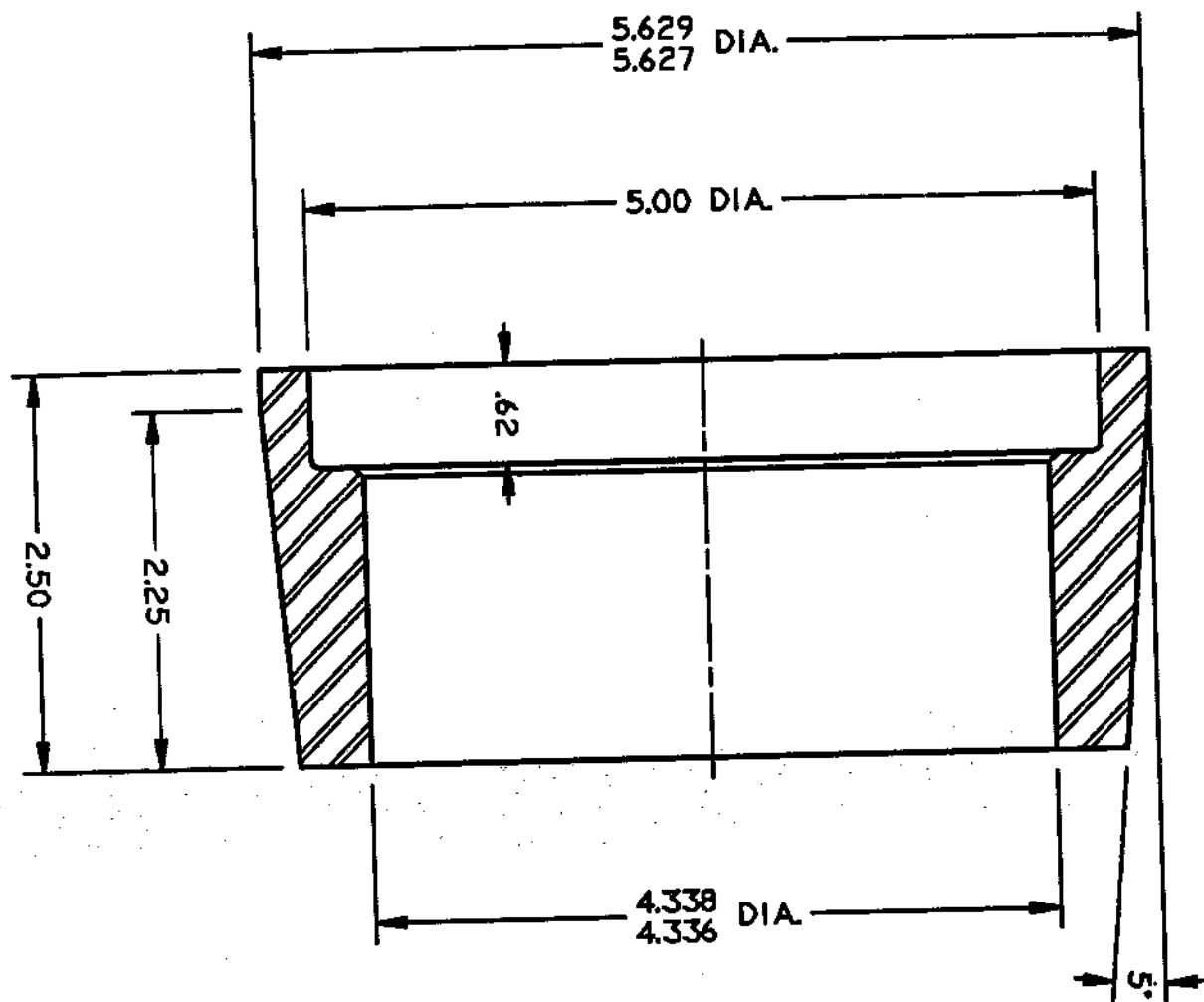




T-158045  
ASSEMBLY PRESSING TOOL for BEARING CUP (1C)



T-160766  
 ASSEMBLY PRESSING TOOL for SEAL (1B)

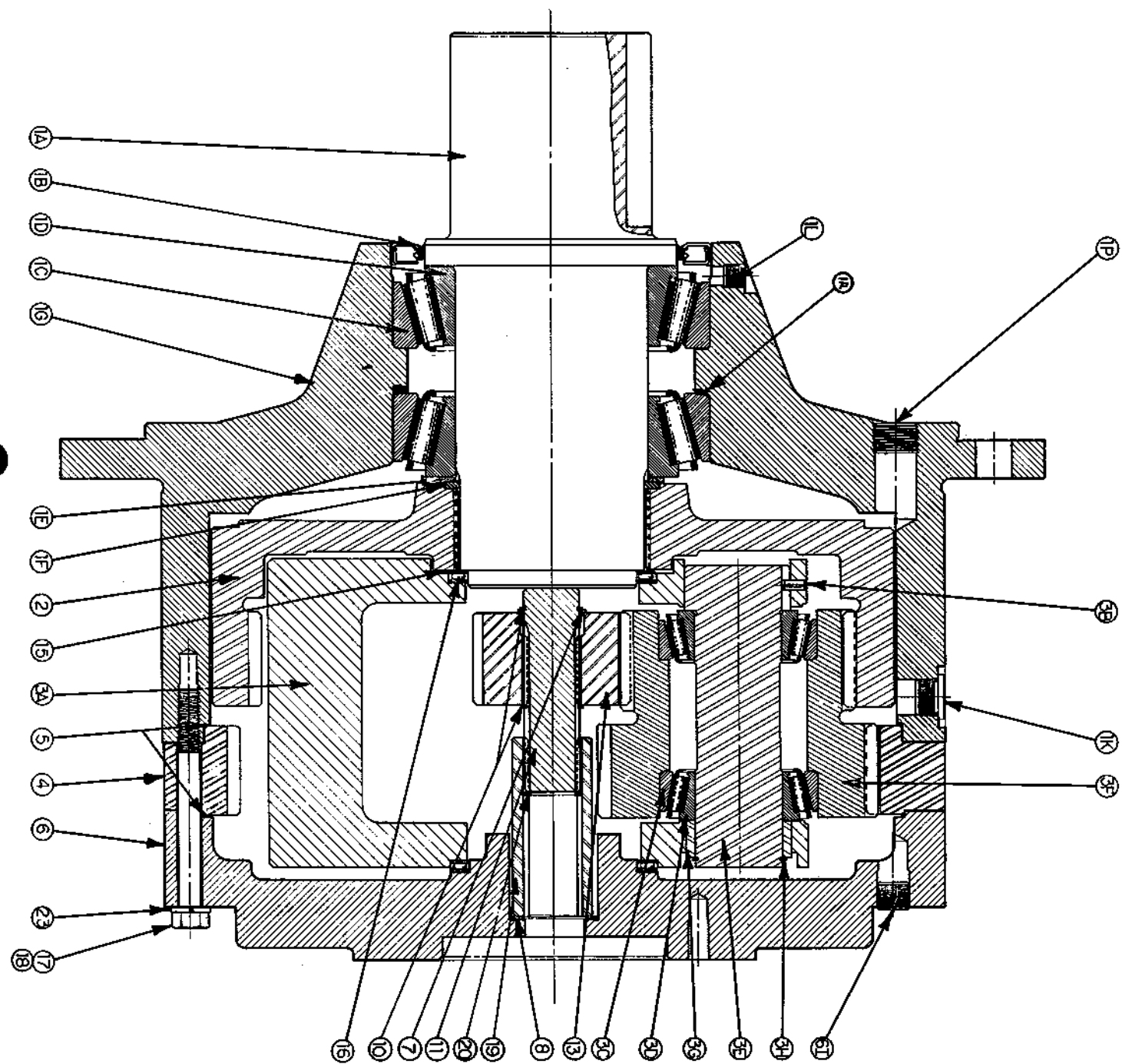


T-161038  
 ASSEMBLY PRESSING TOOL for SEAL (1B)

## PARTS LIST FOR "A" DRIVE

ITEM	QTY.	DESCRIPTION
1	1	HUB-SHAFTSUB-ASSEMBLY
1A	1	OUTPUT SHAFT
1B	1	SEAL
1C	2	BEARING CUP
1D	2	BEARING CONE
1E	1	BEARING SHIM/WASHER
1F	1	RETAINING RING
1G	1	HUB
1K	1	PLUG
1L	1	PIPE PLUG
1P	2	MAGNETIC PIPE PLUG
1R	1	SHIM SET
2	1	INTERNAL GEAR
3	1	CARRIER SUB-ASSEMBLY
3A	1	CARRIER HOUSING
3B	3	ROLL PIN
3C	6	BEARING CUP
3D	6	BEARING CONE
3E	3	PLANET SHAFT
3F	3	CLUSTER GEAR
3G	3	SPACER
3H	3	RETAINING RING
4	1	RING GEAR
5	2	"O" RING
6	1	COVER
6I	2	MAGNETIC PIPE PLUG
7	1	WASHER
8	1	THRUST WASHER
10	2	RETAINING RING
11	1	INPUT SHAFT
13	1	INPUT GEAR
15	4	THRUST WASHER
16	2	THRUST BEARING
17	16	BOLT
18	4	SHOULDER BOLT
19	1	COUPLING
20	1	RETAINING RING
22	4	LOCK WASHER
23	16	LOCK WASHER
24	1	ID PLATE
25	4	DRIVE SCREW

## CROSS-SECTIONAL VIEW OF "A" DRIVE





## PARTS LIST FOR "B" DRIVE

---

ITEM	QTY.	DESCRIPTION
1	1	HUB-SHAFTSUB-ASSEMBLY
1A	1	OUTPUT SHAFT
1B	1	SEAL
1C	2	BEARING CUP
1D	2	BEARING CONE
1E	1	BEARING SHIM/WASHER
1F	1	RETAINING RING
1G	1	HUB
1K	1	PLUG
1L	1	PIPE PLUG
1P	2	MAGNETIC PIPE PLUG
1R	1	SHIM SET
2	1	INTERNAL GEAR
3	1	CARRIER SUB-ASSEMBLY
3A	1	CARRIER HOUSING
3B	3	ROLL PIN
3C	6	BEARING CUP
3D	6	BEARING CONE
3E	3	PLANET SHAFT
3F	3	CLUSTER GEAR
3G	3	SPACER
3H	3	RETAINING RING
4	1	RING GEAR
5	2	"O" RING
6	1	COVER
6I	2	MAGNETIC PIPE PLUG
8	1	THRUST WASHER
13	1	INPUT GEAR
15	4	THRUST WASHER
16	2	THRUST BEARING
17	16	BOLT
18	4	SHOULDER BOLT
22	4	LOCK WASHER
23	16	LOCK WASHER
24	1	ID PLATE
25	4	DRIVE SCREW

## CROSS-SECTIONAL VIEW OF "B" DRIVE

