

# Torque-Hub® Final Drives

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## Service Manual



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# Introduction

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This Service Manual is a step-by-step guide designed for the customer or shop mechanic who is servicing or repairing a particular model of Torque-Hub Final Drive. (The model covered by this copy of the Manual is specified on the Manual cover.)


Included are —

1. assembly and exploded view drawings
2. disassembly procedure
3. main assembly procedure (assuming all sub-assemblies to be intact)
4. sub-assembly procedures.

At the time of printing, this Manual was complete for the specific Torque-Hub model designated. However, Fairfield Manufacturing Co., Inc., reserves the right to update and improve its products at any time. All specifications and procedures are therefore subject to change without notice.

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## Safety

Standard safety practices should be followed during the disassembly and assembly procedures described. Safety glasses and safety shoes should be worn; heavy, heat resistant gloves should be used when heated components are handled. Be especially alert when you see a caution symbol () . This symbol indicates that a particular operation could cause personal injury if not performed properly or if certain safety procedures are not followed.

# 31A-"B" DRIVE

## Disassembly Procedure

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1. Loosen all 12 Cover Bolts (12)&(13) and drain the oil from the unit.
  2. Remove the 12 Cover Bolts (12)&(13) and lift off the Cover (6). Remove and discard the "O" Ring (5) from the counterbore of the Cover (6).
  3. Remove the Input Gear (8) and Thrust Washer (10).
  4. Lift out the Carrier Assembly (3) and top Thrust Washer (11). This Thrust Washer (11) may stick to the inside of the Cover (6).
  5. Remove the Input Thrust Spacer (9).
  6. Lift out the Internal Gear (2) and Thrust Washer (11). The Thrust Washer (11) may stick to the under side of the Carrier (3).
  7. Remove the Retaining Ring (1) from the Output Shaft (1A) and discard.
-  Eye Protection should be worn during Retaining Ring (1) removal.
8. Remove Bearing Shim (1H) from the Output Shaft (1A).
  9. The Output Shaft (1A) may now be pressed out of the Hub (1G).
  10. The Bearing Cups (1C)&(1E) will remain in Hub (1G) as will Bearing Cone (1F). Bearing Cone (1D) will remain on the Output Shaft (1A). The Seal (1B) will be automatically removed during this procedure.

**NOTE:** If Bearing replacement is necessary, the Bearing Cups can be removed with a slide hammer puller or driven out with a punch.

11. To remove the Cluster Gears (3F) from the Carrier (3A), drive the Anti-roll Pin (3G) into the Planet Shaft (3E). The Planet Shaft (3E) may now be tapped out of the Carrier. After Planet Shaft (3E) has been removed the Roll Pin (3G) can be driven out.

12. The Cluster Gear (3F) can now be removed from the Carrier (3A). The Thrust Washers (3B) will be removed with the Cluster Gear (3F).

13. The Needle Rollers (3C) and Spacer (3D) are now removed from the Cluster Gear (3F).

**WARNING:** When rebuilding or repairing the unit, the Retaining Ring (1), "O" Rings (5) and Seal (1B) should ALWAYS be replaced.

# Main Assembly Procedure




1. With the Hub Shaft Sub-assembly resting on the Shaft (1A) install Internal Gear (2). The Spline of the Internal Gear (2) bore will mesh with the Spline of the Output Shaft (1A).



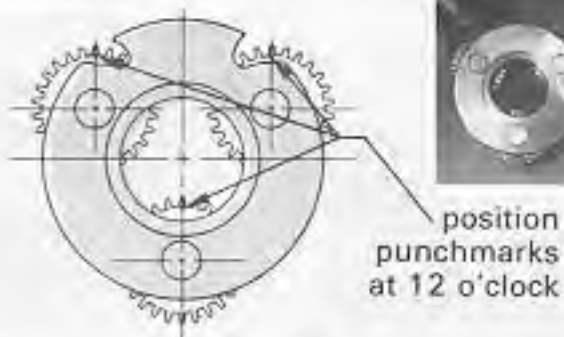
2. Thrust Washer (11) is installed on the face of the Output Shaft (1A). Sufficient Grease or Petroleum Jelly should be used to hold Thrust Washer (11) in place.



3. Place "O" Ring (5) into Hub counterbore. Use petroleum jelly to hold "O" Ring in place.  
 Beware of sharp edges of the counterbore while seating this "O" Ring.  
Also at this time locate and mark the 4 counter beamed holes in the face of the Hub (1G). This is for identification later in the assembly.



4. Thrust Spacer (9) is installed into the bore of the Output Shaft (1A). This should be a slip fit and the Thrust Spaces should rotate in this location.



- Place Carrier Assembly (3) on a flat surface with the large gears (3F) up and positioned as shown. Find the punch marked tooth on each large gear (3F) and locate at 12 o'clock (straight-up) from each planet pin. Marked tooth will be located just under the Carrier (3A) on upper two gears (3F).



- With shoulder side of Ring Gear (4) facing down, place Ring Gear over (into mesh with) large gears. Be sure that punch marks remain in correct location during Ring Gear installation. The side of the Ring Gear with an "X" stamped on it should be up.



- While holding Ring Gear (4) and Cluster Gears (3F) in mesh, place small side of Cluster Gears (3F) into mesh with the Internal Gear (2) and Input Gear (13). On the Ring Gear locate the hole marked "X" over one of the marked counterbored holes (Step 3) in Hub (1G).

**NOTE:** If gears do not mesh easily or Carrier Assembly does not rotate freely, then remove the Carrier and Ring Gear and check the Cluster Gear timing.



- Input Gear (8) is installed, meshing with the teeth of the large diameter Cluster Gear (3F). The counterbore on the Input Gear (8) locates on the shoulder of the Thrust Spacer (9). This is to be a slip fit and operate freely.



9. Thrust Washer (10) is installed onto the Input Gear (8) and should locate on the gear teeth shoulder.



10. Thrust Washer (11) is installed into the counterbore of the Carrier (3).



11. Place "O" Ring (5) into Cover (6) counterbore. Use petroleum jelly to hold "O" Ring in place.

⚠ Beware of sharp edges of the counterbore while seating this "O" Ring.



12. The Cover (6) is now installed on this assembly. Taking care to correctly align Pipe Plug hole (20) with those in the Hub (1J), usually 90° to one another.

Locate the 4 counterbore holes in Hub (1G) [marked in Step 3] and install 4 Shoulder Bolts (13). A slight tap with a hammer may be necessary to align Shoulder Bolt with Hub (1G) counterbore.



13. Install regular Grade 8 Bolts (12) into remaining holes.





14. Pipe Plugs (20) are to be installed into Cover (6) using a lubricant seal of some sort.



15. Torque Shoulder Bolts (13) to 23-27 ft.-lbs. and regular Grade 8 Bolts (12) to 23-27 ft.-lbs.

This completes the assembly. The unit must be filled one-half full of EP 90 lubricant before operation if the unit is mounted horizontally, and completely filled if mounted vertically. In vertical mounting application case oil circulation is recommended.

# Hub Shaft Sub-Assembly



1. Press Bearing Cone (1D) onto Shaft (1A).



2. Press Bearing Cup (1C) into Hub (1G) taking care to insure cup start square with the bore of Hub (1G).



3. Invert Hub (1G) and press Bearing Cup (1E) into intercounterbore of Hub (1G).



4. Returning the Hub (1G) to locate on the large diameter end, the Output Shaft (1A) is carefully installed into the Hub (1G).





5. The Shaft Seal (1B) is installed over the Output Shaft (1A) and into the counterbore of the Hub (1G). Care should be taken to insure the Seal (1B) is being correctly installed (smooth face UP and located just flush with the counterbore face).



6. The Bearing Cone (1F) is an interference fit and has to be pressed or tapped on.



7. Pipe Plugs (1J & 1K) should be checked and/or installed at this time in the assembly.



8. Bearing Spacer (1H) is installed around the Output Shaft (1A) and locates on Bearing Cone (1F).



9. Retaining ring (1I) installed into the groove provided in the Output Shaft (1A). This Retaining Ring (1I) should never be reused in a repair or rebuild.

⚠ Eye protection should be worn during this procedure.



10. A soft metal punch should be used to insure that this Retaining Ring (11) is completely seated in the groove of the Output Shaft (1A).

⚠ Eye protection should be worn during this procedure.



11. Upon completion of Step 10, rap the internal end of the Output Shaft (1A) twice with a piece of soft metal rod. This will release the preload which was on the Bearings.

This completes the Hub Shaft Sub-Assembly—Items (1A) through (1J). If this assembly is not going to be used right away, it should be oiled and covered to help prevent rusting.

## Carrier Sub-Assembly



1. Apply a coat of grease or petroleum jelly to Cluster Gear bore.



2. Place sixteen Needle Rollers into Cluster Gear bore.



3. Place Spacer washer into opposite side of Cluster Gear and against Needle Rollers.



4. Place second set of sixteen Needle Rollers into Cluster Gear.



5. Apply grease or petroleum jelly to the tang side of two Thrust Washers. Place Thrust Washers against bosses in Carrier with washer tang fitting into slot in Carrier outside diameter.

Note: Some old style Carriers will not have slots and tangs should be located inside boss relief.



6. While keeping Thrust Washers in place, slide Cluster Gear into Carrier with the larger gear on the side with the small pin hole.

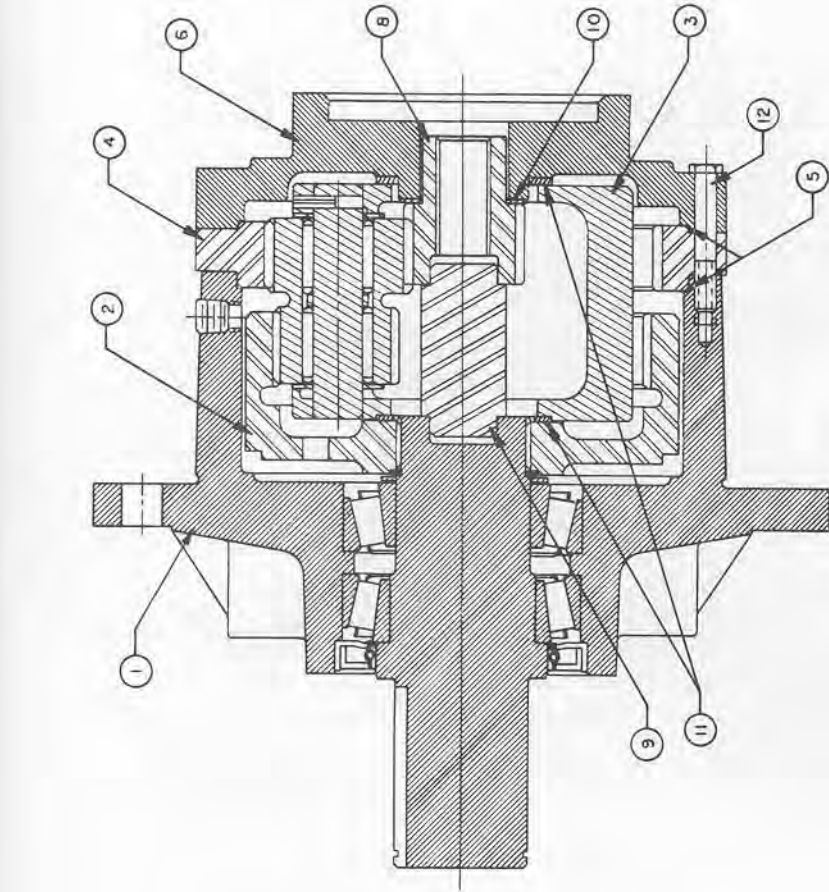


7. Line up Cluster Gear and thrust Washers with hole in Carrier and slide Planet Shaft through. Line up chamfered side of hole in Planet Shaft with pin hole in Carrier.



8. Drive Anti-Roll Pin flush into Carrier hole, thereby locking Planet Shaft into place.

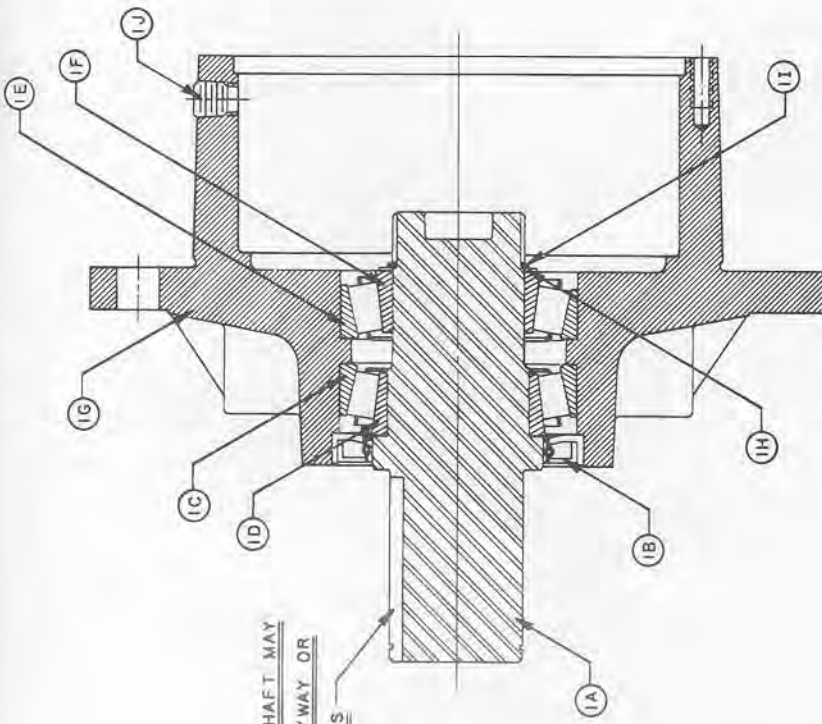
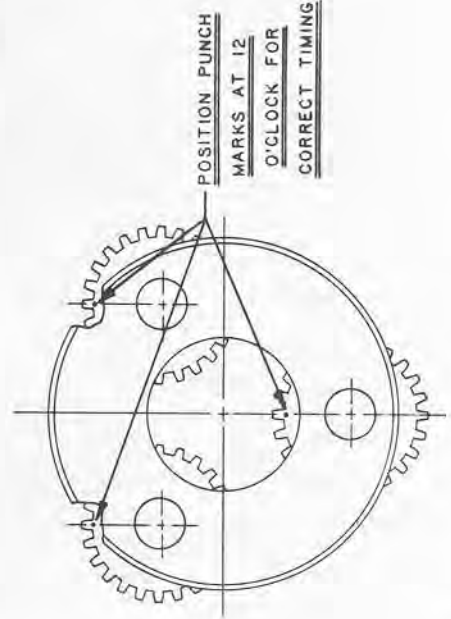
Repeat these steps for remaining two Cluster Gears to complete Carrier Sub Assembly.



COMPLETE ASSEMBLY

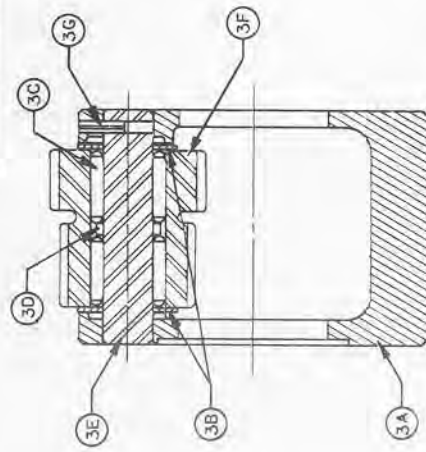


VIEW OF SHOULDER BOLT

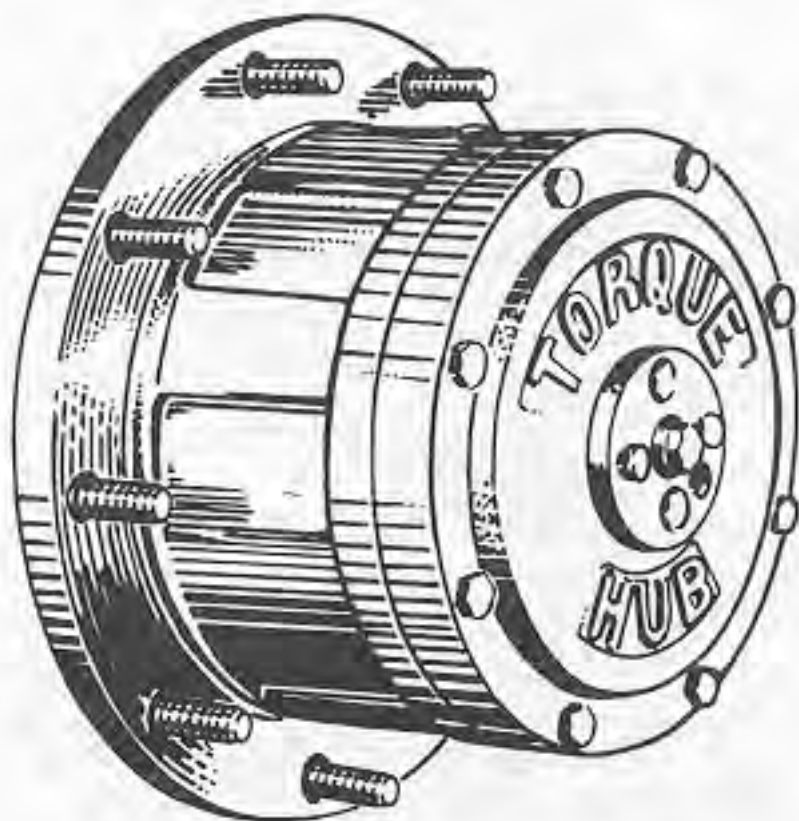


OUTPUT SHAFT MAY HAVE KEYWAY OR SPLINES

HUB-SHAFT SUBASSEMBLY



CARRIER SUBASSEMBLY



FOR MATERIAL HANDLING EQUIPMENT, FARM MACHINERY, ROAD EQUIPMENT, MINING MACHINERY, ETC.

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