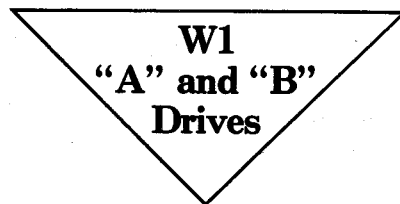


TORQUE-HUB[®]

Final Drives

ASSEMBLY-DISASSEMBLY MANUAL

FOR THE



UNIT

FAIRFIELD

GEARED FOR EXCELLENCE

This service manual is for WI "A" or "B" drives.
There are different Main Assemblies for "A" and "B" drives, but
all other sections of the manual are the same (unless noted) for "A" or "B" drives.

INTRODUCTION

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 the disassembly/assembly procedures of this manual. The identification numbers refer to parts in the Parts List section of this manual and to parts in the Cross-Sectional View of the units.

The Tool List mentions any specialized tools normally used to assemble this unit, and the tool print pages contain diagrams of the tools in the Tool List. However, it is not mandatory that these tools be used in this unit's assembly. 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 found on page III before getting started.

SAFETY

Follow standard safety practices during the disassembly and assembly procedures. 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 not performed properly or if certain safety procedures are not followed.

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.

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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 you should examine them 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

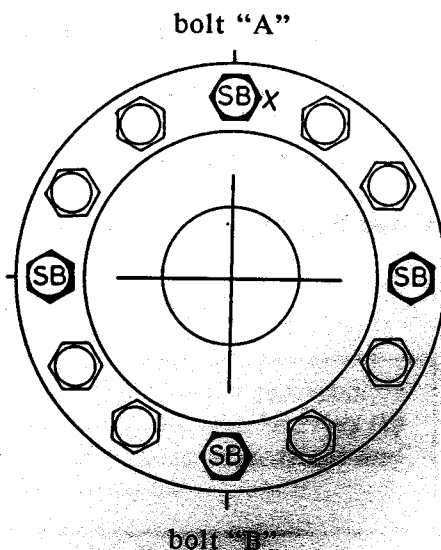
The purpose of a leak test is to make sure the unit is air tight. You can tell if your unit has a leak if the pressure gauge reading on your air checker starts to fall once you have pressurized the unit. Leaks will most likely occur at the main seal or wherever "O" rings or gaskets are located. Usually you can detect the exact location of a leak 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, replace the part immediately.

TIGHTENING and TORQUING BOLTS

If you use an air impact wrench to tighten bolts, take extreme care to insure that you do NOT tighten the bolts beyond their indicated torque specification. Never use an impact wrench to tighten shoulder bolts. Always 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 -- EP90

On normal applications, use EP90. 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. (See Diagram A.)

Approximate volume - 17 oz. [0.5 ltr]

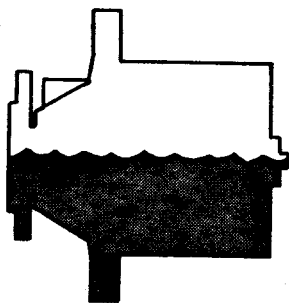


Diagram A

There are two different Main Assemblies: one has steps for units with "A" drives, and one has steps for units with "B" drives.

To determine if you have an "A" or "B" drive unit, look at the model code on the ID tag of your unit:

- If the last two digits of your model code are 18, 24, 40 or 60, you have an "A" drive.
- If the last two digits of your model code are 30, 35, 49 or 68, you have a "B" drive.

IMPORTANT: When rebuilding a unit, use new seals and "O" rings. Never re-use seals and "O" rings, as this could cause your unit to have a leak.

MAIN DISASSEMBLY for "A" Drives

1. Turn hub (1G) over onto its side. Remove coupling (14) from the wide end of spindle (1A).
2. Mark location of shoulder bolt holes on outside of ring gear and hub for easy re-alignment when rebuilding. Remove the four shoulder bolts (13) and twelve bolts (12) from cover (6).
3. Remove the sixteen flat washers (16) from cover (6).
4. Lift cover sub-assembly (6) off of ring gear (4), and carefully set cover on table, interior side facing up. (You will disassemble cover later.)

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

5. Remove "O" ring (5) from the counterbore around the edge of cover (6A). Discard the "O" ring.

NOTE: If "O" ring is not in the cover counterbore, it is in the ring gear counterbore. Remove it from the hub and discard it.

6. Remove thrust washer (11) from the counterbore in top of carrier (3A).
7. Lift ring gear (4) off of hub (1G).
8. Lift carrier sub-assembly (3) out of hub (1G).
9. Remove thrust spacer (10) from on input shaft sub-assembly (7) in the middle of spindle (1A).

["A" Disassembly continued on next page]

MAIN DISASSEMBLY for "B" Drives

1. Turn hub (1G) over onto its side. Remove coupling (14) from the wide end of spindle (1A).
2. Mark location of shoulder bolt holes on outside of ring gear and hub for easy re-alignment when rebuilding. Remove the four shoulder bolts (13) and twelve bolts (12) from cover (6).
3. Remove the sixteen flat washers (16) from cover (6).
4. Lift cover sub-assembly (6) off of ring gear (4), and set cover on table, interior side facing up.

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

5. Remove "O" ring (5) from the counterbore around the edge of cover (6A). Discard the "O" ring.

NOTE: If "O" ring is not in the cover counterbore, it is in the ring gear counterbore. Remove it from the hub and discard it.

6. Remove thrust washer (11) from the counterbore in top of carrier (3A).
7. Remove input gear (8) from the middle of carrier sub-assembly (3).
8. Lift ring gear (4) off of hub (1G).
9. Lift carrier sub-assembly (3) out of hub (1G).

["B" Disassembly continued on next page]

Main Disassembly - continued

Main Disassembly for "A" Drive - continued

10. Remove input gear (8) from input shaft sub-assembly (7).
11. Remove thrust spacer (9) from input shaft sub-assembly (7).
12. Remove input shaft sub-assembly (7) from the middle of spindle (1A), and stand input shaft (7A) on its splined end.

CAUTION: Wear safety glasses during this step, and be aware that spring and spacers compressed by retaining ring may pop suddenly off shaft when you remove the retaining ring.

13. Using retaining ring pliers, remove retaining ring (7B) from the groove on input shaft (7A).
 14. Remove one spacer (7D), one spring (7C) and other spacer (7D) from input shaft (7A).
 15. Remove thrust washer (11) from around spindle (1A).
 16. Lift internal gear (2) out of hub (1G).
- CAUTION:** Beware of sharp edges in counterbore when you remove the "O" ring.
17. Remove "O" ring (5) from the counterbore in hub (1G). Discard the "O" ring.
 18. At this point, the main disassembly for "A" drives is complete.

Main Disassembly for "B" Drive - continued

10. Remove thrust spacer (9) from input shaft (7) in the middle of spindle (1A).
11. Lift input shaft sub-assembly (7) out of middle of spindle (1A), and stand input shaft (7A) on its splined end.

CAUTION: Wear safety glasses during this step, and be aware that spring and spacers compressed by retaining ring may pop suddenly off shaft when you remove the retaining ring.

12. Using retaining ring pliers, remove retaining ring (7B) from the groove on input shaft (7A).
13. Remove one spacer (7D), one spring (7C), and other spacer (7D) from input shaft (7A).
14. Remove thrust washer (11) from around spindle (1A).
15. Lift internal gear (2) out of hub (1G).

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

16. Remove "O" ring (5) from the counterbore in hub (1G). Discard the "O" ring.
17. At this point the main disassembly for "B" drives is complete.

HUB-SPINDLE DISASSEMBLY

NOTE: Start with large end of hub facing up, large end of spindle facing down.

CAUTION: Wear safety glasses during this step.

1. Remove retaining ring (1I) from around spindle (1A) in hub (1G).

2. Remove spacer (1H) from around spindle (1A) in hub (1G).

3. Set hub (1G), small end/spindle facing down, up on something that will support the hub's flange while it lifts hub up so spindle is not resting on anything. Carefully press or hammer spindle (1A) down out of hub (1G). **NOTE:** If seal (1B) and bearing cone (1D) come out of hub and rest on spindle, remove these parts from the spindle and set them aside. Discard the seal.

4. If seal and bearing cone did not come out of the small end of hub (1G) when you pressed spindle out of hub, remove seal (1B) and bearing cone (1D) from the small end of hub (1G). Discard the seal.

5. Bearing cone (1F) should be lying loose in wide end of hub (1G). Remove bearing cone (1F) from inside hub (1G).

NOTE: If you use a punch and hammer, make sure you do not strike the counterbore with the punch when you remove the bearing cup.

6. Remove bearing cup (1C) from the counterbore in the small end of hub (1G).

NOTE: If you use a punch and hammer, make sure you do not strike the counterbore with the punch when you remove the bearing cup.

7. Turn hub (1G) over and lift it out of the flange-support. Remove bearing cup (1E) from the counterbore in the wide end of hub (1G).

8. Turn hub (1G) over onto its small end. Remove two pipe plugs (1J) from the two pipe plug holes in the side of hub (1G).

NOTE: If your unit does not have studs, skip this step:

9. Press the nine studs (1N) out of the stud holes in hub (1G).

10. At this point the hub-spindle disassembly is complete.

COVER DISASSEMBLY

1. Remove the two bolts (6C) holding disconnect cap (6D) to cover (6A).

2. Remove disconnect cap (6D) from on top of cover cap (6B) and cover (6A).

3. Remove the two bolts (6C) holding cover cap (6B) to cover (6A).

4. Remove cover cap (6B) from cover (6A).

5. Remove disconnect rod (6E) from cover cap (6B).

6. Pry "O" ring (6F) out of the groove inside cover cap (6B). Discard the "O" ring.

7. Remove "O" ring (6G) from the flange of cover cap (6B). Discard the "O" ring.

8. Remove pipe plug (6H) from cover (6A).

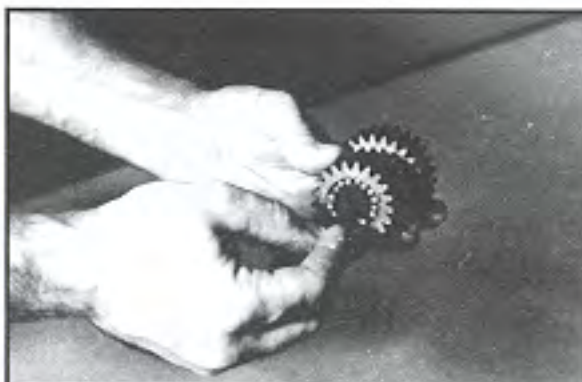
9. At this point the cover disassembly is complete.

CARRIER DISASSEMBLY

NOTE: When you remove the needle rollers from the cluster gears, discard the old needle rollers and use new ones during re-assembly.

1. Using a punch and hammer, drive **roll pin (3G)** into **planet shaft (3E)**. NOTE: If you don't drive the roll pin all the way into the planet shaft, you could damage the carrier when you remove the planet shaft from the carrier.
2. Using a punch and hammer, drive **planet shaft (3E)** out of the planet shaft hole in **carrier housing (3A)**.
3. When you remove **planet shaft (3E)** from the carrier housing, one **thrust washer (3B)**, one **cluster gear (3F)**, and one more **thrust washer (3B)** will come off of the planet shaft and come to rest inside the carrier. Remove these parts from inside the carrier.
4. Remove 16 **needle rollers (3C)** from inside one end of **cluster gear (3F)**. Discard the needle rollers.
5. Remove one **spacer (3D)** from inside **cluster gear (3F)**.
6. Remove the remaining 16 **needle rollers (3C)** from the other side of **cluster gear (3F)**. Discard the needle rollers.
7. Repeat steps 1-6 to remove and disassemble the two remaining cluster gears.
8. At this point the carrier disassembly is complete.

CARRIER SUB-ASSEMBLY



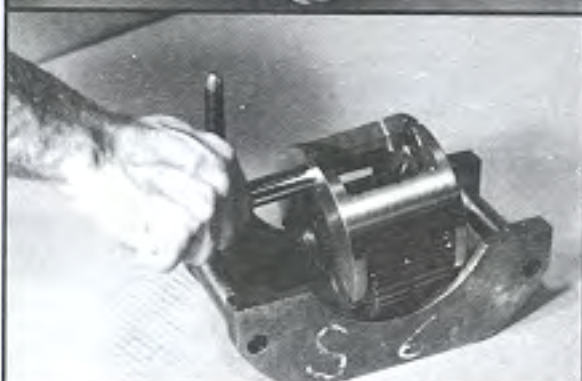
1. Apply grease to the inside of one cluster gear (3F) and line one half of cluster gear with 16 needle rollers (3C).



2. Place one spacer (3D) inside cluster gear (3F) so that it rests on top of the needle rollers.



3. Line the remaining half of cluster gear (3F) with 16 needle rollers (3C).



4. Set carrier housing (3A) on table, sideways. Insert a planet shaft (3E), roll pin hole last, into one of the planet shaft holes from roll-pin-holed side of carrier housing (3A).



5. Place one thrust washer (3B) onto the end of planet shaft (3E) inside carrier. Fit tang of thrust washer into the slot on the inside edge of the planet shaft hole.



6. Following the thrust washer, place cluster gear (3F), large end toward roll pin hole in carrier housing, onto planet shaft (3E).



7. Following the cluster gear, place one more thrust washer (3B) onto planet shaft (3E), fitting the tang of thrust washer into the slot on the inside edge of the planet shaft hole. Now insert planet shaft (3E) through the opposite planet shaft hole in carrier housing (3A).



8. Use an alignment punch or similar tool to align the roll pin holes in carrier housing (3A) and planet shaft (3E).



9. Drive roll pin (3G) down into the aligned roll pin holes in carrier housing (3A) and planet shaft (3E).

10. Repeat steps 1-9 to assemble and install the two remaining cluster gears.

11. At this point the carrier sub-assembly is complete.

COVER SUB-ASSEMBLY



1. Using disconnect rod, push "O" ring (6F) into the groove inside cover cap (6B).



2. Place "O" ring (6G) onto cover cap (6B) so that it rests against the flange of cover cap.



3. Insert disconnect rod (6E) into cover cap (6B).



4. Set cover (6A) on table, exterior side up. Place cover cap (6B) onto cover (6A), aligning the pipe plug hole in the cover cap over the pipe plug hole in the cover.



5. Place two of the cover cap bolts (6C) into any two bolt holes that are 180° apart on cover cap (6B), and tighten bolts.



6. Using a torque wrench, apply 36-49 in.-lbs. [4-5 Nm] of torque to both bolts (6C).



7. With large end down, place disconnect cap (6D) onto cover cap (6B), aligning the pipe plug hole in the disconnect cap over the pipe plug hole in the cover cap.



8. Place the two remaining bolts (6C) into the bolt holes in disconnect cap (6D), and tighten bolts.



9. Using a torque wrench, apply 36-49 in.-lbs. [4-5 Nm] of torque to both bolts (6C).

10 Cover Sub-Assembly



10. Apply a light coat of "Never-Seize" to pipe plug (6H) and tighten it into the pipe plug hole in cover (6A).

11. At this point the cover sub-assembly is complete.

HUB-SPINDLE SUB-ASSEMBLY



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

1. Set hub (1G) onto its large end. Press bearing cup (1C) into the counterbore in the small end of hub (1G).



NOTE: If your unit does not have studs, skip this step:

2. Press the nine studs (1N) into the stud holes in hub (1G).



3. Apply a light coat of "Never-Seize" to two pipe plugs (1J) and tighten them into the two pipe plug holes in the side of hub (1G).



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

4. Turn hub (1G) over onto its small end. Press bearing cup (1E) down into the counterbore in the deep end of hub (1G).



5. Set hub (1G) onto its large end. Place bearing cone (1D) into bearing cup (1C).



6. Press seal (1B) into the small end of hub (1G).



7. Oil spindle, then lower hub (1G), small end down, onto spindle (1A).



8. Press bearing cone (1F) onto spindle (1A) in hub (1G).



9. Place spacer (1H) onto spindle (1A) in hub (1G).



NOTE: Make sure the retaining ring is securely seated in the groove.

10. Place retaining ring (11) over the spacer onto spindle (1A) in hub (1G).

11. At this point the hub-spindle sub-assembly is complete.

NOTE: There are "A" drive and "B" drive units, with different input shafts/gears. You will need to know if you have an "A" or "B" drive so you can complete your assembly. Look at your unit's model number on the ID tag and determine which you have:

- "A" drives have a model number whose last two digits are 18, 24, 40, or 60.
- "B" drives have a model number whose last two digits are 30, 35, 49, or 68.

This section is only for "A" drives. If you have a "B" drive, turn to page 21.

MAIN ASSEMBLY for "A" Drive Units Only



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

1. Grease "O" ring (5) and place it into the counterbore in hub (1G).
- NOTE:** "O" ring may be stretched or pinched together to make it fit the counterbore exactly.



2. Oil all exposed surfaces inside hub (1G).



3. Place internal gear (2) into hub (1G) so that its internal splines mesh with the external splines of spindle (1A). Oil internal gear (2).



4. Place thrust washer (11) around spindle (1A) so that it rests on the bottom of internal gear (2).



5. Stand input shaft (7A) on its splined end. Place one spacer (7D) onto the smooth end of input shaft (7A).



6. Place one spring (7C) onto the smooth end of input shaft (7A).



7. Place one other spacer (7D) onto the smooth end of input shaft (7A).



CAUTION: Wear safety glasses during this step, and be aware that spring and spacers compressed by retaining ring may pop suddenly off shaft if you release the ring before it is properly in place.

8. Using retaining ring pliers, insert retaining ring (7B) into the groove on input shaft (7A) by compressing the spring and spacers together.