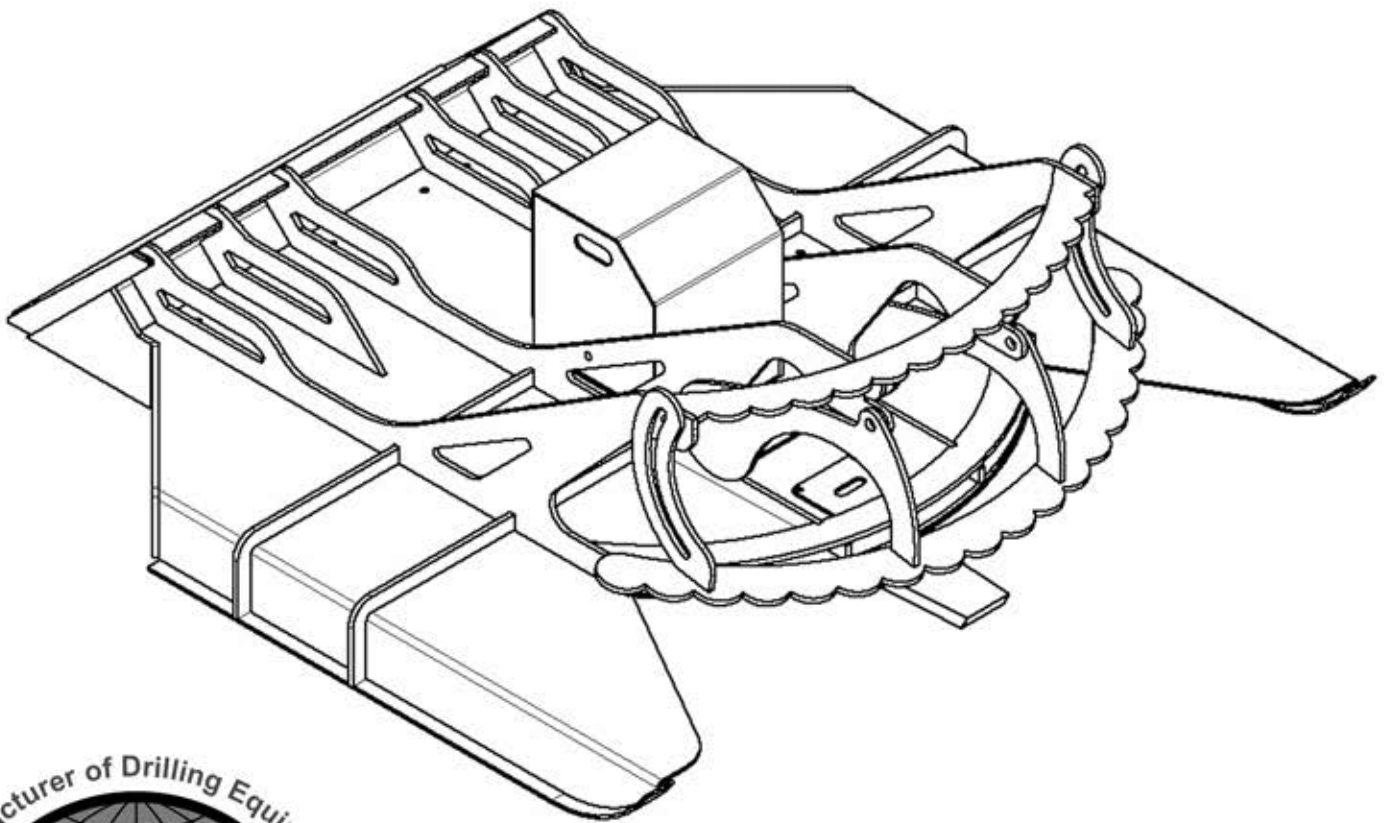


# **GROUND FORCE**

## **BRUSH BEAVER**

**HAR-BB72 & HAR-BB78**

# **Operation and Safety Manual**



**Harleman Manufacturing**

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**BULLET PROOF GLASS  
DOOR REQUIRED ON  
MACHINE**

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# Safety Symbols & Equipment Signs

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This is the safety alert symbol. When you see this symbol on your equipment or in this manual, be alert to the potential for personal injury or injury to others.



This symbol means to take notice. Following this symbol is useful and important information.

## Warning



Before using your new machine, you and all other operators should completely read through this manual. Failure to fully understand how to operate this machine and take safety precautions could lead to serious injury and death.



These signs should remain on the machine always, **DO NOT** remove. If the signs ever becomes lost or damaged they should be replaced.

**DANGER**

**ROTATING BLADES  
STAY BACK  
1000 FEET!**

# General Safety Instructions

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**Read through entire manual**



**Always keep the manual in a safe and easily accessible place.**



**Make sure to replace all missing or damaged decals.**



**Do not make unauthorized modifications to machine which could decrease it's stability and life or cause injury and possibly death. We also encourage you to only use authorized replacement parts from Harleman Mfg. which were made specifically for this machine.**



**If there is any part of this guide you do not understand feel welcome to call our shop at any time. The number is 417-876-3011.**



**Never use alcohol or drugs while using this machine, doing so could lead to serious injury or death.**



**Anyone under the age of 18 should not operate this machine.**



**Always wear relevant safety apparel. If using a skidsteer with an open cab you should always wear safety glasses and protective head gear. You never know when stray debris may ricochet your way.**

# Attaching the machine

## Part A

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# Attaching the machine

## Part B

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The skid steer must be equipped with a compatible Standard Universal Quick Mount Hitch and Front Auxiliary Hydraulics to connect and operate the machine.



The skid steer must be equipped with an Operator Front Protective Door. Serious injury or death can result from a thrown object hitting an unprotected operator.

### Securing Equipment to the Skid Steer

1. With the engine completely shut down and the parking brake set, rotate the skid steer latch handles upward to the unlatched position. The latch handles must be completely raised to fully retract the hitch lock pins.
2. Start the skid steer and tilt the hitch mounting plate forward while guiding the mounting plate crest under the attachment saddle of the mower. Raise and roll back the mounting plate until the mower hitch plate is securely seated flat against the skid steer mounting plate.
3. With the mower fully supported by the skid steer boom, lower the mower to ground level. Slightly tilt the front of the mower head upward about 2" from ground level. Turn off the engine, set the parking brake, and exit the skid steer. Push both latch handles downward to engage the hitch pins into the mower hitch retaining tabs. Now the mower hitch is securely attached to the mounting plate of the skid steer.

### Attaching the Hydraulic Lines

1. Before you connect hydraulic lines to the skid steer be sure that the hydraulic lines and quick couplers are of the same size and type.
2. With the skid steer completely shut down and secured in position and the mower resting at ground level, relieve auxiliary hydraulic pressure by moving the control levers back and forth several times.
3. When connecting the skid steer hydraulic lines to the mower, keep hoses, quick couplers, and swivels free of contamination. Clean dirt and other debris from the connections with a clean rag to prevent contamination of the hydraulic oil.
4. The mower will only operate with oil fed through the mower in one direction. If the mower does not operate when the auxiliary hydraulics are engaged, oil is probably being fed through the motor in the reverse direction. To correct this problem, reverse the hydraulic line connection between the mower and skid steer and engage the hydraulics again or try engaging the auxiliary hydraulic lever in the opposite direction.



# How to operate

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1. This machine was designed to cut brush and trees up to a **MAXIMUM 6" diameter**.
2. Proper operating speed for equipment will vary depending upon the height, density, and type of the material to be cut.
3. Stay alert and watch for power lines and solid ground objects.
4. Choose a driving pattern that provides the maximum pass length and minimizes turning.
5. If mowing in reverse, operate the skid steer and mower at a reduced ground speed to ensure skid steer and mower control is maintained.



For safety reasons never operate this machine with the deck up.



! Properly Cleaning and Storing your new machine is critical to maintaining it's appearance and ensuring years of service.

## Storage

1. Thoroughly clean all debris off the mower to prevent damage from rotting grass and standing water.
2. Check the mower for worn and damaged parts periodically. Perform repairs and make replacements immediately to prevent potential hazards.
3. Make sure to store the mower in a clean, dry place with the mower housing resting securely on blocks or at ground level.
4. Keep the hydraulic hose ends from sitting in water, dirt and other contaminants. Connect the mower's hydraulic lines together to prevent dirt and other contamination from entering the hydraulic system.
5. You can use spray touch-up enamel where necessary to prevent rust and to maintain the appearance of the mower.

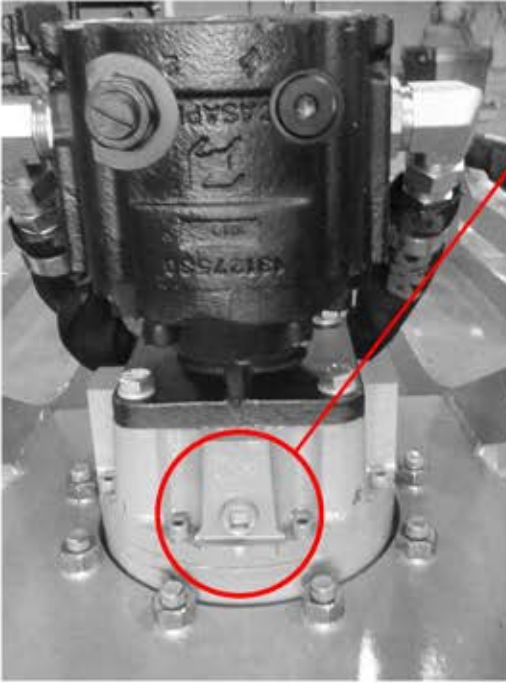


When not in use always make sure the machine is positioned flat on the ground.



# How To Change Oil

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## FILL PLUG

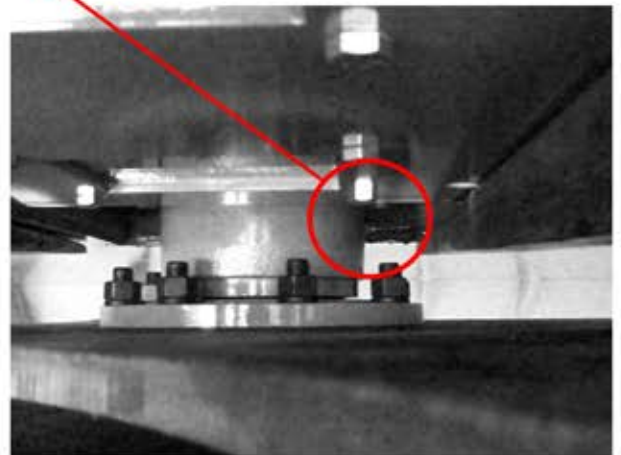
Fill with "1 Qt." of oil.  
(80-90 Full Synthetic)

Since our equipment  
ships ready to use  
there is no need to  
fill the drive with oil.  
The drive is prefilled  
prior to shipping.



## DRAIN PLUG

Change oil every 500  
hours.

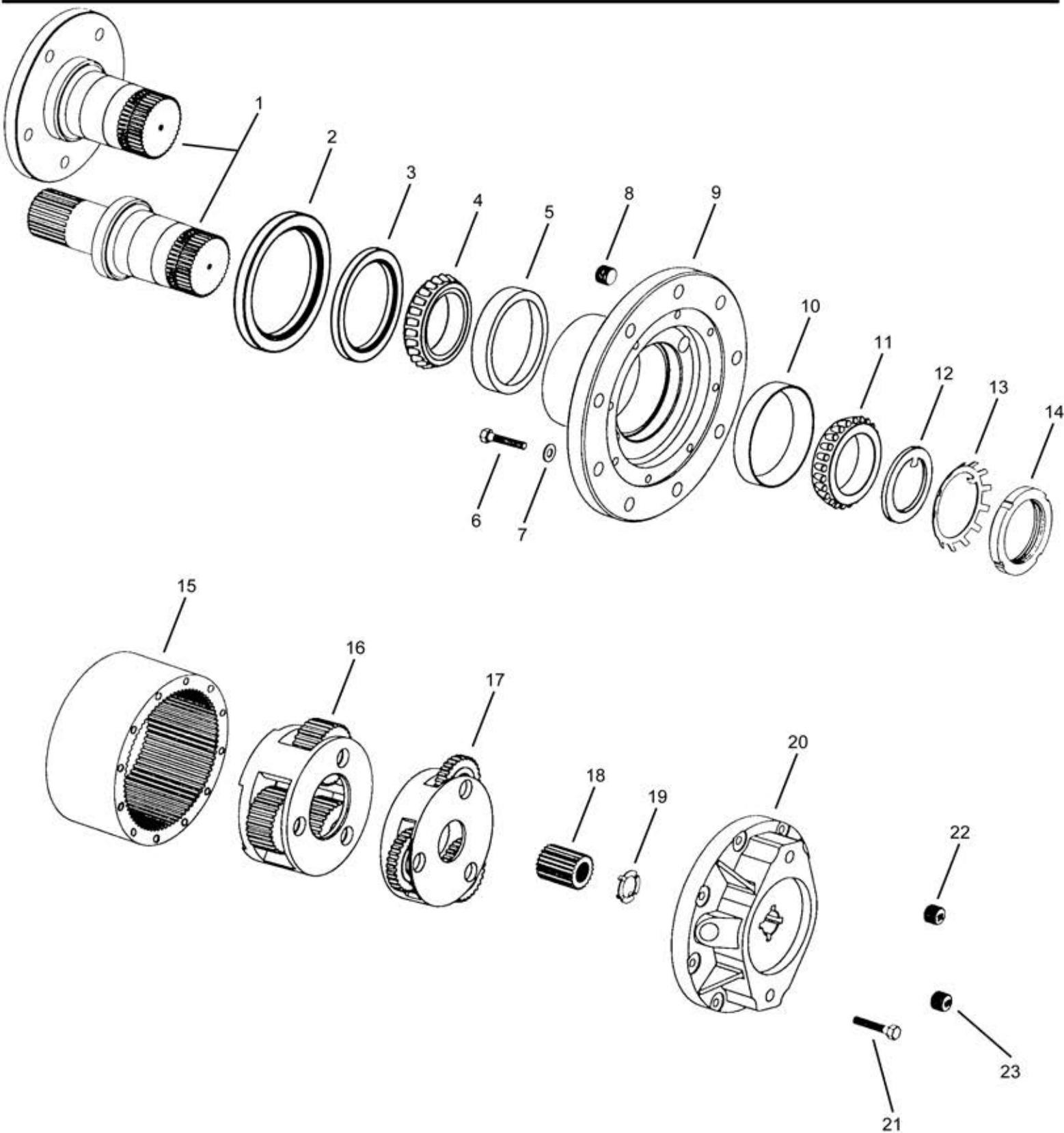




**Power Wheel® Service Manual**  
**Model 7 Double Reduction**  
**Shaft and Spindle Output Drives**

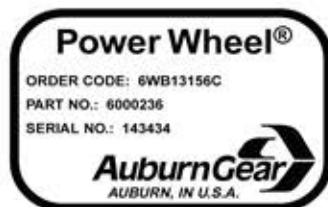


**PHONE: (219) 925-3200**  
**FAX: (219) 925-4725**



# IDENTIFICATION

**IMPORTANT:** All Power Wheel units and kits are shipped with a nameplate that includes the Auburn Gear part number and order code as shown.



Example:

In addition to the nameplate, Power Wheel drives are stamped with an identification number which appears on the cover or hub flange as shown.

Example: **6000236-A-4-9**

When ordering parts, the information included on the nameplate or the stamped identification number is necessary to accurately identify the drive and obtain the correct replacement parts. Once this information has been obtained, contact Auburn Gear for the appropriate parts list.

## DISASSEMBLY OF POWER WHEEL

### STEP 1

Remove eight hex head bolts (21) from cover (20). Lift cover (20) from assembly. Thrust washer (19) usually remains with cover (20).

### STEP 2

Lift sun gear (18) from primary carrier assembly (17).

### STEP 3

Remove primary carrier assembly (17).

### STEP 4

Remove the secondary carrier assembly (16)

### STEP 5

One tab of lock washer (13) will be engaged in slot of bearing nut (14); bend back to release. Remove the bearing nut (14), lock washer (13) and thrust washer (12). **NOTE:** A special locknut wrench, 596Z, is required for the removal of the bearing locknut. Contact Auburn Gear for procurement of wrench and other service tools.

### STEP 6

Bolt spindle drive tool, 598FF, to ring gear (15). Grade 8 bolts should be used. Drive shaft (1) from hub (9) by turning center bolt of spindle drive tool. Care should be taken to avoid damaging splines and threads on shaft. **NOTE:** Bearing cone (11) has been designed with a press fit with respect to shaft (1). Considerable force will be required to remove cone from shaft.

### STEP 7

Remove spindle drive tool from ring gear (15).

### STEP 8

Remove the 18 bolts (6) and flat washers (7) from hub (9) and remove ring gear (15). It may be necessary to strike ring gear (15) with a rubber mallet to loosen from hub (9).

### STEP 9

Remove boot seal (2) if included, oil seal (3) and bearing cones (4 & 11) from hub (9). Inspect bearing cups (5 & 10) in hub (9) and remove only if replacement is required.

## ASSEMBLY OF POWER WHEEL

### STEP 1

Press new bearing cups (5 & 10) into each side of hub (9). It is recommended that bearing cups (5 & 10) and cones (4 & 11) be replaced in sets.

### STEP 2

Assemble bearing cone (4) into cup (5) at seal end of hub (9) and press a new seal (3) into hub (9).

### STEP 3

Lubricate lips of oil seal (3) and boot seal (2) if unit is so equipped and lower hub (9) onto output shaft (1). Keep hub (9) centered to prevent damage to oil seal (3).

### STEP 4

Assemble bearing cone (11) over output shaft (1). Press bearing cone (11) over output shaft bearing journal using press and cylindrical bearing cone driver 598E. Press bearing cone (11) down until rollers just touch cup (10). Take care to avoid pressing cone (11) too far. **NOTE:** If a press is not available, place tool 598E over splined end of output shaft (1) on the edge of bearing cone (11) and drive into place with hammer or mallet. If this method is used, care must be taken to avoid damage to bearing cone and spindle.

### STEP 5

Install thrust washer (12) and bearing nut (14). **DO NOT install lock washer (13) at this time.**

### STEP 6

Clean mating surfaces and apply a bead of silicone sealant to face of hub (9) that mates with ring gear (15). See instructions on sealant package. Hub (9) is attached to ring gear (15) with 18 3/8-24 grade 8 hex head cap screws (6) and flat washers (7). Torque cap screws to 52 - 60 lb.-ft. (70 - 81 Nm).

### STEP 7

Place spindle drive tool, 598FF, over shaft (1) and bolt or pin to ring gear (15). Make sure center bolt of drive tool is not touching spindle and is prevented from rotating by jam nuts provided on tool.

### STEP 8

Check initial rolling torque by installing a lb.-in. torque wrench (arm or dial type) on center nut of spindle/shaft drive tool and turning hub (9) slowly and steadily with the torque wrench. Note mean torque. An initial bearing rolling torque of greater than 52 lb.-in. with boot seal installed or 48 lb.-in. without boot seal means that the cone (11) was pressed on too tightly in step 4. In this case, back off bearing cone (11) by pressing output shaft (1) out of cone (11) until initial preload is relieved. See step 6 of disassembly procedure.

### STEP 9

Torque bearing nut (14) with bearing nut wrench 596Z until a bearing rolling torque of 42 - 50 lb.-in., with a boot seal installed, or 38 - 46 lb.-in., without a boot seal, is reached. This may require several trials of pressing the cone (11) by torquing the nut (14) and then checking the rolling torque. Rotate hub (9) by hand as nut is being tightened in order to seat bearings. **NOTE:** Up to 250 lb.-ft. of torque may have to be applied to bearing nut (14) in order to press cone (11) into position.

### STEP 10

Remove bearing nut (14) and install lock washer (13). Replace bearing nut (14).

### STEP 11

Re-torque bearing nut (14) to 60 - 70 lb.-ft. (80 - 94 Nm).

#### STEP 12

Secure bearing nut (14) by bending a lock washer (13) tab into one of four bearing nut slots. If no tab aligns with a slot, the nut may be tightened until one of the slots aligns with a lock washer tab.

#### STEP 13

Place secondary carrier assembly (16) into ring gear (15) aligning the gear teeth. Carrier splines mesh with splines on output shaft (1).

#### STEP 14

Lower primary carrier assembly (17) into assembly. Align sun gear teeth with secondary carrier planetary gears and primary planet gears with ring gear (15).

#### STEP 15

Install primary sun gear (18) into primary carrier assembly. Sun gear (18) should turn freely by hand when assembled.

**NOTE:** When installing a hydraulic motor to the Power Wheel drive it is necessary to place an "O" ring or gasket (not supplied by Auburn Gear) between the motor and the planetary drive. "O" ring sizes: SAE A 2-042, SAE B 2-155, SAE C 2-159. Apply sealant to motor mounting bolt threads when holes in cover are thru holes.

#### STEP 16

Apply a bead of silicone sealant to cover face of ring gear (15). Secure thrust washer (19) with tangs engaged in cover (20). **NOTE:** Washer (19) can be secured to cover (20) with a small amount of grease or silicone sealant. Assemble cover (20) to ring gear (15). Align cover (20) with hub (9) such that pipe plug holes on cover (20) align with mounting holes in hub (9).

#### STEP 17

Install eight 5/16-18 x 1 inch bolts (21) and torque to 20 - 25 lb.-ft. (27 - 34 Nm).

#### STEP 18

Position filler opening horizontally and fill unit to oil level hole in hub (9). Install pipe plugs (8), (22) and (23).

## CARRIER ASSEMBLIES

It is recommended that the primary and secondary carrier assemblies (16 & 17) be serviced in their entirety to protect the integrity of the Power Wheel drive.

## LUBRICATION RECOMMENDATIONS

Observe lubrication recommendations given by the original equipment manufacturer. When specific recommendations are not available, use mild extreme pressure lubricant API-GL-5, No. 80 or 90 when filling the Power Wheel under normal temperature ranges between 0 - 120°F (-18 to 49°C). Power Wheel is to be half full of oil when unit is mounted level and horizontal. Use drain and fill plugs located in cover and ring gear. Oil is to be changed after first 50 hours of operation with subsequent changes every 1000 hours or yearly, whichever comes first. If unit is to be operated vertically, if ambient conditions are outside the specified range, or if the oil temperature exceeds 200°F (93°C) contact Auburn Gear for oil and level recommendations.

## STORAGE

A protective film is applied to the Power Wheel at the factory to prevent rust during shipment. Additional protection may be required if the Power Wheel is to be stored for an extended period of time.

## SEALING COMPOUND

Silastic RTV732 sealer and General Electric Silimate RTV No. 1473 or RTV No. 1503 are currently recommended for sealing gasket surfaces. Sealant should be applied in a continuous bead, which should be centered on the surface to be sealed but should move to the inside of the hole at each bolt hole location. For service requirements order Auburn Gear part number 604101.

## SPECIFICATIONS

Maximum intermittent output torque .....	70,000 lb. in. (7,910 Nm)
Maximum input speed .....	5,000 RPM
Oil capacity .....	31 oz (920 ml)

ITEM NO.	DESCRIPTION*	NO. USED IN ASS'Y.	ITEM NO.	DESCRIPTION*	NO. USED IN ASS'Y.
1	Output Shaft or Spindle	1	13	Lock Washer 605004	1
2	Boot Seal	1	14	Bearing Nut 614913	1
3	Oil Seal 604415	1	15	Ring Gear	1
4	Bearing Cone 613317	1	16	Secondary Carrier Assembly	1
5	Bearing Cup 613316	1	17	Primary Carrier Assembly	1
6	Hex Head Bolt (Grade 8)	18	18	Primary Sun Gear	1
7	Flat Washer	18	19	Thrust Washer	1
8	Pipe Plug 03-04-101-09	1	20	Cover	1
9	Hub	1	21	Hex Head Bolt	8
10	Bearing Cup 613318	1	22	Magnetic Plug 14-00-052-002	1
11	Bearing Cone 613319	1	23	Pipe Plug 03-04-101-01	1
12	Thrust Washer 619321	1			

\* Contact Auburn Gear with part number and order code of drive to obtain the appropriate parts list. Refer to parts list for the specific part numbers and quantities.

### Model 7 Power Wheel® Service Kits

Part No.	Description	Included Items
596Z	Bearing Locknut Tool	Not Shown
598E	Bearing Cone Driver	Not Shown
598FF	Spindle/Shaft Drive Tool	Not Shown