



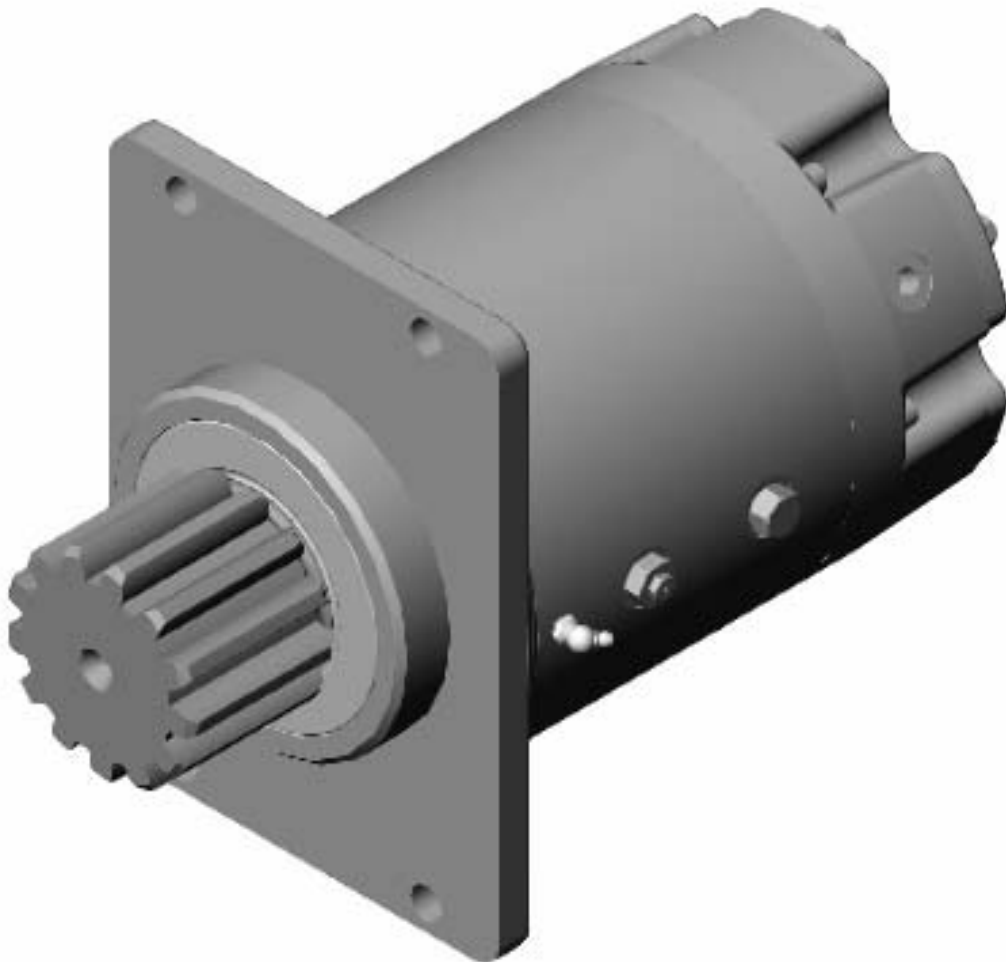
Tulsa Winch

20 SERIES

30 SERIES

45 SERIES

**SWING-DRIVE
SERVICE MANUAL**



This manual will primarily assist in disassembly and assembly procedures of major components for all model 2000/3000 Swing Drives. Item numbers, indicated in parentheses throughout this manual, refer to the Tulsa Winch Model 2025-S and 3025-S exploded parts breakdown drawing.

LUBRICATION AND MAINTENANCE

Manufacturer recommends changing oil after first 50 hours of operation. Oil should be changed at 500-hour intervals thereafter. All gearboxes require GL-5 grade EP 80/90 gear oil for lubrication. Some units may be equipped with a grease fitting for lubrication of the output shaft bearings (pinion up applications). The shaft bearings should be greased sparingly at every 50 operating hours with a lithium or GP bearing lube. In pinion down applications, gearbox oil will lubricate shaft bearings.

OIL CAPACITIES:

	PINION UP	PINION DOWN
20	.75 qts.	.75 qts.
30	.75 qts.	.75 qts.
45	2.50 qts.	2.75 qts.
45 (W/GLIDE-SWING BRAKE)	2.00 qts.	2.25 qts.

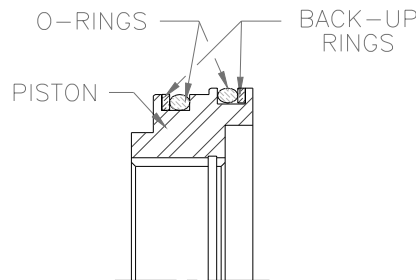
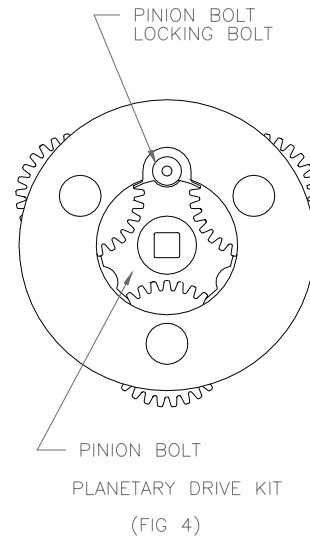
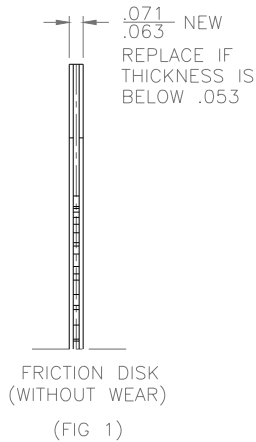
DISASSEMBLY PROCEDURE **FOR 20, 30, & 45 SERIES SWING DRIVE**

1. Remove drive from vehicle and drain gearbox lubricant by removing the drain plug (26).
2. Remove the motor from the motor adapter (3).
3. Remove the brake assembly from the gear housing assembly (1) by removing capscrews (27). NOTE: Notice the position of the brake port in conjunction with the drain and fill holes in the housing for reassembly.
4. Inspect the motor adapter o-ring (24) for wear. Replace if necessary.
5. Separate the motor adapter (3) from the brake housing (2) by removing capscrews (28). NOTE: Notice the position of the motor mounting hole in relation to the brake release port for reassembly. CAUTION: The motor adapter is spring-loaded and the capscrews should be loosened in a sequence that will allow an even load distribution on the motor adapter.
6. Remove the springs (15) and the brake driver (8) from the brake housing (2).
7. If applicable remove retaining ring (37) from the brake piston (5).
8. Remove the stator plates (16) and friction discs (17) from the brake piston (5). Inspect stator plates for excessive grooving or burn spots. Also, inspect friction discs for wear. Replace as required. (Ref. Fig. 1)
9. Remove the piston (5) from the brake housing (2). NOTE: Notice the position of the dowel pin hole in piston with the

brake release port for reassembly.
 NOTE: A port-a-power can be used to assist in removal of piston by slowly pressurizing the brake release port until piston clears the top of the housing.

10. Inspect the piston o-rings (20 & 21) and the back-up rings (19 & 22) for damage, replace if necessary. (Ref. Fig. 2)
11. If applicable inspect the thrust plate (9) for excessive grooving and replace if necessary by removing snap ring (36).
12. If applicable remove the brass thrust washer (34) and sun gear (7).
13. Remove Input planet set (4) by pulling straight up and out of the gear housing (1).
14. Remove the pinion locking bolt (4.1) or (46.8) and pinion bolt (4.14) or (46.5) from the output planet carrier (4.2) or (46.1). (Ref. Fig. 4)
15. Remove output planet set (4) or (46) by pulling straight up and out of the gear housing (1).

16. Disassemble planet set sub-assemblies per exploded parts breakdown drawing.
17. Inspect parts from planet sets and replace if necessary.
18. Remove the inboard bearing (11) and inspect for wear.
19. Remove the pinion shaft (6) from the housing (1) and inspect the pinion shaft, seal, and bearing for wear.
20. Remove outboard bearing (11) and seal (10).
21. Inspect for wear and replace if necessary.



O-RING INSTALLATION

ASSEMBLY PROCEDURE

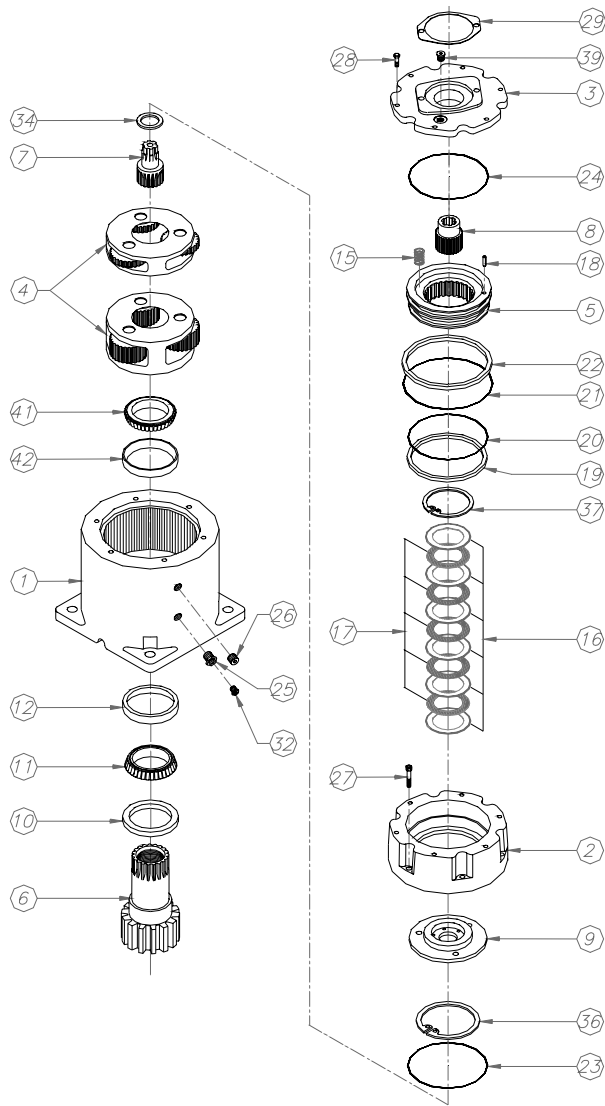
FOR 20, 30 & 45 SERIES SWING DRIVE

1. Press the inboard and outboard bearing cup (12) & (42) into the gear housing (1) if replaced.
2. Grease pack the bearing cones (11)& (41) with EP-2 before installation.
3. Install the outboard cone (11) into the outboard cup (12). Press the seal (10) into the gear housing (1) from the outboard side.
4. Slide the output pinion (6) into the housing (1) from the outside.
5. Install the inboard bearing cone (11) or (41).
6. Separate the gear set (4) into sections.
7. Apply Loctite to the threads of the pinion bolt (14.4). Install the output carrier assembly (2.4) into the gear housing (1). Tighten the pinion bolt halfway, check the alignment of the output carrier (2.4) with the spline on the pinion shaft (6), then tighten the pinion bolt the rest of the way. Torque the pinion bolt to 50 Ft. Lbs., loosen and re-torque until the pinion locking bolt aligns with the slot on the pinion bolt at 25 Ft. lbs. for the 20 & 30 series and 50 Ft. lbs. for the 45 series swing-drive. If the pinion bolt is between slots always tighten to the next slot. NOTE: Install a 1/2-13 bolt into the end of the pinion shaft on the outboard side and check the rolling torque. Preload of the bearing rolling torque should be 35-50 Ft. lbs. Apply Loctite to the pinion *locking* bolt (1.4) and torque to 20 Ft. Lbs. (Ref. Fig.4)
8. Install the input carrier assembly. If applicable with Sun gear attached with retaining ring.
9. If applicable install the sun gear (7) and thrust washer (34).
10. Assemble the brake section by first installing the o-ring (23) on the brake housing (2). Install capscrews (27) to the brake housing (2) and torque to 10 ft. lbs. NOTE: Notice the position of the brake release port in conjunction with the drain and fill holes in the housing.
11. Install the o-ring (20) and back-up ring (19) on the small step of the piston (5).
12. Install one back-up ring (22) and one o-ring (21) on the large step of the piston (5). Apply a slight film of oil on the o-rings and back-up rings before installing.
13. Install the stator plates (16) and friction disks (17) starting with one stator plate and alternating between friction disk and stator plate until six stator plates and five friction disks are used. NOTE: Soak friction disk in EP-90 for 24 hrs. before installation. (Note: for 20 & 30 series swing drives you must perform step 14 before 13).
14. Carefully press the assembled piston (5) into the brake housing (2), taking care not to damage the rings. NOTE: Notice the position of the dowel pin hole in piston with the brake release port for correct assembly.
15. Insert the brake driver (8) into the assembled brake housing (2) and piston (5).
16. If applicable reinstall the retaining ring (37) into the piston.
17. Install springs (15) into the holes in the motor adapter (3).
18. Mount the motor adapter (3) to the brake housing (2) with capscrews (28) checking to make sure the roll pin (18) is in line with the dowel hole in piston (5). NOTE: Notice the position of the motor mounting hole in relation to the brake release port for correct reassembly.
19. Fill the gearbox to desired level with EP-90 gear lube.

2025/3025 SWING DRIVE

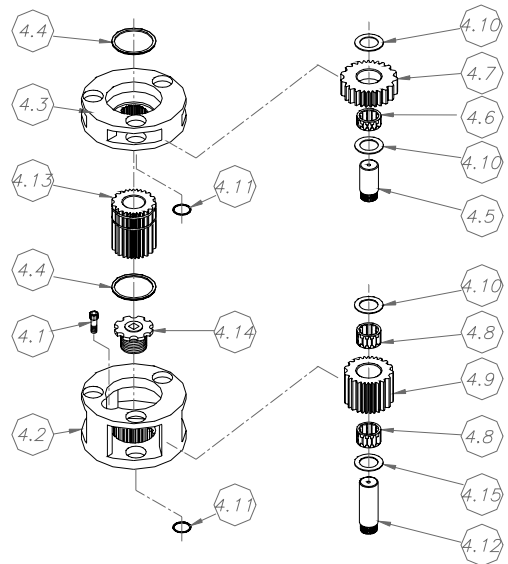
$I_{T_{EM}}$	O_{TY}	PART NO.	DESCRIPTION
1	1	43356	HOUSING, GEAR
2	1	40785	HOUSING, BRAKE
3	1	43310	ADAPTER, MOTOR
4	1	4040	GEARING, PLANETARY
5	1	40787	PISTON, BRAKE
6	1	43360	SHAFT, OUTPUT, PINION
7	1	40793	GEAR, SUN
8	1	40792	GEAR, BRAKE DRIVER
9	1	41372	PLATE, THRUST
10	1	41073	SEAL, OIL
11	2	41080	CONE, BEARING
12	2	41081	CUP, BEARING
15	6	41795	SPRING
16	6	40842	PLATE, STATOR
17	5	32937	DISK, FRICTION
18	1	40855	PIN, ROLL
19	1	40930	RING, BACK-UP
20	1	40931	O-RING
21	1	40853	O-RING
22	1	40851	RING, BACK-UP
23	1	33094	O-RING
24	1	40854	O-RING
25	1	42752	ADAPTER PLUG
26	1	939487	PLUG, O-RING
27	6	34462	CAPSCREW
28	6	40856	CAPSCREW
29	1	40147	GASKET
32	1	13050	BREATHER
34	1	40857	WASHER, THRUST
36	1	40858	RING, RETAINING
37	1	40852	RING, RETAINING
39	1	41307	PLUG, O-RING
41	1	42009	BEARING CONE
42	1	42010	BEARING CUP

PART NO. TAKEN FROM 81620



GEAR SET (ITEM 4 OF ABOVE)

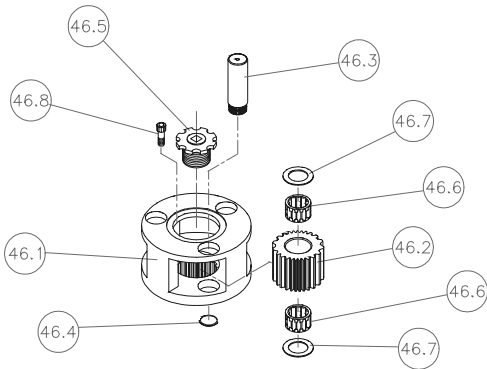
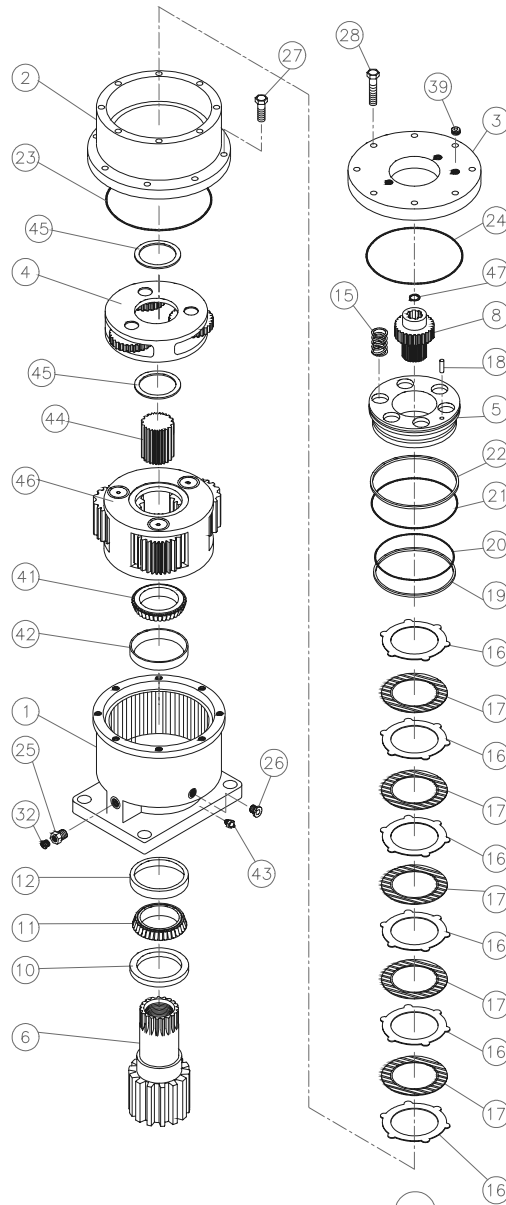
$I_{T_{EM}}$	O_{TY}	PART NO.	DESCRIPTION
4.1	1	41904	SCREW, CAP
4.2	1	41914	CARRIER, OUTPUT
4.3	1	41910	CARRIER, INPUT
4.4	2	41901	RING, RETAINING
4.5	3	41907	PIN, PLANET
4.6	3	41905	BEARING, NEEDLE
4.7	3	41912	GEAR, PLANET, PRIMARY
4.8	6	41906	BEARING, NEEDLE
4.9	3	41911	GEAR, PLANET, SECONDARY
4.10	9	996457	WASHER, THRUST
4.11	6	41903	RING, RETAINING
4.12	3	41908	PIN, PLANET
4.13	1	41913	GEAR, SUN, SECONDARY
4.14	1	41909	BOLT, PINION
4.15	3	42207	WASHER, THRUST



4536 SWING DRIVE

$I_{T_{EM}}$	Q_{TY}	PART NO.	DESCRIPTION
1	1	42674	HOUSING, GEAR
2	1	42680	HOUSING, BRAKE
3	1	42682	COVER, BRAKE, ADAPTER
4	1	4170	GEAR SET, INPUT
5	1	42697	PISTON, BRAKE
6	1	42671	SHAFT, OUTPUT, PINION
8	1	42683	DRIVER, BRAKE
10	1	41073	SEAL, OIL
11	1	41080	CONE, BEARING
12	1	41081	CUP, BEARING
15	6	41718	SPRING, BRAKE
16	6	42111	PLATE, STATOR
17	5	33564	DISK, FRICTION
18	1	27590	PIN
19	1	42675	RING, BACK-UP
20	1	42672	O-RING
21	1	32186	O-RING
22	1	42337	RING, BACK-UP
23	1	939452	O-RING
24	1	33094	O-RING
25	1	42752	ADAPTER PLUG
26	1	939487	PLUG, O-RING
27	8	20522	CAPSCREW
28	8	939261	CAPSCREW
32	1	13050	BREATHER
39	1	42392	PLUG, O-RING
41	1	41275	BEARING CONE
42	1	42012	BEARING CUP
43	1	21128	FITTING, GREASE ZERK
44	1	42676	GEAR, SUN, OUTPUT
45	2	41722	RACE </td
46	1	4198	GEAR SET, OUTPUT
47	1	41994	RING, RETAINING

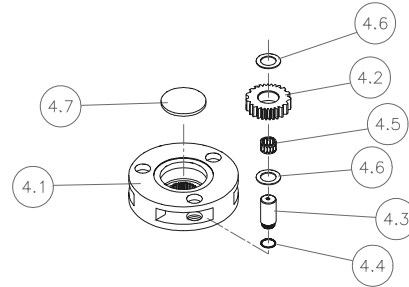
PART NO. TAKEN FROM 81335



GEAR SET (ITEM 4 ABOVE)

46.1	1	42677	CARRIER, OUTPUT
46.2	3	42678	GEAR, PLANET, OUTPUT
46.3	3	42184	PIN, PLANET
46.4	3	41715	RING, RETAINING
46.5	1	41909	BOLT, PINION
46.6	6	30484	BEARING, NEEDLE
46.7	6	28771	RACE
46.8	1	41904	BOLT, PINION

PART NO. TAKEN FROM SA4198



GEAR SET (ITEM 46 ABOVE)

4.1	1	42323	CARRIER, INPUT
4.2	3	42304	GEAR, PLANET, INPUT
4.3	3	41760	PIN, PLANET
4.4	3	41715	RING, RETAINING
4.5	3	30484	BEARING, NEEDLE
4.6	6	28771	RACE
4.7	1	41769	PLATE

PART NO. TAKEN FROM SA4170