HY13-1528-001/US

Service Procedure

Effective: May 2018

HTE/HTJ Series

Integrated Hydrostatic Transmission

⚠ WARNING

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

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Definitions

NOTE: A NOTE provides key information to make a procedure easier or quicker to complete.

CAUTION: A CAUTION refers to procedure that must be followed to avoid damaging the Transmission or other system components.

WARNING: A WARNING REFERS TO PROCEDURE THAT MUST BE FOLLOWED FOR THE SAFETY OF THE EQUIPMENT OPERATOR AND THE PERSON INSPECTING OR REPAIRING THE TRANSMISSION.

Disclaimer

This Service Manual has been prepared by Parker Hannifin for reference and use by mechanics who have been trained to repair and service hydraulic motors and systems on commercial and non-commercial equipment applications. Parker Hannifin has exercised reasonable care and diligence to present accurate, clear and complete information and instructions regarding the techniques and tools required for maintaining, repairing and servicing the complete line of Parker Integrated Hydrostatic Transmission Units. However, despite the care and effort taken in preparing this general Service Manual, Parker **makes no warranties** that (a) the Service Manual or any explanations, illustrations, information, techniques or tools described herein are either accurate, complete or correct as applied to a specific Transmission unit, or (b) any repairs or service of a particular Transmission unit will result in a properly functioning Transmission unit.

If inspection or testing reveals evidence of abnormal wear or damage to the unit or if you encounter circumstances not covered in the Manual, STOP – CONSULT THE EQUIPMENT MANUFACTURER'S SERVICE MANUAL AND WARRANTY. DO NOT TRY TO REPAIR OR SERVICE A UNIT WHICH HAS BEEN DAMAGED OR INCLUDES ANY PART THAT SHOWS EXCESSIVE WEAR UNLESS THE DAMAGED AND WORN PARTS ARE REPLACED WITH ORIGINAL PARKER REPLACEMENT AND SERVICE PARTS AND THE UNIT IS RESTORED TO PARKER SPECIFICATIONS FOR THE UNIT.

It is the responsibility of the mechanic performing the maintenance, repairs or service on a particular Transmission unit to (a) inspect the unit for abnormal wear and damage, (b) choose a repair procedure which will not endanger his/her safety, the safety of others, the equipment, or the safe operation of the Transmission, and (c) fully inspect and test the unit and the hydraulic system to insure that the repair or service of the unit has been properly performed and that the Transmission will function properly.

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Introduction

The three-column format used in this Service Manual will help make it easy for you to service a HTE/HTJ Series Integrated Hydrostatic Transmission. Column one gives a brief key for each step, column two explains in detail the procedure you should follow, and column three illustrates the procedure with photographs. **Pay special attention to the notes, cautions and warnings.**

This manual contains troubleshooting information and checklists. With them you can diagnose a hydraulic system problem without removing the HTE/HTJ Transmission, the checklists will help you to determine where the problem may be.

Item numbers on the exploded view correspond with item numbers used throughout the Service Manual.

As you gain experience in servicing HTE/HTJ Transmission, you may find that some information in this Service Manual could be clearer and more complete. If so, let us know about it. Don't try to second-guess the Service Manual; if problems occur that you cannot solve, please contact our service department at 423-639-8151, or your local Parker approved distributor. Servicing the HTE/HTJ Transmission should be safe and productive. Visit our website at www.parker.com/pumpmotor.

Design Features

HTE/HTJ Transmission

- High efficiency results in a cooler running system
- Top housing is sturdy, lightweight aluminum, excellent at dispersing heat, resulting in an overall cooler system
- High capacity thrust bearing provides longer transmission life

Torqmotor

- Roller vane to reduce friction and internal leakage and to maintain efficiency
- A patented orbiting commutator system for less wear and longer life
- A unique high-pressure shaft seal
- Manifold designed to improve operating efficiency
- Roller vane and sealed commutation assure high volumetric efficiency and smooth low speed operation

CONVERSIONS

INCHES	mm	INCHES	mm
.020	.51	1.060	26.92
.021	.53	1.295	32.89
.029	.74	1.297	32.94
.030	.76	1.396	35.46
.111	2.81	1.398	35.51
.119	3.02	1.500	38.10
.152	3.86	1.620	41.15
.160	4.06	1.622	41.20
.296	7.52	1.983	50.37
.304	7.72	1.985	50.42
.460	11.68	2.000	50.80
.470	11.94	2.120	53.85
.500	12.70	2.122	53.90
.585	14.86	2.233	56.72
.595	15.11	2.235	56.77
.660	16.76	2.483	63.07
.675	17.15	2.485	63.12
.750	19.05	2.500	63.50
1.000	25.40	2.880	73.20
1.058	26.87		

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Troubleshooting Guide

NOTE
Before troubleshooting any system problem, check service literature published by the equipment and/or component manufacturers. Follow their instructions, if given, for checking any component other than the HTE/HTJ Transmission.

Preparation
Make your troubleshooting easier by preparing as follows:

- work in a clean, well-lighted place;
- have proper tools and materials nearby;
- have an air pressure source

WARNING
SINCE SOLVENTS ARE FLAMMABLE, BE EXTREMELY CAREFUL WHEN USING ANY SOLVENT, EVEN A SMALL EXPLOSION OR FIRE COULD CAUSE INJURY OR DEATH.

WARNING
WEAR EYE PROTECTION AND BE SURE TO COMPLY WITH OSHA AND OTHER MAXIMUM AIR PRESSURE REQUIREMENTS. KEEP HANDS CLEAR OF FAN AND MOVING PARTS CAN CAUSE PERSONAL INJURY. SHUT OFF ENGINE AND LET ENTIRE SYSTEM COOL BEFORE REMOVING ANY COMPONENT.

Preliminary Checks
Hydraulic systems are often trouble-free. Hence, the problem an operator complains of could be caused by something other than the hydraulic components.

Thus, once you have determined that a problem exists, start with the easy-to-check items, such as:

- parts damaged from impact that were not properly repaired, or that should have been replaced
- improper replacement parts used in previous servicing
- mechanical linkage problems such as binding, broken, or loose parts or slipping belts

Hydraulic Components
If you think the problem is caused by a hydraulic component, start by checking the easy-to-reach items.

Check all belts for cracks, hardening, or other signs of wear. Check all pulleys, fans and bolts to make sure they are tightened to specified torque value. Look for leaks, especially at the coupling shaft and plugs.

If necessary replace filter. Always replace with original Parker filter. Torque to 115–135 in. lbs.

Visually check other components to see if they are loosely mounted, show signs of leaks, or other damage or wear.

Suspect Faulty Transmission
Before the HTE/HTJ Transmission is disassembled for repair, make sure all control arm adjustments and engine speed requirements are per OEM specification. Also make sure the parking brake is releasing fully on both sides.

If there is a defect in the HTE/HTJ Transmission, a right to left side performance difference should be noticeable. To test for this condition, run the vehicle at full forward throttle and control levers. The vehicle should track nearly straight both on flat ground and on uphill grades.

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Troubleshooting Checklist

Trouble	Cause	Remedy
Fluid Leakage	1. Caps and plugs loose, worn or damaged	Check & replace damaged gasket or “O” rings. Torque to manufacturers specifications
	2. Seals deteriorated	Replace seals by disassembling unit
Operates Hot	1. Debris buildup	Remove debris
	2. Oil level low	Fill to proper oil level
	3. Oil contaminated	Change filter and refill with new, clean oil
	4. Cooling fan damaged	Replace fan
	5. Excessive loading	Reduce vehicle load
	6. Air trapped in system	Run vehicle slowly forward and then reverse several times
No or Low Power	1. Bypass valve open	Turn to closed position
	2. Oil level low	Fill to proper oil level
	3. Oil contaminated	Change filter and refill with new, clean oil
	4. Excessive loading	Reduce vehicle load
	5. Engine speed low	Adjust engine speed to correct value
	6. Air trapped in system	Run vehicle slowly forward and then reverse several times
	7. Suspect internal component damage	Disassemble and inspect
	8. Pulley or belt loose	Tighten to specifications
Noisy Unit	1. Excessive loading	Reduce vehicle load
	2. Oil level low	Fill to proper oil level
	3. Oil contaminated	Change filter and refill with new, clean oil
	4. Excessive speed input	Adjust input speed above 1800 rpm and below 3600 rpm
	5. Air trapped in system	Run vehicle slowly forward and then reverse several times
	6. Bypass valve open	Turn to closed position

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Tools and Materials Required for Servicing

- Clean, petroleum-based solvent
- To insure maximum HTE/HTJ Series transmission performance and life, use a Parker qualified oil. HTE/HTJ Series transmissions come factory filled with Parker HT-1000 transmission oil. Oil change intervals depend on the type of oil used. Always change the filter when changing the oil.

Qualified Oils	Number of hours
Parker HT-1000™ (P/N 406030) 1U.S. Gal. (3.8L)	1000
Castrol Syntec 5W50	500
Amsoil AW ISO 68	500
Shell TTF-SB	500
Other*	250

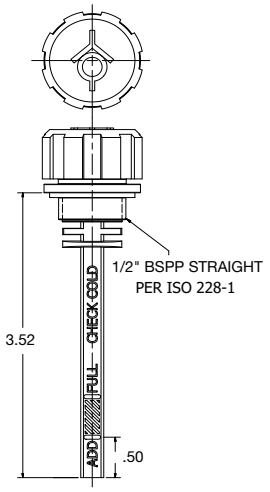
*Must be premium grade synthetic based engine oil with a minimum viscosity grade of 15W40

- Emery paper
- Vise with soft jaws
- Air pressure source
- Arbor press
- Flat screw driver
- Grease pencil or paint pen
- Small gear puller
- 1/4 inch torque wrench
- Sockets: 3/16 inch, 5/16 inch, 1/2 inch, 3/4 inch, 8mm Torx Bit, 1 1/8 inch, 1 1/2 inch
- Vise grip™ pliers
- Internal snap ring pliers
- Clean corrosion resistant grease. Recommended grease is Mobil Mobilith SHC® 460

CAUTION
Mixing greases that have different bases can be detrimental to bearing life.

Breather/Dipstick (37)

After draining the oil, and changing the filter, refill the unit with Parker HT-1000 transmission oil or other approved hydraulic fluid to a level in the hashed area on the dipstick. This is the normal operating range when the oil is cold. The “FULL” line on the dipstick indicates the maximum cold oil level to avoid overflow when the oil gets hot in operation.



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Bolt Torque

HTE/HTJ Transmission Assembly Torques

End block to housing (35)	10–13 ft-lbs	120–156 in-lbs
Charge cover bolts (36)	10–13 ft-lbs	120–156 in-lbs
Shock/check valves (5)	21–24 ft-lbs	252–288 in-lbs
Magnetic hex plugs (34)	8.3–12.5 ft-lbs	100–150 in-lbs
Motor bolts (62)	25–30 ft-lbs	
Filter plug (10)	9.5–11 ft-lbs	115–135 in-lbs
Fan nut (27)	40–60 ft-lbs	
Breather/dipstick (37)	3–5 ft-lbs	18–30 in-lbs
Control arm bolt	12.5–15 ft-lbs	150–180 in-lbs
Housing bolt (return to neutral)	22–24 ft-lbs	
Return to neutral bolts (31)	12.5–15 ft-lbs	150–180 in-lbs
Brake bolts (43)	25–28 ft-lbs	
Castle nut (60)	175-112 ft-lbs Plus rotation to align Cotter Pin when assembled with Drum Assembly	
Self Locking nut (61)	200 ft-lbs minimum	

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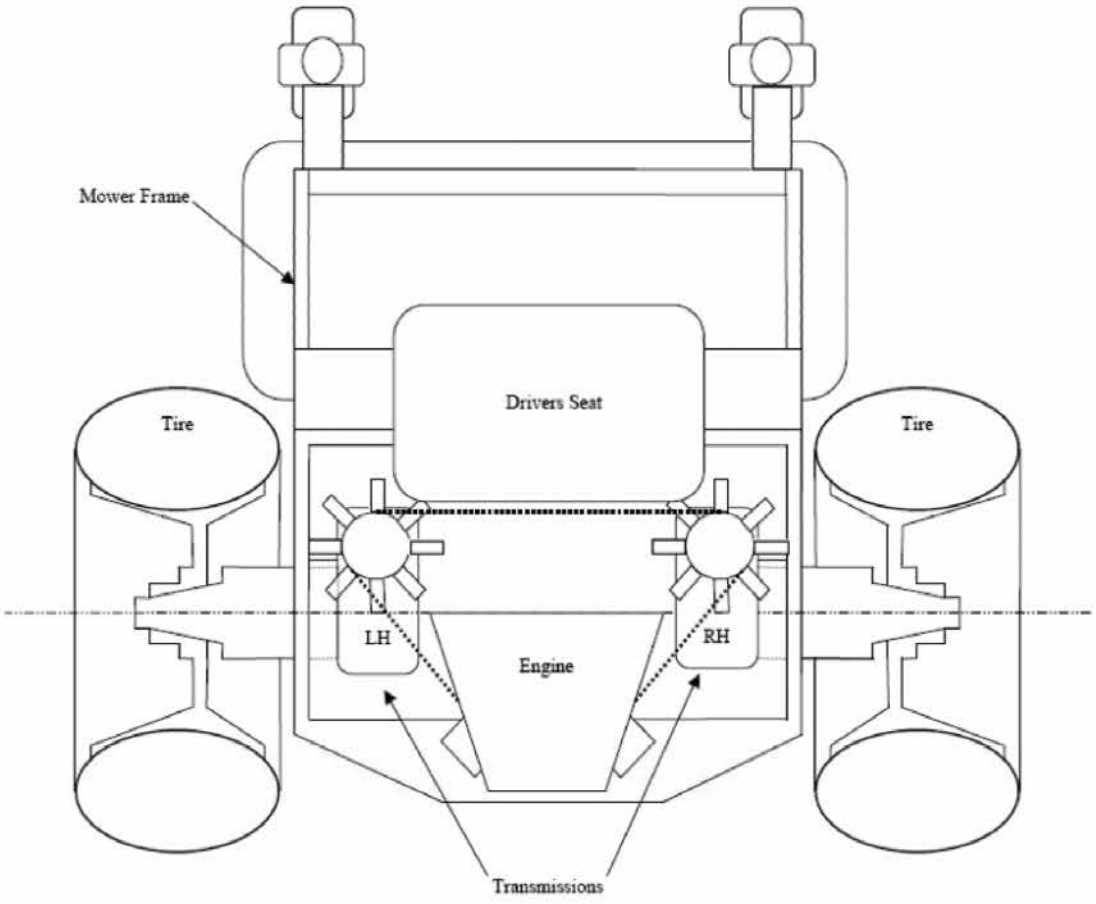
Dimensional Data

Rear of Mower



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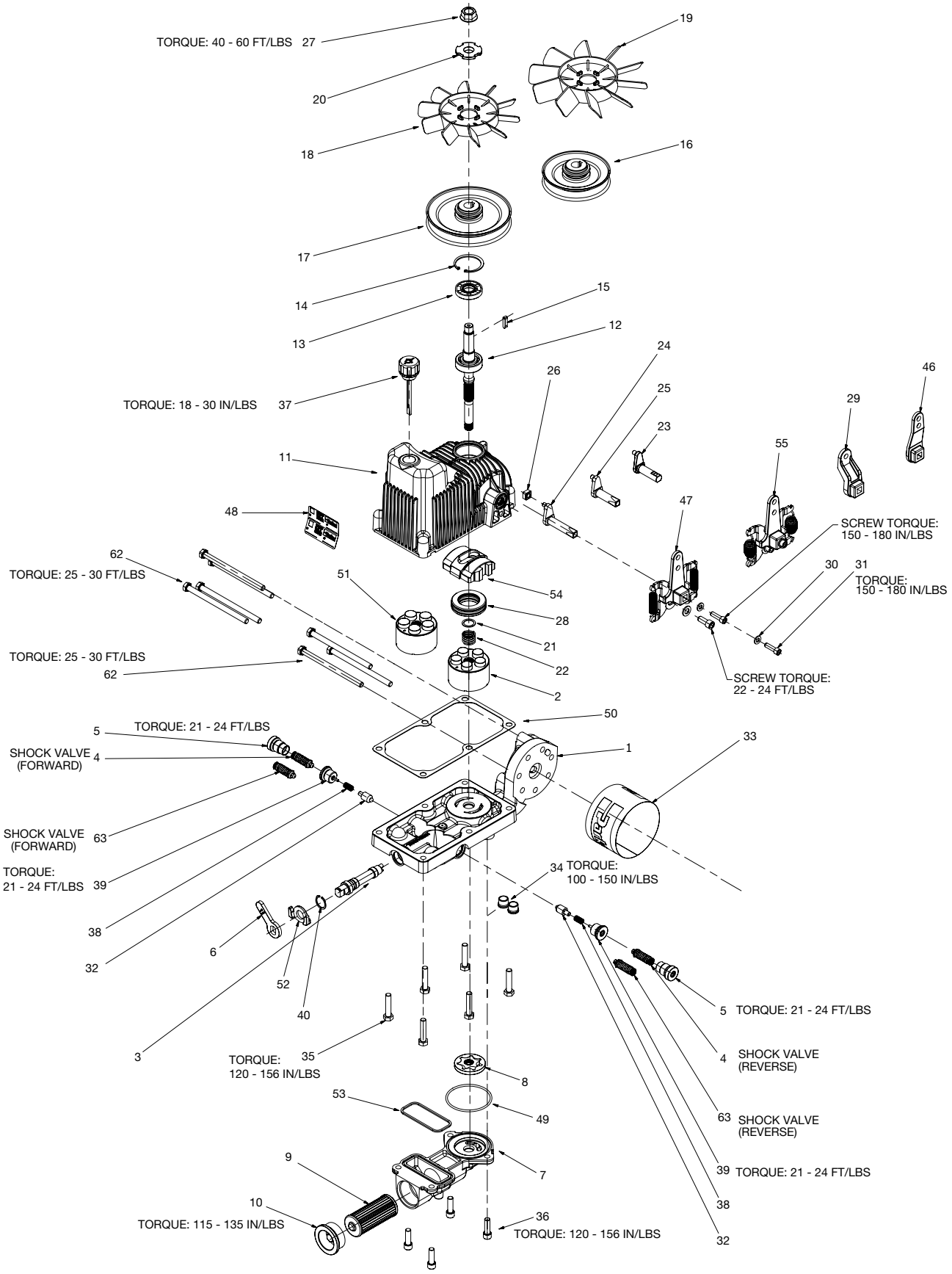
Typical Assembly

Exploded View, Left Hand Assembly



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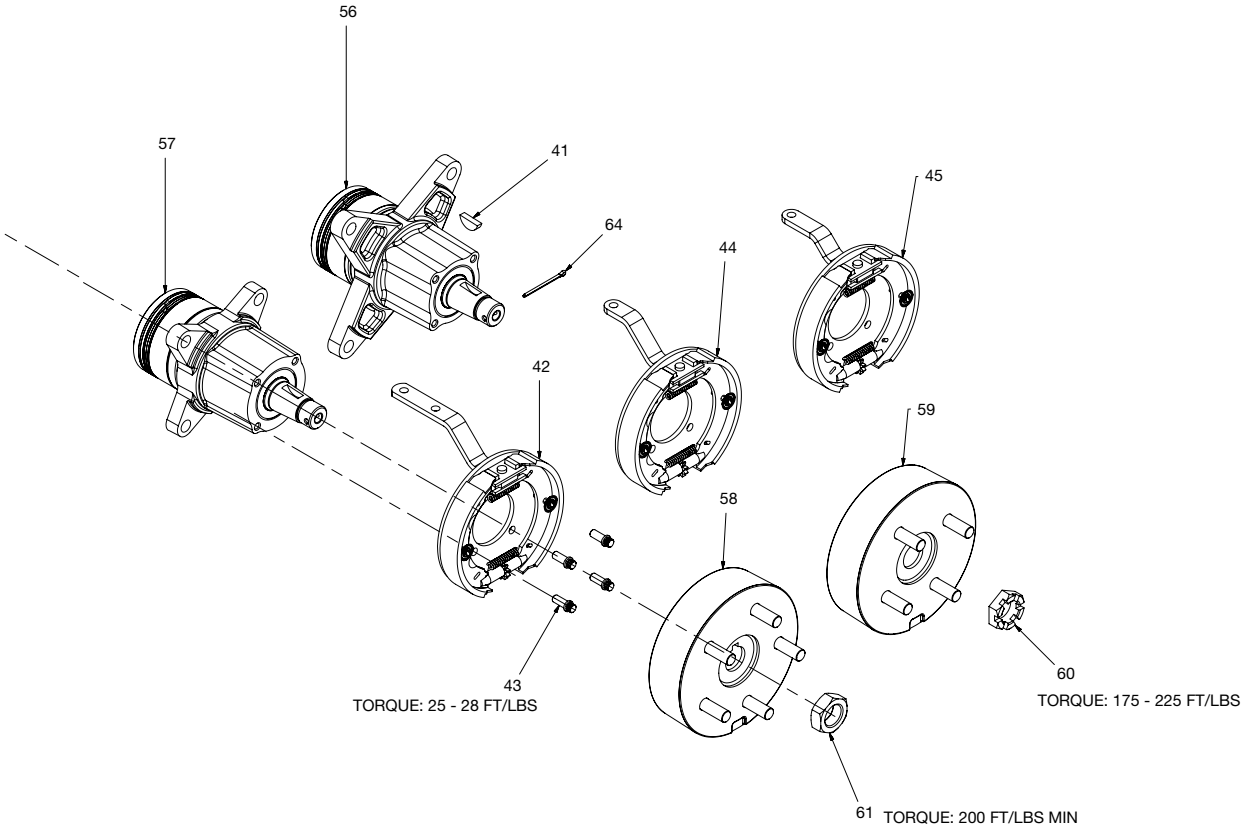
Exploded View, Left Hand Assembly

Parts list available on pages 14-17 and exploded view of Torqmotor available on page 18.



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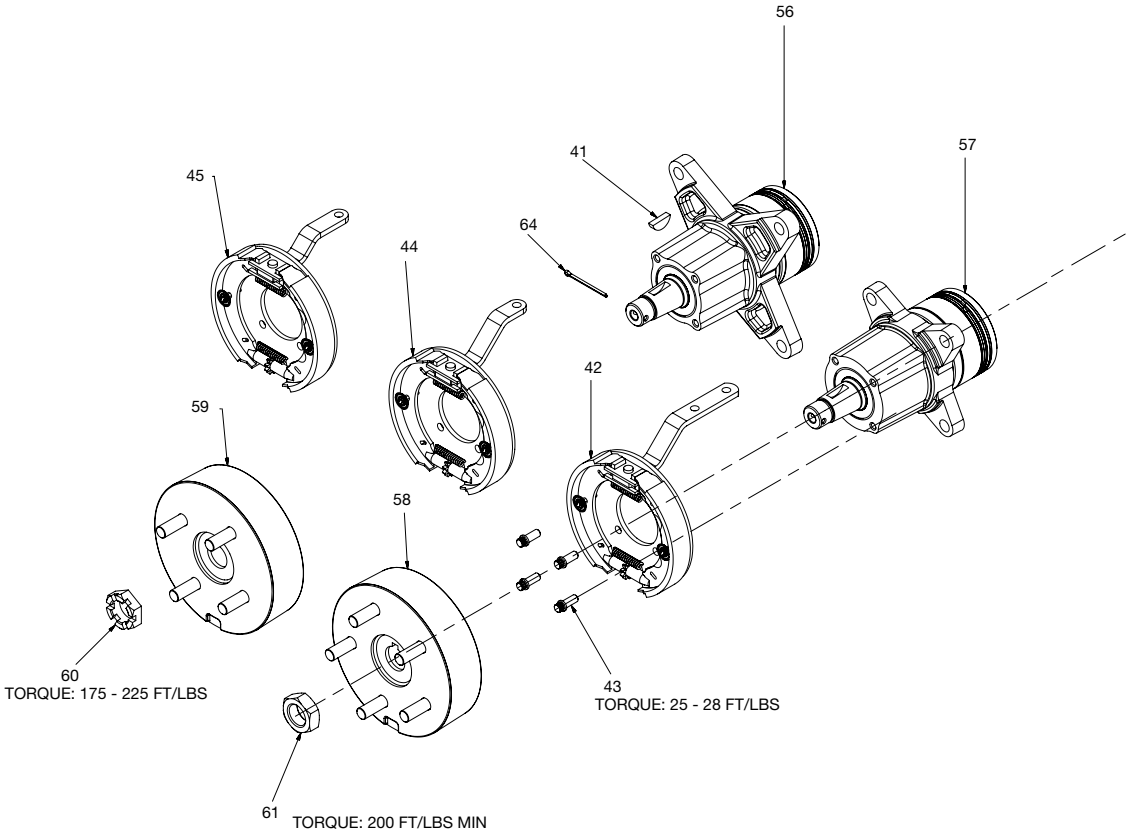
Exploded View, Right Hand Assembly

Parts list available on pages 14-17 and exploded view of Torqmotor available on page 18.



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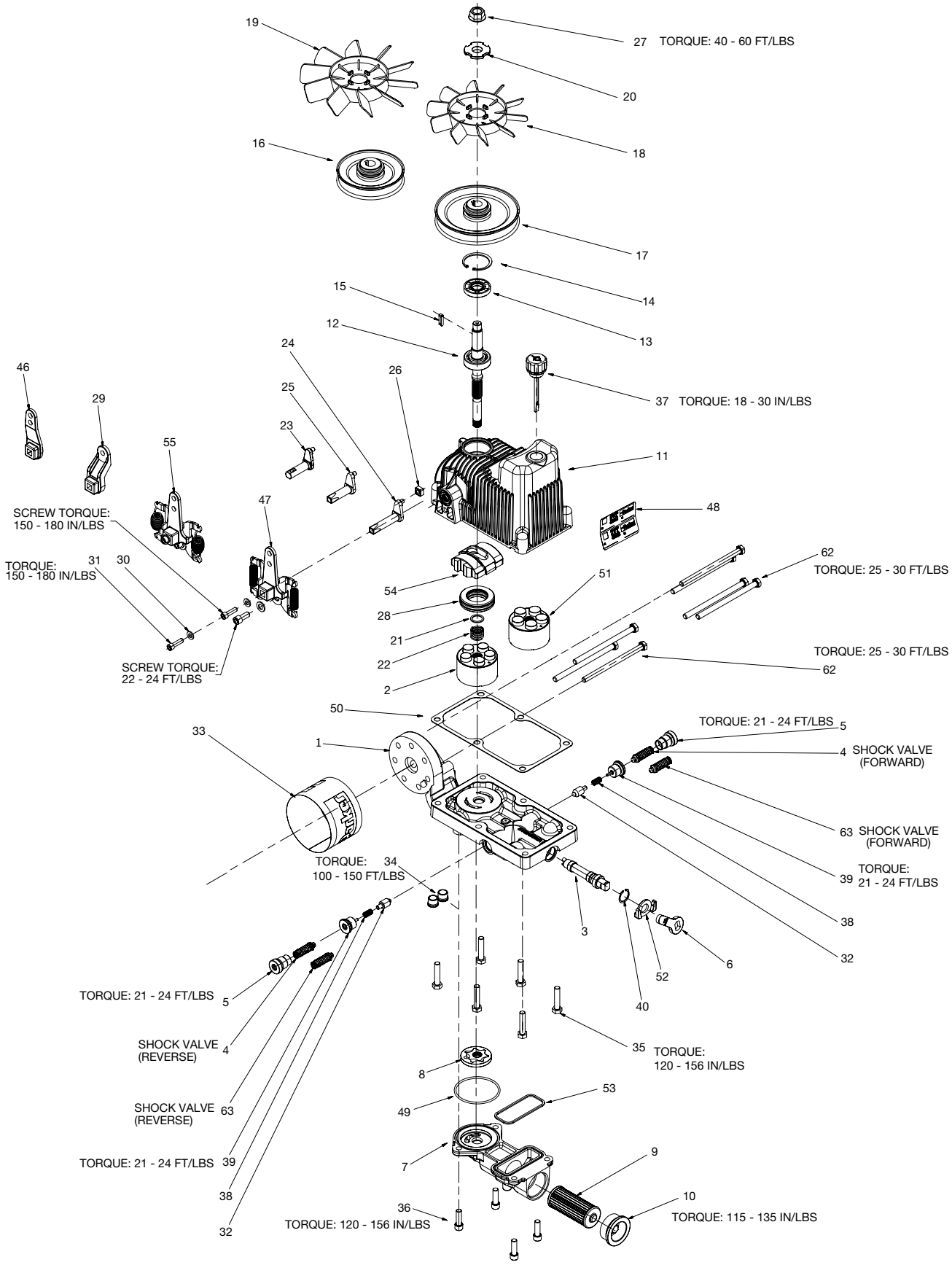
Exploded View, Right Hand Assembly



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Typical Assembly

Item	Description	Part Number	Torque
1	Endblock (LH)	HTE016001LA1	
	Endblock (RH)	HTE016001RA1	
2	Piston & Barrel Assembly (10cc)	H1107000	
3	SA, Bypass Valve	410171	
4	Relief Valve Sub-Assembly, Shock Valve (2)	410132 (Ø.018 Orifice)	
		410133 (Ø.024 Orifice)	
		410134 (Ø.031 Orifice)	
5	Plug & O-Ring Assembly (2)	036041	21-24 ft-lbs
6	Bypass Control Lever	452026	
7	Cover, Charge Pump (Machined)	HTE018000	
8	Rotor Set Assembly	H1014001	
9	Filter	411154S	
10	Plug & O-Ring Assembly	036325	115-135 in-lbs
11	SA, Top Housing (LH)	HTE012001LA1	
	SA, Top Housing (RH)	HTE012001RA1	
12	Pump Shaft Assembly	HTE019000A1	
13	Shaft Seal	478003	
14	Retaining Ring (Internal)	401201	
15	Key	039055	
16	Pulley (4 inch)	403006	
17	Pulley (5 inch)	403005	
18	Fan (6 inch)	420002	
19	Fan (7 inch)	420004	
20	Spacer, Fan	477036	
21	Washer (Central Spring Backup)	028011	
22	Spring (Central)	401310	
23	Trunnion Arm (Machined)	452003	
24	Trunnion Arm (Long)	452022	
25	Trunnion Arm (Short)	452024	
26	Control Block	452004	
27	Nut, Flange 1/2-20 UNF	025167	40-60 ft-lbs
28	Thrust Bearing Assembly	066012	
29	Bracket, Rotating	420107	
30	Washer, Flat	028022	
31	Socket Head Cap Screw 1/4-20	020299	150-180 in-lbs
32	Valve Poppet (2)	409047 (No Orifice)	
		409048 (Ø.018 Orifice)	
		409049 (Ø.024 Orifice)	
		409050 (Ø.031 Orifice)	
		409051 (Ø.044 Orifice)	
33	Motor Cover	402191 (TJ0130 & TJ0165)	
		402191 (TE0130 & TE0165)	
		402192 (TJ0195 & TJ0230)	
		402192 (TE0195 & TE0230)	
		402193 (TJ0260 & TJ0295)	
		402193 (TE0260 & TE0295)	
34	Plug, Magnetic Hex (2)	036023-006	100-150 in-lbs

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Typical Assembly

Item	Description	Part Number	Torque
35	Screw, Hex Head (6) 5/16-18 X 1.50	020301-008	120-156 in-lbs
36	Screw, Socket Head Cap (4) 5/16-18	021450	120-156 in-lbs
37	Breather/dipstick	411157	18-30 in-lbs
38	Spring (2)	401143	
39	Plug & O-Ring Assembly (2)	409035	21-24 ft-lbs
40	Retaining Ring	MS16627-2081	
41	Woodruff Key 1/4 x 1	038015	
42	Brake Assembly	490164	
43	Flange Head Cap Screw (4)	020207	25-28 ft-lbs
44	Brake Assembly	490167	
45	Brake Assembly	490169	
46	Bracket, Rotating	420106	
47	Return to Neutral Assembly	420105	
48	Parker Identification Tag	030055	
49	Packing, Preformed, O-Ring Seal	032202-144	
50	Gasket, Top Housing	034010	
51	Piston & Barrel Assembly (12cc) - TJ only	HTE127000	
52	Stop, Bypass	477383	
53	Seal, Charge Pump Cover	032865	
54	Swash Block	HTE013000	
55	SA Return	420112	
56	Torqmotor™ (LH)	TJ0130SD080HTAB	
		TJ0165SD080HTAB	
		TJ0195SD080HTAB	
		TJ0230SD080HTAB	
		TJ0260SD080HTAB	
		TJ0295SD080HTAB	
		TE0130SD250HTAB	
		TE0165SD250HTAB	
		TE0195SD250HTAB	
		TE0230SD250HTAB	
		TE0260SD250HTAB	
		TE0295SD250HTAB	
56	Torqmotor™ (RH)	TJ0130SD081HTAB	
		TJ0165SD081HTAB	
		TJ0195SD081HTAB	
		TJ0230SD081HTAB	
		TJ0260SD081HTAB	
		TJ0295SD081HTAB	
		TE0130SD251HTAB	
		TE0165SD251HTAB	
		TE0195SD251HTAB	
		TE0230SD251HTAB	
		TE0260SD251HTAB	
		TE0295SD251HTAB	
57	Torqmotor™ (LH)	TJ0130SD080HTAA	
		TJ0165SD080HTAA	

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Item	Description	Part Number	Torque
57	Torqmotor™ (LH)	TJ0195SD080HTAA	
		TJ0230SD080HTAA	
		TJ0260SD080HTAA	
		TJ02950SD080HTAA	
		TE0130SD250HTAA	
		TE0165SD250HTAA	
		TE0195SD250HTAA	
		TE0230SD250HTAA	
		TE0260SD250HTAA	
		TE0295SD250HTAA	
57	Torqmotor™ (RH)	TJ0130SD081HTAA	
		TJ0165SD081HTAA	
		TJ0195SD081HTAA	
		TJ0230SD081HTAA	
		TJ0260SD081HTAA	
		TJ0295SD081HTAA	
		TE0130SD251HTAA	
		TE0165SD251HTAA	
		TE0195SD251HTAA	
		TE0230SD251HTAA	
		TE0260SD251HTAA	
		TE0295SD251HTAA	
58	Drum Assembly (5 bolt) - HTJ	490216	
	Drum Assembly (5 bolt) - HTE	490212	
59	Drum Assembly (4 bolt) - HTJ	490218	
	Drum Assembly (4 bolt) - HTE	490214	
60	Castle Nut - HTJ	025113	Torque 175-225 ft lbs. Plus rotation to align Cotter Pin when asselmbled w/ Drum Assembly
	Castle Nut - HTE	025161	
61	Nut, 1-20 Self Lock - HTJ	025126	200 ft-lbs
	Nut, 1-20 Self Lock - HTE	025136	200 ft-lbs
62	Special Bolt (7)	021465 (4) (TJ0130 & TJ0165)	25-30 ft-lbs
		021465 (4) (TE0130 & TE0165)	25-30 ft-lbs
		021414 (4) (TJ0195 & TJ0230)	25-30 ft-lbs
		021414 (4) (TE0195 & TE0230)	25-30 ft-lbs
		021448 (4) (TJ0260 & TJ0295)	25-30 ft-lbs
		021448 (4) (TE0260 & TE0295)	25-30 ft-lbs
		021308 (3) (TJ0130 & TJ0165)	25-30 ft-lbs
		021308 (3) (T0130 & TE0165)	25-30 ft-lbs
		021310 (3) (TJ0195 & TJ0230)	25-30 ft-lbs
		021310 (3) (TE0195 & TE0230)	25-30 ft-lbs
		021384 (3) (TJ0260 & TJ0295)	25-30 ft-lbs
		021384 (3) (TE0260 & TE0295)	25-30 ft-lbs
63	Relief Valve (2)	410112 (No Orifice)	
64	Cotter Pin	040204	
65	Seal Ring - Viton (5) - HTJ	032822	
	Seal Ring (5) - HTE	032821	

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Item	Description	Part Number	Torque
66	Wear Plate - Required on TJ0130, TJ0195 & TJ0260	477037	
	Wear Plate - Required on TE0130, TE0195 & TE0260	477037	
67	Wear Plate - Required on TJ0165, TJ0230 & TJ0295	477376	
	Wear Plate - Required on TE0165, TE0230 & TE0295	477376	
68	Rotor Assembly	TE087023 (TJ0130 & TE0130)	
		TE107023 (TJ0165 & TE0165)	
		TE127023 (TJ0195 & TE0195)	
		TE147023 (TJ0230 & TE0230)	
		TE167023 (TJ0260 & TE0260)	
		TE187023 (TJ0295 & TE0295)	
69	Washer, Thrust	028034	
70	SA, Manifold - Finished - Required on TJXXXXSD080HTAX & TEXXXXSD250HTAX	TE015000	
71	SA, Manifold - Finished - Required on TJXXXXSD081HTAX & TEXXXXSD251HTAX	TE015001	
72	Commutator Assembly - HTJ	TJ018000-A1	
	Commutator Assembly - HTE	TE018005-A1	
73	Drive Link	TJ103000 (TJ0130 & TJ0165)	
		TJ143000 (TJ0195 & TJ0230)	
		TJ183000 (TJ0260 & TJ0295)	
		TE103000 (TE0130 & TE0165)	
		TE143000 (TE0195 & TE0230)	
		TE183000 (TE0260 & TE0295)	
74	Coupling Shaft - HTJ	MP019000	
	Coupling Shaft - HTE	MF019011	
75	Needle Bearing - HTJ	069513	
	Needle Bearing - HTJ	069512	
76	Thrust Washer) - HTJ - (2)	028348	
	Thrust Washer - HTE	028483	
77	Thrust Bearing - HTJ	069030	
	Thrust Bearing - HTE	065066	
78	Shaft Seal - Buna - HTJ	032817	
	Shaft Seal - HTE	032377	
79	Back-up Washer - HTJ	029118	
	Back-up Washer - HTE	028552	
80	Back-up Ring - HTJ	028515	
	Back-up Ring - HTE	028516	
81	SA, Motor Housing - HTJ	TJ012000	
	SA, Motor Housing - HTE	TE012000	
82	SA, Motor Housing - HTJ	TJ012001	
	SA, Motor Housing - HTE	TE012003	
83	Bearing - HTJ	068027	
	Bearing - HTE	065506	
84	Dirt and Water Seal - HTJ	478035	
	Dirt and Water Seal - HTE	478036	
85	Commutator Seal	032866	
86	Commutator - HTJ	TG014000	
86	Commutator - HTE	ME014000	

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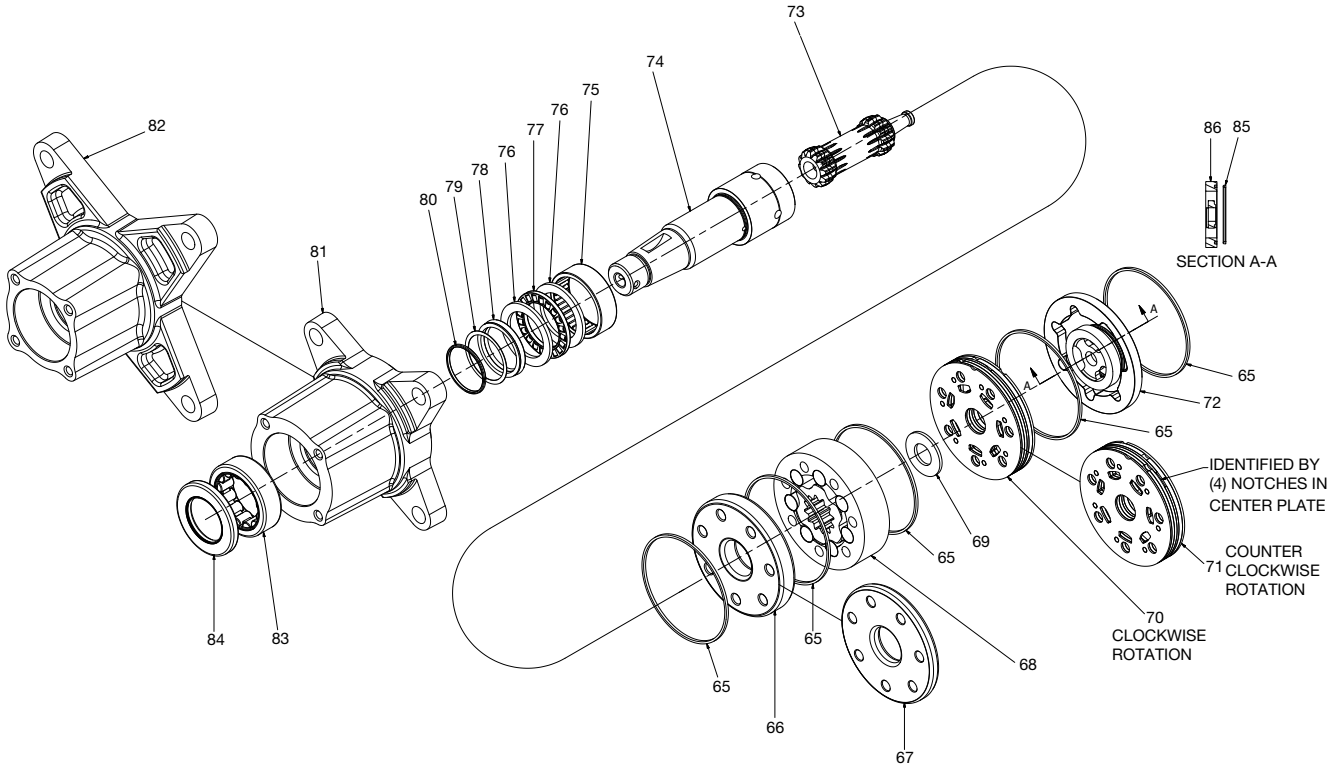
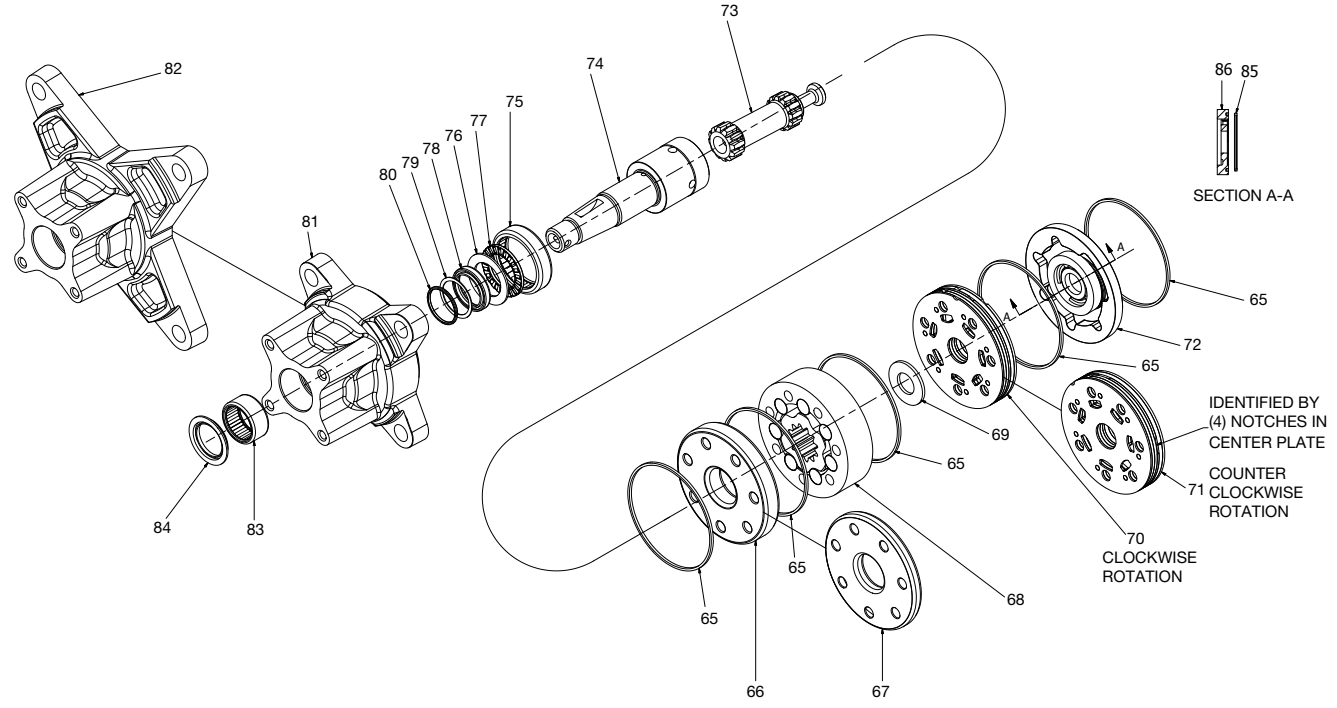
Torqmotor™ HTJ Exploded View



Torqmotor™ HTE Exploded View



Parts list available on pages 14-17

Parker Hannifin Corporation
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Seal Kit Data

ITEM	QUANTITY	PART NUMBER	DESCRIPTION
SK000315		**PARTS LIST - FILTER KIT**	
1	1	411154S	FILTER
2	1	036325	PLUG & O-RING ASSEMBLY
	1	SK000315 SHEET 3	SERVICE BULLETIN
SK000316		**PARTS LIST - 7” FAN KIT W/ 5” PULLEY**	
1	1	025167	NUT
2	1	477036	SPACER, FAN
3	1	420004	FAN (7” DIAMETER)
4	1	403005	PULLEY ASSEMBLY (5”)
5	1	039055	KEY
	1	SK000316 SHEET 3	SERVICE BULLETIN
SK000346		**PARTS LIST - 6 “ FAN KIT W/ 5” PULLEY**	
1	1	025167	NUT
2	1	477036	SPACER, FAN
3	1	420002	FAN (6” DIAMETER)
4	1	403005	PULLEY ASSEMBLY (5”)
5	1	039055	KEY
	1	SK000346 SHEET 3	SERVICE BULLETIN
SK000347		**PARTS LIST - 7” FAN KIT W/ 4” PULLEY**	
1	1	025167	NUT
2	1	477036	SPACER, FAN
3	1	420004	FAN (7” DIAMETER)
4	1	403006	PULLEY ASSEMBLY (4”)
5	1	039055	KEY
	1	SK000347 SHEET 3	SERVICE BULLETIN
SK000348		**PARTS LIST - 6” FAN KIT W/ 4” PULLEY**	
1	1	025167	NUT
2	1	477036	SPACER, FAN
3	1	420002	FAN (6” DIAMETER)
4	1	403006	PULLEY ASSEMBLY (4”)
5	1	039055	KEY
	1	SK000348 SHEET 3	SERVICE BULLETIN
SK000349		**PARTS LIST - HTJ MOTOR SERVICE KIT ONLY**	
1	1	478035	DIRT AND WATER SEAL
2	1	028615	BACK-UP RING
3	1	029118	BACK-UP WASHER
4	1	032817	SHAFT SEAL - BUNA
5	1	032866	COMMUTATOR SEAL
6	5	032822	SEAL RING - VITON
	1	SK000349 SHEET 3	SERVICE BULLETIN
SK000350		**PARTS LIST - HTE MOTOR SERVICE KIT ONLY**	
1	1	478036	DIRT AND WATER SEAL
2	1	028516	BACK-UP RING
3	1	028552	BACK-UP WASHER
4	1	032377	SHAFT SEAL - RULON AR
5	1	032866	COMMUTATOR SEAL
6	5	032821	SEAL RING - VITON
	1	SK000350 SHEET 3	SERVICE BULLETIN

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Seal Kit Data

ITEM	QUANTITY	PART NUMBER	DESCRIPTION
SK000351	**PARTS LIST - HTJ COMPLETE SERVICE KIT (RELIEF VALVE PLUG)**		
1	1	401201	RETAINING RING (INTERNAL)
2	1	478003	SHAFT SEAL
3	1	478004	TRUNNION ARM SEAL
4	1	034010	GASKET, TOP HOUSING
5	2	036041	PLUG AND O-RING ASSEMBLY
6	5	032203-111	BYPASS VALVE O-RING
7	1	032865	SEAL, CHARGE PUMP COVER
8	1	032202-144	PACKING, PERFORMED, O-RING SEAL
9	1	478035	DIRT AND WATER SEAL
10	1	028515	BACK-UP RING
11	1	029118	BACK-UP WASHER
12	1	032817	SHAFT SEAL - BUNA
13	5	032822	SEAL RING - VITON
14	1	032866	COMMUTATOR SEAL
	1	SK000351 SHEET 3	SERVICE BULLETIN

SK000352	**PARTS LIST - HTJ COMPLETE SERVICE KIT (POPPET VALVE PLUG)**		
1	1	401201	RETAINING RING (INTERNAL)
2	1	478003	SHAFT SEAL
3	1	478004	TRUNNION ARM SEAL
4	1	034010	GASKET, TOP HOUSING
5	2	409035	PLUG AND O-RING ASSEMBLY
6	5	032203-111	BYPASS VALVE O-RING
7	1	032865	SEAL, CHARGE PUMP COVER
8	1	032202-144	PACKING, PERFORMED, O-RING SEAL
9	1	478035	DIRT AND WATER SEAL
10	1	028515	BACK-UP RING
11	1	029118	BACK-UP WASHER
12	1	032817	SHAFT SEAL - BUNA
13	5	032822	SEAL RING - VITON
14	1	032866	COMMUTATOR SEAL
	1	SK000352 SHEET 3	SERVICE BULLETIN

SK000354	**PARTS LIST - HTE COMPLETE SERVICE KIT (POPPET VALVE PLUG)**		
1	1	401201	RETAINING RING (INTERNAL)
2	1	478003	SHAFT SEAL
3	1	478004	TRUNNION ARM SEAL
4	1	034006	GASKET, TOP HOUSING
5	2	409035	PLUG AND O-RING ASSEMBLY
6	5	032203-111	BYPASS VALVE O-RING
7	1	032865	SEAL, CHARGE PUMP COVER
8	1	032202-144	PACKING, PERFORMED, O-RING SEAL
9	1	478036	DIRT AND WATER SEAL
10	1	028516	BACK-UP RING
11	1	028552	BACK-UP WASHER
12	1	032377	SHAFT SEAL - RULON AR
13	5	032821	SEAL RING - VITON
14	1	032866	COMMUTATOR SEAL
	1	SK000354 SHEET 3	SERVICE BULLETIN

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Seal Kit Data

ITEM	QUANTITY	PART NUMBER	DESCRIPTION
SK000355	**PARTS LIST - HTJ 4 BOLT BRAKE SERVICE KIT W/ CASTLE NUT, ONE HOLE LEVER**		
1	1	038015	WOODRUFF KEY 1/4 X 1
2	1	490169	BRAKE ASSEMBLY
3	4	020207	FLANGE HEAD CAP SCREW
4	1	490218	DRUM ASSEMBLY 4 BOLT
5	1	025113	NUT, TYPE 2
6	1	040204	COTTER PIN
	1	SK000355 SHEET 3	SERVICE BULLETIN

SK000356	PARTS LIST - HTJ 5 BOLT BRAKE SERVICE KIT W/ CASTLE NUT, ONE HOLE LEVER		
1	1	038015	WOODRUFF KEY 1/4 X 1
2	1	490169	BRAKE ASSEMBLY
3	4	020207	FLANGE HEAD CAP SCREW
4	1	490216	DRUM ASSEMBLY 5 BOLT
5	1	025113	NUT, TYPE 2
6	1	040204	COTTER PIN
	1	SK000356 SHEET 3	SERVICE BULLETIN

SK000357	PARTS LIST - HTJ 4 BOLT BRAKE SERVICE KIT W/ PATCH LOCK NUT, ONE HOLE LEVER		
1	1	038015	WOODRUFF KEY 1/4 X 1
2	1	490169	BRAKE ASSEMBLY
3	4	020207	FLANGE HEAD CAP SCREW
4	1	490218	DRUM ASSEMBLY 4 BOLT
5	1	025126	NUT, 1-20 SELF LOCK
	1	SK000357 SHEET 3	SERVICE BULLETIN

SK000358	PARTS LIST - HTJ 5 BOLT BRAKE SERVICE KIT W/ PATCH LOCK NUT, ONE HOLE LEVER		
1	1	038015	WOODRUFF KEY 1/4 X 1
2	1	490169	BRAKE ASSEMBLY
3	4	020207	FLANGE HEAD CAP SCREW
4	1	490216	DRUM ASSEMBLY 5 BOLT
5	1	025126	NUT, 1-20 SELF LOCK
	1	SK000358 SHEET 3	SERVICE BULLETIN

SK000359	PARTS LIST - HTJ 4 BOLT BRAKE SERVICE KIT W/ CASTLE NUT, ONE HOLE LEVER		
1	1	038015	WOODRUFF KEY 1/4 X 1
2	1	490167	BRAKE ASSEMBLY
3	4	020207	FLANGE HEAD CAP SCREW
4	1	490218	DRUM ASSEMBLY 4 BOLT
5	1	025113	NUT, TYPE 2
6	1	040204	COTTER PIN
	1	SK000359 SHEET 3	SERVICE BULLETIN

SK000360	PARTS LIST - HTJ 5 BOLT BRAKE SERVICE KIT W/ CASTLE NUT, ONE HOLE LEVER		
1	1	038015	WOODRUFF KEY 1/4 X 1
2	1	490167	BRAKE ASSEMBLY
3	4	020207	FLANGE HEAD CAP SCREW
4	1	490216	DRUM ASSEMBLY 5 BOLT
5	1	025113	NUT, TYPE 2
6	1	040204	COTTER PIN
	1	SK000360 SHEET 3	SERVICE BULLETIN

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ITEM	QUANTITY	PART NUMBER	DESCRIPTION
SK000361	**PARTS LIST - HTJ 4 BOLT BRAKE SERVICE KIT W/ PATCH NUT, ONE HOLE LEVER**		
1	1	038015	WOODRUFF KEY 1/4 X 1
2	1	490167	BRAKE ASSEMBLY
3	4	020207	FLANGE HEAD CAP SCREW
4	1	490218	DRUM ASSEMBLY 4 BOLT
5	1	025126	NUT, 1-20 SELF LOCK
	1	SK000361 SHEET 3	SERVICE BULLETIN
SK000362	**PARTS LIST - HTJ 5 BOLT BRAKE SERVICE KIT W/ PATCH NUT, ONE HOLE LEVER**		
1	1	038015	WOODRUFF KEY 1/4 X 1
2	1	490167	BRAKE ASSEMBLY
3	4	020207	FLANGE HEAD CAP SCREW
4	1	490216	DRUM ASSEMBLY 5 BOLT
5	1	025126	NUT, 1-20 SELF LOCK
	1	SK000362 SHEET 3	SERVICE BULLETIN
SK000363	**PARTS LIST - HTJ 4 BOLT BRAKE SERVICE KIT W/ CASTLE NUT, TWO HOLE LEVER**		
1	1	038015	WOODRUFF KEY 1/4 X 1
2	1	490164	BRAKE ASSEMBLY
3	4	020207	FLANGE HEAD CAP SCREW
4	1	490218	DRUM ASSEMBLY 4 BOLT
5	1	025113	NUT, TYPE 2
6	1	040204	COTTER PIN
	1	SK000363 SHEET 3	SERVICE BULLETIN
SK000364	**PARTS LIST - HTJ 5 BOLT BRAKE SERVICE KIT W/ CASTLE NUT, TWO HOLE LEVER**		
1	1	038015	WOODRUFF KEY 1/4 X 1
2	1	490164	BRAKE ASSEMBLY
3	4	020207	FLANGE HEAD CAP SCREW
4	1	490216	DRUM ASSEMBLY 5 BOLT
5	1	025113	NUT, TYPE 2
6	1	040204	COTTER PIN
	1	SK000364 SHEET 3	SERVICE BULLETIN
SK000365	**PARTS LIST - HTJ 4 BOLT BRAKE SERVICE KIT W/ PATCH NUT, TWO HOLE LEVER**		
1	1	038015	WOODRUFF KEY 1/4 X 1
2	1	490164	BRAKE ASSEMBLY
3	4	020207	FLANGE HEAD CAP SCREW
4	1	490218	DRUM ASSEMBLY 4 BOLT
5	1	025126	NUT, 1-20 SELF LOCK
	1	SK000365 SHEET 3	SERVICE BULLETIN
SK000366	**PARTS LIST - HTJ 5 BOLT BRAKE SERVICE KIT W/ PATCH NUT, TWO HOLE LEVER**		
1	1	038015	WOODRUFF KEY 1/4 X 1
2	1	490164	BRAKE ASSEMBLY
3	4	020207	FLANGE HEAD CAP SCREW
4	1	490216	DRUM ASSEMBLY 5 BOLT
5	1	025126	NUT, 1-20 SELF LOCK
	1	SK000366 SHEET 3	SERVICE BULLETIN

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Seal Kit Data

ITEM	QUANTITY	PART NUMBER	DESCRIPTION
SK000367	**PARTS LIST - HTE 4 BOLT BRAKE SERVICE KIT W/CASTLE NUT, TWO HOLE LEVER**		
1	1	038015	WOODRUFF KEY 1/4 X 1
2	1	490164	BRAKE ASSEMBLY
3	4	020207	FLANGE HEAD CAP SCREW
4	1	490214	DRUM ASSEMBLY 4 BOLT
5	1	025161	NUT, TYPE 2
6	1	040205	COTTER PIN
	1	SK000367 SHEET 3	SERVICE BULLETIN
SK000368	**PARTS LIST - HTE 5 BOLT BRAKE SERVICE KIT W/ PATCH NUT, TWO HOLE LEVER**		
1	1	038015	WOODRUFF KEY 1/4 X 1
2	1	490164	BRAKE ASSEMBLY
3	4	020207	FLANGE HEAD CAP SCREW
4	1	490212	DRUM ASSEMBLY 5 BOLT
5	1	025161	NUT, TYPE 2
6	1	040205	COTTER PIN
	1	SK000368 SHEET 3	SERVICE BULLETIN
SK000369	**PARTS LIST - HTE 4 BOLT BRAKE SERVICE KIT W/ PATCH NUT, TWO HOLE LEVER**		
1	1	038015	WOODRUFF KEY 1/4 X 1
2	1	490164	BRAKE ASSEMBLY
3	4	020207	FLANGE HEAD CAP SCREW
4	1	490214	DRUM ASSEMBLY 4 BOLT
5	1	025136	NUT, 3/4-16 UNF - 2B
	1	SK000369 SHEET 3	SERVICE BULLETIN
SK000370	**PARTS LIST - HTE 5 BOLT BRAKE SERVICE KIT W/ PATCH NUT, TWO HOLE LEVER**		
1	1	038015	WOODRUFF KEY 1/4 X 1
2	1	490164	BRAKE ASSEMBLY
3	4	020207	FLANGE HEAD CAP SCREW
4	1	490212	DRUM ASSEMBLY 5 BOLT
5	1	025136	NUT, 3/4-16 UNF - 2B
	1	SK000370 SHEET 3	SERVICE BULLETIN
SK000371	**PARTS LIST - HTE 4 BOLT BRAKE SERVICE KIT W/ CASTLE NUT, ONE HOLE LEVER**		
1	1	038015	WOODRUFF KEY 1/4 X 1
2	1	490167	BRAKE ASSEMBLY
3	4	020207	FLANGE HEAD CAP SCREW
4	1	490214	DRUM ASSEMBLY 4 BOLT
5	1	025161	NUT, TYPE 2
6	1	040205	COTTER PIN
	1	SK000371 SHEET 3	SERVICE BULLETIN
SK000372	**PARTS LIST - HTE 5 BOLT BRAKE SERVICE KIT W/ CASTLE NUT, ONE HOLE LEVER**		
1	1	038015	WOODRUFF KEY 1/4 X 1
2	1	490167	BRAKE ASSEMBLY
3	4	020207	FLANGE HEAD CAP SCREW
4	1	490212	DRUM ASSEMBLY 5 BOLT
5	1	025161	NUT, TYPE 2
6	1	040205	COTTER PIN
	1	SK000372 SHEET 3	SERVICE BULLETIN

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Seal Kit Data

ITEM	QUANTITY	PART NUMBER	DESCRIPTION
SK000373	**PARTS LIST - HTE 4 BOLT BRAKE SERVICE KIT W/ PATCH NUT, ONE HOLE LEVER**		
1	1	038015	WOODRUFF KEY 1/4 X 1
2	1	490167	BRAKE ASSEMBLY
3	4	020207	FLANGE HEAD CAP SCREW
4	1	490214	DRUM ASSEMBLY 4 BOLT
5	1	025136	NUT, 3/4-16 UNF - 2B
	1	SK000373 SHEET 3	SERVICE BULLETIN
SK000374	**PARTS LIST - HTE 5 BOLT BRAKE SERVICE KIT W/ PATCH NUT, ONE HOLE LEVER**		
1	1	038015	WOODRUFF KEY 1/4 X 1
2	1	490167	BRAKE ASSEMBLY
3	4	020207	FLANGE HEAD CAP SCREW
4	1	490212	DRUM ASSEMBLY 5 BOLT
5	1	025136	NUT, 3/4-16 UNF - 2B
	1	SK000374 SHEET 3	SERVICE BULLETIN
SK000375	**PARTS LIST - HTE 4 BOLT BRAKE SERVICE KIT W/ CASTLE NUT, ONE HOLE LEVER**		
1	1	038015	WOODRUFF KEY 1/4 X 1
2	1	490169	BRAKE ASSEMBLY
3	4	020207	FLANGE HEAD CAP SCREW
4	1	490214	DRUM ASSEMBLY 4 BOLT
5	1	025161	NUT, TYPE 2
6	1	040205	COTTER PIN
	1	SK000375 SHEET 3	SERVICE BULLETIN
SK000376	**PARTS LIST - HTE 5 BOLT BRAKE SERVICE KIT W/ CASTLE NUT, ONE HOLE LEVER**		
1	1	038015	WOODRUFF KEY 1/4 X 1
2	1	490169	BRAKE ASSEMBLY
3	4	020207	FLANGE HEAD CAP SCREW
4	1	490212	DRUM ASSEMBLY 5 BOLT
5	1	025161	NUT, TYPE 2
6	1	040205	COTTER PIN
	1	SK000376 SHEET 3	SERVICE BULLETIN
SK000377	**PARTS LIST - HTE 4 BOLT BRAKE SERVICE KIT W/ PATCH NUT, ONE HOLE LEVER**		
1	1	038015	WOODRUFF KEY 1/4 X 1
2	1	490169	BRAKE ASSEMBLY
3	4	020207	FLANGE HEAD CAP SCREW
4	1	490214	DRUM ASSEMBLY 4 BOLT
5	1	025136	NUT, 3/4-16 UNF - 2B
	1	SK000377 SHEET 3	SERVICE BULLETIN
SK000378	**PARTS LIST - HTE 5 BOLT BRAKE SERVICE KIT W/ PATCH NUT, ONE HOLE LEVER**		
1	1	038015	WOODRUFF KEY 1/4 X 1
2	1	490169	BRAKE ASSEMBLY
3	4	020207	FLANGE HEAD CAP SCREW
4	1	490212	DRUM ASSEMBLY 5 BOLT
5	1	025136	NUT, 3/4-16 UNF - 2B
	1	SK000378 SHEET 3	SERVICE BULLETIN

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Warning Data

Before you disassemble the HTE/HTJ Transmission or any of its components, read this entire manual. It provides important information on parts and procedures you will need to know to service the HTE/HTJ Transmission unit. Be sure that you know and understand the equipment and any hazards associated with performing these procedures.

Thoroughly clean off all outside dirt and grass, especially from around fittings and hose connections before disconnecting and removing the HTE/HTJ Transmission. Remove rust or corrosion from the coupling shaft.

Remove belt connections and immediately plug port holes and any fluid lines.

Depending on how the HTE/HTJ is mounted to vehicle, the nut, brake hub and brake back plate needs to be removed prior to the HTE/HTJ removal for inspection and/or repair. It is recommended by the factory to remove these items prior to HTE/HTJ as a safer practice. Refer to exploded view illustrations for removal and replacement of the brake assembly and torque specifications.

Remove the HTE/HTJ Transmission from the system, drain it of fluid and take it to a clean work surface.

Remove the fan from shaft prior to servicing any portion of HTE/HTJ Transmission to prevent from breaking.

Clean and dry the HTE/HTJ Transmission before you start to disassemble it.

As you disassemble the HTE/HTJ Transmission, clean all parts, except seals, in clean, OSHA approved solvent and use low pressure air to blow them dry.

WARNING
Since they are oil and grease that can be flammable, be extremely careful when using any solvent. Even a small explosion or fire could cause injury or death.

WARNING
WEAR EYE PROTECTION AND BE SURE TO COMPLY WITH OSHA OR OTHER MAXIMUM AIR PRESSURE REQUIREMENTS.

WARNING
Never steam or high pressure wash hydraulic components. Do not force or abuse closely fitted parts.

WARNING
Never attempt to tow, push or pull equipment with another vehicle. Towing will cause hydraulic transmission further damage. If equipment needs to be moved, make sure both transmission bypass valves are open and hand push.

Keep parts separate to avoid nicks and burrs.

Discard all seals and seal rings as they are removed from the HTE/HTJ Transmission. Replace all seal rings and any damaged or worn parts with genuine Parker or OEM approved service parts.

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Reference Exploded Assembly View

Remove HTE/HTJ Transmission unit from vehicle

Thoroughly clean unit free of grass and other debris. Let dry and place on a clean working table. (SEE FIGURE 1)

Figure 1

Loosen plug, remove filter and drain oil from unit

Place a pan for oil collection under the unit. Remove the breather/dipstick (37) and filter (9) from the unit to drain all fluid. (SEE FIGURES 2-4)

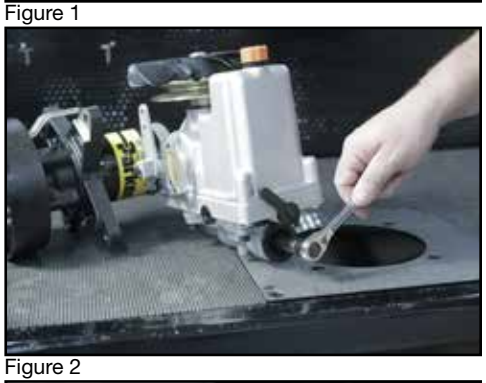

Figure 2

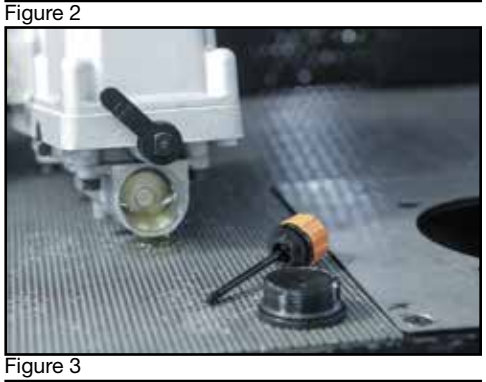

Figure 3

Use a strong magnet or a pair of needle nose pliers to remove filter (9).

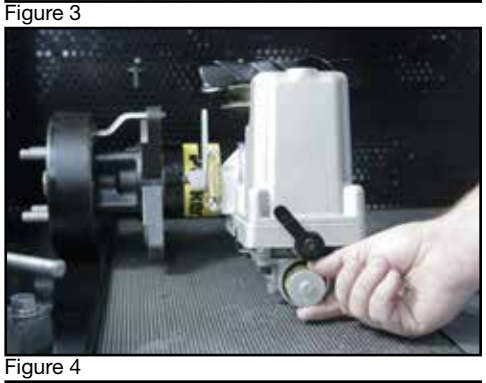

Figure 4

Loosen shaft nut and remove

Remove cotter pin (64) if installed, loosen and remove the castle nut (60). (SEE FIGURE 5-6)

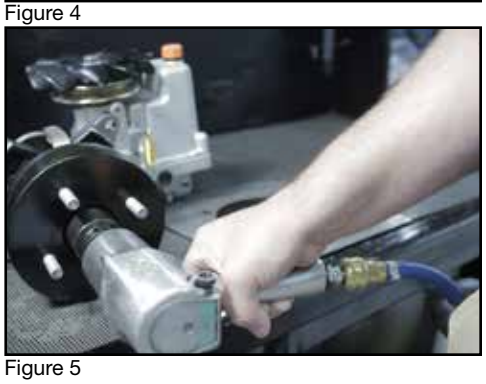

Figure 5


Figure 6

Remove brake drum Use a 3-jaw puller to remove brake drum (58 or 59) from coupling shaft (74). (SEE FIGURE 7)

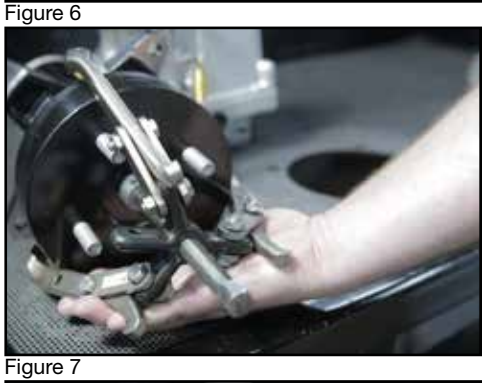
Figure 7

Remove shaft key Remove shaft key (if installed)

Remove brake bolts and brake Remove 4 flange head cap screws (43) (requires 12 point, 5/16-inch socket) to remove brake. (SEE FIGURES 8-9)

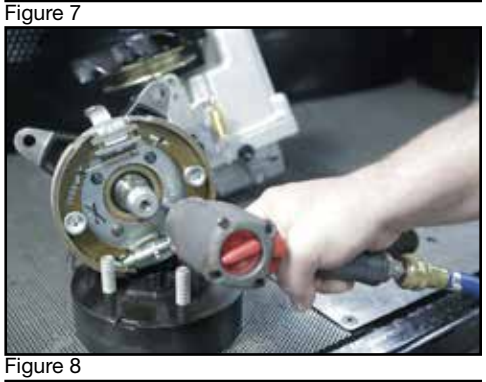
Figure 8


Figure 9

Remove springs from return to neutral assembly If so equipped, use a hook to remove both springs from the Return to Neutral assembly (47). (SEE FIGURES 10-11)

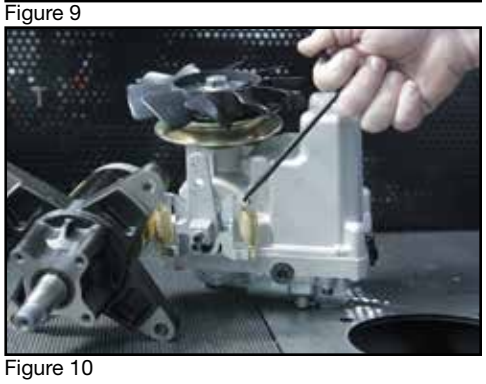
Figure 10

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Figure 11

Remove control arm socket screw (SEE FIGURES 12-13)


Figure 12

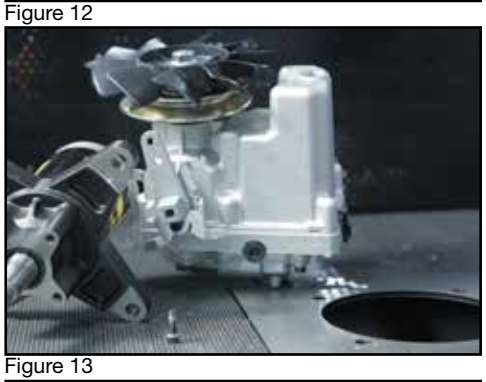
Figure 13

Remove return to neutral control arm Gently pry the control arm away from the rotating brackets (29 or 46) using a flat head screwdriver. (SEE FIGURE 14)

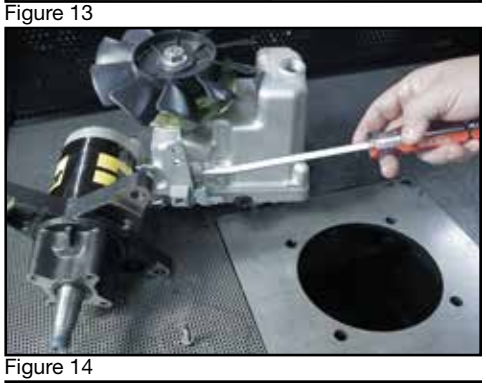
Figure 14

Remove rotating brackets (SEE FIGURE 15)

Inspect bushings for damage

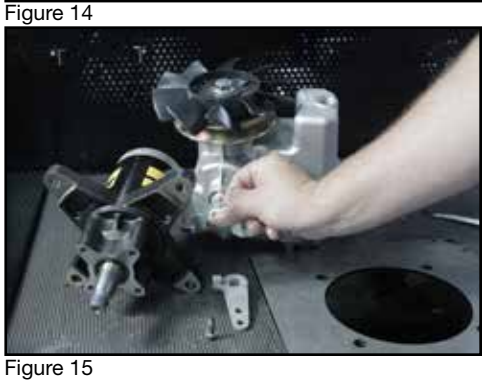
Figure 15

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Disassembly and Inspection

Remove stationary bracket socket head cap screw (31) (SEE FIGURES 16-17)


Figure 16


Figure 17

Remove flange nut (27) and fan (18 or 19) (SEE FIGURES 18-19)


Figure 18


Figure 19

Remove pulley Use a 3-jaw puller to remove pulley (16 or 17). (SEE FIGURES 20-21)

Note: Do not attach jaws of puller to outer edge of pulley. Attach jaws to recessed groove on hub section of pulley.


Figure 20

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Figure 21

Remove shaft key (15) (SEE FIGURE 22)

Figure 22

Remove Parker motor cover Peel off motor wrap decal (33). (SEE FIGURE 23)

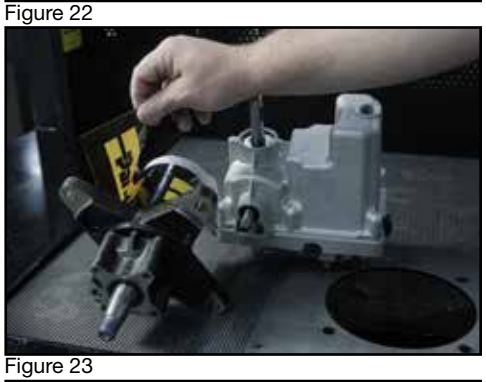

Figure 23

Clamp in vise with motor shaft down. Use paint pen (or equivalent) to make letter "V" alignment marks on the exterior of the motor. (SEE FIGURE 24)

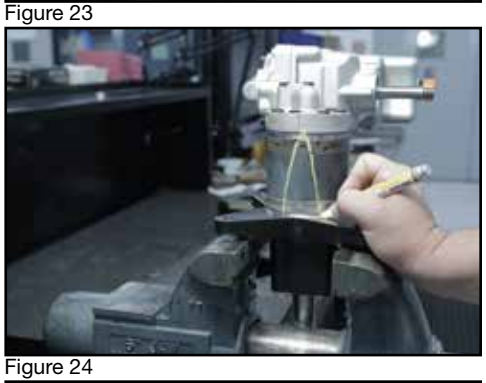

Figure 24

Loosen all seven motor end cap bolts (62), holding pump section (SEE FIGURE 25 & 26)

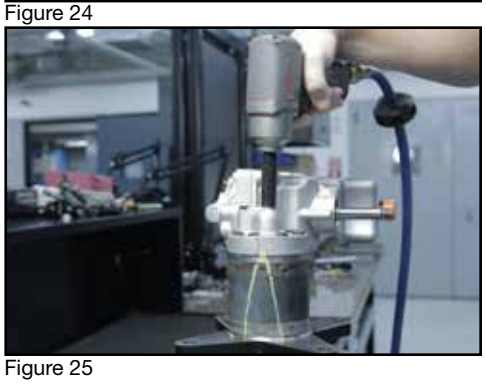

Figure 25

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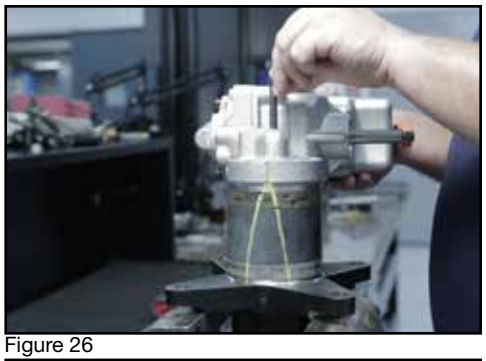

Figure 26

Set pump down onto pulley to support during service

Lay the pulley (16 or 17) flat on the work table and use it to support the pump section during disassembly.
(SEE FIGURE 27)

Figure 27

Remove section seal

With the Torqmotor™ (56 or 57) still clamped securely in the vise, remove the section seal (65) and discard.
(SEE FIGURE 28)

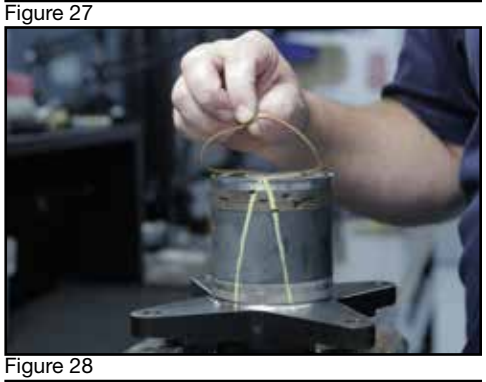

Figure 28

Remove commutator ring

Remove the commutator ring (72).
(SEE FIGURE 29)

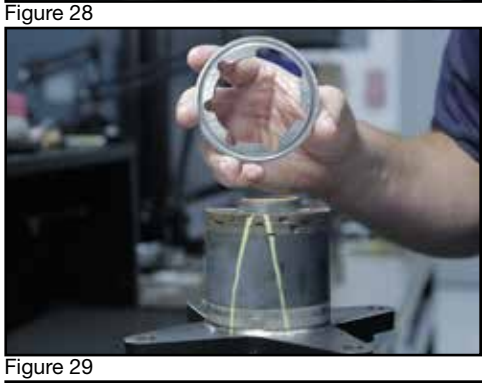

Figure 29

Remove commutator

Remove the commutator (72).
(SEE FIGURE 30)

Figure 30

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Disassembly and Inspection

Remove commutator seal

Use an air hose to blow air into the seal ring (65) groove to lift commutator seal (85) out of the commutator (72). Note that the flat edge of the seal is facing up. Discard the seal. (SEE FIGURES 31-32)

*Caution use proper precautions when working with compressed air, personal protective equipment required.

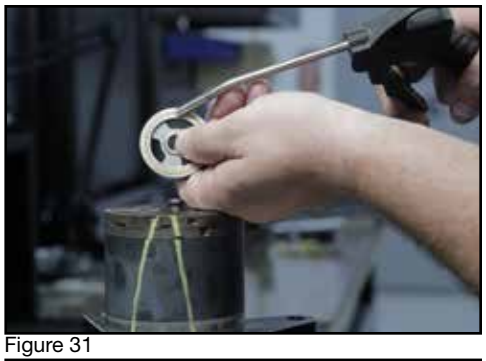

Figure 31

Figure 32

Remove manifold seal

Remove manifold seal (65) and discard. (SEE FIGURE 33)

Figure 33

Remove manifold

Remove the manifold (70 or 71). Note that the manifold is made up of several plates bonded together which do not require additional disassembly. (SEE FIGURE 34)

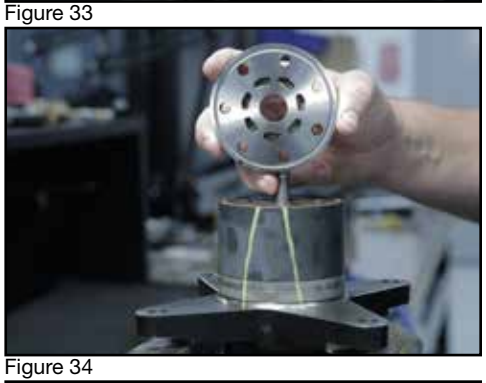

Figure 34

Remove washer

Remove washer (69). (SEE FIGURE 35)

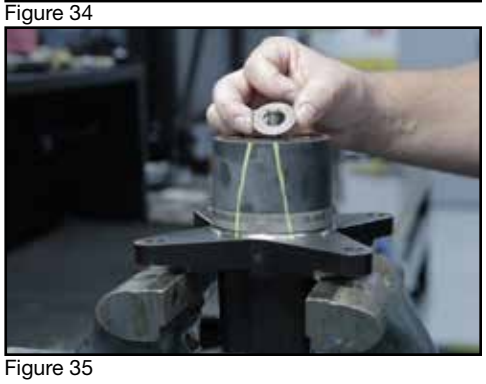

Figure 35

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Disassembly and Inspection

Remove rotor set seal

Remove rotor set seal (65) and discard. (SEE FIGURE 36)

Figure 36

Remove rotor set

Remove the rotor set (68), taking care not to drop any rollers that may be loose. (SEE FIGURE 37)

Figure 37

Remove drive link

Remove drive link (73). (SEE FIGURE 38)

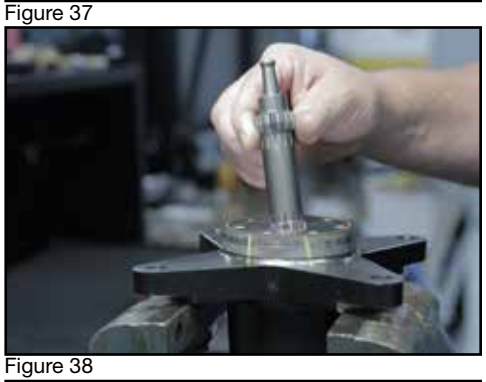

Figure 38

Remove wear plate seal

Remove wear plate seal (65) and discard. (SEE FIGURE 39)

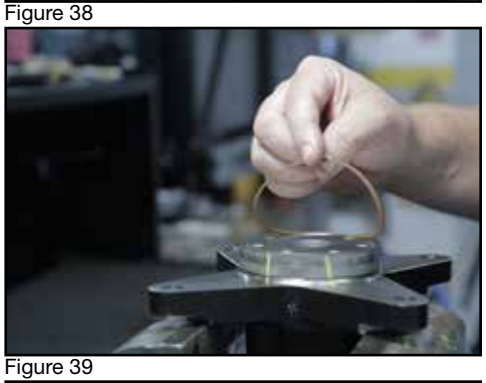

Figure 39

Remove wear plate

Remove wear plate (66 or 67). (SEE FIGURE 40)

Figure 40

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Disassembly and Inspection

Remove housing seal

Remove housing seal (65) and discard. (SEE FIGURE 41)

Figure 41

Remove shaft

Remove the coupling coupling shaft (74) by pushing and rotating the coupling shaft from below the motor housing (81 or 82). (SEE FIGURE 42)

Figure 42

Remove shaft seal, backup ring and backup washer

Because they are captured in the housing cavity, the TJ series Torqmotor™ requires that the thrust bearing (77) and thrust washers (76) be lifted vertically in order to remove the backup ring (80), backup washer (79) and shaft seal (78) from the housing (81 or 82). (SEE FIGURES 43-45)

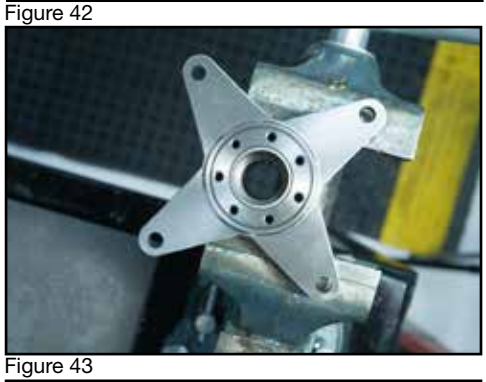

Figure 43

Figure 44

Figure 45

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Remove bypass arm

Use a flat screwdriver to gently pry off the bypass arm (6). (SEE FIGURES 46-47)

Your transmission assembly may include a plastic stop washer behind the lever, remove this as well. Note the position and orientation of the washer before removal.

Figure 46

Figure 47

Remove shock valves

To facilitate reassembly of each shock valve (4 or 69) on the proper side and orientation, place a mark across the housing (11) and valve on the FWD side only (as indicated on the endblock with a “F” in the casting).

Degraded performance may occur if the reverse valve is installed in the FWD endblock location. Remove each valve, place a mark across the internal spring to match the parts. (SEE FIGURES 48-55)

Figure 48

Remove shock valves, separate parts and mark for reassembly

Figure 49

Figure 50

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Greeneville, TN 37745 US

Figure 51

Figure 52

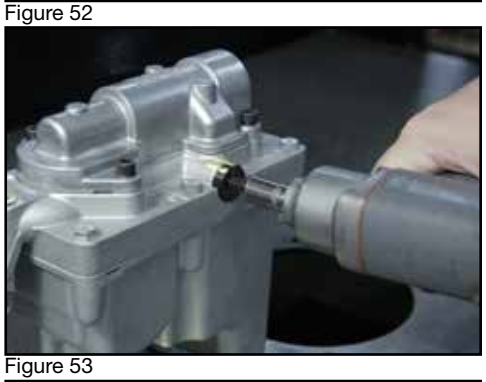

Figure 53

Figure 54

Figure 55

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Remove charge pump cover

Remove all 4 bolts (36) and lift off charge cover (7). (SEE FIGURES 56-57)

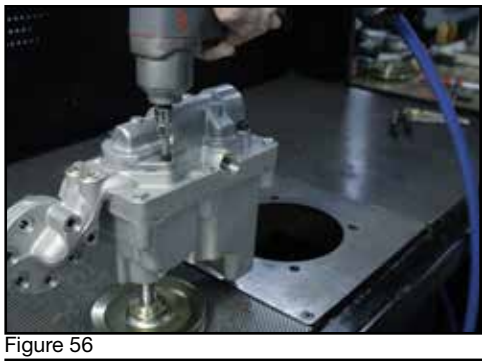
Figure 56

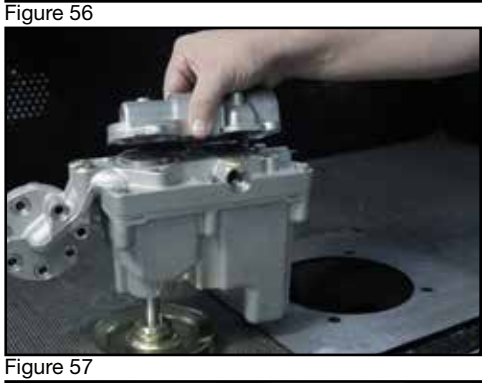
Figure 57

Remove charge pump cover seals

Remove and discard 2 seals (49 & 53) inside the charge pump cover (7). (SEE FIGURES 58-59)


Figure 58


Figure 59

Remove charge pump rotor set

Remove charge pump rotor set (8). (SEE FIGURE 60)


Figure 60

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Remove end block

Remove 6 end block bolts (35). (SEE FIGURE 61)

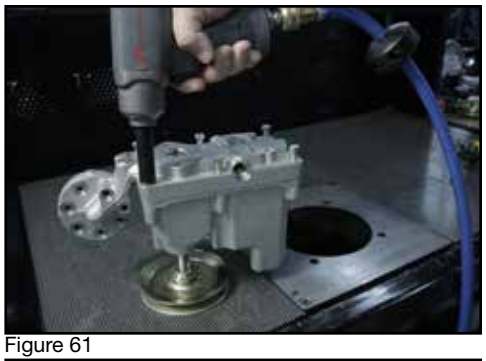
Figure 61

To overcome the vacuum seal inside the pump, reach under the end block (1) and hold the piston and barrel assembly (2 or 51) in place while lifting off the end block (1). (SEE FIGURES 62-63)

A pry bar may be required to assist in top housing to end block separation.

Please ensure the work area is kept clean during all stages of disassembly and re-assembly. Also use care when working with pry bars to avoid damaging the flat surfaces.


Figure 62

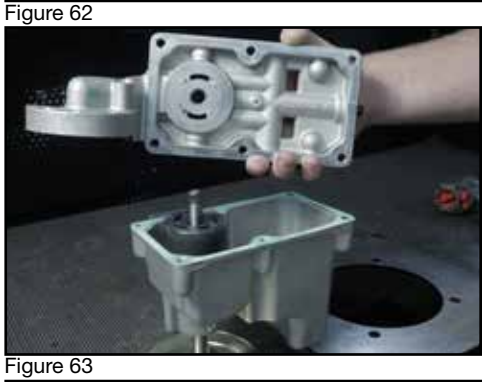
Figure 63

Remove piston and barrel assembly

Turn the pump up 90 degrees and carefully remove the piston and barrel assembly (2 or 51) taking care not to drop any loose pistons. (SEE FIGURE 64)

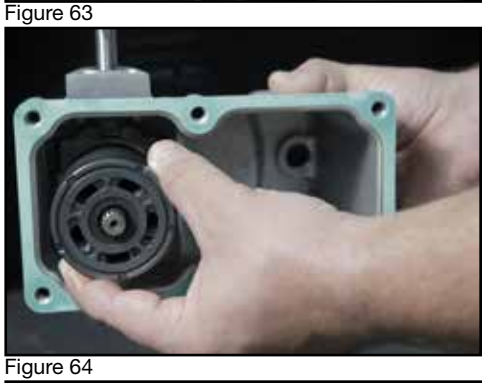
Figure 64

Remove central spring and central washer

Remove the central spring (22) and washer (21). (SEE FIGURE 65)


Figure 65

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Remove swash block and thrust bearing package

Remove swash block (54) and thrust bearing assembly (28).
(SEE FIGURES 66-67)


Figure 66


Figure 67

Remove cradle bushings

Remove the 2 cradle bushings.
(SEE FIGURE 68)

Please use a strong magnet to aid in cradle bushing removal.

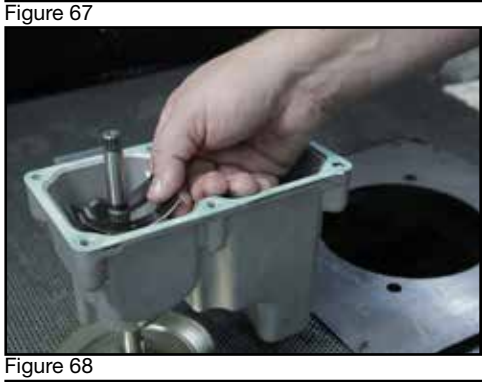
Figure 68

Remove control block

Remove the control block (26).
(SEE FIGURE 69)

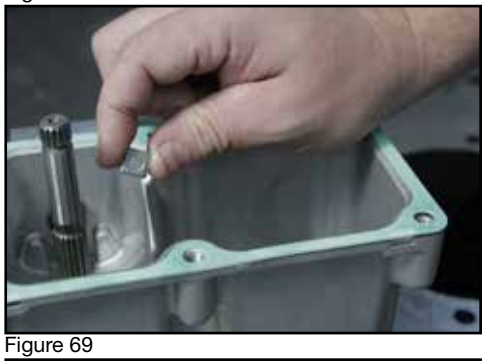
Figure 69

Remove retaining ring and shaft seal

Invert the pump and use snap ring pliers, remove the retaining ring (14).
(SEE FIGURES 70-71)


Figure 70

Figure 71

Tap out shaft with mallet Use a soft mallet to tap out the pump shaft assembly (12) and shaft seal (13). (SEE FIGURES 72-74)

Figure 72

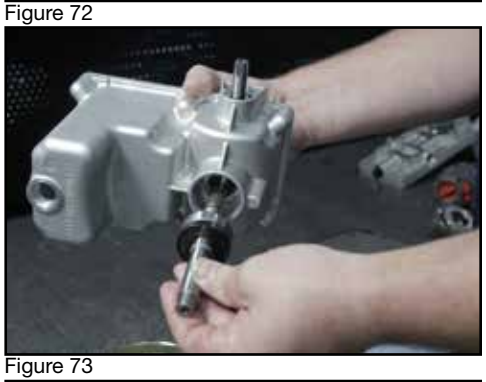

Figure 73

Figure 74

Remove trunnion arm Remove trunnion arm (23, 24 or 25) (SEE FIGURE 75)

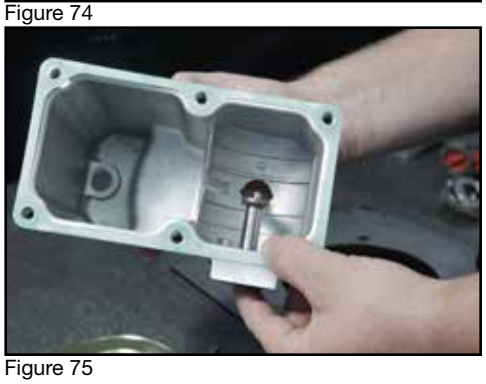

Figure 75

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Remove trunnion seal

Use a small screwdriver to gently pry out trunnion seal. (SEE FIGURE 76)

Figure 76

Remove gasket

Remove gasket (50). (SEE FIGURE 77)

If needed use light flexible scraper to remove residual seal material. Take care to not harm the aluminum sealing surface.

Figure 77

The disassembly of the HTE/HTJ Transmission is now complete.

Reassembly

Assemble trunnion seal

Assemble the trunnion seal (SEE FIGURE 78)

Press in with a 5/8” socket.

Figure 78

Assemble trunnion arm

Assemble the trunnion arm (23, 24 or 25). (SEE FIGURE 79)

Figure 79

Assemble pump shaft

Install pump assembly shaft (12). (SEE FIGURE 80)

Figure 80

Install washer

Install washer (30), if included. (SEE FIGURE 81)

(Note: Not all transmissions include this washer. Discontinued on transmissions built after 6/3/15 so not necessary to replace washer.)

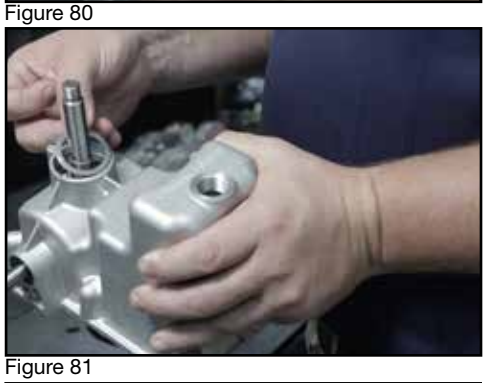

Figure 81

Install pump shaft seal using socket to press

Install the pump, using a socket to press the seal evenly and firmly. (SEE FIGURE 82)

Use a 1 1/8 inch deep well socket.

Figure 82

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Install retaining ring

Install retaining ring (14) using snap ring pliers. (SEE FIGURES 83-84)

Figure 83

Figure 84

Install cradle bushings

Invert top housing (11) with the pump shaft down, using the pulley to support the housing.

Install the cradle bushings onto the pins. (SEE FIGURE 85)

Figure 85

Install control block

Install control block (26) on to trunnion arm (23, 24, or 25). (SEE FIGURES 86-87)

Figure 86

Figure 87

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Reassembly

Install swash block

Install the swash block (54) over the pump shaft. (SEE FIGURE 88)


Figure 88

Assemble thrust bearing package

Assemble thrust bearing assembly (28) over the pump shaft. The thin race should be at the bottom of the stack. (SEE FIGURE 89)

CAUTION! Installing the bearing races in the incorrect sequence will lead to serious internal damage to the transmission.


Figure 89

Install central washer

Install the backup washer (21) over the pump shaft. (SEE FIGURE 90)


Figure 90

Install central spring

Install the central spring (22) over the pump shaft. (SEE FIGURE 91)


Figure 91

Install piston and barrel assembly

Hold the housing at 90 degree angle and assemble the piston and barrel assembly (2 or 51) over the pump shaft. Take care not to drop any pistons. (SEE FIGURE 92)

If a piston does drop, re-install piston, spring, and spring seat back into barrel and attempt again.


Figure 92

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Ensure piston and barrel assembly (2 or 51) travels on shaft with spring action. (SEE FIGURE 93)

With both hands pushing on barrel face the assembly should compress and release without binding.

Figure 93

Install new gasket

Install a new gasket (50) (SEE FIGURE 94)

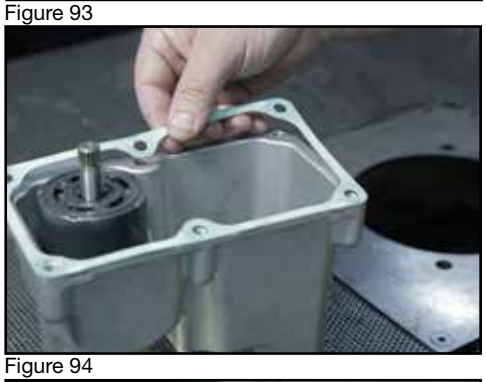

Figure 94

Assemble end block

Assemble the end block (1) over the housing gasket (50). (SEE FIGURE 95)

Figure 95

Install 6 bolts, evenly and alternately by hand

Install 6 housing bolts (35), hand tightening each bolt alternately and evenly. (SEE FIGURES 96-97)

Tighten the housing bolts in a crisscross pattern.

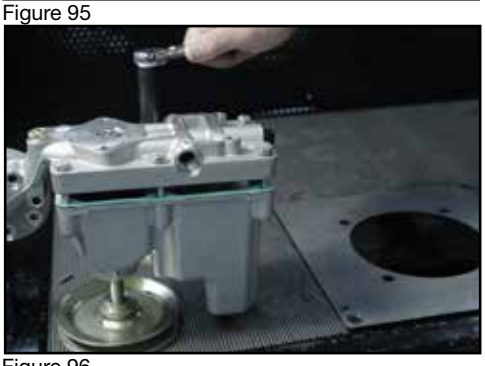

Figure 96

Figure 97

Torque end block bolts

Torque end block bolts (35) to 10–13 ft-lbs. (SEE FIGURE 98)

Figure 98

Install charge pump

Install the charge pump rotor set assembly (8) over the pump shaft. (SEE FIGURES 99-100)

Figure 99

Figure 100

Install charge pump cover seals

Install new seals (49 & 53) into the charge pump cover (7). (SEE FIGURE 101)

You may use petroleum jelly to hold seals in place during installation.

Figure 101

Install cover inline with charge pump

Install charge pump (7) cover onto the endblock (1), in line with the charge pump. (SEE FIGURE 102)

Adjust charge cover position to align bolt holes.

Figure 102

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Reassembly

Install charge pump cover bolts

Install charge pump cover (7) with 4 bolts (36), tightening each bolt alternately and evenly. Torque bolts to 10–13 ft-lbs. (SEE FIGURES 103-104)

Figure 103

Figure 104

Install shock valves, matching marks

Install shock valves (4 or 63) on each side of the pump housing (11). Use the mark made during disassembly to ensure valves are reassembled in the same positions. Torque valves to 21–24 ft-lbs. (SEE FIGURES 105-106)

Figure 105

Figure 106

Install bypass arm

Install bypass arm (6). (SEE FIGURE 107)

Figure 107

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Install filter

Install new filter (9). (SEE FIGURE 108)

Figure 108

Insert plug

Install filter plug (10). Torque to 9.5–1 ft-lbs. (SEE FIGURE 109)

Figure 109

Torqmotor™ reassembly

Clamp Torqmotor™ housing (81 or 82) into soft-jawed vise, shaft end pointed down. (SEE FIGURE 110)

Figure 110

Install backup ring, backup washer and shaft seal

Holding the thrust bearing (77) and thrust washer (76) package vertically, install a **new** backup ring (80), **new** backup washer (79) and **new** shaft seal (78) with the lip facing out towards the motor. Ensure they are seated correctly before reseating the thrust bearing package (75). (SEE FIGURES 111-113)

Figure 111

Figure 112

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Figure 113

Install shaft

Install coupling shaft (74) into the motor. (SEE FIGURE 114)

Figure 114

Install housing seal

Apply a small amount of clean grease and install a new seal (65) into the housing groove. (SEE FIGURE 115)

Figure 115

Assemble wear plate and seal

Assemble the wear plate (66 or 67) onto the housing with alignment marks matched. (SEE FIGURE 116)

Figure 116

Apply a small amount of clean grease and install a new seal (65) into the wear plate (66 or 67) groove. (SEE FIGURE 117)

Figure 117

Install drive link

Install drive link (73), aligning teeth to engage coupling shaft (74). (SEE FIGURE 118)

Figure 118

Install rotor set

Install the rotor set (68) over the drive link (73) and onto the wear plate (66 or 67) with alignment marks matched. (SEE FIGURE 119)

Figure 119

Install washer

Install washer (69) over the drive link (73) and onto the rotor set (68). (SEE FIGURE 120)

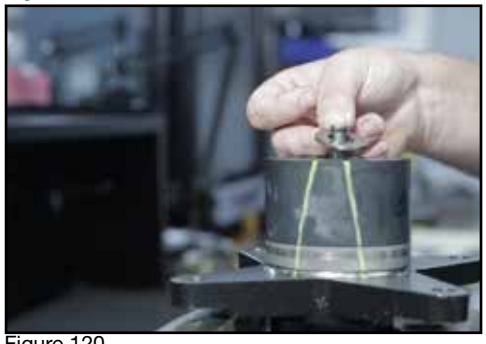

Figure 120

Install rotor set seal

Install a new seal (65) into the rotor set (68) groove. (SEE FIGURE 121)

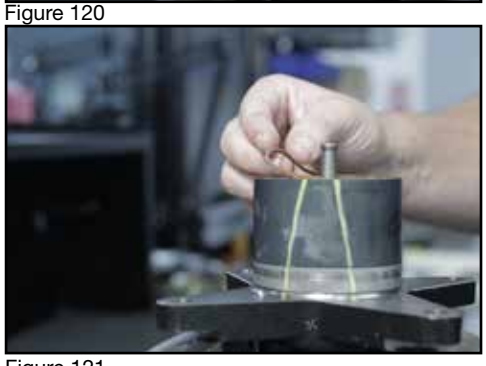

Figure 121

Install manifold

Install the manifold (70 or 71) over the drive link (73) and onto the rotor set (68) with alignment marks matched. (SEE FIGURE 122)

Figure 122

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Install manifold seal

Install a new seal (65) into the manifold (70 or 71) groove. (SEE FIGURE 123)

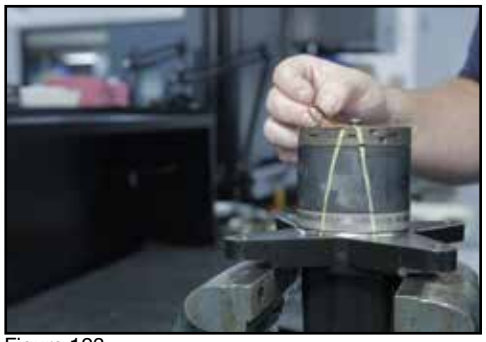

Figure 123

Install commutator seal

Install a new seal (85) into the groove of the commutator (72) with the flat edge of the seal facing up. (SEE FIGURE 124)

Figure 124

Install commutator

Install commutator (72) over the drive link (73) onto the manifold (70 or 71). (SEE FIGURE 125)

Figure 125

Install commutator ring

Install the commutator ring (86) onto the manifold with alignment marks matched. (SEE FIGURE 126)

Figure 126

Install commutator ring seal

Install a new seal (65) into the commutator ring groove. (SEE FIGURE 127)

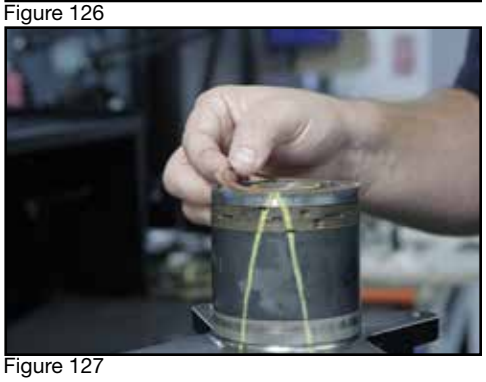

Figure 127

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Assemble motor to pump section

Assemble motor (56 or 57) to pump section with alignment marks matched using the 7 special bolts (62).

Ensure correct length bolts are used in each bolt location.

Tighten end cover bolts alternately and evenly by hand, then torque to 25–30 ft-lbs. (SEE FIGURES 128-130)


Figure 128

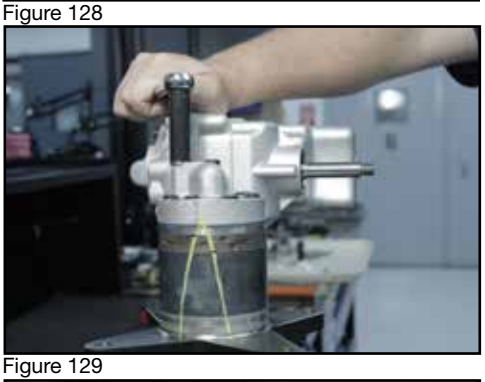
Figure 129


Figure 130

Install shaft key

Set transmission on work table. Install pump shaft key (15). (SEE FIGURE 131)

A light tap with a hammer may be needed to install the key.


Figure 131

Install pulley

Install the pulley (16 or 17) over the pump shaft. (SEE FIGURE 132)

Make sure pulley is installed with the puller groove facing up.


Figure 132

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Install fan

Assemble fan (18 or 19) and fan spacer (20) then install onto shaft. (SEE FIGURE 133)

Figure 133

Torque fan nut

Install fan nut (27) and torque to 40–60 ft-lbs. (SEE FIGURES 134-135)

To torque the fan nut, hold pulley with a strap wrench or similar tool.

Figure 134

Figure 135

Install return to neutral stationary bracket

Install stationary bracket onto trunnion arm (23, 24 or 25). (SEE FIGURE 136)

Figure 136

Install return to neutral stationary bracket screw

Install stationary bracket screw and torque to 22–24 ft-lbs. (SEE FIGURES 137-138)

Figure 137

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Figure 138

Install return to neutral rotating brackets

Install rotating brackets onto trunnion arm (23, 24 or 25). (SEE FIGURES 139-140)

Figure 139

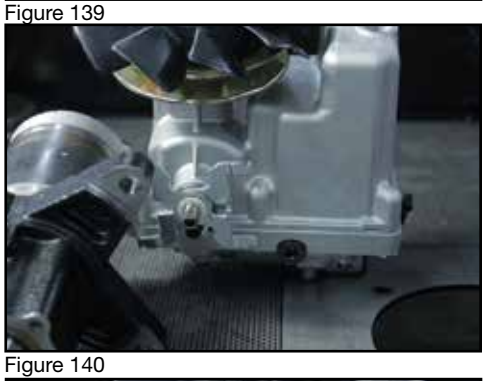

Figure 140

Install return to neutral control arm

Install control arm (47) over trunnion arm (23, 24 or 25). (SEE FIGURE 141)

Figure 141

Install return to neutral control arm

Install control arm screw and torque to 12.5–15 ft-lbs. (SEE FIGURES 142-143)

Figure 142

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Figure 143

Install return to neutral springs

Using a spring puller tool install the two springs onto the rotating brackets. (29 or 46) (SEE FIGURES 144-145)

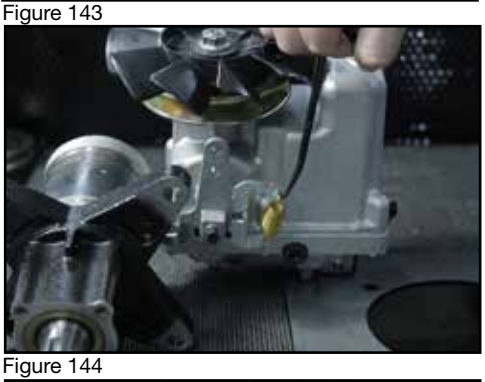

Figure 144

Figure 145

Attach brake

Install the brake (42, 44 or 45) onto the motor housing with 4 bolts (43). Torque bolts to 25–28 ft-lbs. (SEE FIGURES 146-147)

Figure 146

Figure 147

Reassembly

Install key

Install woodruff key (41) into coupling shaft (74). (SEE FIGURE 148)

Figure 148

Install brake drum

Install brake drum (58 or 59) onto motor shaft with notch aligned with woodruff key. (SEE FIGURE 149)

Ensure woodruff key (41) remains in place while installing brake hub.

Figure 149

Attach shaft nut

Install hub nut and torque to 175-225 ft lbs plus rotation to align cotter pin (64) when assembled with Drum Assembly (58 or 59) for castle nut (60) or 200 ft lbs minimum for self locking nut (61). (SEE FIGURES 150-151)

Figure 150

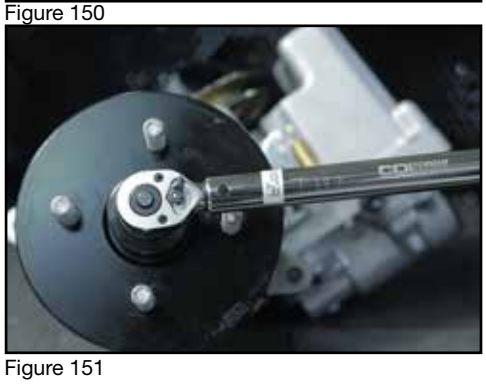

Figure 151

Fill with oil and install breather/dipstick

Fill the reservoir with Parker HT-1000 transmission oil or other approved hydraulic fluid. The cold fluid level should be in the hashed area of the dipstick. Insert the breather/dipstick (37) and torque to 18–30 in-lbs. (SEE FIGURE 152)

Figure 152

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System Maintenance Tips

- Adjust fluid level in reservoir as necessary.
- Encourage all operators to report any malfunction or accident that may have damaged the hydraulic system or component.
- Do not attempt to weld any broken HTE/HTJ Transmission component. Replace any component with original Parker parts.
- Do not cold straighten, hot straighten, or bend any HTE/HTJ Transmission part.
- Prevent dirt or other foreign matter from entering the hydraulic system. Clean the area around the filler caps before checking oil level.
- Investigate and correct any external leak in the hydraulic system, no matter how minor the leak.
- Comply with Parker specifications for cleaning or replacing the filter.

⚠ **CAUTION: Do not weld, braze, solder or any way alter any HTE/HTJ Transmission component.**

⚠ **CAUTION: Maximum operating pressure must not exceed recommended HTE/HTJ Transmission pressure capacity.**

⚠ **CAUTION: Always carefully inspect any system component that may have been struck or damaged during operation or in an accident. Replace any component that is damaged or questionable.**

⚠ **CAUTION: Do not force any coupling onto the pump coupling shaft as this could damage the unit internally.**

⚠ **CAUTION: Do not mix oil types. Any mixture or any unapproved oil could deteriorate the seals. Maintain the proper fluid level in the reservoir. When changing fluid, completely drain old oil from the system. It is suggested also that you flush the system with clean oil.**

Parker extends close technical cooperation and assistance. If problems occur which you cannot solve, please contact our service department at 423-639-8151, or your local Parker approved Distributor.

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Notes

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1. Terms and Conditions. Seller's willingness to offer Products, or accept an order for Products, to or from Buyer is subject to these Terms and Conditions or any newer version of the terms and conditions found on-line at www.parker.com/saleterms/. Seller objects to any contrary or additional terms or conditions of Buyer's order or any other document issued by Buyer.

2. Price Adjustments; Payments. Prices stated on Seller's quote or other documentation offered by Seller are valid for 30 days, and do not include any sales, use, or other taxes unless specifically stated. Unless otherwise specified by Seller, all prices are F.C.A. Seller's facility (INCOTERMS 2010). Payment is subject to credit approval and is due 30 days from the date of invoice or such other term as required by Seller's Credit Department, after which Buyer shall pay interest on any unpaid invoices at the rate of 1.5% per month or the maximum allowable rate under applicable law.

3. Delivery Dates; Title and Risk; Shipment. All delivery dates are approximate and Seller shall not be responsible for any damages resulting from any delay. Regardless of the manner of shipment, title to any products and risk of loss or damage shall pass to Buyer upon placement of the products with the shipment carrier at Seller's facility. Unless otherwise stated, Seller may exercise its judgment in choosing the carrier and means of delivery. No deferment of shipment at Buyers' request beyond the respective dates indicated will be made except on terms that will indemnify, defend and hold Seller harmless against all loss and additional expense. Buyer shall be responsible for any additional shipping charges incurred by Seller due to Buyer's acts or omissions.

4. Warranty. Seller warrants that the Products sold hereunder shall be free from defects in material or workmanship for a period of eighteen months from the date of delivery to Buyer or 2,000 hours of normal use, whichever occurs first. The prices charged for Seller's products are based upon the exclusive limited warranty stated above, and upon the following disclaimer: **DISCLAIMER OF WARRANTY:** THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO PRODUCTS PROVIDED HEREUNDER. SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING DESIGN, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

5. Claims; Commencement of Actions. Buyer shall promptly inspect all Products upon delivery. No claims for shortages will be allowed unless reported to the Seller within 10 days of delivery. No other claims against Seller will be allowed unless asserted in writing within 30 days after delivery. Buyer shall notify Seller of any alleged breach of warranty within 30 days after the date the defect is or should have been discovered by Buyer. Any action based upon breach of this agreement or upon any other claim arising out of this sale (other than an action by Seller for an amount due on any invoice) must be commenced within 12 months from the date of the breach without regard to the date breach is discovered.

6. LIMITATION OF LIABILITY. UPON NOTIFICATION, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE A DEFECTIVE PRODUCT, OR REFUND THE PURCHASE PRICE. IN NO EVENT SHALL SELLER BE LIABLE TO BUYER FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR AS THE RESULT OF, THE SALE, DELIVERY, NON-DELIVERY, SERVICING, USE OR LOSS OF USE OF THE PRODUCTS OR ANY PART THEREOF, OR FOR ANY CHARGES OR EXPENSES OF ANY NATURE INCURRED WITHOUT SELLER'S WRITTEN CONSENT, EVEN IF SELLER HAS BEEN NEGLIGENT, WHETHER IN CONTRACT, TORT OR OTHER LEGAL THEORY. IN NO EVENT SHALL SELLER'S LIABILITY UNDER ANY CLAIM MADE BY BUYER EXCEED THE PURCHASE PRICE OF THE PRODUCTS.

7. User Responsibility. The user, through its own analysis and testing, is solely responsible for making the final selection of the system and Product and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application and follow applicable industry standards and Product information. If Seller provides Product or system options, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products or systems.

8. Loss to Buyer's Property. Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, will be considered obsolete and may be destroyed by Seller after two consecutive years have elapsed without Buyer ordering the items manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.

9. Special Tooling. A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture Products. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the Products, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

10. Buyer's Obligation; Rights of Seller. To secure payment of all sums due or otherwise, Seller shall retain a security interest in the goods delivered and this agreement shall be deemed a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its attorney to execute and file on Buyer's behalf all documents Seller deems necessary to perfect its security interest.

11. Improper use and Indemnity. Buyer shall indemnify, defend, and hold Seller harmless from any claim, liability, damages, lawsuits, and costs (including attorney fees), whether for personal injury, property damage, patent, trademark or copyright infringement or any other claim, brought by or incurred by Buyer, Buyer's employees, or any other person, arising out of: (a) improper selection, improper application or other misuse of Products purchased by Buyer from Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, plans, drawings, or specifications furnished by Buyer to manufacture Product; or (d) Buyer's failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as otherwise provided.

12. Cancellations and Changes. Orders shall not be subject to cancellation or change by Buyer for any reason, except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage. Seller may change product features, specifications, designs and availability with notice to Buyer.

13. Limitation on Assignment. Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.

14. Force Majeure. Seller does not assume the risk and shall not be liable for delay or failure to perform any of Seller's obligations by reason of circumstances beyond the reasonable control of Seller (hereinafter "Events of Force Majeure"). Events of Force Majeure shall include without limitation: accidents, strikes or labor disputes, acts of any government or government agency, acts of nature, delays or failures in delivery from carriers or suppliers, shortages of materials, or any other cause beyond Seller's reasonable control.

15. Waiver and Severability. Failure to enforce any provision of this agreement will not waive that provision nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect.

16. Termination. Seller may terminate this agreement for any reason and at any time by giving Buyer thirty (30) days written notice of termination. Seller may immediately terminate this agreement, in writing, if Buyer: (a) commits a breach of any provision of this agreement (b) appointments a trustee, receiver or custodian for all or any part of Buyer's property (c) files a petition for relief in bankruptcy on its own behalf, or by a third party (d) makes an assignment for the benefit of creditors, or (e) dissolves or liquidates all or a majority of its assets.

17. Governing Law. This agreement and the sale and delivery of all Products hereunder shall be deemed to have taken place in and shall be governed and construed in accordance with the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to this agreement.

18. Indemnity for Infringement of Intellectual Property Rights. Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that a Product sold pursuant to this Agreement infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Product, replace or modify the Product so as to make it noninfringing, or offer to accept return of the Product and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The foregoing provisions of this Section shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

19. Entire Agreement. This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of sale. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged.

20. Compliance with Law, U.K. Bribery Act and U.S. Foreign Corrupt Practices Act. Buyer agrees to comply with all applicable laws and regulations, including both those of the United Kingdom and the United States of America, and of the country or countries of the Territory in which Buyer may operate, including without limitation the U. K. Bribery Act, the U.S. Foreign Corrupt Practices Act ("FCPA") and the U.S. Anti-Kickback Act (the "Anti-Kickback Act"), and agrees to indemnify and hold harmless Seller from the consequences of any violation of such provisions by Buyer, its employees or agents. Buyer acknowledges that they are familiar with the provisions of the U. K. Bribery Act, the FCPA and the Anti-Kickback Act, and certifies that Buyer will adhere to the requirements thereof. In particular, Buyer represents and agrees that Buyer shall not make any payment or give anything of value, directly or indirectly to any governmental official, any foreign political party or official thereof, any candidate for foreign political office, or any commercial entity or person, for the purpose of influencing such person to purchase products or otherwise benefit the business of Seller.

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