

Parker HTE/HTJ Series Integrated Hydrostatic Transmission

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HTE/HTJ Series Service Manual

A 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.

This product can expose you to chemicals including lead and DEHP, which are known to the State of California to cause cancer, and birth defects or other reproductive harm. For more information go to www.p65warnings.ca.gov

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Disclaimer

This Service Manual has been prepared by Parker Hannifin for reference and use by individuals 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 individual 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.



General Information

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 illustrates the procedure, column two gives a brief key for each step, and column three explains in detail the procedure you should follow. <u>Pay special attention to the notes</u>, cautions and warnings.

This manual contains troubleshooting information and checklists. With them you can potentially 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 Transmissions, you may find that some information in this Service Manual could be clearer and more complete. If so, please contact your local dealer or OEM manufacturer's technical service department. Don't try to second-guess the Service Manual; if problems occur that you cannot solve, please contact your local dealer or OEM manufacturer's technical service department.

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



General Information

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



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



WEAR EYE PROTECTION AND BE SURE TO COMPLY WITH OSHA AND OTHER MAXIMUM AIR PRESSURE REQUIREMENTS. KEEP HANDS CLEAR OF FAN, 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.

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.



Troubleshooting Checklist (page 1 of 2)

General Cautions

Caution: Do not pressure wash the transmission to remove debris. Use a power blower to remove built up debris. Caution: Use of Foam/ Liquid filled tires is not recommended.

Problem/ Symptom	What to Check/ Look For/ Look At	Potential Repair Fix
Fluid Leakage	Shaft seal leaking (Trunnion, Input, Motor Output Seal)	Replace shaft seal
NOTE: Refer to owners manual for proper transmission fluid and fill volume.	Filter plug leak- Check proper plug torque, inspect for seal damage, inspect for cap damage	If plug is loose, torque to proper torque speci- fication, if seal damage replace plug, if plug is cracked replace plug
	Magnetic plugs leaking	Torque to proper spec. If leak continues, magnetic plug, install new plug , torque to proper spec, re-fill oil
	Motor static seals leaking (motor section seals, motor top housing interface seals)	Dis-assemble transmission, remove pump section from motor, replace seals as necessary
No Power	1. Proper fluid level	Refer to OEM owners manual- Check transmission fluid level, adjust as necessary
NOTE: Verify Engine is running / operating properly	2. Bypass lever position	Ensure lever is in the proper operating position (Straight up and down)
NOTE: Refer to owners manual for proper transmission fluid and fill volume.	3. Drive belt broken or lack of proper tension	Inspect belt and tensioner pulley and spring, repair as necessary
	Trunnion lever/ control linkage disconnected/ damaged	Inspect linkage and repair as necessary
	5. Internal components of transmission are damaged	Remove transmission, dis-assemble, repair/ replace as necessary
Low Power	1. Excessive load	Verify mower use conditions, reduce weight of load or towing amount
NOTE: Verify operating conditions (BELOW)	2. Low fluid level	Refer to OEM owners manual- check and fill as necessary
- Mowing? Heavy grass/ normal grass conditions	3. Belt tension	Refer to OEM owners manual- adjust belt tension to proper specification
- <i>Towing?</i> Trailer/ logs/ field maintenance equipment	4. Transmissions over heat	Check fan for broken blades, check for debris wrapped around pulley shaft
NOTE: Refer to owners manual for proper transmission fluid and fill volume.	5. Engine speed low	Refer to OEM owners manual- Check RPM of engine to ensure proper operation
	6. Control lever doesn't have full range of motion	Check linkage for interference or damage
	7. Brake Drag	Refer to OEM owners manual- for proper speci- fied brake adjustment
	8. Pulley Loose- can spin on shaft	Verify proper nut torque for fan/ pulley, tighten as necessary
	9. Pulley Alignment (transmission to engine)	Verify pulley alignment with clutch/ engine, trans- mission pulley installed correctly
	10. Contaminated fluid/ filter clog	Drain fluid, install new filter, re-fill oil
	11. Worn internal components	Remove transmission, dis-assemble, repair/ replace as necessary



Troubleshooting Checklist (page 2 of 2)

Problem/ Symptom	What to Check/ Look For/ Look At Potential Repair Fix	
Lack of control/jerky control	1. Proper tire pressure	Refer to OEM owners manual- Verify proper tire inflation, adjust as necessary
NOTE: Refer to owners manual for proper transmission fluid and fill volume.	2. Inspect control linkage dampeners	Inspect dampener for smooth and proper range of motion, replace as necessary
	3. Loose control lever/ linkage	Verify linkage connections, repair as necessary
	4. RTN function (If equipped)	Verify RTN bolt torque, RTN adjustment, repair as necessary
	5. Belt tension	Refer to OEM owners manual-verify proper tension, adjust as necessary
	Proper engine governor speed control (fluctuating RPM)	Refer to OEM owners manual- verify RPM, adjust as necessary
	7. Brake Drag	Refer to OEM owners manual- for proper speci- fied brake adjustment
	8. Loose lug nuts	Refer to OEM owners manual- for proper torque specification
	9. Output axel shaft castle nut is loose	Inspect shaft, threads, and hub for damage, repair as necessary, and re-torque to proper torque specification
	10. Internal components of transmission are damaged	Remove transmission, dis-assemble, repair/ replace as necessary
Noisy Unit	1. Excessive load	Verify mower use conditions, reduce weight of load or towing amount
NOTE: Verify location of the noise- engine/ deck/ transmission	2. Low fluid level	Refer to OEM owners manual- Check and fill as necessary
NOTE: Refer to owners manual for proper transmission fluid and fill volume.	3. Contaminated fluid/ filter clog	Drain fluid, install new filter, re-fill oil
	Internal components of transmission are damaged	Remove transmission, dis-assemble, repair/ replace as necessary
Miscellaneous	Lack of brake holding power	Refer to OEM owners manual- for proper speci- fied brake adjustment



Tools and Materials Required for Servicing

- Clean, petroleum-based solvent
- Emery paper
- · Vise with soft jaws
- Air pressure source
- Arbor press
- Flat screw driver
- Grease pen
- · Small gear puller
- 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

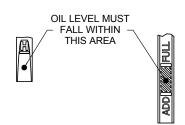
Mixing greases that have different bases can be detrimental to bearing life.

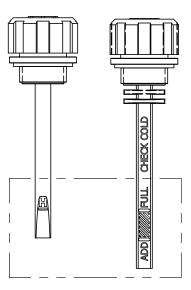
To insure maximum HTE/HTJ Transmission performance and life, use Parker-1000™ oil. HTE/ HTJ transmissions come factory filled with Parker HT-1000™ oil. Oil change intervals depend on the type of oil used. Follow OEM manufacturers recommended oil change interval. Always change the filter when changing the oil.

Approved Oil	Change Interval (hrs)	Packaging	P/N
	1000	Hydraulic Transmission Oil Service Kit	SK000444
Parker HT-1000™		1 U.S. Gallon (3.8L)	406030
		1 U.S. Quart (0.79L)	406032
Shell TTF-SB	250		

Breather Dipstick

After draining the oil, and changing the filter, refill the unit to the appropriate level (approximately 1.5 US quart) as indicated by the hatched range on the dipstick.







System Maintenance Tips

- Adjust fluid level in integrated 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 dipstick 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 replacing the filter.



CAUTION

Do not weld, braze, solder or alter any HTE/HTJ Transmission component.



CAUTION

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 mix oil types. Any mixture or unapproved oil could deteriorate the seals. When changing fluid, completely drain old oil from the system and refill with HT-1000™.

If problems occur which you cannot solve, please contact your local dealer or OEM manufacturer's technical service department.



General Information

Warning Data

Before disassembly of 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.

Depending on how the HTE/HTJ is mounted to vehicle, the nut, brake hub and/or brake back plate may need to be removed prior to removing the HTE/HTJ for inspection and/or repair. Refer to exploded view illustrations for removal and replacement of the brake assembly and torque specifications.

Remove the HTE/HTJ Transmission from the chassis and clean all exterior surfaces. Take it to a clean work surface or work bench and start the disassembly/repair process.

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



WARNING

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

Do not tow, push, or pull faster than 5 mph. Towing may cause hydraulic transmission further damage. If equipment needs to be moved, make sure both transmission bypass valves are open and push by hand.

Keep parts separate to avoid nicks and burrs.

Replace all seal rings and any damaged or worn parts with genuine Parker or OEM approved service parts.

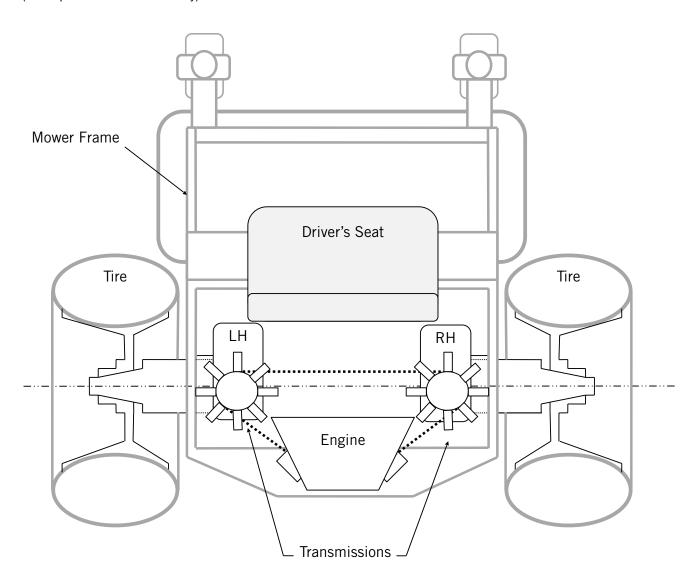


HTE/HTJ Transmission Assembly Rebuild Bolt Torques

Component	ft-lbs	in-lbs
Brake Assembly	25-28	
Castle Nut / Patch Lock Nut	200- 300	
	plus rotation to	align
	Cotter Pin	
Charge Cover Bolts	15–18	90-110
Control Arm Bolt	12.5-15	150-180
End Block to Housing	15–18	180–216
Fan Nut	40–60	
Filter Plug	8.3-10	100-120
Magnetic hex plugs	8.3–12.5	100–150
Motor Bolts	25–30	
Shock/ Check Valves	21-24	252-288



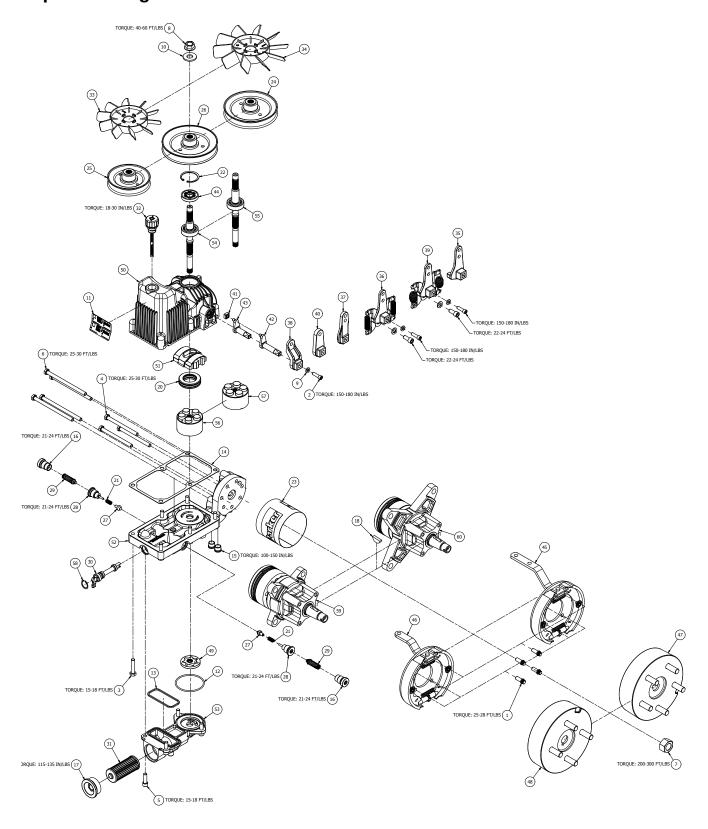
Top View of Mower (Some parts sectioned for clarity)







Exploded Diagram and Parts List - Lefthand Unit

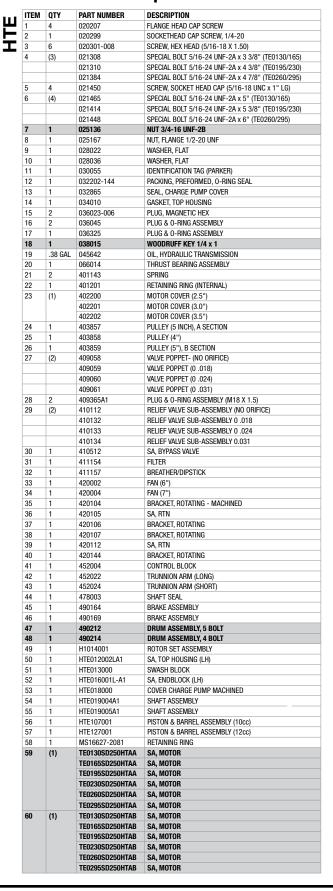




Left-hand Unit Exploded View & Parts List (page 1 of 5)

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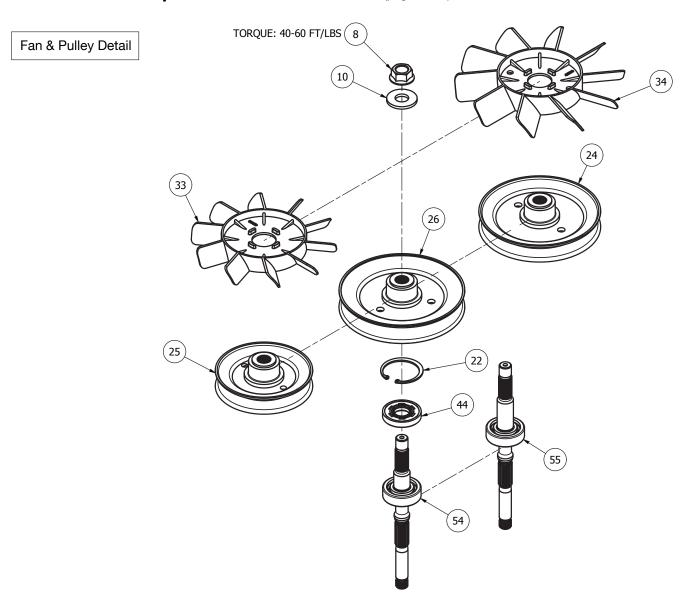
NOTE: Gray cells indicated unshared part numbers between the HTE & HTJ



ITEM	QTY	PART NUMBER	DESCRIPTION
1	4	020207	FLANGE HEAD CAP SCREW
2	1	020299	SOCKETHEAD CAP SCREW, 1/4-20
3	6	020301-008	SCREW, HEX HEAD (5/16-18 X 1.50)
4	(3)	021308	SPECIAL BOLT 5/16-24 UNF-2A x 3 3/8" (TJ0130/165)
	(-)	021310	SPECIAL BOLT 5/16-24 UNF-2A x 4 3/8" (TJ0195/230)
		021384	SPECIAL BOLT 5/16-24 UNF-2A x 4 7/8" (TJ0260/295)
5	4	021450	SCREW, SOCKET HEAD CAP (5/16-18 UNC x 1"LG)
6	(4)	021465	SPECIAL BOLT 5/16-24 UNF-2A x 5" (TJ0130/165)
		021414	SPECIAL BOLT 5/16-24 UNF-2A x 5 3/8" (TJ0195/230)
		021448	SPECIAL BOLT 5/16-24 UNF-2A x 6" (TJ0260/295)
7	1	025126	NUT 1-20 UNEF-2B
8	1	025167	NUT, FLANGE 1/2-20 UNF
9	1	028022	WASHER, FLAT
10	1	028036	WASHER, FLAT
11	1	030055	IDENTIFICATION TAG (PARKER)
12	1	032202-144	PACKING, PREFORMED, O-RING SEAL
13	1	032865	SEAL, CHARGE PUMP COVER
14	1	034010	GASKET, TOP HOUSING
15	2	036023-006	PLUG, MAGNETIC HEX
16	2	036045	PLUG & 0-RING ASSEMBLY
17	1	036325	PLUG & 0-RING ASSEMBLY
18	1	038016	W00DRUFF KEY 5/16 x 1
19	.38 GAL	045642	OIL, HYDRAULIC TRANSMISSION
20	1	066014	THRUST BEARING ASSEMBLY
21	2	401143	SPRING
22	1	401201	RETAINING RING (INTERNAL)
23	(1)	402200	MOTOR COVER (2.5")
20	(1)	402200	MOTOR COVER (3.0")
	-		
		402202	MOTOR COVER (3.5")
24	1	403857	PULLEY (5 INCH), A SECTION
25	1	403858	PULLEY (4")
26	1	403859	PULLEY (5"), B SECTION
27	(2)	409058	VALVE POPPET (NO ORIFICE)
		409059	VALVE POPPET (0 .018)
		409060	VALVE POPPET (0 .024)
		409061	VALVE POPPET (0 .031)
28	2	409365A1	PLUG & O-RING ASSEMBLY (M18 X 1.5)
29	(2)	410112	RELIEF VALVE SUB-ASSEMBLY (NO-ORIFICE)
29	(2)		, ,
		410132	RELIEF VALVE SUB-ASSEMBLY 0 .018
		410133	RELIEF VALVE SUB-ASSEMBLY 0 .024
		410134	RELIEF VALVE SUB-ASSEMBLY 0 .031
30	1	410512	SA, BYPASS VALVE
31	1	411154	FILTER
32	1	411157	BREATHER/DIPSTICK
33	1	420002	FAN (6")
34	1	420004	FAN (7")
35	1	420104	BRACKET, ROTATING - MACHINED
36	1	420105	SA, RTN
			-
37	1	420106	BRACKET, ROTATING
38	1	420107	BRACKET, ROTATING
39	1	420112	SA, RTN
40	1	420144	BRACKET, ROTATING
41	1	452004	CONTROL BLOCK
42	1	452022	TRUNNION ARM (LONG)
43	1	452024	TRUNNION ARM (SHORT)
44	1	478003	SHAFT SEAL
45	1		
	1	490164	BRAKE ASSEMBLY BRAKE ASSEMBLY
46		490169	
47	1	490216	DRUM ASSEMBLY, 5 BOLT
48	1	490218	DRUM ASSEMBLY, 4 BOLT
49	1	H1014001	ROTOR SET ASSEMBLY
50	1	HTE012002LA1	SA, TOP HOUSING (LH)
51	1	HTE013000	SWASH BLOCK
52	1	HTE016001L-A1	SA, ENDBLOCK (LH)
53	1	HTE018000	COVER CHARGE PUMP MACHINED
54	1	HTE019004A1	SHAFT ASSEMBLY
55	1	HTE019005A1	SHAFT ASSEMBLY
56	1	HTE107001	PISTON & BARREL ASSEMBLY (10cc)
57	1	HTE107001	
	_		PISTON & BARREL ASSEMBLY (12cc)
58	1	MS16627-2081	RETAINING RING
59	(1)	TJ0130SD080HTAA	SA, MOTOR
		TJ0165SD080HTAA	SA, MOTOR
		TJ0195SD080HTAA	SA, MOTOR
		TJ0230SD080HTAA	SA, MOTOR
		TJ0260SD080HTAA	SA, MOTOR
		TJ0295SD080HTAA	SA, MOTOR
60	(4)		
mil	(1)	TJ0130SD080HTAB	SA, MOTOR
00		TJ0165SD080HTAB	SA, MOTOR
00		TJ0195SD080HTAB	SA, MOTOR
		1001000200011112	
00		TJ0230SD080HTAB	SA, MOTOR
00			



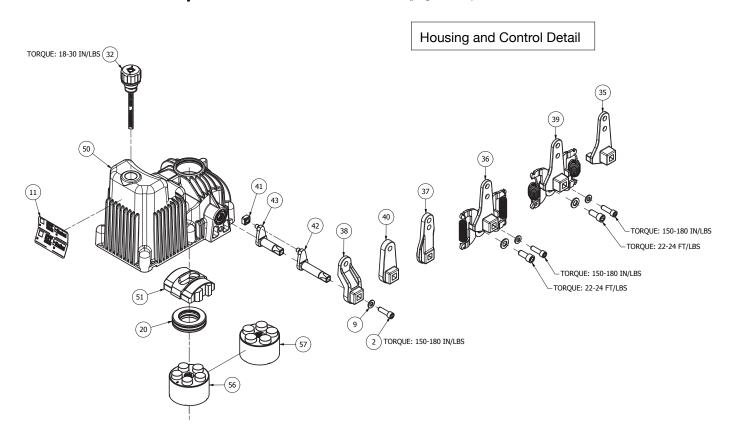
Left-hand Unit Exploded View & Parts List (page 2 of 5)



ITEM	QTY	Series	PART NUMBER	DESCRIPTION
8	1	HTE/HTJ	025167	NUT, FLANGE 1/2-20 UNF
10	1	HTE/HTJ	028036	WASHER, FLAT
22	1	HTE/HTJ	401201	RETAINING RING (INTERNAL)
24	1	HTE/HTJ	403857	PULLEY (5 INCH), A SECTION
25	1	HTE/HTJ	403858	PULLEY (4")
26	1	HTE/HTJ	403859	PULLEY (5"), B SECTION
33	1	HTE/HTJ	420002	FAN (6")
34	1	HTE/HTJ	420004	FAN (7")
44	1	HTE/HTJ	478003	SHAFT SEAL
54	1	HTE/HTJ	HTE019004A1	SHAFT ASSEMBLY
55	1	HTE/HTJ	HTE019005A1	SHAFT ASSEMBLY



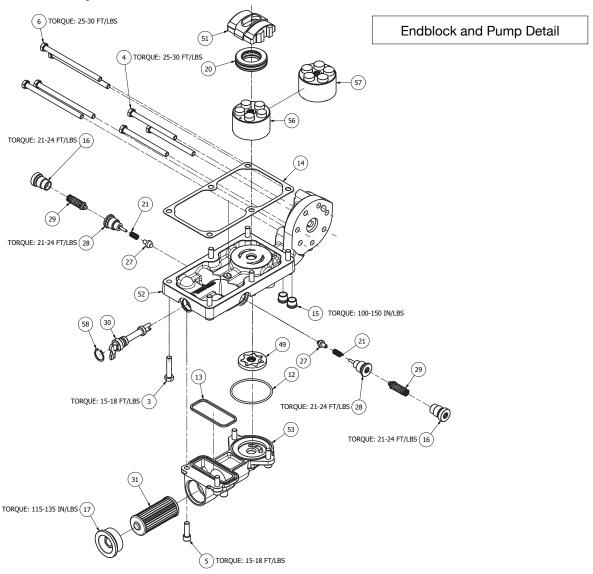
Left-hand Unit Exploded View & Parts List (page 3 of 5)

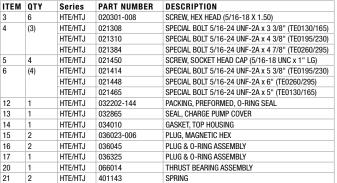


ITEM	QTY	Series	PART NUMBER	DESCRIPTION
11	1	HTE/HTJ	030055	IDENTIFICATION TAG (PARKER)
20	1	HTE/HTJ	066014	THRUST BEARING ASSEMBLY
35	1	HTE/HTJ	420104	BRACKET, ROTATING - MACHINED
36	1	HTE/HTJ	420105	SA, RTN
37	1	HTE/HTJ	420106	BRACKET, ROTATING
38	1	HTE/HTJ	420107	BRACKET, ROTATING
39	1	HTE/HTJ	420112	SA, RTN
40	1	HTE/HTJ	420144	BRACKET, ROTATING
41	1	HTE/HTJ	452004	CONTROL BLOCK
42	1	HTE/HTJ	452022	TRUNNION ARM (LONG)
43	1	HTE/HTJ	452024	TRUNNION ARM (SHORT)
50	1	HTE/HTJ	HTE012002LA1	SA, TOP HOUSING (LH)
51	1	HTE/HTJ	HTE013000	SWASH BLOCK
52	1	HTE/HTJ	HTE016001L-A1	SA, ENDBLOCK (LH)
53	1	HTE/HTJ	HTE018000	COVER CHARGE PUMP MACHINED
56	1	HTE/HTJ	HTE107001	PISTON & BARREL ASSEMBLY (10cc)
57	1	HTE/HTJ	HTE127001	PISTON & BARREL ASSEMBLY (12cc)



Left-hand Unit Exploded View & Parts List (page 4 of 5)



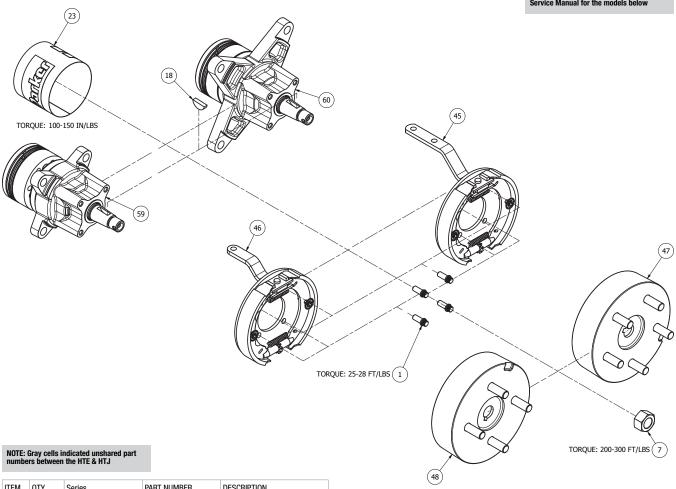


27	(2)	HTE/HTJ	409058	VALVE POPPET- (NO ORIFICE)
		HTE/HTJ	409059	VALVE POPPET (0 .018)
		HTE/HTJ	409060	VALVE POPPET (0 .024)
		HTE/HTJ	409061	VALVE POPPET (0 .031)
28	2	HTE/HTJ	409365A1	PLUG & O-RING ASSEMBLY (M18 X 1.5)
29	(2)	HTE/HTJ	410112	RELIEF VALVE SUB-ASSEMBLY (NO ORIFICE)
		HTE/HTJ	410132	RELIEF VALVE SUB-ASSEMBLY 0 .018
		HTE/HTJ	410133	RELIEF VALVE SUB-ASSEMBLY 0 .024
		HTE/HTJ	410134	RELIEF VALVE SUB-ASSEMBLY 0.031
30	1	HTE/HTJ	410512	SA, BYPASS VALVE
31	1	HTE/HTJ	411154	FILTER
51	1	HTE/HTJ	HTE013000	SWASH BLOCK
52	1	HTE/HTJ	HTE016001L-A1	SA, ENDBLOCK (LH)
53	1	HTE/HTJ	HTE018000	COVER CHARGE PUMP MACHINED
56	1	HTE/HTJ	HTE107001	PISTON & BARREL ASSEMBLY (10cc)
57	1	HTE/HTJ	HTE127001	PISTON & BARREL ASSEMBLY (12cc)
58	1	HTE/HTJ	MS16627-2081	RETAINING RING



Left-hand Unit Exploded View & Parts List (page 5 of 5)

NOTE: For Torqmotor™ exploded diagrams and parts lists see specific Torqmotor™ Service Manual for the models below



ITEM	QTY	Series	PART NUMBER	DESCRIPTION
1	4	HTE/HTJ	020207	FLANGE HEAD CAP SCREW
7	1	HTE	025136	NUT 3/4-16 UNF-2B
7	1	HTJ	025126	NUT 1-20 UNEF-2B
18	1	HTE	038015	WOODRUFF KEY 1/4 x 1
18	1	HTJ	038016	W00DRUFF KEY 5/16 x 1
23	(1)	HTE/HTJ	402200	MOTOR COVER (2.5")
23	(1)	HTE/HTJ	402201	MOTOR COVER (3.0")
23	(1)	HTE/HTJ	402202	MOTOR COVER (3.5")
45	1	HTE/HTJ	490164	BRAKE ASSEMBLY
46	1	HTE/HTJ	490169	BRAKE ASSEMBLY
47	1	HTE	490212	DRUM ASSEMBLY, 5 BOLT
47	1	HTJ	490216	DRUM ASSEMBLY, 5 BOLT
48	1	HTE	490214	DRUM ASSEMBLY, 4 BOLT
48	1	HTJ	490218	DRUM ASSEMBLY, 4 BOLT

TE0165SD250HTAA TE0195SD250HTAA TE0230SD250HTAA TE0260SD250HTAA TE0260SD250HTAA TE0295SD250HTAA TE0295SD250HTAA TJ0130SD080HTAA TJ0195SD080HTAA TJ0260SD080HTAA TJ0260SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAA TE0165SD250HTAB TE0165SD250HTAB TE0230SD250HTAB TE0230SD250HTAB TE0260SD250HTAB TE0295SD250HTAB TE0295SD250HTAB TE0295SD250HTAB TE0295SD250HTAB TE0295SD250HTAB TE0295SD250HTAB TE0295SD250HTAB	SA, MOTOR SA, MOTOR SA, MOTOR SA, MOTOR
TE0230SD250HTAA TE0260SD250HTAA TE0260SD250HTAA TE0295SD250HTAA TE0295SD250HTAA TJ0130SD080HTAA TJ0195SD080HTAA TJ0230SD080HTAA TJ0260SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAA TE0165SD250HTAB TE0165SD250HTAB TE0230SD250HTAB TE0230SD250HTAB TE0260SD250HTAB TE0295SD250HTAB TE0295SD250HTAB	SA, MOTOR
TE0260SD250HTAA TE0295SD250HTAA TE0295SD250HTAA TE0295SD250HTAA TJ0130SD080HTAA TJ0195SD080HTAA TJ0260SD080HTAA TJ0260SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAA TE0165SD250HTAB TE0165SD250HTAB TE0230SD250HTAB TE0230SD250HTAB TE0260SD250HTAB TE0295SD250HTAB TE0295SD250HTAB TE0295SD250HTAB	·
59 (1) HTJ TJ0130SD080HTAA TJ0165SD080HTAA TJ0165SD080HTAA TJ0195SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAA TC0165SD250HTAB TE0165SD250HTAB TE0230SD250HTAB TE0260SD250HTAB TE0295SD250HTAB TE0295SD250HTAB TE0295SD250HTAB	SA, MOTOR
59 (1) HTJ TJ0130SD080HTAA TJ0165SD080HTAA TJ0195SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAA TE0130SD250HTAB TE0165SD250HTAB TE0230SD250HTAB TE0260SD250HTAB TE0295SD250HTAB TE0295SD250HTAB TE0295SD250HTAB	
TJ0165SD080HTAA TJ0195SD080HTAA TJ0230SD080HTAA TJ0230SD080HTAA TJ0260SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAB TE0130SD250HTAB TE0195SD250HTAB TE0230SD250HTAB TE0260SD250HTAB TE0295SD250HTAB TE0295SD250HTAB TE0295SD250HTAB	SA, MOTOR
TJ0195SD080HTAA TJ0230SD080HTAA TJ0260SD080HTAA TJ0260SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAB TE0195SD250HTAB TE0195SD250HTAB TE0230SD250HTAB TE0260SD250HTAB TE0295SD250HTAB TE0295SD250HTAB TE0295SD250HTAB	SA, MOTOR
TJ0230SD080HTAA TJ0260SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAA TJ0295SD250HTAB TE0165SD250HTAB TE0195SD250HTAB TE0230SD250HTAB TE0260SD250HTAB TE0295SD250HTAB TE0295SD250HTAB TE0295SD250HTAB	SA, MOTOR
TJ0260SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAA TJ0295SD080HTAA TE0130SD250HTAB TE0165SD250HTAB TE0195SD250HTAB TE0230SD250HTAB TE0260SD250HTAB TE0295SD250HTAB TE0295SD250HTAB TE0295SD250HTAB	SA, MOTOR
GO (1) HTE TE0130SD250HTAB TE0130SD250HTAB TE0165SD250HTAB TE0195SD250HTAB TE0230SD250HTAB TE0260SD250HTAB TE0295SD250HTAB TE0295SD250HTAB TE0295SD250HTAB	SA, MOTOR
60 (1) HTE TE0130SD250HTAB TE0165SD250HTAB TE0195SD250HTAB TE0230SD250HTAB TE0260SD250HTAB TE0295SD250HTAB TE0295SD250HTAB TE0295SD250HTAB	SA, MOTOR
TE0165SD250HTAB TE0195SD250HTAB TE0230SD250HTAB TE0260SD250HTAB TE0295SD250HTAB TE0295SD250HTAB TE030SD250HTAB	SA, MOTOR
TE0195SD250HTAB TE0230SD250HTAB TE0260SD250HTAB TE0295SD250HTAB TE0295SD250HTAB TE0295SD250HTAB	SA, MOTOR
TE0230SD250HTAB TE0260SD250HTAB TE0295SD250HTAB TE0295SD250HTAB TJ0130SD080HTAB	SA, MOTOR
TE0260SD250HTAB TE0295SD250HTAB G0 (1) HTJ TJ0130SD080HTAB	SA, MOTOR
TE0295SD250HTAB 60 (1) HTJ TJ0130SD080HTAB	SA, MOTOR
60 (1) HTJ TJ0130SD080HTAB	SA, MOTOR
	SA, MOTOR
TJ0165SD080HTAB	SA, MOTOR
	SA, MOTOR
TJ0195SD080HTAB	SA, MOTOR
TJ0230SD080HTAB	SA, MOTOR
TJ0260SD080HTAB	SA, MOTOR
TJ0295SD080HTAB	

Right-hand Unit Exploded View & Parts List (page 1 of 5)

NOTE: Gray cells indicated unshared part numbers between the HTE & HTJ

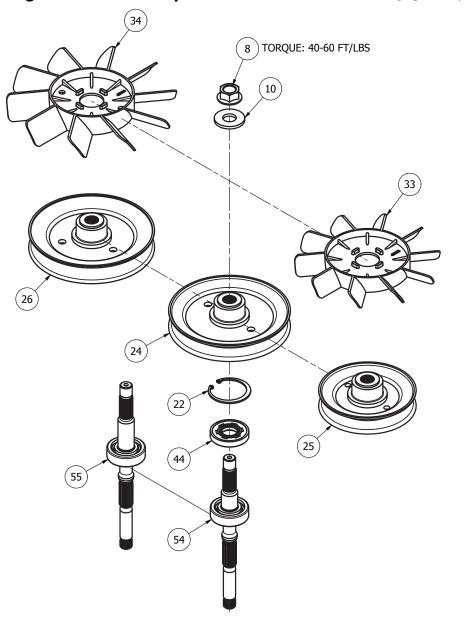


ITEM	QTY	PART NUMBER	DESCRIPTION
1	4	020207	FLANGE HEAD CAP SCREW
2	1	020299	SOCKETHEAD CAP SCREW, 1/4-20
3	6	020301-008	SCREW, HEX HEAD (5/16-18 X 1.50)
4	(5)	021308	SPECIAL BOLT 5/16-24 UNF-2A x 3 3/8" (TE0130/165)
		021310	SPECIAL BOLT 5/16-24 UNF-2A x 4 3/8" (TE0195/230)
		021384	SPECIAL BOLT 5/16-24 UNF-2A x 4 7/8" (TE0260/295)
5	4	021450	SCREW, SOCKET HEAD CAP (5/16-18 UNC x 1" LG)
6	(2)	021465	SPECIAL BOLT 5/16-24 UNF-2A x 5" (TE0130/165)
		021414	SPECIAL BOLT 5/16-24 UNF-2A x 5 3/8" (TE0195/230)
		021448	SPECIAL BOLT 5/16-24 UNF-2A x 6" (TE0260/295)
7	1	025136	NUT 3/4-16 UNF-2B
8	1	025167	NUT, FLANGE 1/2-20 UNF
9	1	028022	WASHER, FLAT
10	1	028036	WASHER, FLAT
11	1	030075	IDENTIFICATION TAG, RH (GREEN)
12	1	032202-144	PACKING, PREFORMED, 0-RING SEAL
13	1	032865	SEAL, CHARGE PUMP COVER
14	1	034010	GASKET, TOP HOUSING
15	2	036023-006	PLUG, MAGNETIC HEX
16	2	036045	PLUG & 0-RING ASSEMBLY
17	1	036325	PLUG & 0-RING ASSEMBLY
18	1	038015	WOODRUFF KEY 1/4 x 1
19	.38 GAL	045642	OIL, HYDRAULIC TRANSMISSION
20	1	066014	THRUST BEARING ASSEMBLY
21	2	401143	SPRING
22	1	401201	RETAINING RING (INTERNAL)
23	(1)	402200	MOTOR COVER (2.5")
	'	402201	MOTOR COVER (3.0")
		402202	MOTOR COVER (3.5")
24	1	403857	PULLEY (5 INCH), A SECTION
25	1	403858	PULLEY (4")
26	1	403859	PULLEY (5"), B SECTION
27	(2)	409058	VALVE POPPET- (NO ORIFICE)
	(-)	409059	VALVE POPPET (0 .018)
		409060	VALVE POPPET (0 .024)
		409061	VALVE POPPET (0 .031)
28	2	409365A1	PLUG & O-RING ASSEMBLY (M18 X 1.5)
29	(2)	410112	RELIEF VALVE SUB-ASSEMBLY (NO-ORIFICE)
23	(2)	410132	RELIEF VALVE SUB-ASSEMBLY 0 .018
		410133	RELIEF VALVE SUB-ASSEMBLY 0 .024
		410134	RELIEF VALVE SUB-ASSEMBLY 0 .031
30	1	410512	SA, BYPASS VALVE
31	1	411154	FILTER
32	1	411157	BREATHER/DIPSTICK
33	1	420002	FAN (6")
34	1	420002	FAN (7")
35	1	420104	BRACKET, ROTATING - MACHINED
36	1	420104	SA, RTN
37	1	420105	BRACKET, ROTATING
38 39	1	420107	BRACKET, ROTATING
		420112	SA, RTN PRACKET POTATING
40	1	420144	BRACKET, ROTATING
41	1	452004	CONTROL BLOCK
42	1	452022	TRUNNION ARM (LIONG)
43	1	452024	TRUNNION ARM (SHORT)
44	1	478003	SHAFT SEAL
45	1	490164	BRAKE ASSEMBLY
46	1	490169	BRAKE ASSEMBLY
47	1	490212	DRUM ASSEMBLY, 5 BOLT
48	1	490214	DRUM ASSEMBLY, 4 BOLT
49	1	H1014001	ROTOR SET ASSEMBLY
50	1	HTE012002RA1	SA, TOP HOUSING (RH)
51	1	HTE013000	SWASH BLOCK
52	1	HTE016001R-A1	SA, ENDBLOCK (RH)
53	1	HTE018000	COVER CHARGE PUMP MACHINED
54	1	HTE019004A1	SHAFT ASSEMBLY
55	1	HTE019005A1	SHAFT ASSEMBLY
56	1	HTE107001	PISTON & BARREL ASSEMBLY (10cc)
57	1	HTE127001	PISTON & BARREL ASSEMBLY (12cc)
58	1	MS16627-2081	RETAINING RING
59	(1)	TE0130SD251HTAA	SA, MOTOR
		TE0165SD251HTAA	SA, MOTOR
		TE0195SD251HTAA	SA, MOTOR
		TE0230SD251HTAA	SA, MOTOR
		TE0260SD251HTAA	SA, MOTOR
		TE0295SD251HTAA	SA, MOTOR
60	(1)	TE0130SD251HTAB	SA, MOTOR
55	(.)	TE0165SD251HTAB	SA, MOTOR
		TE0195SD251HTAB	SA, MOTOR
		TE0230SD251HTAB	SA, MOTOR SA, MOTOR
		TE0260SD251HTAB	

L	(pugc	1 of 5)	numbers between the HTE & HTJ
ITEM	QTY	PART NUMBER	DESCRIPTION
1	4	020207	FLANGE HEAD CAP SCREW
2	1	020299	SOCKETHEAD CAP SCREW, 1/4-20
3	6	020301-008	SCREW, HEX HEAD (5/16-18 X 1.50)
4	(5)	021308	SPECIAL BOLT 5/16-24 UNF-2A x 3 3/8" (TJ0130/165)
		021310	SPECIAL BOLT 5/16-24 UNF-2A x 4 3/8" (TJ0195/230)
		021384	SPECIAL BOLT 5/16-24 UNF-2A x 4 7/8" (TJ0260/295)
5	4	021450	SCREW, SOCKET HEAD CAP (5/16-18 UNC x 1"LG)
6	(4)	021465	SPECIAL BOLT 5/16-24 UNF-2A x 5" (TJ0130/165)
		021414	SPECIAL BOLT 5/16-24 UNF-2A x 5 3/8" (TJ0195/230)
		021448	SPECIAL BOLT 5/16-24 UNF-2A x 6" (TJ0260/295)
7	1	025126	NUT 1-20 UNEF-2B
8	1	025167	NUT, FLANGE 1/2-20 UNF
9	1	028022	WASHER, FLAT
10	1	028036	WASHER, FLAT
11	1	030075	IDENTIFICATION TAG, RH (GREEN)
12	1	032202-144	PACKING, PREFORMED, O-RING SEAL
13	1	032865	SEAL, CHARGE PUMP COVER
14	1	034010	GASKET, TOP HOUSING
15	2	036023-006	PLUG, MAGNETIC HEX
16	2	036045	PLUG & 0-RING ASSEMBLY
17	1	036325	PLUG & O-RING ASSEMBLY
18	1	038016	W00DRUFF KEY 5/16 x 1
19	.38 GAL	045642	OIL, HYDRAULIC TRANSMISSION
20	1	066014	THRUST BEARING ASSEMBLY
21	2	401143	SPRING
22	1	401201	RETAINING RING (INTERNAL)
23	(1)	402200	MOTOR COVER (2.5")
	T	402201	MOTOR COVER (3.0")
		402202	MOTOR COVER (3.5")
24	1	403857	PULLEY (5 INCH), A SECTION
25	1	403858	PULLEY (4")
26	1	403859	PULLEY (5"), B SECTION
27	(2)	409058	VALVE POPPET (NO ORIFICE)
		409059	VALVE POPPET (0 .018)
		409060	VALVE POPPET (0 .024)
		409061	VALVE POPPET (0 .031)
28	2	409365A1	PLUG & O-RING ASSEMBLY (M18 X 1.5)
29	(2)	410112	RELIEF VALVE SUB-ASSEMBLY (NO-ORIFICE)
		410132	RELIEF VALVE SUB-ASSEMBLY 0 .018
		410133	RELIEF VALVE SUB-ASSEMBLY 0 .024
		410134	RELIEF VALVE SUB-ASSEMBLY 0 .031
30	1	410512	SA, BYPASS VALVE
31	1	411154	FILTER
32	1	411157	BREATHER/DIPSTICK
33	1	420002	FAN (6")
34	1	420004	FAN (7")
35	1	420104	BRACKET, ROTATING - MACHINED
36	1	420105	SA, RTN
37	1	420106	BRACKET, ROTATING
38	1	420107	BRACKET, ROTATING
39	1	420112	SA, RTN
40	1	420144	BRACKET, ROTATING
41	1	452004	CONTROL BLOCK
42	1	452022	TRUNNION ARM (LONG)
43	1	452024	TRUNNION ARM (SHORT)
44	1	478003	SHAFT SEAL
45	1	490164	BRAKE ASSEMBLY
46	1	490169	BRAKE ASSEMBLY
47	1	490216	DRUM ASSEMBLY, 5 BOLT
48	1	490218	DRUM ASSEMBLY, 4 BOLT
49	1	H1014001	ROTOR SET ASSEMBLY
50	1	HTE012002RA1	SA, TOP HOUSING (RH)
51	1	HTE013000	SWASH BLOCK
52	1	HTE016001R-A1	SA, ENDBLOCK (RH)
53	1	HTE018000	COVER CHARGE PUMP MACHINED
54	1	HTE019004A1	SHAFT ASSEMBLY
55	1	HTE019005A1	SHAFT ASSEMBLY
56	1	HTE107001	PISTON & BARREL ASSEMBLY (10cc)
57	1	HTE127001	PISTON & BARREL ASSEMBLY (12cc)
58	1	MS16627-2081	RETAINING RING
59	(1)	TJ0130SD081HTAA	SA, MOTOR
		TJ0165SD081HTAA	SA, MOTOR
		TJ0195SD081HTAA	SA, MOTOR
		TJ0230SD081HTAA	SA, MOTOR
		TJ0260SD081HTAA	SA, MOTOR
		TJ0295SD081HTAA	SA, MOTOR
60	(1)	TJ0130SD081HTAB	SA, MOTOR
		TJ0165SD081HTAB	SA, MOTOR
		TJ0195SD081HTAB	SA, MOTOR
		TJ0230SD081HTAB	SA, MOTOR
		TJ0260SD081HTAB	SA, MOTOR
		TJ0295SD081HTAB	SA, MOTOR



Right-hand Unit Exploded View & Parts List (page 2 of 5)

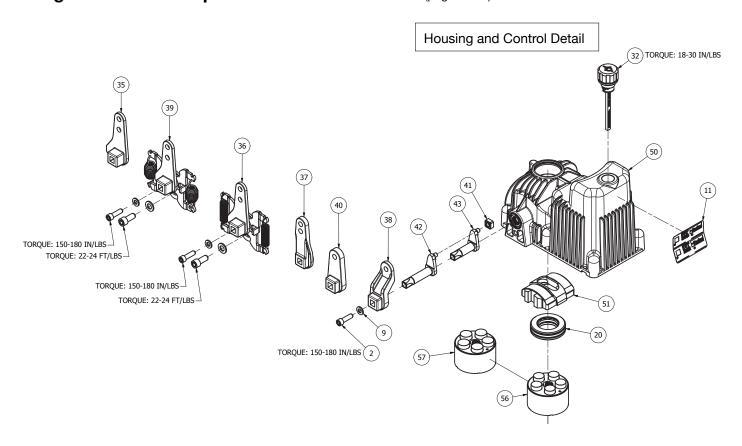


Fan & Pulley Detail

ITEM	QTY	Series	PART NUMBER	DESCRIPTION
8	1	HTE/HTJ	025167	NUT, FLANGE 1/2-20 UNF
10	1	HTE/HTJ	028036	WASHER, FLAT
22	1	HTE/HTJ	401201	RETAINING RING (INTERNAL)
24	1	HTE/HTJ	403857	PULLEY (5 INCH), A SECTION
25	1	HTE/HTJ	403858	PULLEY (4")
26	1	HTE/HTJ	403859	PULLEY (5"), B SECTION
33	1	HTE/HTJ	420002	FAN (6")
34	1	HTE/HTJ	420004	FAN (7")
44	1	HTE/HTJ	478003	SHAFT SEAL
54	1	HTE/HTJ	HTE019004A1	SHAFT ASSEMBLY
55	1	HTE/HTJ	HTE019005A1	SHAFT ASSEMBLY



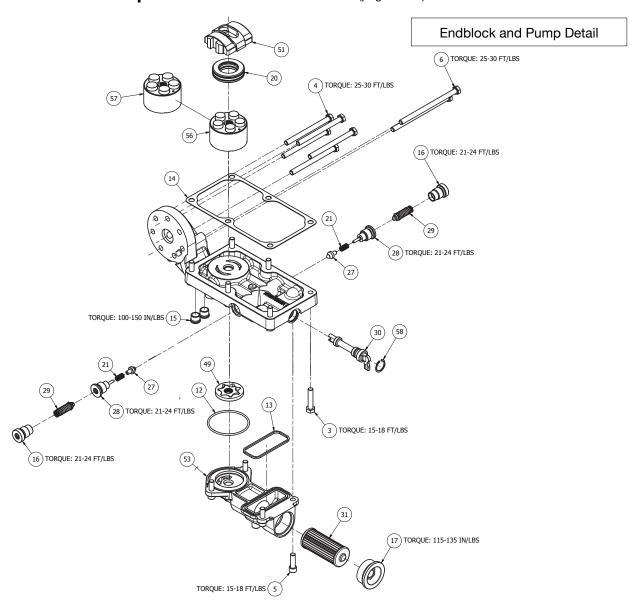
Right-hand Unit Exploded View & Parts List (page 3 of 5)



ITEM	QTY	Series	PART NUMBER	DESCRIPTION
11	1	HTE/HTJ	030075	IDENTIFICATION TAG, RH (GREEN)
20	1	HTE/HTJ	066014	THRUST BEARING ASSEMBLY
35	1	HTE/HTJ	420104	Bracket, rotating - Machined
36	1	HTE/HTJ	420105	SA, RTN
37	1	HTE/HTJ	420106	BRACKET, ROTATING
38	1	HTE/HTJ	420107	BRACKET, ROTATING
39	1	HTE/HTJ	420112	SA, RTN
40	1	HTE/HTJ	420144	BRACKET, ROTATING
41	1	HTE/HTJ	452004	CONTROL BLOCK
42	1	HTE/HTJ	452022	TRUNNION ARM (LONG)
43	1	HTE/HTJ	452024	TRUNNION ARM (SHORT)
50	1	HTE/HTJ	HTE012002RA1	SA, TOP HOUSING (RH)
51	1	HTE/HTJ	HTE013000	SWASH BLOCK
52	1	HTE/HTJ	HTE016001R-A1	SA, ENDBLOCK (RH)
53	1	HTE/HTJ	HTE018000	COVER CHARGE PUMP MACHINED
56	1	HTE/HTJ	HTE107001	PISTON & BARREL ASSEMBLY (10cc)
57	1	HTE/HTJ	HTE127001	PISTON & BARREL ASSEMBLY (12cc)



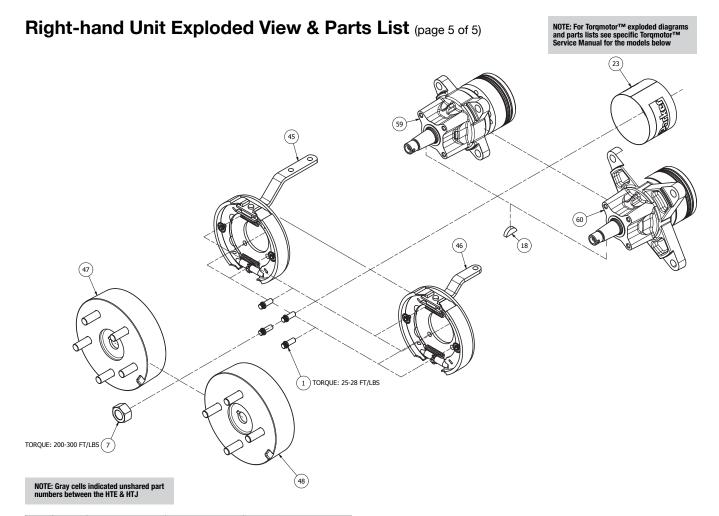
Right-hand Unit Exploded View & Parts List (page 4 of 5)



ITEM	QTY	Series	PART NUMBER	DESCRIPTION
3	6	HTE/HTJ	020301-008	SCREW, HEX HEAD (5/16-18 X 1.50)
4	(3)	HTE/HTJ	020301-008	SCREW, HEX HEAD (5/16-18 X 1.50)
		HTE/HTJ	021308	SPECIAL BOLT 5/16-24 UNF-2A x 3 3/8" (TE0130/165)
		HTE/HTJ	021310	SPECIAL BOLT 5/16-24 UNF-2A x 4 3/8" (TE0195/230)
5	4	HTE/HTJ	021384	SPECIAL BOLT 5/16-24 UNF-2A x 4 7/8" (TE0260/295)
6	(4)	HTE/HTJ	021450	SCREW, SOCKET HEAD CAP (5/16-18 UNC x 1" LG)
		HTE/HTJ	021465	SPECIAL BOLT 5/16-24 UNF-2A x 5" (TE0130/165)
		HTE/HTJ	021414	SPECIAL BOLT 5/16-24 UNF-2A x 5 3/8" (TE0195/230)
12	1	HTE/HTJ	032202-144	PACKING, PREFORMED, O-RING SEAL
13	1	HTE/HTJ	032865	SEAL, CHARGE PUMP COVER
14	1	HTE/HTJ	034010	GASKET, TOP HOUSING
15	2	HTE/HTJ	036023-006	PLUG, MAGNETIC HEX
16	2	HTE/HTJ	036045	PLUG & O-RING ASSEMBLY
17	1	HTE/HTJ	036325	PLUG & O-RING ASSEMBLY
20	1	HTE/HTJ	066014	THRUST BEARING ASSEMBLY
21	2	HTE/HTJ	401143	SPRING

27	(2)	HTE/HTJ	409058	VALVE POPPET (NO ORIFICE)
		HTE/HTJ	409059	VALVE POPPET (0 .018)
		HTE/HTJ	409060	VALVE POPPET (0 .024)
		HTE/HTJ	409061	VALVE POPPET (0 .031)
28	2	HTE/HTJ	409365A1	PLUG & O-RING ASSEMBLY (M18 X 1.5)
29	(2)	HTE/HTJ	410112	RELIEF VALVE SUB-ASSEMBLY (NO-ORIFICE)
		HTE/HTJ	410132	RELIEF VALVE SUB-ASSEMBLY 0 .018
		HTE/HTJ	410133	RELIEF VALVE SUB-ASSEMBLY 0 .024
		HTE/HTJ	410134	RELIEF VALVE SUB-ASSEMBLY 0 .031
30	1	HTE/HTJ	410512	SA, BYPASS VALVE
31	1	HTE/HTJ	411154	FILTER
51	1	HTE/HTJ	HTE013000	SWASH BLOCK
52	1	HTE/HTJ	HTE016001R-A1	SA, ENDBLOCK (RH)
53	1	HTE/HTJ	HTE018000	COVER CHARGE PUMP MACHINED
56	1	HTE/HTJ	HTE107001	PISTON & BARREL ASSEMBLY (10cc)
57	1	HTE/HTJ	HTE127001	PISTON & BARREL ASSEMBLY (12cc)
58	1	HTE/HTJ	MS16627-2081	RETAINING RING





ITEM	QTY	Series	PART NUMBER	DESCRIPTION
1	4	HTE/HTJ	020207	FLANGE HEAD CAP SCREW
7	1	HTE	025136	NUT 3/4-16 UNF-2B
7	1	HTJ	025126	NUT 1-20 UNEF-2B
18	1	HTE	038015	WOODRUFF KEY 1/4 x 1
18	1	HTJ	038016	W00DRUFF KEY 5/16 x 1
23	(1)	HTE/HTJ	402200	MOTOR COVER (2.5")
23	(1)	HTE/HTJ	402201	MOTOR COVER (3.0")
23	(1)	HTE/HTJ	402202	MOTOR COVER (3.5")
45	1	HTE/HTJ	490164	BRAKE ASSEMBLY
46	1	HTE/HTJ	490169	BRAKE ASSEMBLY
47	1	HTE	490212	DRUM ASSEMBLY, 5 BOLT
47	1	HTJ	490216	DRUM ASSEMBLY, 5 BOLT
48	1	HTE	490214	DRUM ASSEMBLY, 4 BOLT
48	1	HTJ	490218	DRUM ASSEMBLY, 4 BOLT

59	(1)	HTE	TE0130SD251HTAA	SA, MOTOR
			TE0165SD251HTAA	SA, MOTOR
			TE0195SD251HTAA	SA, MOTOR
			TE0230SD251HTAA	SA, MOTOR
			TE0260SD251HTAA	SA, MOTOR
			TE0295SD251HTAA	SA, MOTOR
59	(1)	HTJ	TJ0130SD081HTAA	SA, MOTOR
			TJ0165SD081HTAA	SA, MOTOR
			TJ0195SD081HTAA	SA, MOTOR
			TJ0230SD081HTAA	SA, MOTOR
			TJ0260SD081HTAA	SA, MOTOR
			TJ0295SD081HTAA	SA, MOTOR
60	(1)	HTE	TE0130SD251HTAB	SA, MOTOR
			TE0165SD251HTAB	SA, MOTOR
			TE0195SD251HTAB	SA, MOTOR
			TE0230SD251HTAB	SA, MOTOR
			TE0260SD251HTAB	SA, MOTOR
			TE0295SD251HTAB	SA, MOTOR
60	(1)		TJ0130SD081HTAB	SA, MOTOR
			TJ0165SD081HTAB	SA, MOTOR
			TJ0195SD081HTAB	SA, MOTOR
			TJ0230SD081HTAB	SA, MOTOR
			TJ0260SD081HTAB	SA, MOTOR
			TJ0295SD081HTAB	SA, MOTOR





Service Kit Information (page 1 of 6)

SK000313	3 Parts List- Breather Dipstick/ Service Kit				
Item	QTY	Part Number	Description		
1	1	411157	Breather/ Dipstick		
	1	SK000313 Sht 3	Service Bulletin		

SK000315	SK000315 Parts List- Filter Kit				
Item	QTY	Part Number	Description		
1	1	411154S	Filter (Service)		
2	1	036325	Plug & O-ring Assm		
	1	SK000315 Sht 3	Service Bulletin		

SK000316	Parts L	ist- 5" Pulley, 7" Fan		
Item	QTY	Part Number	Description	
1	1	025167	Nut	
2	1	477036	Spacer, Fan	
3	1	420004	Fan (7" Diameter)	
4	1	403005	Pulley Assm (5")	
5	1	039055	Key	
	1	SK000316 Sht 3	Service Bulletin	

SK000317	Parts List- Patch Lock Nut/ Key Service Kit				
Item	QTY	Part Number	Description		
1	1	038015	Woodruff Key		
2	1	025136	Nut		
	1	SK000317 Sht 3	Service Bulletin		

SK000328	Parts Lis	st- RTN Service Kit	
Item	QTY	Part Number	Description
1	1	420097	Fixed Bracket
2	1	420099	Spring Arm
3	1	420100	Spring Arm
4	2	420111	Spring
5	1	420104	Rotating Bracket
6	1	028022	Washer
7	1	020299	SHCS, 1/4"-20
8	1	028035	Washer
9	1	020298	SCHS, 5/16"-18
	1	SK000328 Sht 3	Service Bulletin

SK000334	SK000334 Parts List- RTN Service Kit					
Item	QTY	Part Number	Description			
1	1	420105	SA, RTN			
	1	SK000334 Sht 3	Service Bulletin			

SK000349	Parts List- HTJ Motor Service Kit Only			
Item	QTY	Part Number	Description	
1	1	478035	Dirt & Water Seal	
2	1	028515	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	
		SK000349 Sht 3	Service Bulletin	

SK000476	Parts Lis	t- HTE Motor Service Kit Only ((In	ncludes Install / Removal Tool: 900017 / 900018)
Item	QTY	Part Number	Description
1	1	478036	Dirt & Water Seal
2	1	028516	Back-Up Ring* (Date Code prior to 25 216)
3	1	028552	Back-Up Washer* (Date Code prior to 25 216)
4	1	032379	Shaft Seal
5	1	032866	Commutator Seal
6	5	032821	Seal Ring
		SK000350 Sht 3	Service Bulletin



Service Kit Information (page 2 of 6)

SK000351	Parts List-	HTJ Complete Service Kit (Relief Valv	ve Caps)
Item	QTY	Part Number	Description
1	1	401201	Retaining Ring (internal)
2	1	478003	Shaft Seal
3	1	478004	Trunnion Arm Seal
4	1	034010	Gasket, Top Housing
5	1	034045	Plug and O-Ring Assm
6	1	032203-111	Bypass Valve O-Ring
7	1	032865	Seal, Charge Pump Cover
8	1	032202-144	Packing, Preformed, 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 Sht 3	Service Bulletin

SK000352	Parts Lis	st- HTJ Complete Service Kit ((Check Valve Caps)
Item	QTY	Part Number	Description
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 & O-Ring Assm
6	1	032203-111	Bypass Valve O-Ring
7	1	032865	Seal, Charge Pump Cover
8	1	032202-144	Packing, Preformed, 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 Sht 3	Service Bulletin

SK000478	Parts List-	HTE Complete Service Kit (Check Val	ve Caps)
Item	QTY	Part Number	Description
1	1	401201	Retaining Ring (internal)
2	2	409035	Plug & O-Ring Assembly
3	1	478004	Trunnion Arm Seal
4	1	034010	Gasket, Top Housing
5	1	478003	Shaft Seal
6	1	032202-111	Bypass Valve O-Ring
7	1	032865	Charge Pump Cover Sq. Seal
8	1	032202-144	Charge Pump Cover, O-Ring
SK000477	Parts List-	HTE Complete Service Kit (Relief Valve Cap	os)
Item	QTY	Part Number	Description
1	1	401201	Retaining Ring (internal)
2	2	036045	Plug & O-Ring Assembly
3	1	478004	Trunnion Arm Seal
4	1	034010	Gasket, Top Housing
5	1	478003	Shaft Seal
6	1	032202-111	Bypass Valve O-Ring
7	1	032865	Charge Pump Cover Sq. Seal
8	1	032202-144	Charge Pump Cover, O-Ring



Service Kit Information (page 3 of 6)

SK000355	Parts List- HTJ 4 Bolt Brake Service Kit W/ Castle Nut One Hole Lever		
Item	QTY	Part Number	Description
1	1	038016	Woodruff Key 1/4 x 1
2	1	490169	Brake Assm
3	4	020207	Flange Head Cap Screw
4	1	490218	Drum Assm, 4 Bolt
5	1	025113	Nut, Type 2
6	1	040204	Cotter pin
	1	SK000355 Sht 3	Service Bulletin

SK000356	Parts List- HTJ 5 Bolt Brake Service Kit W/ Castle Nut One Hole Lever				
Item	QTY	Part Number	Description		
1	1	038015	Woodruff Key 1/4 x 1		
2	1	490169	Brake Assm		
3	4	020207	Flange Head Cap Screw		
4	1	490216	Drum Assm, 5 bolt		
5	1	025113	Nut, Type 2		
6	1	040204	Cotter pin		
	1	SK000356 Sht 3	Service Bulletin		

SK000357	Parts List- HTJ 4 Bolt Brake Service Kit W/ Patch Lock Nut One Hole Lever			
Item	QTY	Part Number	Description	
1	1	038016	Woodruff Key 1/4 x 1	
2	1	490169	Brake Assm	
3	4	020207	Flange Head Cap Screw	
4	1	490218	Drum Assm, 4 Bolt	
5	1	025126	Nut, 1-20 Self Lock	
	1	SK000357 Sht 3	Service Bulletin	

SK000358	Parts List- HTJ 5 Bolt Brake Service Kit W/ Patch Lock Nut One Hole Lever			
Item	QTY	Part Number	Description	
1	1	038016	Woodruff Key 1/4 x 1	
2	1	490169	Brake Assm	
3	4	020207	Flange Head Cap Screw	
4	1	490216	Drum Assm, 5 bolt	
5	1	025126	Nut, 1-20 Self Lock	
	1	SK000358 Sht 3	Service Bulletin	

SK000359	Parts List- HTJ 4 Bolt Brake Service Kit w/ Castle Nut One Hole Lever			
Item	QTY	Part Number	Description	
1	1	038015	Woodruff Key 1/4 x 1	
2	1	490167	Brake Assm	
3	4	020207	Flange Head Cap Screw	
4	1	490218	Drum Assm, 4 Bolt	
5	1	025113	Nut, Type 2	
6	1	040204	Cotter Pin	
	1	SK000359 Sht 3		

SK000363	Parts List- HTJ 4 Bolt Brake Service Kit W/ Castle Nut Two Hole Lever			
Item	QTY	Part Number	Description	
1	1	038015	Woodruff Key 1/4 x 1	
2	1	490164	Brake Assm	
3	4	020207	Flange Head Cap Screw	
4	1	490218	Drum Assm, 4 Bolt	
5	1	025113	Nut, Type 2	
6	1	040204	Cotter Pin	
	1	SK000363 Sht 3	Service Bulletin	



Service Kit Information (page 4 of 6)

SK000364	Parts List-	Parts List- HTJ 5 Bolt Brake Service Kit W/ Castle Nut Two Hole Lever			
Item	QTY	Part Number	Description		
1	1	038015	Woodruff Key 1/4 x 1		
2	1	490164	Brake Assm		
3	4	020207	Flange Head Cap Screw		
4	1	490216	Drum Assm, 5 Bolt		
5	1	025113	Nut, Type 2		
6	1	040204	Cotter Pin		
	1	SK000364 Sht 3	Service Bulletin		

SK000365	Parts List-	Parts List- HTJ 4 Bolt Brake Service Kit W/ Patch Lock Two Hole Lever			
Item	QTY	Part Number	Description		
1	1	038015	Woodruff Key 1/4 x 1		
2	1	490164	Brake Assm		
3	4	020207	Flange Head Cap Screw		
4	1	490218	Drum Assm, 4 Bolt		
5	1	025126	Nut, 1-20 Self Lock		
	1	SK000365 Sht 3	Service Bulletin		

SK000366	Parts List- HTJ 5 Bolt Brake Service Kit W/ Patch Lock Two Hole Lever				
Item	QTY	Part Number	Description	Description	
1	1	038015	Woodruff Key 1/4 x 1		
2	1	490164	Brake Assm		
3	4	020207	Flange Head Cap Screw		
4	1	490216	Drum Assm, 5 Bolt		
5	1	025126	Nut, 1-20 Self Lock		
	1	SK000366 Sht 3	Service Bulletin		

SK000367	Parts List- HTE 4 Bolt Brake Service Kit W/ Castle Nut Two Hole Lever				
Item	QTY	Part Number	Description		
1	1	038015	Woodruff Key 1/4 x 1		
2	1	490164	Brake Assm		
3	4	020207	Flange Head Cap Screw		
4	1	490214	Drum Assm, 4 Bolt		
5	1	025136	Nut 3/4-16 UNF-2B, Type 1		
	1	SK000367 Sht 3	Service Bulletin		

SK000368	Parts List-	HTE 5 Bolt Brake Service Kit W/ Castle I	Nut Two Hole Lever
Item	QTY	Part Number	Description
1	1	038015	Woodruff Key 1/4 x 1
2	1	490164	Brake Assm
3	4	020207	Flange Head Cap Screw
4	1	490212	Drum Assm, 4 Bolt
5	1	025136	Nut 3/4-16 UNF-2B, Type 1
	1	SK000368 Sht 3	Service Bulletin

SK000369	Parts Li	st- HTE 4 Bolt Brake Service K	it W/ Patch Lock Two Hole Lever	
Item	QTY	Part Number	Description	
1	1	038015	Woodruff Key 1/4 x 1	
2	1	490164	Brake Assm	
3	4	020207	Flange Head Cap Screw	
4	1	490214	Drum Assm, 4 Bolt	
5	1	025136	Nut, 3/4-16 UNF- 2B	
	1	SK000369 Sht 3	Service Bulletin	



Service Kit Information (page 5 of 6)

SK000370	Parts List- HTE 5 Bolt Brake Service Kit W/ Patch Lock Two Hole Lever				
Item	QTY	Part Number	Description		
1	1	038015	Woodruff Key 1/4 x 1		
2	1	490164	Brake Assm		
3	4	020207	Flange Head Cap Screw		
4	1	490212	Drum Assm, 5 Bolt		
5	1	025136	Nut, 3/4-16 UNF- 2B		
	1	SK000370 Sht 3	Service Bulletin		

SK000371	Parts List-	Parts List- HTE 4 Bolt Brake Service Kit w/ Castle Nut One Hole Lever				
Item	QTY	Part Number	Description			
1	1	038015	Woodruff Key 1/4 x 1			
2	1	490169	Brake Assm			
3	4	020207	Flange Head Cap Screw			
4	1	490214	Drum Assm, 4 Bolt			
5	1	025136	Nut, 3/4-16 UNF- 2B			
	1	SK000371 Sht 3	Service Bulletin			

SK000375	Parts List- HTE 4 Bolt Brake Service Kit w/ Castle Nut One Hole Lever				
Item	QTY	Part Number	Description		
1	1	038015	Woodruff Key 1/4 x 1		
2	1	490169	Brake Assm		
3	4	020207	Flange Head Cap Screw		
4	1	490214	Drum Assm, 4 Bolt		
5	1	025161	Nut, Type 2		
6	1	040204	Cotter Pin		
	1	SK000375 Sht 3	Service Bulletin		

SK000376	Parts List- HTE 5 Bolt Brake Service Kit w/ Castle Nut One Hole Lever				
Item	QTY	Part Number	Description		
1	1	038015	Woodruff Key 1/4 x 1		
2	1	490169	Brake Assm		
3	4	020207	Flange Head Cap Screw		
4	1	490212	Drum Assm, 5 Bolt		
5	1	025161	Nut, Type 2		
6	1	040204	Cotter Pin		
	1	SK000376 Sht 3	Service Bulletin		

SK000377	Parts List- HTE 4 Bolt Brake Service Kit w/ Patch Lock Nut One Hole Lever				
Item	QTY	Part Number	Description		
1	1	038015	Woodruff Key 1/4 x 1		
2	1	490169	Brake Assm		
3	4	020207	Flange Head Cap Screw		
4	1	490214	Drum Assm, 4 Bolt		
5	1	025136	Nut, 3/4-16 UNF- 2B		
	1	SK000377 Sht 3	Service Bulletin		

SK000378	Parts List- HTE 5 Bolt Brake Service Kit w/ Patch Lock Nut One Hole Lever			
Item	QTY	Part Number	Description	
1	1	038015	Woodruff Key 1/4 x 1	
2	1	490169	Brake Assm	
3	4	020207	Flange Head Cap Screw	
4	1	490212	Drum Assm, 5 Bolt	
5	1	025136	Nut, 3/4-16 UNF- 2B	
	1	SK000378 Sht 3	Service Bulletin	



General Information

Service Kit Information (page 6 of 6)

SK000385	Parts List-	Bypass Lever Service Kit	
Item	QTY	Part Number	Description
1	1	452026	Bypass Control Lever
2	1	477383	Stop, Bypass

SK000386	Parts List-	arts List- Fan Kit- 6 Inch		
Item	QTY	Part Number	Description	
1	1	025167	Nut	
2	1	420002	Fan (6" Diameter)	
	1	SK000386 Sht 3	Service Bulletin	

SK000387	Parts Lis	Parts List- Fan Kit- 7 Inch		
Item	QTY	Part Number	Description	
1	1	025167	Nut	
2	1	420004	Fan (7" Diameter)	
	1	SK000387 Sht 3	Service Bulletin	
SK000411	Parts Lis	rts List- 5" Pulley Service Kit		
Item	QTY	Part Number	Description	
1	1	025167	Nut, Flange 1/2-20 UNF	
2	1	403857	Pulley (5")	
	1	SK000411 Sht 3	Service Bulletin	

SK000412	Parts List- 4" Pulley Service Kit		
Item	QTY	Part Number	Description
1	1	025167	Nut, Flange 1/2-20 UNF
2	1	403858	Pulley (4")
	1	SK000412 Sht 3	Service Bulletin

SK000444	Parts List-	ts List- Transmission Oil Filter Kit		
Item	QTY	Part Number	Description	
1	1	406030	HT-1000 Oil (Gallon)	
2	2	411154S	Filter (Service)	
3	4	036023-006	Magnetic Plug With O-Ring	
		SK000444 Sht 3,4,5	Service Bulletin	

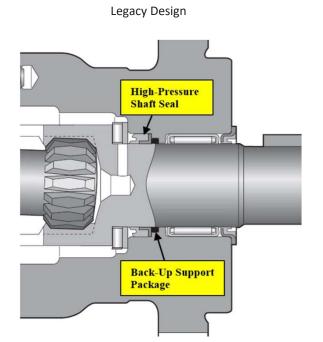
SK000446	Parts List	ts List- HTE/ HTJ Charge Pump, Cover, & Seal Kit		
Item	QTY	Part Number	Description	
1	1	034010	Gasket, Top Housing	
2	1	032202-144	Packing, Preformed, O-Ring Seal	
3	1	032865	Seal, Charge Pump Cover	
4	1	HTE018000	Cover Charge Pump Machined	
	1	SK000446 Sht 3	Service Bulletin	



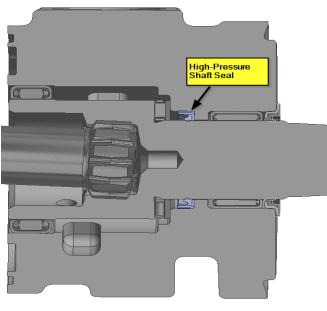
In late 2025, a design change was made to our HTE transmission motor section.

A new, single-piece, high-pressure shaft seal has been implemented in the HTE family of motors. The previous design utilized a fully elastomeric seal, a back-up washer, and a back-up ring. With the new single-piece design, the backup ring and back-up washer have been eliminated and replaced with a one-piece, metal case seal that simplifies installation.

Motor Cross Section Comparing Legacy Shaft Seal Package and New Shaft Seal Package:



New Design



Made before Aug. 4, 2025 Date Code 25 216

Made on or after Aug. 4, 2025 Date Code 25 216



Illustration	Step	Instruction
	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. Place a pan for oil collection under the unit.
	Remove filter plug.	1. Using a 3/4" socket, loosen filter plug.
		2. Remove plug from unit.
	Remove filter.	Gently slide filter from unit. May need to use a strong magnet or a pair of needle nose pliers.
	Remove breather/dipstick.	Loosen and remove breather/dipstick. Drain all fluid from unit.
	Loosen shaft nut and remove.	 NOTE For HTE: Use 1 1/8" 6-point socket to remove the nut. For HTJ: Use 1 1/2" 6-point socket to remove the nut.

Illustration	Step	Instruction
	Remove brake drum.	Use a 2-jaw or 3-jaw puller to remove drum from coupling shaft.
	Remove the Woodruff key.	May need to use a small flat-head screwdriver to gently pry off key.
	Remove brake bolts and brake.	1. Remove 4 flange head cap screws using a 12 point, 5/16-inch socket.
		2. Remove brake.
	Go to Next Page	



Disassembly & Inspection

Illustration	Step	Instruction
	Remove control arm socket screw.	Use a 3/16" Allen wrench to loosen and remove screw.
	Remove control arm.	Carefully use a chisel as a wedge between the housing and the control arm to remove the control arm.
	Remove flange nut and fan.	Use 3/4" 6-point socket to loosen and remove the flange nut on the fan.
		2. Remove fan.



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Illustration	Step	Instruction
	Remove pulley.	Slide off pulley.
Tarke.	Remove Parker motor cover.	Peel off motor wrap decal.
	Begin motor disassembly.	Clamp in vise with motor shaft down. Use paint pen (or equivalent) to make letter "V" alignment marks on the exterior of the motor.
	Remove motor end cap bolts.	 Using a 1/2" socket, loosen all seven motor end cap bolts. Hold pump section with other hand to stabilize.
	Separate pump section from motor.	
	Set pump aside to work on the motor.	Lay the pulley flat on the work table and use it to support the pump section during disassembly. Set pump down onto pulley to support during service.

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Illustration Step Instruction



Remove section seal from

With the Torqmotor™ still clamped securely in the vise, remove the section seal and discard.



Remove commutator ring.



Remove commutator.



Remove commutator seal.

1. Use compressed air to loosen and lift the seal from its groove.

NOTE: Use an OSHA approved compressed air gun and direct a jet of air at the seal groove.



A CAUTION

Use all safety precautions when working with compressed air.

2. Note that the flat edge of the seal is facing up. Discard the seal.



Remove section seal

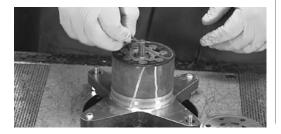


Illustration	Step	Instruction
	Remove manifold.	Remove the manifold. Note that the manifold is made up of several plates bonded together which do not require additional disassembly.
	Remove washer.	
	Remove rotor set seal and discard.	
	Remove rotor set.	Note: Take care not to drop any rollers that may be loose.
	Remove wear plate seal.	Discard seal once removed.
	Go to Next Page	



Illustration	Step	Instruction
	Remove wear plate.	
	Remove drive link.	Place mark on drive link. Place mark on coupling shaft, making sure both line up with the previous mark on top of the drive link.
		3. Remove drive link.
	Remove coupling shaft.	Remove the coupling shaft by pressing and rotating on the motor housing.
	Go to Next Page	



Illustration Step Instruction



Remove shaft seal, backup ring and backup washer.

: cf'< H9 'k #8 Uh/'7 cXY'cb cf'Uzh/f'&) '&% ž'; c'hc'b YIhi dU[Y'zb f'g\UzhigYU'fYacjU' dfcW/XifY" **NOTE:** For the HTE Series, the thrust package can be easily removed from the top of the motor after coupling shaft is removed.



1. Using a screwdriver, press from the front of the motor housing, releasing the shaft seal.



2. Then from the back of the motor housing, remove the shaft seal.



3. Remove the washer.

Washer will not be present in HTE w/ Date Code on or after 25 216.



4. Remove the backup ring.

Backup Ring will not be present in HTE w/ Date Code on or after 25 216.



Removal Instructions for shaft seals in HTE Transmissions w/ Date Code on or after 25 216:

- 1. With a disassembled motor, remove the coupling shaft from the motor housing.
- 2. Using the supplied snap ring, install the snap ring in the area shown on Figure 1.
- 3. Using tool 900018, press the snap ring slowly in the direction shown in Figure 1.

The snap ring will expand and catch the seal to remove it from the housing.

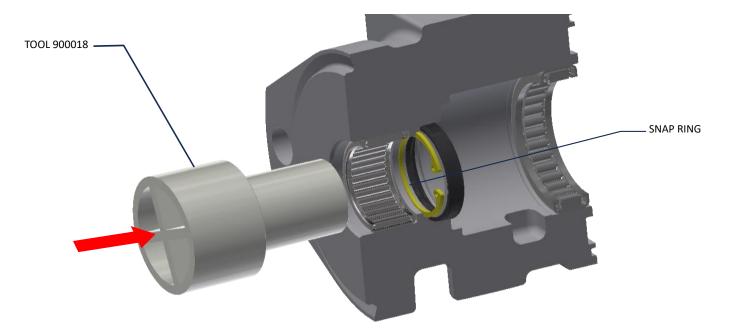


Figure 1

Motor disassembly complete

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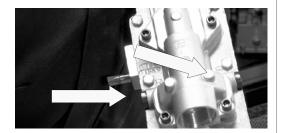
Illustration Step Instruction



Remove shock valves.

NOTE: Degraded performance may occur if the REVERSE valve is installed in the FORWARD endblock location.

1. To facilitate the reassembly of each shock valve on the proper side and orientation, place a mark across the housing and plug on the reverse side (as indicated on the endblock with an "R" in the casting).



2. Place a mark across the housing and plug on the forward side (as indicated on the endblock with "F" in the casting).



3. Loosen the shock valve using a 5/16" hex wrench on the reverse side.



4. Remove reverse shock valve.



Mark shock valve in the same color that was used to mark the housing and plug.

Go to Next Page



Illustration	Step	Instruction
		6. Repeat same process for the forward side, <i>marking in different color</i> so can easily identify for reassembly.
	Remove charge pump cover.	Remove all 4 bolts with an 1/4" hex wrench.
		2. Lift off charge cover.
	Remove charge pump cover seals.	3. Remove and discard 2 seals, from inside the charge pump cover.
	Remove charge pump rotor set.	

Illustration	Step	Instruction
	Remove end block.	1. Remove 6 end block bolts using a 1/2" 6-point socket.
		2. To separate the barrel assembly from the endblock, reach under the end block and hold the piston and barrel assembly in place while lifting off the end block.
		3. If necessary, to assist in top housing to end block separation a pry bar may be used.
		4. 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.
	Remove piston and barrel assembly.	Turn the pump up 90 degrees and carefully remove the piston and barrel assembly taking care not to drop any loose pistons.
	Remove swash block and thrust bearing package.	Slide swash block and thrust bearing assembly off shaft.
		Separate the thrust bearing assembly from the swash block and check for damage.



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Illustration	Step	Instruction
	Remove the control block.	
	Remove cradle bushings.	Remove the cradle bushings (a pick, or compressed air can assist). Use a strong magnet to aid in cradle bushing removal.
	Remove retaining ring and shaft seal.	Invert the pump and use snap ring pliers, remove the retaining ring.
	Remove pump shaft assembly and shaft seal.	Use a soft mallet to tap out the pump shaft assembly.
		Slide out pump shaft assembly from underneath.



Illustration	Step	Instruction
		Separate the shaft seal from the pump shaft assembly.
	Remove trunnion arm.	 Press trunnion arm from outside the pump body. Lift arm out from the inside.
	Remove trunnion seal.	Gently pry out trunnion seal. You may need to use a small screwdriver to assist. Note: Be careful not to scratch housing while using screw driver.
	Remove gasket.	If needed use light flexible scraper to remove residual seal material. Note: Take care to not harm the aluminum sealing surface.
	HTE/HTJ Disassembly Complete	



Illustration	Step	Instruction
	Begin HTE/HTJ Reassembly Assemble the trunnion seal.	Press in with a 5/8" socket or by hand with even pressure.
MAR STATE OF THE PARTY OF THE P	Assemble the trunnion arm.	Press arm from inside body through the trunnion seal until flush with housing.
	Install pump assembly shaft.	Invert the pump and push shaft in place from outside.
	Install pump shaft seal.	2. May need to tap lightly on shaft and bearing assembly with mallet until it is seated in the housing.
		 Install the pump seal, using a socket to press it in evenly and firmly. To aid in even installation, use a deepwell socket with an outside diameter slightly less than 40mm or 1.574".* *1 1/8" deep well impact socket shown.
	Go to Next Page	



Illustration	Step	Instruction
	Install retaining ring.	Install retaining ring using snap ring pliers.
		A deep well socket and firm hand pressure may be needed to ensure the retaining ring is inside the groove.
	Install control block.	Install control block onto trunnion arm.
	Go to Next Page	



Illustration	Step	Instruction
	Install cradle bushings.	Invert top housing with the pump shaft down, using the pulley to support the housing.
I O I O I O I O I O I O I O I O I O I O		2. Install the cradle bushings onto the pins.
	Install swash block.	Holding top housing at 45 degrees and trunnion arm facing down, install the swash block over the pump shaft.
		Orient the control block so it slides into the swash block using a flathead screwdriver.
	Install piston and barrel assembly.	 Holding the housing at a 90 degree angle and assemble the piston and barrel assembly over the pump shaft. Take care not to drop any pistons. If a piston does drop, re-install piston, spring, and spring seat back into barrel and attempt again.
		4. Ensure piston and barrel assembly travels on shaft with spring action.5. With both hands pushing on barrel face the assembly should compress and release without binding.



Illustration	Step	Instruction
	Install a new gasket.	Place new gasket on top housing, using screw holes to align.
	Assemble end block.	 Assemble the end block over the housing gasket. Press down again to ensure spring action is still present and that none of the pistons have fallen out.
	Install 6 housing bolts.	Install 6 housing bolts, hand tightening each bolt alternately and evenly.
		2. Tighten the housing bolts in a crisscross pattern with a 1/2" socket wrench.
	Torque end block bolts.	1. Torque end block bolts to 15–18 ft-lbs.
	Install charge pump.	Install the charge pump rotor set assembly (over the pump shaft).



Illustration	Step	Instruction
	Install charge pump cover seals.	 Install new seals into the charge pump cover. May need to use petroleum jelly to hold seals in place during installation.
	Install cover inline with charge pump.	 Install charge pump cover onto the endblock, in line with the charge pump. Adjust charge cover position to align bolt holes.
	Install charge pump cover bolts.	Install charge pump cover with 4 bolts, tightening each bolt alternately and evenly.
		2. Torque bolts to 15–18 ft-lbs.
	Install shock valves, matching marks.	 Install shock valves on each side of the pump housing. Use the mark made during disassembly to ensure valves are reassembled in the same positions. Tighten color-coordinated caps using a 5/16" hex wrench.
		3. Torque valves to 21–24 ft-lbs.



Illustration Step Instruction



Install new filter.



Insert plug.

1. Install filter plug.



- 2. Tighten plug using torque wrench with socket.
- 3. Torque to 9.5–11 ft-lbs.



Install backup ring, backup washer and shaft seal.

Backup Ring & Backup Washer will not be present in HTE w/ Date Code on or after 25 216. 1. Holding the thrust bearing and thrust washer package vertically, install a new backup ring.



2. Install a new backup washer.



Shaft Seal Installation Procedure for HTE w/ Date Code on or after 25 216 is on the next page. Using the lubricant provided in the seal kit, grease shaft seal before installing.

Assembly

Installation Instructions for shaft seals in HTE Transmission w/ Date Code on or after 25 216:

- 1. Clean the motor housing seal bore thoroughly to remove any debris.
- 2. Fully lubricate a new shaft seal with clean hydraulic oil and place on the installation tool 900017 as shown in Figure 2.



Figure 2

- 3. If having an older housing (Date Code prior to 25 216), install the backup ring and washer as before.
- 4. Align the seal and installation tool 900017 with the seal bore as shown in Figure 3.
- 5. Align tool 900018 with installation tool 900017 and apply force to installation tool 900018 until the seal is fully pressed into the bore. *An arbor press is recommended to provide sufficient force*.
- 6. Carefully remove press tool 900018 and the installation tool 900017 from the seal, taking caution not to damage the seal.

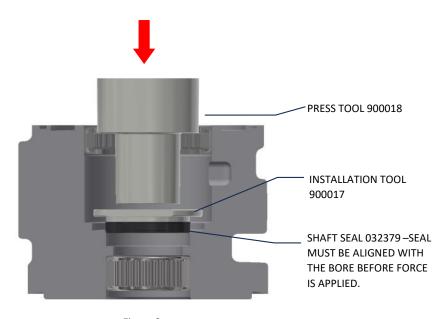


Figure 3



package.

Steps 4 & 5 pertain to HTE w/ Date Code on or before 25 216. Steps 4 & 5 pertain to HTE w/ Date Code on or before 25 216. 4. Install a new shaft seal with the lip facing towards the motor. 5. Ensure all three are seated correctly before installing the thrust bearing



6. Reinstall thrust bearing package with washer on bottom and bearing on top.



Torqmotor™ reassembly

Clamp Torqmotor™ housing into softjawed vise, shaft end pointed down.



Install shaft.

Using the grease included with the seal kit, grease the coupling shaft to install in the motor.



Install housing seal.

Apply a small amount of clean grease and install a new seal into the housing groove.



Assembly

Illustration	Step	Instruction
	Install drive link.	 Install drive link, aligning teeth to engage coupling shaft. Line up previously drawn on witness marks.
	Assemble wear plate and seal.	Assemble the wear plate onto the housing with alignment marks matched.
		2. Apply a small amount of clean grease and install a new seal into the wear plate groove.
	Install rotor set.	 Install the rotor set over the drive link and onto the wear plate. Align witness marks drawn during disassembly.
	Install rotor set seal.	Install a new seal into the rotor set groove.
	Install washer.	Install washer over the drive link and onto the rotor set.

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Illustration	Step	Instruction
	Install manifold.	 Install the manifold over the drive link and onto the rotor set. Make sure witness marks are matched.
	Install manifold seal.	Install a new seal into the manifold groove.
	Install commutator ring.	Install the commutator ring onto the manifold with alignment marks matched.
	Install commutator ring seal.	Install a new seal into the commutator ring groove.
	Install commutator.	Install commutator over the drive link onto the manifold.
NOTION DETAIL B	Install commutator seal.	Install a new seal into the groove of the commutator with the flat edge of the seal facing up.



Illustration	Step	Instruction
	Assemble motor to pump section.	Assemble motor to pump section with alignment marks matched.
		2. Install 7 special bolts through pump and motor.3. Ensure correct length bolts are used in each bolt location.4. Tighten end cover bolts alternately and evenly by hand.
		5. Torque bolts to 25–30 ft-lbs.
	Install pulley.	 Install the pulley over the pump shaft. Make sure pulley is installed with the puller groove facing up.
	Install fan.	Assemble fan and fan washer, install onto shaft.
	Torque fan nut.	Install fan nut and torque to 40–60 ft- lbs.



Illustration	Step	Instruction
	Install Woodruff key.	Install woodruff key into coupling shaft.
		May need to gently tap key into place with a brass mallet.
	Attach brake.	Install the brake onto the motor housing.
		2. Insert 4 bolts into motor housing to secure brake.
		3. Torque bolts to 25–28 ft-lbs.
	Install brake drum.	 Install brake drum onto motor shaft with notch aligned with woodruff key. Ensure woodruff key remains in place while installing brake hub.

Assembly	HTE/HTJ Series Integrated Hydrostatic Transmission		
Illustration	Step	Instruction	
	Attach shaft nut.	1. Install shaft nut onto brake drum.	
		2. Torque to 200 ft-lbs — 300 ft-lbs.	
OIL LEVEL MUST THIS AREA	Fill with oil and install dip stick/breather.	Fill reservoir with approximately 1.5 US quarts of approved hydraulic fluid. Note: Fluid level should reach the tip of the dipstick or be within the hatched region depending on which dipstick is used.	
		2. Re-install breather/dipstick.3. Hand tighten.	
	HTE/HTJ reassembly complete		





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Quote: means the offer or proposal made by Seller to

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