



B-SERIES

PARTS COUNTERMAN'S CATALOG

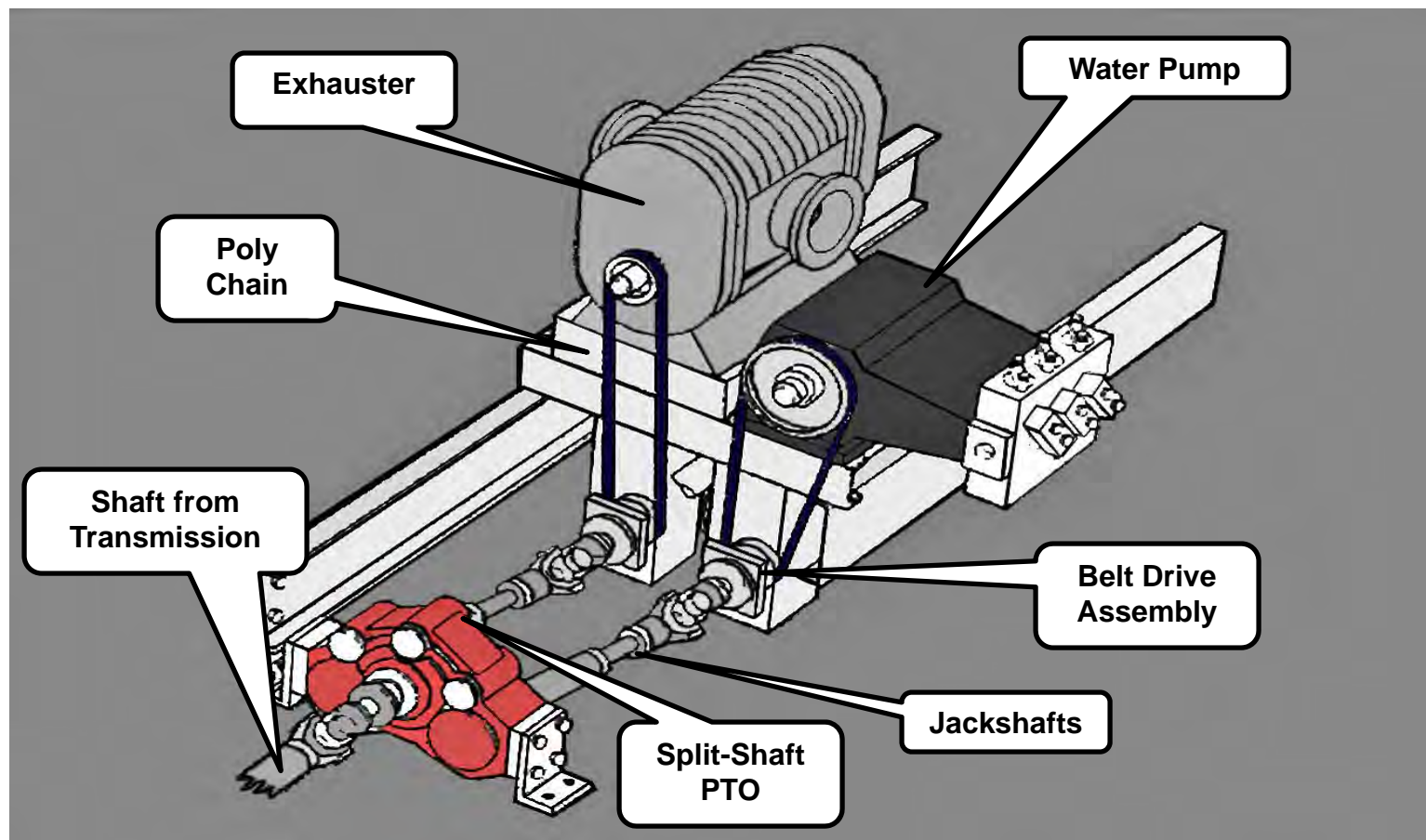
Section 9

Powerdeck & Drivetrain



THE STANDARD B-SERIES MACHINE

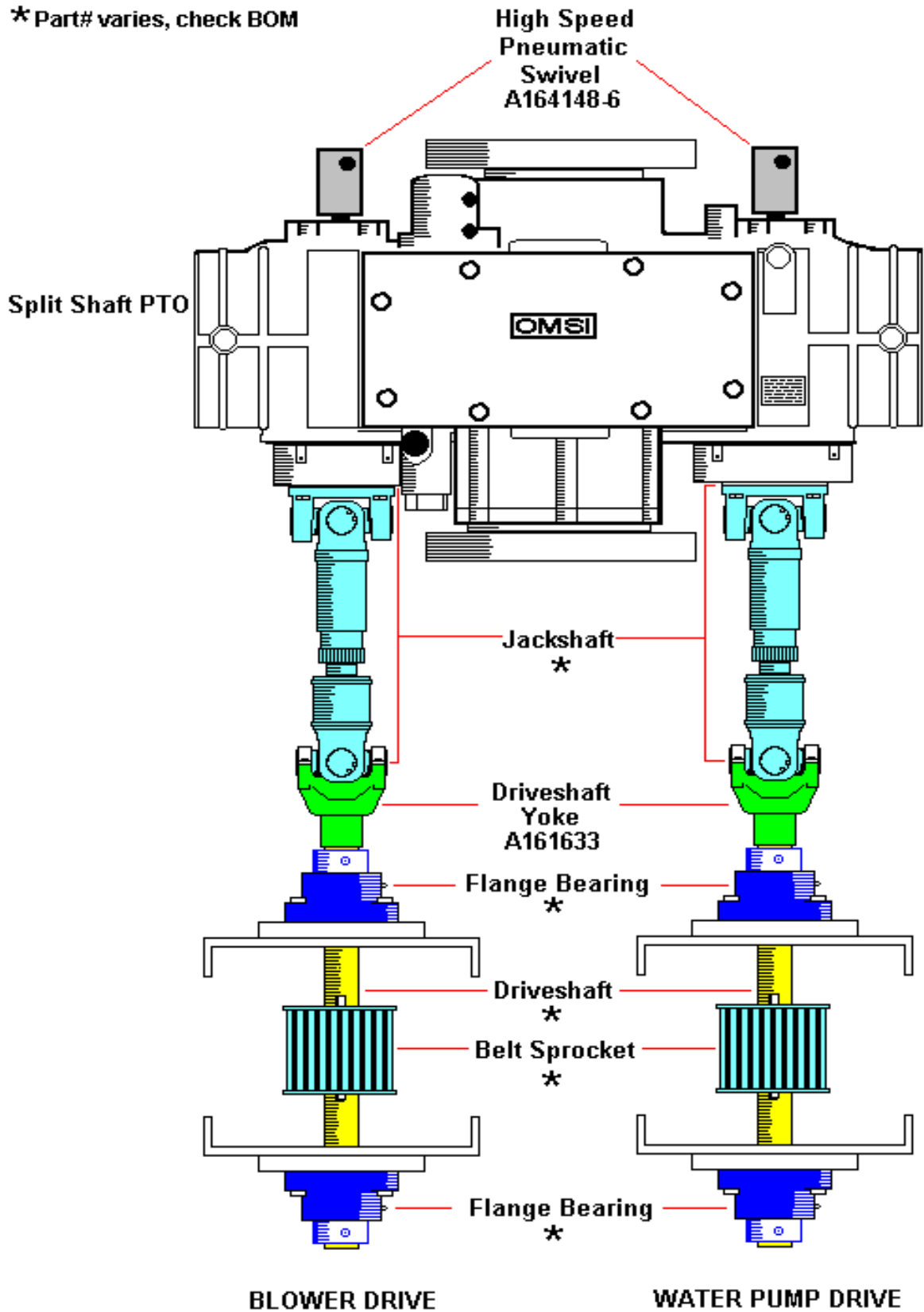
Our standard B-Series machine receives all its power from the chassis. The chassis engine, through its transmission, to the **Split Shaft Power Take-off (PTO)**. The PTO has two clutch operated out drives. These out drives are used to power the water pump and exhauster through a **Poly Chain**. The **pump** for our hydraulic system is mounted to and driven by the PTO. The pump only operates when the PTO is engaged. Switches in the cab engage the PTO through electro/pneumatic solenoids (*commonly called the Ross Valve*). There are auxiliary switches in the cab for the water pump and exhauster. During operation you will use the switches provided at the operator station to engage the water pump and exhauster.





TYPICAL B-SERIES DRIVE TRAIN LAYOUT

* Part# varies, check BOM

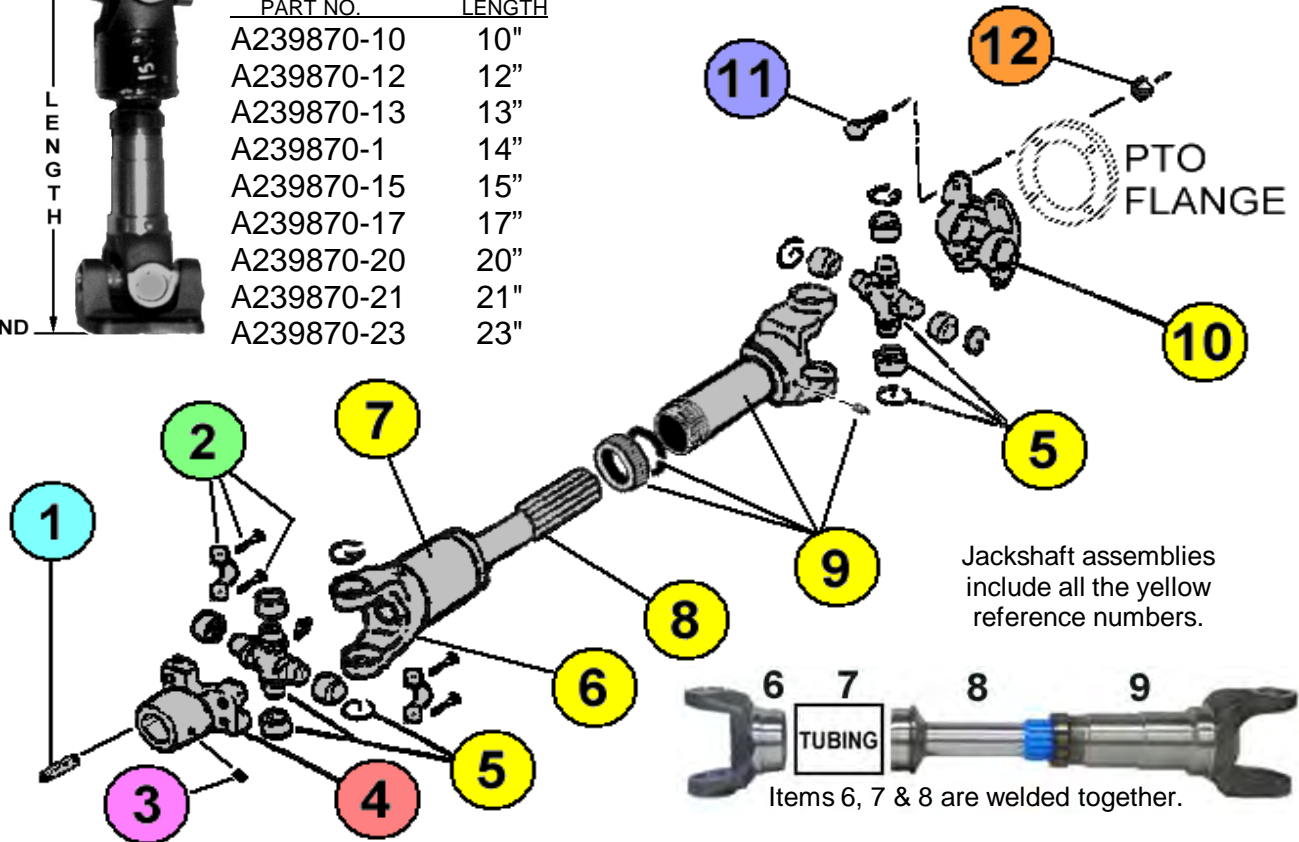


PTO Jackshafts and Components



JACKSHAFT ASSEMBLIES

PART NO.	LENGTH
A239870-10	10"
A239870-12	12"
A239870-13	13"
A239870-1	14"
A239870-15	15"
A239870-17	17"
A239870-20	20"
A239870-21	21"
A239870-23	23"

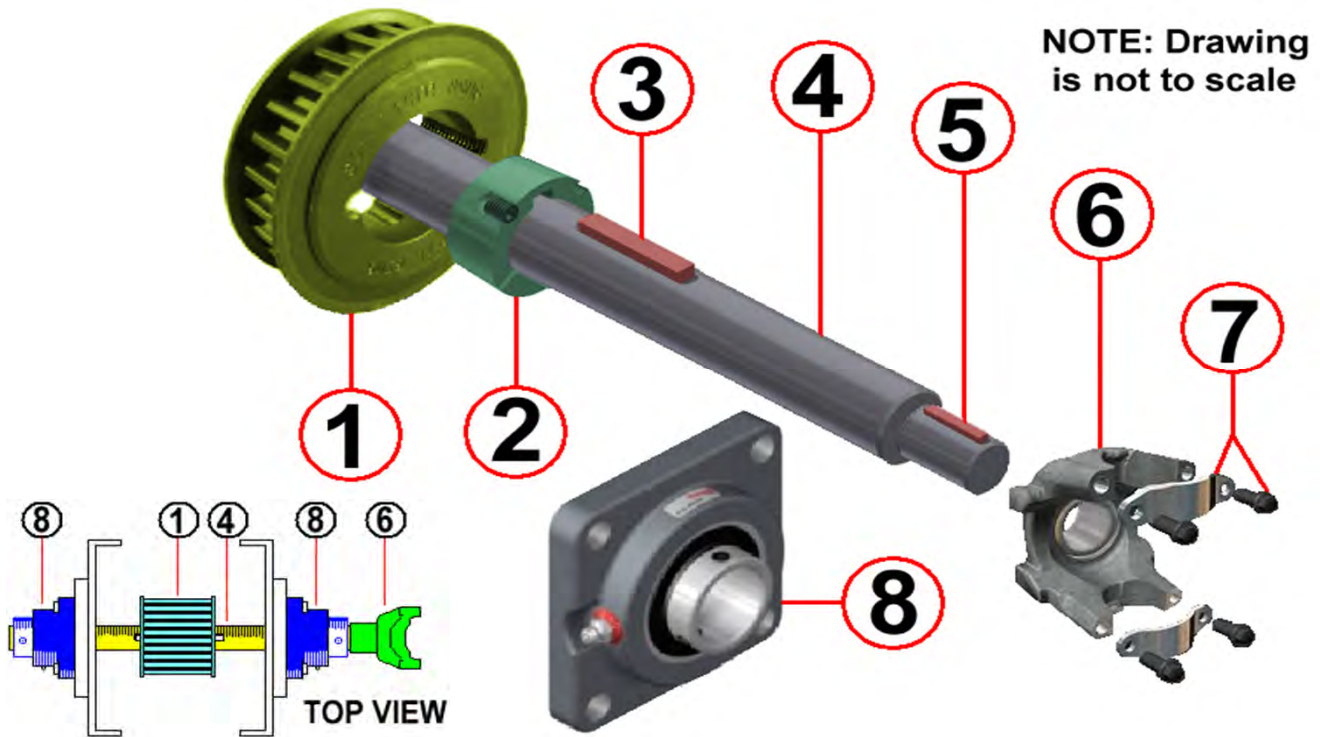


ITEM #	PART NUMBER	DESCRIPTION	QTY.
1	A234285-15	Key, 3/8" Sq. X 1-3/4"L	1
2	A161634	Strap Kit <i>(Note: Order p/n A161602 U-bolt Kit for older A161601 End Yoke)</i>	1
3	A170387	Set Screw, 1/2"-20 x 1/2"	2
4	A161633	End Yoke, Strap Style <i>(replaces obsolete p/n A161601 U-Bolt Style End Yoke)</i>	1
5	A161592	Cross Kit (Universal Joint)	2
6	A161593	Tube Yoke (weld on)	1
7	A236154	Tubing, 3" x.083" (specify length when ordering)	1
8	A161595	Tube Shaft (weld on)	1
9	A161594	Slip Yoke Assembly	1
10	A241767	Flange Yoke, Modified to fit OMSI output flange	1
11	A101440	Bolt, 14mm-2.0 x 45mm	4
12	A103327	Locknut, 14mm-2.0	4

Note: Items 1, 2, 3, 4, 11 and 12 are not included with replacement jackshaft assemblies.

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B-SERIES DRIVESHAFTS



NOTE: Drawing is not to scale

ITEM	DESCRIPTION	PART NO.	QTY.
1	Drive Sprocket	**	1
2	Taper Lock Bushing, 1-15/16" Shaft	**	1
3	Keyway for Taper Lock bushing	A236018-21	1
4	Drive Shaft, 1-15/16" x 19.5" OAL (65gpm pump or Roots 624 blower)	A238068	1
	Drive Shaft, 1-15/16" x 22" OAL* (80gpm or larger water pump or large CFM blower)	A238050	
5	Keyway for End Yoke	A234285-15	1
6	End Yoke (NOTE: Replaces obsolete p/n A161601 u-bolt style End Yoke)	A161633	1
7	Strap Kit (NOTE: Order p/n A161602 U-bolt kit for older A161601 End Yoke)	A161634	1
8	Std. 4-Bolt Flange Ball Bearing (used with A238068 drive shaft)	A160300	2
	HD 4-Bolt Flange Tapered Roller Bearing (used with most A238050 drive shafts)	A304367	
	HD 4-Bolt Flange Spherical Bearing (used with some A238050 drive shafts)	121003451 A	

* Was originally 22.5" long, but was shorten in 2008 for clearance reasons

** Consult BOM or the size charts on the following pages.

NOTE: Occasionally there are other shafts and related components used. Please verify the shaft dimensions before ordering, especially for units built prior to 1999.



POWERDECK DRIVESHAFT BEARINGS



A160300



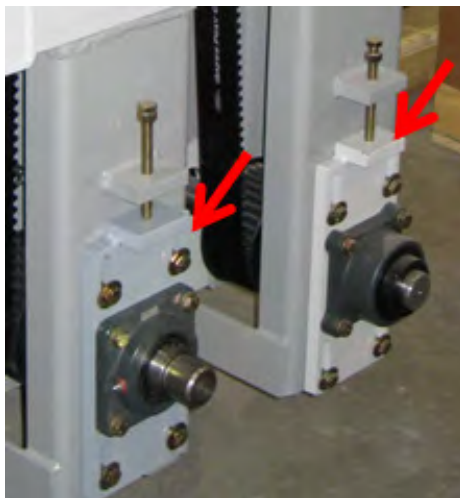
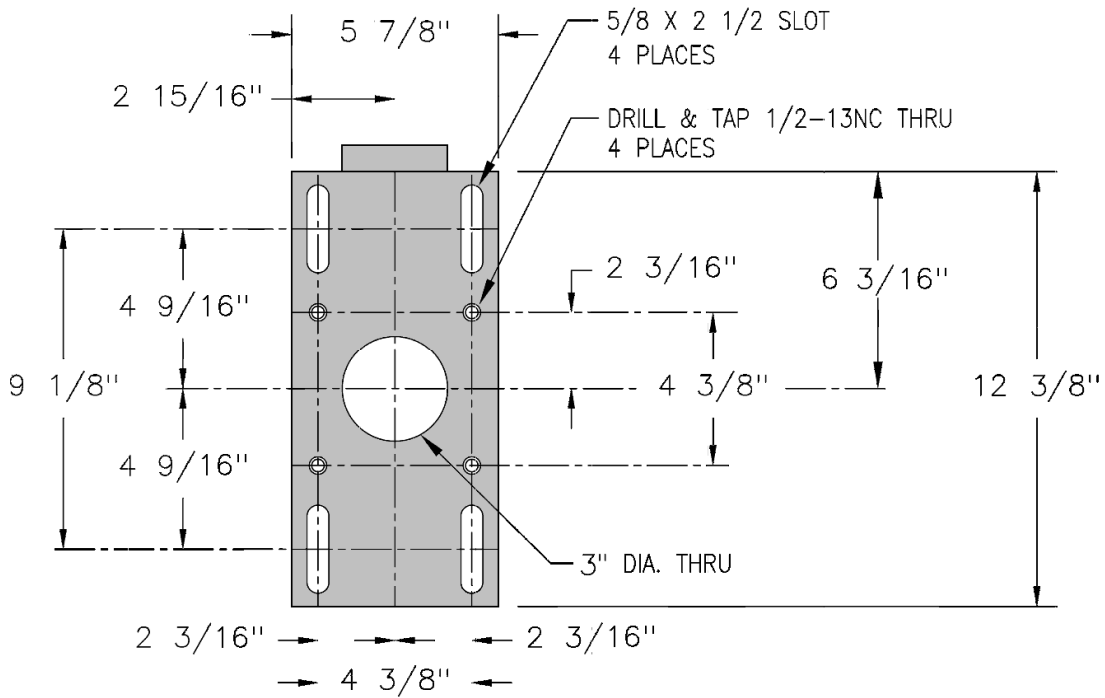
A304367



121003451 Rev. A

A241475

DRIVE BELT TAKE UP PLATE



Used on most models

For your convenience here are the shaft sizes typically found on the B and X series machines.

WATER PUMP INPUT SHAFT SIZES

HE & KL General Pump	35 mm
HF & KF General Pump	40 mm
KD716 Uraca	46 mm
LH, MS & MWR General Pump	50 mm
MH & MK General Pump, P345 Uraca	55 mm

BLOWER INPUT SHAFT SIZES

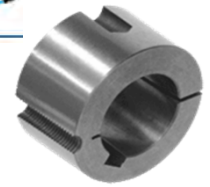
VTB-820 Hibon	42 mm
624 Roots	2" (50.8 mm)
SIAV-840 Hibon	65mm
824 & 827 Roots, TS56 Hibon	2-3/4" (69.9 mm)
SIAV-8702 & SIAV-8902 Hibon	70 mm
1125 Roots Tri-nado	3" (76.2 mm)

DRIVESHAFT DIAMETER

B-Series Powerdeck Driveshafts	1-15/16" (49.2 mm)
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TAPER LOCK BUSHINGS



STYLE DIM.	1215	1610	2517	3020	3525	3535	4030	4535	5040
	1.88"OD x 1.5" 1.75" B.C.	2.25"OD x 1" 2.125" B.C.	3.38"OD x 1.75" 3.250" B.C.	4.25"OD x 2" 4.000" B.C.	5"OD x 2.5" 4.830" B.C.	5"OD x 3.5" 4.830" B.C.	5.75"OD x 3" 5.540" B.C.	6.38"OD x 3.5" 6.130" B.C.	7"OD x 4" 6.720" B.C.
BORE	14.6 ft. lbs. *	14.6 ft. lbs. *	35.8 ft. lbs. *	66.7 ft. lbs. *	88.3 ft. lbs. *	88.3 ft. lbs. *	141.7 ft. lbs.*	204.2 ft. lbs.*	258.3 ft. lbs.*
35mm				A249149	A249175				
1-1/4"	A383114								
1-1/2"		A381055	A380168	A163022	A381989				
1-9/16"		A165017							
40mm			A163003-2		A380679				
42mm			A382017						
1-3/4"			A163060	06-0027	A304518	06-0030			
46mm				A380334	A380638				
1-7/8"			06-0021						
48mm					A380923				
1-15/16"			A163024	A163008	A380143				
50mm			A163003	A163002	06-0434				
2"			A163007	A380142	A249169			A163503	
2-1/8"			06-0449	06-0028		06-0031			
55mm				A388665	A249176		A163505		
2-3/16"			A383139	A165023					
2-1/4"				A388559					
2-3/8"				A163505					
2-1/2"			P06-0003	08-00009					
65mm			121003692	A382322	A388666				
2-11/16"				A380136					
2-3/4"				A163066	A100216	A380145			
70mm				A163308	A163517			A163502	
85mm						A163052-1			
3-1/2"					A388667				
4-1/4"							A163039		A381379

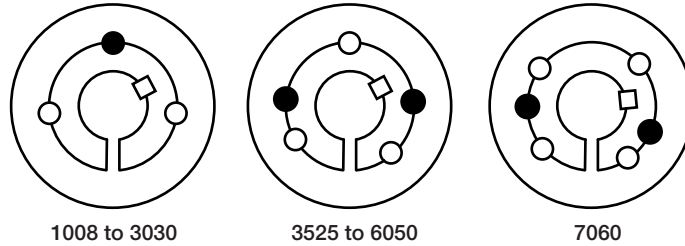
* Mounting Bolt Torque

Dropped from GS

REVISED 5/28/2019

TAPER-LOCK BUSHINGS

Taper-Lock Bushing Installation & Removal



To Install Taper-Lock Type Bushings

1. Clean the shaft, bore of bushing, outside of bushing and the sprocket hub bore of all oil, paint and dirt. File away any burrs. Note: The use of lubricants can cause sprocket breakage. USE NO LUBRICANTS IN THIS INSTALLATION.
2. Insert the bushing into the sprocket hub. Match the hole pattern, not threaded holes (each complete hole will be threaded on one side only).
3. LIGHTLY oil the set screws and thread them into those half-threaded holes indicated by ○ on the diagram above. Note: Do not lubricate the bushing taper, hub taper, bushing bore, or the shaft. Doing so could result in sprocket breakage.
4. With the key in the shaft keyway, position the assembly onto the shaft allowing for small axial movement of the sprocket which will occur during the tightening process. Note: When mounting sprockets on a vertical shaft, precautions must be taken to positively prevent the sprocket and/or bushing from falling during installation.
5. Alternately torque the set screws until the sprocket and bushing tapers are completely seated together (at approximately half of the recommended torque; see table below). Note: Do not use worn hex key wrenches. Doing so may result in a loose assembly or may damage screws.
6. Check the alignment and sprocket axial runout (wobble), and correct as necessary.
7. Continue alternate tightening of the cap screws to the recommended torque values specified in the table below.
8. To increase the bushing gripping force, hammer the face of the bushing using a drift or sleeve (do not hit the bushing directly with the hammer).
9. Re-torque the bushing screws after hammering. Recheck all screw torque values after the initial drive run-in, and periodically thereafter. Repeat steps 5 through 9 if loose.

To Remove

1. Loosen and remove all mounting screws.
2. Insert screws into all jack screw holes indicated by ● (see figure above).
3. Loosen the bushing by alternately tightening the screws in small but equal increments until the tapered sprocket and bushing surfaces disengage.

Bushing Installation

Bushing Style	Bolts		Torque Wrench	
	Qty.	Size	lb-ft	lb-in
1008	2	1/4-20 x 1/2	4.6	55
1108	2	1/4-20 x 1/2	4.6	55
1210 / 1215	2	3/8-16 x 5/8	14.6	175
1310	2	3/8-16 x 5/8	14.6	175
1610 / 1615	2	3/8-16 x 5/8	14.6	175
2012	2	7/16-14 x 7/8	23.3	280
2517 / 2525	2	1/2-13 x 1	35.8	430
3020 / 3030	2	5/8-11 x 1-1/4	66.7	800
3525 / 3535	3	1/2-13 x 1-1/2	83.3	1000
4030 / 4040	3	5/8-11 x 1-3/4	141.7	1700
4535 / 4545	3	3/4-10 x 2	204.2	2450
4545	3	3/4-10 x 2	204.2	2450
5040 / 5050	3	7/8-9 x 2-1/4	258.3	3100
6050	3	1 1/4-7 x 3-1/2	651.7	7820
7060	4	1 1/4-7 x 3-1/2	651.7	7820

Caution: Excessive bolt torque can cause sprocket and/or bushing breakage.

Note: To insure proper bushing/sprocket performance, full bushing contact on the shaft is recommended.

B-SERIES POLYCHAINS



TYPICAL MARKING

14MGT-2660-68
 Pitch Length (MM) Width (MM)

WATER PUMP DRIVE

PART NUMBER	WIDTH		LENGTH		TEETH COUNT	TYPICALLY USED ON *
	MM	INCH	MM	INCH		
A163236	55	2.165	2310	90.940	165	w/Gaso 3364 pump or Aquatech "Fab" pump
A163189	55	2.165	2590	101.970	185	water pump late 80s
A160647	68	2.677	1750	68.898	125	w/Uraca P345 water pump
A380513	68	2.677	1890	74.409	135	w/Uraca KD716 water pump
A160646	68	2.677	1960	77.170	140	most w/MSS55 General Pump
A160644	68	2.677	2100	82.677	150	some w/MSS55 General Pump
A160642	68	2.677	2380	93.700	170	w/Myers D65-20 water pump
A163191	115	4.528	1890	74.400	135	w/90gpm Moro pump (80s)
A163226	115	4.528	2100	82.680	150	90 GPM pump
A163239	115	4.528	2800	110.240	200	B10-2E

EXHAUSTER (BLOWER) DRIVE

PART NUMBER	WIDTH		LENGTH		TEETH COUNT	TYPICALLY USED ON *
	MM	INCH	MM	INCH		
A163018	68	2.677	2520	99.213	180	some w/Roots Exhauster
A160641	68	2.677	2660	104.720	190	most w/Roots Exhauster (current)
A163127	68	2.677	2800	110.236	200	w/Roots Exhauster 624 (early 90s) or 824
A163188	85	3.346	2590	101.970	185	w/A27A (2700 CFM) Exhauster (80s, early 90s)
A160658	90	3.543	2100	82.680	150	Some w/Hibon Exhauster
A160767	170	6.693	2310	90.940	165	w/A45 (4500 CFM) Exhauster (80s, early 90s)
A163195	170	6.693	2800	110.240	200	w/A45 (4500 CFM) Exhauster (80s, early 90s)

** The application shown is where this belt is most commonly used and may be used on other applications. Belt sizing can also vary depending the truck chassis gearing. Please verify dimensions or supply unit ID numbers before ordering.*

NOTE: Refer to Parts Bulletin AQPБ-124 if you are replacing belts on an older unit.

AQUATECH **PARTS BULLETIN**

The following information is excerpted from GatesFacts™ Technical Information Library - Gates Compass™ Power Transmission CD-ROM version 1.2 ©The Gates Rubber Company, Denver, Colorado USA

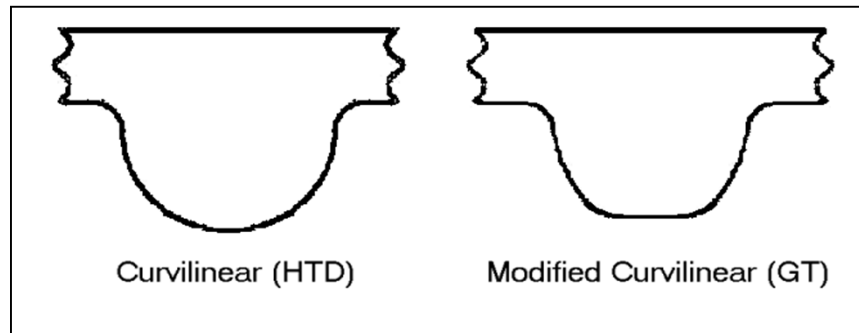
Distinguishing HTD® Belts from PowerGrip® GT® Belts

Since the market introduction of PowerGrip GT, it is becoming increasingly difficult to distinguish between our HTD and PowerGrip GT belts. Because the performance characteristics are so different, confusion must be minimized.

In a generic sense, the HTD profile is a larger and fuller profile than the PowerGrip GT profile. The PowerGrip GT profile is generally shaped more like a gear tooth for improved entry-exit qualities, but still has a round bottom. The actual difference in profile is so subtle that even the trained eye may not be able to consistently differentiate.

There is a relatively simple way to distinguish between these two profiles. Pinch the inside of each belt together causing the teeth to intermesh. With the HTD belt teeth pinched together, you should clearly see the belt tooth interference resulting in gaps through which light is clearly visible. With the PowerGrip GT belt pinched together, the belt teeth intermesh with minimal interference resulting in a clean fit without significant gaps through which light can pass.

The HTD II profile is very similar to PowerGrip GT, and can be identified in the same manner, but this process will not differentiate between these two similar profiles.



Another bit of information that might be useful if the belt still has visible numbers on it: HTD belts typically have a number arrangement such as 2310-14M-55, 2310-14M-55HTD or PC2310-14M-55 where the length in millimeters (2310 in the examples) is listed first.

GT belts typically have a number arrangement such as 14M-2240-68 or 14MGT-2240-68 where the length in millimeters (2240 in the examples) is listed in the middle.

Stock Belt Width Tolerances						
Belt Width (mm) (in)	Belt Width Tolerances					
	Belt (mm)		Belt (mm)		Belt (mm)	
	Lengths (in)	Lengths (in)	Lengths (in)	Lengths (in)	Lengths (in)	Lengths (in)
0 to 33	0 to 33	0 to 33	0 to 33	0 to 33	0 to 33	0 to 33
over 11.1 to 38.1 0.438 1.500	+ .8 - .8 0.032 0.032	+ .8 - 1.2 0.032 0.047	+ .8 - 1.2 0.032 0.047	+ .8 - 1.2 0.032 0.047	+ .8 - 1.2 0.032 0.047	+ .8 - 1.2 0.032 0.047
over 38.1 to 50.8 1.500 2.000	+ .8 - 1.2 0.032 0.047	+ 1.2 - 1.2 0.047 0.047	+ 1.2 - 1.2 0.047 0.047	+ 1.2 - 1.6 0.047 0.063	+ 1.2 - 1.6 0.047 0.063	+ 1.2 - 1.6 0.047 0.063
over 50.8 to 63.5 2.000 2.500	+ 1.2 - 1.2 0.047 0.047	+ 1.2 - 1.6 0.047 0.063	+ 1.2 - 1.6 0.047 0.063	+ 1.6 - 1.6 0.063 0.063	+ 1.6 - 1.6 0.063 0.063	+ 1.6 - 1.6 0.063 0.063
over 63.5 to 76.5 2.500 3.000	+ 1.2 - 1.6 0.047 0.063	+ 1.6 - 1.6 0.063 0.063	+ 1.6 - 1.6 0.063 0.063	+ 1.6 - 2.9 0.063 0.078	+ 1.6 - 2.9 0.063 0.078	+ 1.6 - 2.9 0.063 0.078
over 76.2 to 101.6 3.000 4.000	+ 1.6 - 1.6 0.063 0.063	+ 1.6 - 2.0 0.063 0.078	+ 1.6 - 2.0 0.063 0.078	+ 2.0 - 2.0 0.078 0.078	+ 2.0 - 2.0 0.078 0.078	+ 2.0 - 2.0 0.078 0.078
over 101.6 to 177.8 4.000 7.000	+ 2.4 - 2.4 0.094 0.094	+ 2.4 - 2.8 0.094 0.109	+ 2.4 - 2.8 0.094 0.109	+ 2.4 - 3.2 0.094 0.125	+ 2.4 - 3.2 0.094 0.125	+ 2.4 - 3.2 0.094 0.125
over 177.8 to 7.000				+ 4.8 - 6.4 0.188 0.250	+ 4.8 - 6.4 0.188 0.250	+ 4.8 - 6.4 0.188 0.250

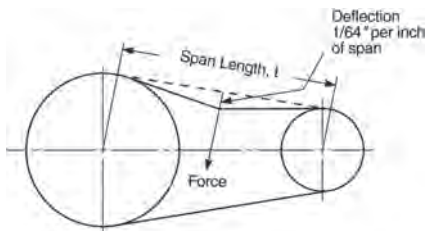
8. Belt Installation Tension

Standard Belt Tensioning Procedure

When installing a Gates PowerGrip® belt:

- Be sure it is tensioned adequately to prevent tooth jumping (ratcheting) under the most severe load conditions which the drive will encounter during operation.
- Avoid extremely high tension which can reduce belt life and possibly damage bearings, shafts and other drive components.

The proper way to check belt tension is to use a tension tester. Gates has a variety of tension testers, ranging from the simple spring scale type tester to the sophisticated Sonic Tension Meter. The spring scale type tester is used by measuring how much force is required to deflect the belt at the center of its span by a specified distance (force deflection method), as shown in the sketch below.



The Sonic Tension Meter measures the vibration of the belt span and instantly converts the vibration frequency into belt static tension (span vibration method).

When you wish to use a numerical method for calculating recommended belt installation tension values, the following procedure may be used.

STEP 1: Calculate the required base static installation tension.

Use Formula 5 to calculate the required base static installation tension.

Formula 5

$$T_{st} = \frac{20HP}{S} + MS^2$$

Where: T_{st} = base static installation tension, Pounds

HP = Horsepower

$$S = \frac{PD \times RPM}{3820}$$

M = Value from Table 3

PD = Sprocket Pitch Diameter, inches

RPM = Sprocket revolutions per minute

Table 3

Pitch	Belt Width	M	Y	Min T _{st} (lb) per span
5M PowerGrip GT3	9mm	0.17	14.88	9.0
	15mm	0.29	24.80	15.0
	25mm	0.48	41.33	25.0
8M PowerGrip GT3	12mm	0.32	25.38	13.5
	20mm	0.54	42.29	22.5
	30mm	0.81	63.44	33.8
	50mm	1.35	105.73	56.2
14M PowerGrip GT3	85mm	2.29	179.74	95.6
	40mm	1.80	93.04	106.0
	55mm	2.48	127.93	145.8
	85mm	3.83	197.72	225.2
5M PowerGrip HTD	115mm	5.18	267.50	304.8
	170mm	7.66	395.43	450.5
	25mm	0.27	24.80	13.5
20M PowerGrip HTD	25mm	0.45	41.33	22.5
	115mm	6.84	402.35	425.5
	170mm	10.11	594.78	629.0
	230mm	13.68	804.70	851.0
XL PowerGrip Timing	290mm	17.25	1014.63	1073.0
	340mm	20.23	1189.56	1258.0
	1/4 in.	0.07	3.30	3.2
	3/8 in.	0.11	4.94	4.9
L PowerGrip Timing	1/2 in.	0.19	7.20	12.5
	3/4 in.	0.28	10.80	18.8
	1 in.	0.38	14.40	25.0
H PowerGrip Timing	3/4 in.	0.35	32.23	56.2
	1 in.	0.46	42.97	75.0
	1-1/2 in.	0.69	64.45	112.5
	2 in.	0.92	85.94	150.0
XH PowerGrip Timing	3 in.	1.38	128.91	225.0
	2 in.	2.67	129.88	210.0
	3 in.	4.00	194.82	315.0
XXH PowerGrip Timing	4 in.	5.34	259.77	420.0
	2 in.	3.52	144.04	260.0
	3 in.	5.28	216.06	390.0
XXH PowerGrip Timing	4 in.	7.04	288.09	520.0
	5 in.	8.80	360.11	650.0

Because of the high performance capabilities of PowerGrip belts, it is possible to design drives that have significantly greater load than are necessary to carry the actual design load. Consequently, Formula 5 can provide T_{st} values less than are necessary for the belt to operate properly, resulting in poor belt performance and reduced service life.

If a more appropriately sized drive cannot be designed, minimum recommended T_{st} values are provided in Table 3 to assure that the PowerGrip® belts function properly when lightly loaded.

Always use the greater T_{st} value; i.e., from T_{st} Formula 5 or Table 3.

NOTE: When applying static belt tension values directly, multiply the required base static installation tension (T_{st}) calculated in Formula 5 by the following factors:

For New Belts:

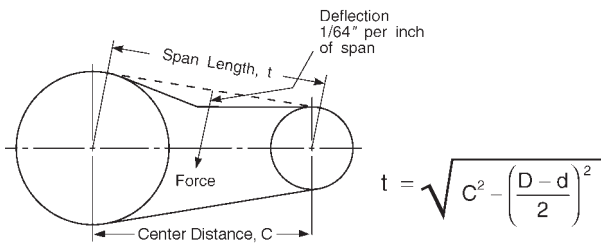
- Minimum Static Tension = $1.0 \times T_{st}$
- Maximum Static Tension = $1.1 \times T_{st}$

For Used Belts:

- Minimum Static Tension = $0.7 \times T_{st}$
- Maximum Static Tension = $0.8 \times T_{st}$

STEP 2: Calculate the minimum and maximum recommended deflection forces.

A. Measure the span length of your drive (see sketch).



B. New belt minimum recommended force:

Formula 6

$$\text{deflection force, Min.} = \frac{1.0 T_{st} + \left(\frac{t}{L}\right) Y}{16}, \text{ lb}_f$$

C. New belt maximum recommended force:

Formula 7

$$\text{deflection force, Max.} = \frac{1.1 T_{st} + \left(\frac{t}{L}\right) Y}{16}, \text{ lb}_f$$

Where: T_{st} = Base Static tension, lb_f
 t = span length, inches
 L = belt pitch length, inches
 Y = constant from Table 3

USED BELT NOTE: For re-installation of a used belt, a recommended tension of $0.7 T_{st}$ to $0.8 T_{st}$ value should be used in calculating the deflection forces, instead of the $1.0 T_{st}$ to $1.1 T_{st}$ shown for new belts.

STEP 3: Applying the tension.

Force deflection tension method

- A. At the center of the span (t) apply a force perpendicular to the span large enough to deflect the belt on the drive $1/64$ inch per inch of span length from its normal position. One sprocket should be free to rotate. Be sure the force is applied evenly across the entire belt width. If the belt is a wide synchronous belt place a piece of steel or angle iron across the belt width and deflect the entire width of the belt evenly.
- B. Compare this deflection force with the range of forces calculated in Step 2.
 1. If it is less than the minimum recommended deflection force, the belt should be tightened.
 2. If it is greater than the maximum recommended deflection force, the belt should be loosened.




Span vibration tension method

The Sonic Tension Meter detects the vibration frequency in the belt span, and converts that measurement into the actual static tension in the belt. To use the Sonic Tension Meter, begin by entering the belt unit weight, belt width, and the span length. To measure the span vibration, press the "Measure" button on the meter, tap the belt span, and hold the microphone approximately $1/4$ " away from the back of the belt. The Sonic Tension Meter will display the static tension, and can also display the span vibration frequency.



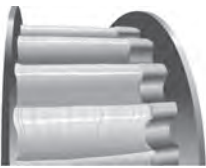

The belt unit weights for use with the Gates Sonic Tension Meter are shown in the following table.

Belt Product Family	Belt Cross Section	Adjusted Belt Weight (grams/meter)
PowerGrip® Timing	XL	2.4
	L	3.2
	H	3.9
	XH	11.3
PowerGrip Timing Twin Power®	XXH	14.9
	XL	1.9
PowerGrip Timing Twin Power®	L	3.2
	H	4.6
	5M	5.8
	8M	5.5
PowerGrip GT®3 (5M, 8M, 14M) and HTD® (20M)	14M	9.7
	20M	12.8
	8M	6.93
PowerGrip GT2 Twin Power	14M	11.44

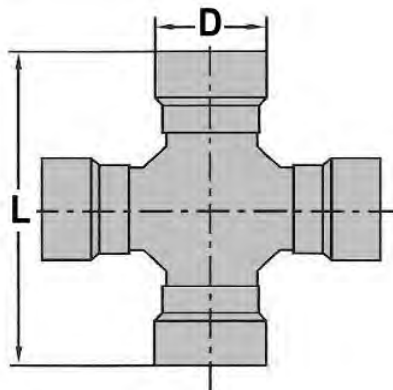
Troubleshooting

Symptom	Diagnosis	Possible Remedy
Unusual noise	Misaligned drive Too low or high belt tension Backside idler Worn sprocket Bent guide flange Belt speed too high Incorrect belt profile for the sprocket (i.e., GT® etc.) Subminimal diameter Excess load	Correct alignment Adjust tension to recommended value Use inside idler Replace sprocket Replace sprocket/flange Redesign drive Use proper Gates PowerGrip® GT®3 belt/sprocket Redesign drive using larger diameters Redesign drive for increased capacity
Tension loss	Weak support structure Excessive sprocket wear Fixed (nonadjustable) centers Excessive debris Excessive load Subminimal diameter Belt, sprockets or shafts running too hot Unusual belt degradation, such as softening or melting	Reinforce the structure Use alternate sprocket material Use inside idler for belt adjustment Protect drive Redesign drive for increased capacity Redesign drive using larger diameters Check for conductive heat transfer from prime mover Reduce ambient drive temperature to 180°F maximum
Belt tracking	Belt running partly off unflanged sprocket Centers exceed 8 times small sprocket diameter and the large sprocket is not flanged. Excessive belt edge wear	Correct alignment Correct parallel alignment to set belt to track on both sprockets Correct alignment
Flange failure 	Belt forcing flanges off	Correct alignment or properly secure flange to sprocket
Excessive belt edge wear 	Damage due to handling Flange damage Belt too wide Belt tension too low Rough flange surface finish Improper tracking Belt hitting drive guard or bracketry	Follow proper handling instructions Repair flange or replace sprocket Use proper width sprocket Adjust tension to recommended value Replace or repair flange (to eliminate abrasive surface) Correct alignment Remove obstruction or use inside idler
Tooth shear 	Excessive shock loads Less than 6 teeth-in-mesh Extreme sprocket runout Worn sprocket Backside idler Incorrect belt profile for the sprocket (i.e., GT®, etc.) Misaligned drive Belt undertensioned	Redesign drive for increased capacity Redesign drive Replace sprocket Replace sprocket Use inside idler Use proper Gates PowerGrip® GT®3 belt/sprocket Correct alignment Adjust tension to recommended value

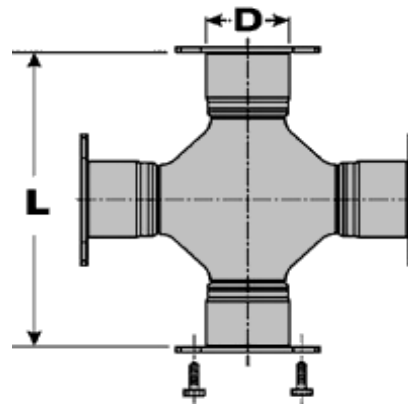
Troubleshooting

Symptom	Diagnosis	Possible Remedy
<p>Premature tooth wear</p> 	<p>Too low or high belt tension Belt running partly off unflanged sprocket Misaligned drive Incorrect belt profile for the sprocket (i.e., GT®, etc.) Worn sprocket Rough sprocket teeth Damaged sprocket Sprocket not to dimensional specification Belt hitting drive bracketry or other structure Excessive load Insufficient hardness of sprocket material Excessive debris Cocked bushing/sprocket assembly</p>	<p>Adjust tension to recommended value Correct alignment Correct alignment Use proper Gates PowerGrip® GT®3 belt/sprocket</p> <p>Replace sprocket Replace sprocket Replace sprocket Replace sprocket Remove obstruction or use inside idler Redesign drive for increased capacity Use a more wear-resistant material Protect belt Install bushing per instructions</p>
<p>Tensile break</p> 	<p>Excessive shock load Subminimal diameter Improper belt handling and storage prior to installation Debris or foreign object in drive Extreme sprocket runout Too low or high belt tension</p>	<p>Redesign drive for increased capacity Redesign drive using larger diameters Follow proper handling and storage procedures</p> <p>Protect drive Replace sprocket Adjust tension to recommended level</p>
<p>Unusual sprocket wear</p> 	<p>Sprocket has too little wear resistance (i.e., plastic, aluminum, softer metals) Misaligned drive Excessive debris Excessive load Too high, too low belt tension Incorrect belt profile (i.e. GT, etc.)</p>	<p>Use alternate sprocket material</p> <p>Correct alignment Protect drive Redesign drive for increased capacity Adjust tension to recommended value Use proper Gates PowerGrip GT®3 belt/sprocket</p>
<p>Belt cracking</p> 	<p>Subminimal diameter Backside idler Extreme low temperature startup Extended exposure to harsh chemicals Cocked bushing/sprocket assembly</p>	<p>Redesign drive using larger diameters Use inside idler Preheat drive environment Protect drive Install bushing per instructions</p>
<p>Excessive temperature (belt, bearing, housing, shafts, etc.)</p>	<p>Misaligned drive Too low or too high belt tension Incorrect belt profile (i.e. GT, etc.)</p>	<p>Correct alignment Adjust tension to recommended value Use proper Gates PowerGrip GT®3 belt/sprocket</p>
<p>Vibration</p>	<p>Incorrect belt profile for the sprocket (i.e. GT, etc.) Too low or too high belt tension Bushing or key loose</p>	<p>Use proper Gates PowerGrip GT®3 belt/sprocket</p> <p>Adjust tension to recommended value Check and reinstall per instructions</p>

SPICER TYPE UNIVERSAL JOINTS



STYLE 1



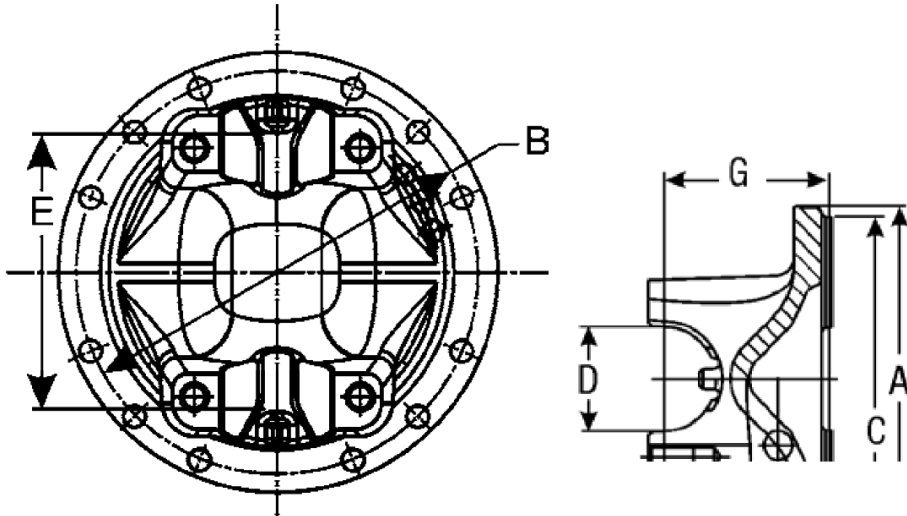
STYLE 2

SERIES	PART NO.	STYLE	L	D
1410	A161592	1	4-3/16"	1-3/16"
1550	A161611 *	1	4-31/32"	1-3/8"
1610	TBA	2	5-5/16"	1-7/8"
1710	A239878-1 *	2	6-3/32"	1-15/16"
1810	U3308-0130 *	2	7-35/64"	1-15/16"
SPL250X	A239879*	1	152mm	60mm

* non stocking item

SPICER SPL250 SERIES DRIVE LINE COMPONENTS

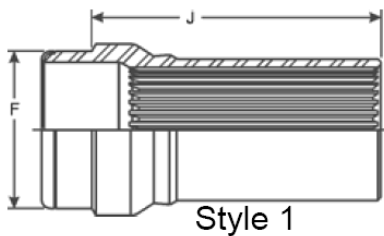
P/N A239872-250



A	B - Bolt Holes			C	G
Flange or Swing Diameter	Bolt Circle Diameter	Diameter D-Drilled T-Tapped	Number of Holes	Pilot Diameter M-Male F-Female	Flange Face to Centerline
8.000	7.250	.479-D	12	7.750M	3.524



P/N A239872-9



SPL250 SERIES

3.858 (98.0mm)-36 Based On 38 Involute Spline

J	Style	Fits Tube/ Tube Yoke Part Number	Mates w/ Part Number	F
End of Spline to Weld				Butt Diameter
6.909	1	120-30-*	—	4.744



SPICER SPL250 SERIES DRIVE LINE COMPONENTS

P/N A239879 U-Joint Kit



P/N A239875 Strap Kit





OMSI SPLIT SHAFT PTO



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To save on file size, this section does not contain the parts manuals for the OMSI PTOs. If you need copies, please feel free to ask for them.



REAR OUTPUT PTO (most domestic units)

- Parts Manual for A164141Mid 90s with shifter fork on outputs
- Parts Manual for A164134Mid 90s to 2009 Power Clutch™ PTO
- Parts Manual for A164134-12011 & on Power Clutch™ PTO
w/positive feedback switch

FRONT OUTPUT PTO (most cab-over and overseas units)

- Parts Manual for A3806432006 to 2009 Power Clutch™ PTO
- Parts Manual for A380643-12011 & on Power Clutch™ PTO
w/positive feedback switch



B-SERIES DRIVELINE PTO ASSEMBLIES

PART NO.	MAKE	TAG NO.	MODEL NUMBER	PTO	OUT	STATUS	NOTES	APPROX YEAR
A161141	CSC		380-4X	Dual		NLA	B & C Series	1986 to 1989
A161144	OMSI	8700-0002-0 (Moro)	PFT 1000/4X	Dual		NLA	B & BH Series	1983 to ?
A164144	OMSI	10030126 & 10030124	PFT 1700/4X	Dual		NLA	B-Series	? to 1994
A164141	OMSI	10750019	PFT PC4/3000 Early style w/forks	Dual	Rear	NLA	B-Series (USE A164134-1)	Mid 90s
121003724 A	OMSI	10750240	PFT PC4/3000HHP	Dual				
A164134	OMSI	10750036	PFT PC4/3000	Dual	Rear	NLA	USE A164134-1 - B Series, with mounting brackets	1999 to 2010
A164134-1	OMSI	10750036-05	PFT PC4/3000	Dual	Rear		Switch Feedback - Replaces A164134	2010 on
A164135	OMSI	10750059	PFT PC4/3000	Dual	Rear	NLA	A164134 w/hyd. pump, check valve, and fittings	
A164135	OMSI	10750067-01	PFT PC4/3000	Dual	Rear		USE A381948	
A164140	OMSI	10750036-02	PFT PC4/3000	Dual		NLA	USE A164134-1	1999 on
A164141	OMSI	10750019	PFT PC4/3000	Dual			USE A164141-1 - with Hydraulic Output	Pre 1999
A164141-1	OMSI	10750132-05	PFT PC4/3000	Dual			with Hydraulic Output	Svc. Repl.
A380643	OMSI	10750067	PFT PC4/3000	Dual	Front	NLA	USE A380643-1 - B-Series w/Reverse PTO & X10s	2003 to 2008
A380643-1	OMSI	10750067-07	PFT PC4/3000	Dual	Front		B-Series w/Reverse PTO & X10s w/Switch Feedback	2005 on
A381620	OMSI	10750135-01	PFT PC4/3000	Dual			"Live Drive" B-Series - used on four units	2005-2008
A383343	OMSI	10750152-01	PFT PC4/3000	Dual			"Live Drive" B-10 28101011 Water Blasting Svcs	2008
A249437	OMSI	10810020	PFT PCV/3000	Tower			Has SAE-C Hyd. Flange	Older
	OMSI	10810078		Tower			Has SAE-B Hyd. Flange - HVV-4915	Current
A304993	OMSI	11710001	PFT PCVT/3000	Tower			Extended Tower	
A381430	OMSI	10810090	PFT PCV/3000	Tower			With 2 Top output, SAE-B Hyd. Flange	
A381618	OMSI	10810112-01	PFT PCV/3000	Tower			Leasco 2005 CB15s & some X-10s 2007 on	2005 on
A381619	OMSI	10810113-02	PFT PCV/3000	Tower			Leasco B-15 25101087	2005

PTO List, Compiled by RR, Revised 3/1/2019



OMSI MODEL PFT-1700/4X RETROFIT INFORMATION



The PFT-1700/4X (pictured above) has been out of production since the late 90s. It was found on B-Series machines circa 1990 to 1996. For production it was replaced by the PFT-PC4/3000 series PTO.

OLD PFT-1700/4X	CURRENT PFT-PC4/3000
<ul style="list-style-type: none">• Aquatech P/N A164144 (NLA)• Capable of 12,500 ft/lb of torque• Auxiliary outputs engaged by mechanical "shift fork"	<ul style="list-style-type: none">• Hi-Vac P/N A164134-1• Capable of 22,000 ft/lb of torque.• Auxiliary outputs engaged by friction disks (OMSI PowerClutch™)

For replacement the current p/n A164134-1 PTO can be used however it is physically shorter (front flange to back flange) so other than having the drive shafts lengthened the following spacers will need to be ordered:

P/N A164137-1 Rear Main Drive Flange Spacer (Output Side)

P/N A164137-2 Front Main Drive Flange Spacer (Input Side)

The existing pneumatic control valve bank can be use since the auxiliaries (lateral outputs) on both models are each controlled by a single airline (air on to engage with spring return.). Two airlines are used to engage and disengage the PTO in and out of work/road mode on both models. Four airlines total.



OMSI Transmissions, Inc.

RECOMMENDED LUBRICATION SYSTEM
PFT-PC2 / PC4 • PFT-PCV / 2A / PCVT SERIES

9319 Ravenna Road • Twinsburg, Ohio 44087 USA • 330-405-7350 • Fax: 330-405-7351 • E-mail: OMSI@OMSItransmissions.com

DUTY CYCLE	CONTINUOUS TIME ON-THE-JOB	RECOMMENDED LUBRICATION SYSTEM
MODERATE	2 – 4 hours	<u>Direct / Mechanical Driven Units:</u> SAE-80W90 <u>PowerClutch Driven Units:</u> Mobil Delvac II ATF
HEAVY	4 – 6 hours	<u>Direct / Mechanical Driven Units:</u> Synthetic 75W-90 API MT-1/GL-5EP <u>PowerClutch Driven Units:</u> Mobil Delvac II ATF
SEVERE	+ 6 hours	<u>Direct / Mechanical Driven Units:</u> Synthetic 75W-90 API MT-1/GL-5EP <u>and Heat Exchanger / Cooling System</u> <u>PowerClutch Driven Units:</u> Mobil Delvac II ATF <u>and Heat Exchanger / Cooling System</u>

NOTE: It is always recommended to monitor the drive system and heat generation around the drive components, as there are many factors (ie: ambient temperature, system loading and efficiency of machine) that affect and condition the operational temperature of the transmission drive.

WE CAN PUT YOUR TRANSMISSION PROJECT IN HIGH GEAR.SM

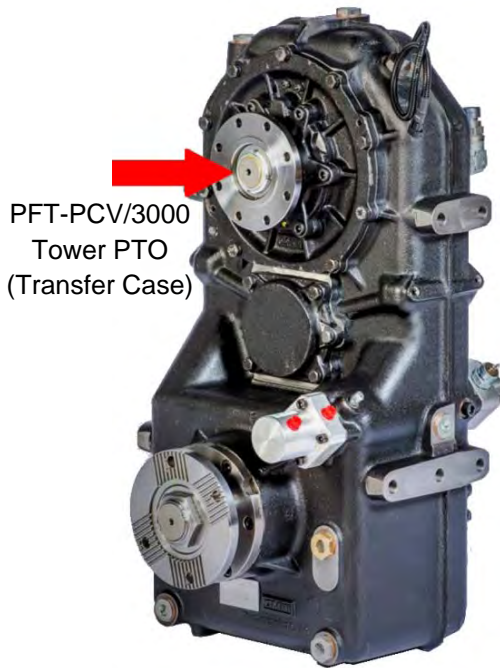


OMSI SPANNER NUTS

Used to secure auxiliary output drive flanges on OMSI PTOs.



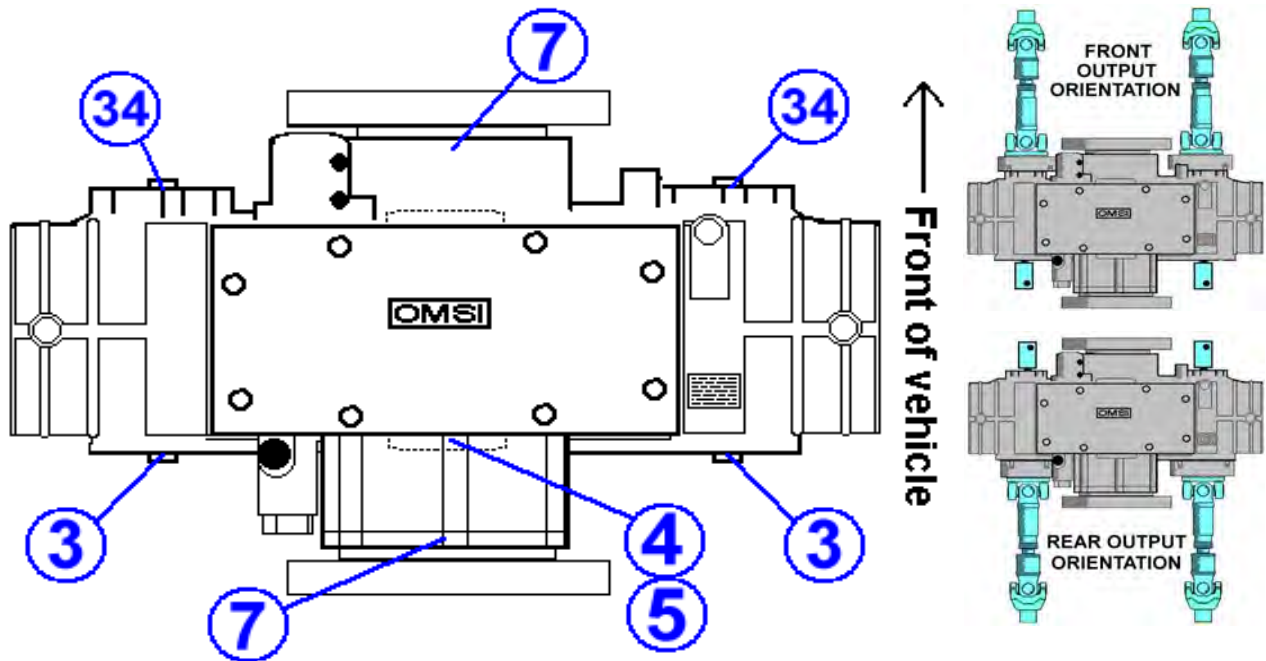
Spanner Nut Socket (Inside and outside view)



NUT P/N	THREAD	O.D.	SOCKET P/N	TORQUE	USED ON
A164514	M30 x 1.5	44mm	A164514-T	199 ft./lbs.	PFT-PC4/3000
A249437-36	M40 x 1.5	57mm	A187410	405 ft./lbs.	PFT-PCV/3000

OMSI PFT PC4/3000 PTO OIL SEALS

Here is a quick reference chart for oil seals used on the current OMSI split shaft PTOs we use on the B-Series combo jet-vac units. Due to the high temperatures these units see in the summer months, we recommend using the viton seals.



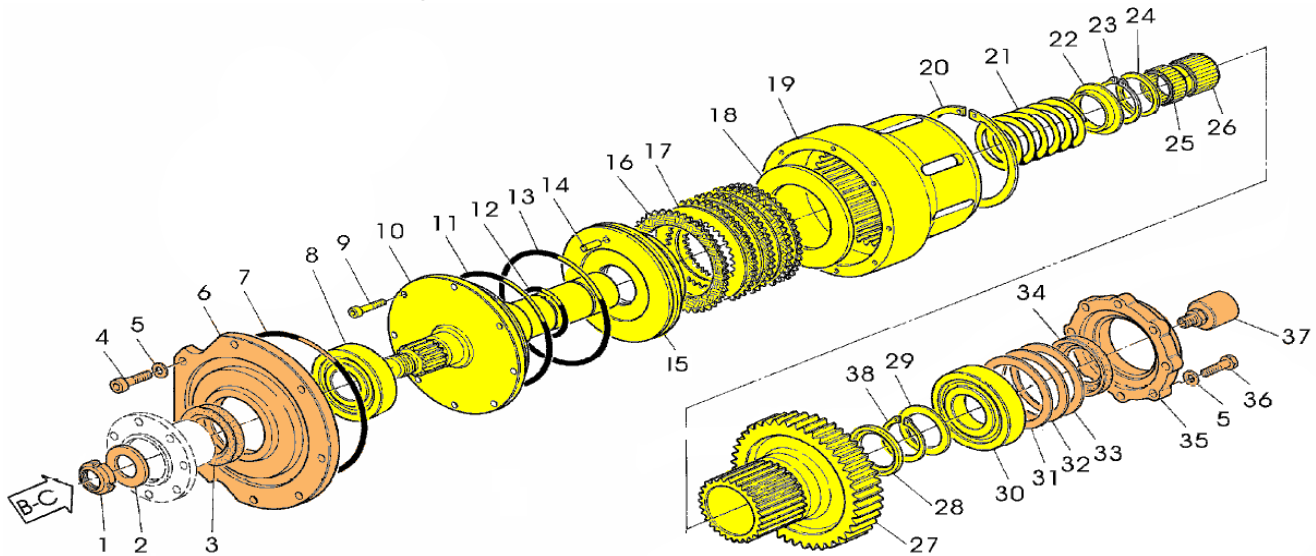
REF. NO.	LOCATION	PART NO. – NBR	PART NO. – VITON
3	Lateral shaft rear – front or rear output PTOs	A164516 or A164204 *	A164587 or A161198 *
34	Lateral shaft front – front output PTO (drive flange end)	A164516 or A164204 *	A164587 or A161198 *
	Lateral shaft front – rear output PTO (air swivel end)	A164547	A164465
4	Hydraulic pump flange at intermediate output (all except spec 10750067)	A164509	A164462
	Hydraulic pump flange at intermediate output (spec 10750067 only)		TBA
5	Cover plate at intermediate output	A164482	A164465
7	Main shaft, Input & Output	A164161 (NLA) or A161278 *	A164421 or A161278-V *

* CSC PTO equivalent sized seal.

Note: Reference numbers match those in the OMSI parts breakdown (on their respective pages).

OMSI CLUTCH PACKS

For your convenience here are charts listing the complete replacement OMSI PowerClutch™ pack for PTOS used in late model Aquatech's.



FOR MODEL PFT-PC2/3000

PTO P/N	OMSI TAG NO.	ORIENTATION	CLUTCH PACK
A164132	10750110	Single Front Output on Left Side	A164132-CPL
A164137	10750058	Single Front Output on Right Side	A164132-CP
A164137-3	10750058-03	Single Front Output on Right Side	A164132-CP

FOR MODEL PFT-PC4/3000

PTO P/N	OMSI TAG NO.	ORIENTATION	LH SIDE CLUTCH PACK	RH SIDE CLUTCH PACK
A164134	10750036	Dual Rear Outputs	A164134-CPL *	A164134-CPR *
A164134-1	10750036-05	Dual Rear Outputs	A164134-CPL *	A164134-CPR *
A164135	10750059	Dual Rear Outputs	A164134-CPL *	A164134-CPR *
A164140	10750036-02	Dual Rear Outputs	A164134-CPL *	A164134-CPR *
A380211	10750064-02	Dual Rear Outputs	A164134-CPL *	A164134-CPR *
A380643	10750067	Dual Front Outputs	A164132-CPL	A164132-CP
A380643-1	10750067-07	Dual Front Outputs	A164132-CPL	A164132-CP
A381620	10750135-01	Dual Rear Outputs	A164134-CPL *	A164134-CPR *
A383343	10750152-01	Dual Front Outputs	A164132-CPL	A164132-CP

* Can use clutch pack p/n A164135-CP "Base PowerClutch Module" (for left or right side). This clutch pack does not include items 1 through 7 and items 31 through 37.

AQUATECH PARTS BULLETIN

It has come to our attention that there was a running design change back in July of 1998 on the shifter forks on OMSI model PFT-PC2/3000 and PFT-PC4/3000 split shaft PTOs. The Aquatech PTO assembly part numbers affected are 164134, 164135, 164137, 164140 and 164141. The earlier design fork was held in place by roll pins. The current design uses a single bolt and nut. When replacing either the fork or the stem (shifter shaft) on the earlier design - both items will have to be replaced together. Also the newer design bolt and nut will be required. The part numbers involved are listed below.



Photo submitted by Gary Karst, Terex Utilities West

FOR ALL ASSEMBLIES LISTED ABOVE

A164440	Main Fork
A164435	Main Stem
A164402	Nut
A164441	Bolt

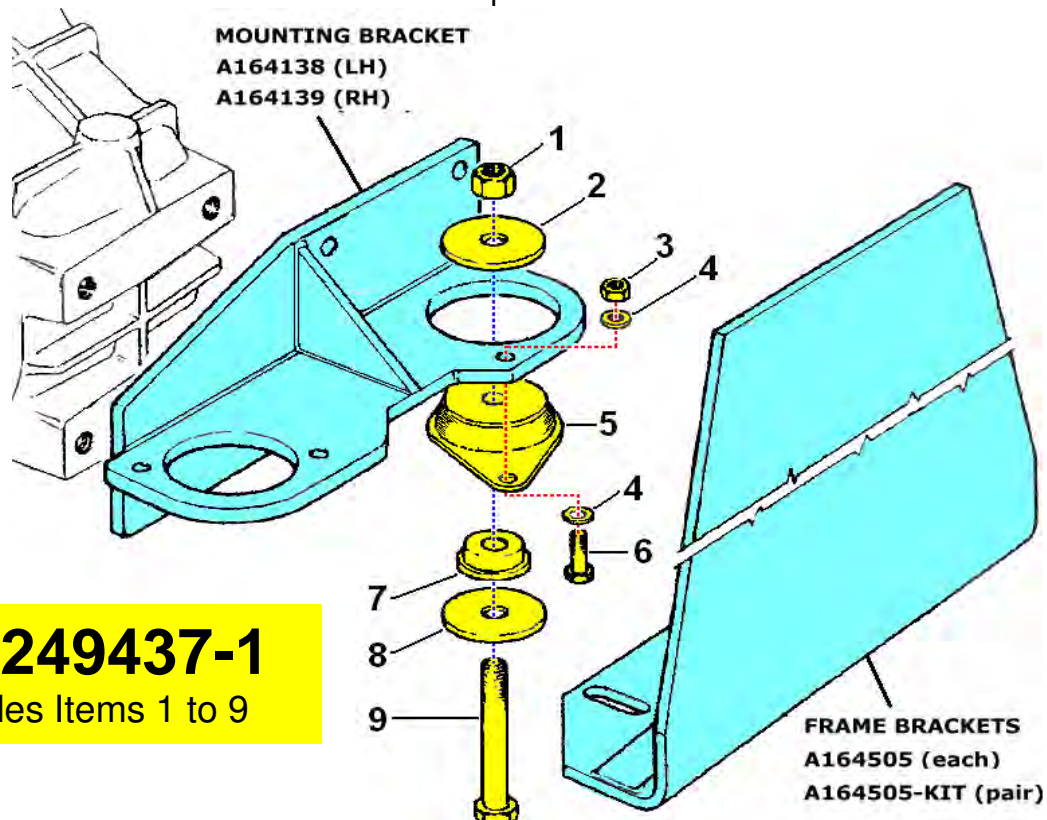
FOR A164141 ONLY *

A164468	Lateral Fork
A164470	Lateral Stem
A164402	Nut
A164441	Bolt

* The other assemblies are not affected on the lateral outputs because they have Power Clutch™ clutch packs.

PTO SILENT BLOCK KITS

The parts breakdowns for the OMSI split shaft PTOs list the Silent Blok™ mounts and related hardware separately. There is a kit available that includes all these items. The kit is part number A249437-1 and contains all the items listed on the chart below. This kit fits our OMSI PTOs since the mid-90s. Earlier models used a part number A161149 Rubber Mount.



Kit A249437-1

Includes Items 1 to 9

ITEM	QTY.	PART NO.	DESCRIPTION
1.	1	A164504	16mm Nut
2.	1	A164497	16mm Washer (60mm O.D.)
3.	2	A164499	10mm Nut
4.	4	A164501	10mm Washer
5.	1	A164500	Silent Blok™ Isolator
6.	2	A164403	10mm X 30mm Bolt
7.	1	A164502	Centering Bushing
8.	1	A164503	16mm Washer (65mm O.D.)
9.	1	A164496	16mm X 110mm Bolt



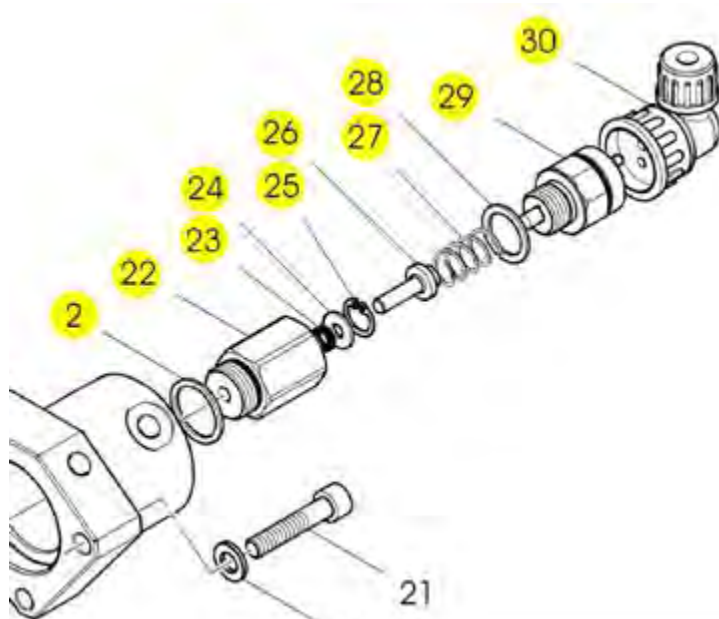
A161149
 (older Aquatech models)



A164134-1-PSK POSITIONING SWITCH KIT FOR



PFT-PC4-3000



CONTENTS OF A164134-1-PSK

ITEM	PART NUMBER	DESCRIPTION
2	A163940	Copper Washer
22	A164486	Extension
23	A164487	O-Ring
24	A164488	Washer
25	A164489	Snap Ring
26	A164490	Pin, Switch
27	A164491	Spring
28	A164407	Copper Washer, D18
29	A164457	Positioning Switch
30	A249437-SC	Switch Cover

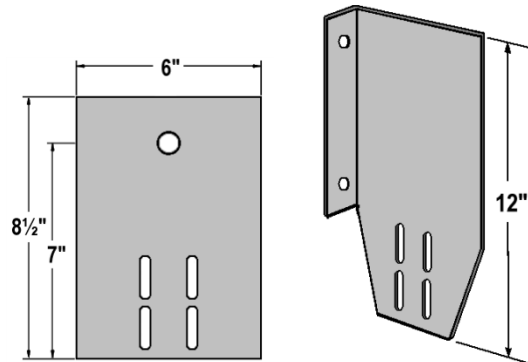


A249437-2

PTO REMOTE OIL LEVEL INSPECTION AND FILLER STATION FOR OMSI PTO



A249437-2



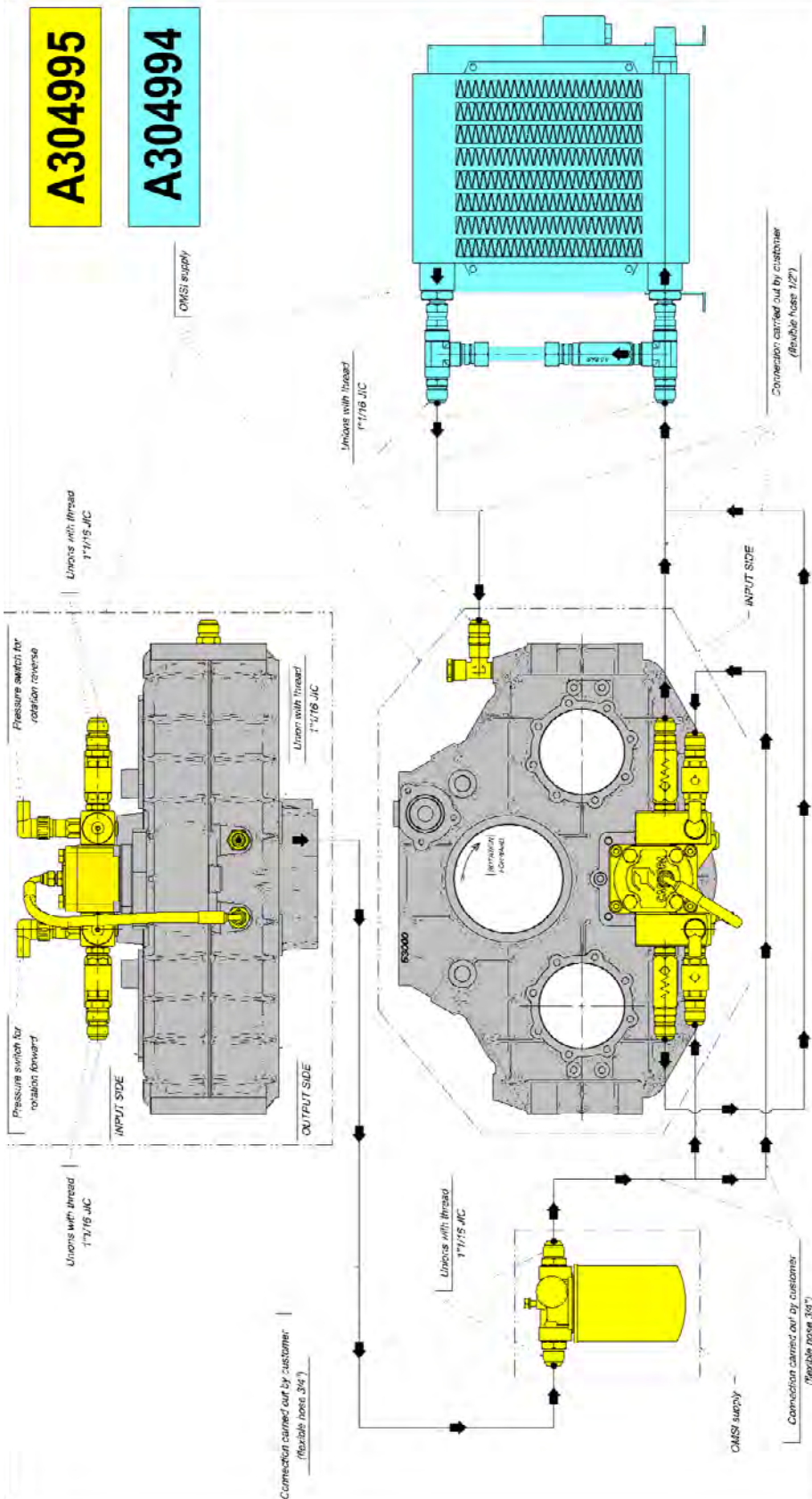
U1007-4048

U1007-4799

PARTS COMMONLY USED TO INSTALL THIS STATION ON VARIOUS UNITS

PART NUMBER	DESCRIPTION
A380847	90° ELBOW ADAPTER, 1/2"BSPP X 1/2"MJIC
A381133	90° ELBOW ADAPTER, 3/4"BSPP X 1/2"MJIC, W/RING
A234382-12	HOSE ASSY - 1/2" X 18", 1/2"FJIC X 1/2"FJIC
U1007-4048	FLAT MOUNTING BRACKET (used on some installations)
U1007-4799	90° MOUNTING BRACKET (used on some installations)

OPTIONAL REMOTE OIL COOLER FOR OMSI PFT/PC4-3000 PTO



The A304995 kit incorporates the cooling pump, manifolds, check valves, pressure switches, filter assembly and connectors / adapters.

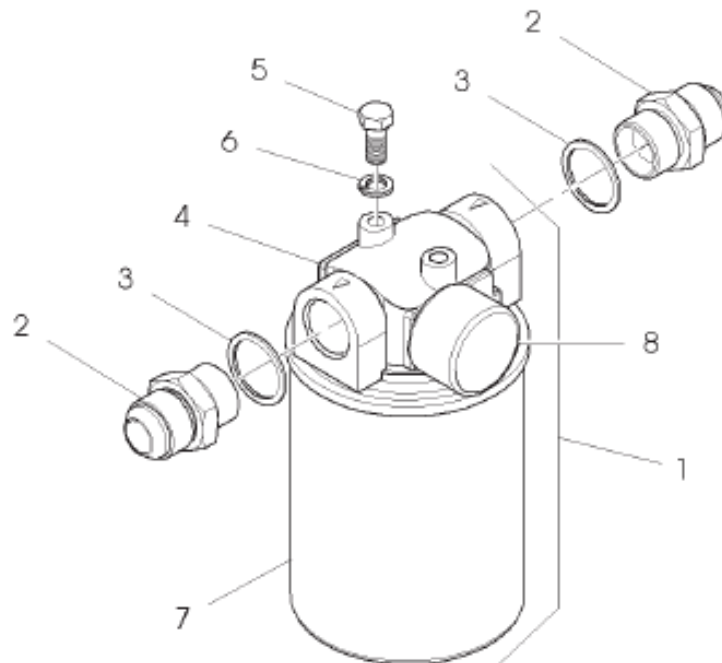
The A304994 kit is the heat exchanger assembly with thermo-coupler, by-pass check valve and inlet / outlet connections.



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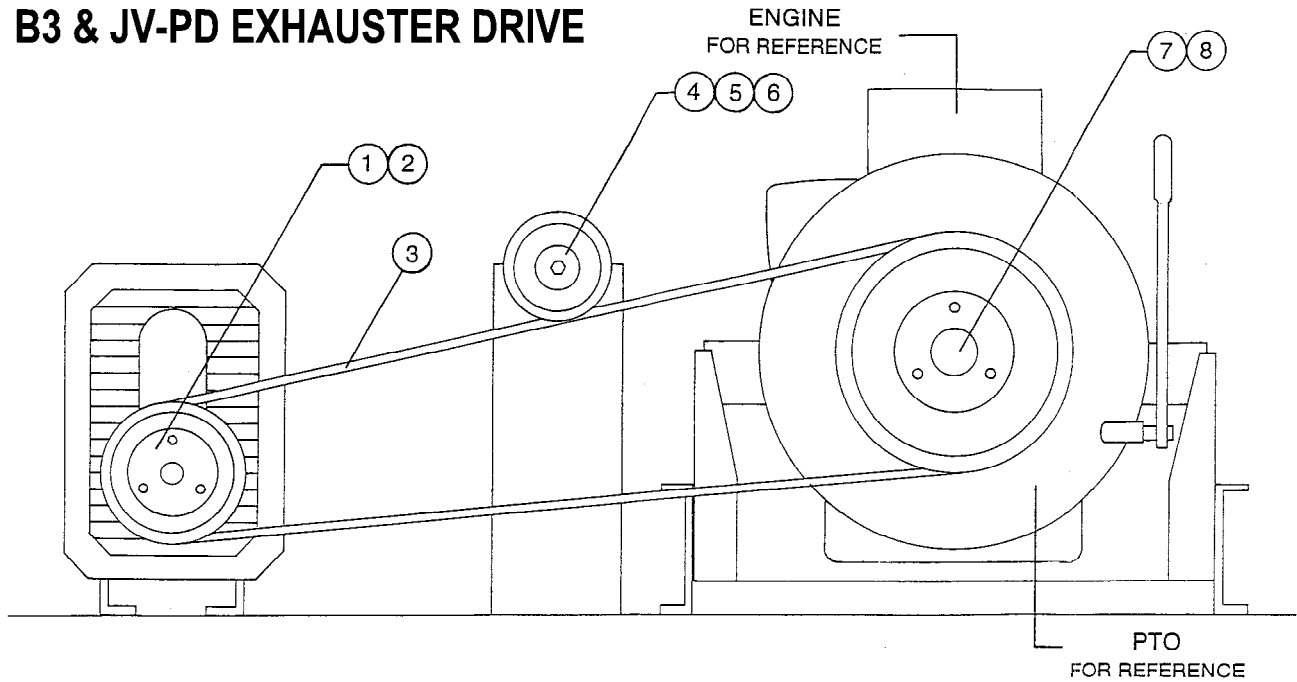
LUBE FILTER ASSEMBLY

(Used with remote oil cooler circulation pump)



POS.	HI-VAC P/N	DESCRIPTION	QTY
1	A164619	Filter Assembly, Inline	1
2	TBA	Adapter	2
3	TBA	Washer, Copper	2
4	TBA	Filter Head	1
5	A100220	Screw, M8x20, Hex Head, 8.8 Din	2
6	TBA	Lock Washer	2
7	A381147-01	Filter, Spin On, Metric Threads	1
8	TBA	Vacuum Gauge	1

B3 & JV-PD EXHAUSTER DRIVE



ITEM	PART NO.	DESCRIPTION	REQ'D
1	A161735	Bushing, 1.5"ID, f/ Blower	1
2	A162931	Sheave, 3 Groove, f/ Blower	1
3	U3404-0005	Belt, 3 Banded, 100"	1
4	A163144	Idler Pulley	1
5	A163143	Idler Shaft	1
6	A163142	Bracket, Idler Mounting	1
7	A160900	Bushing, 2.25"ID, f/ PTO	1
8	A162926	Sheave, 3 Groove, f/ PTO	1



A163142
(Includes Hardware)



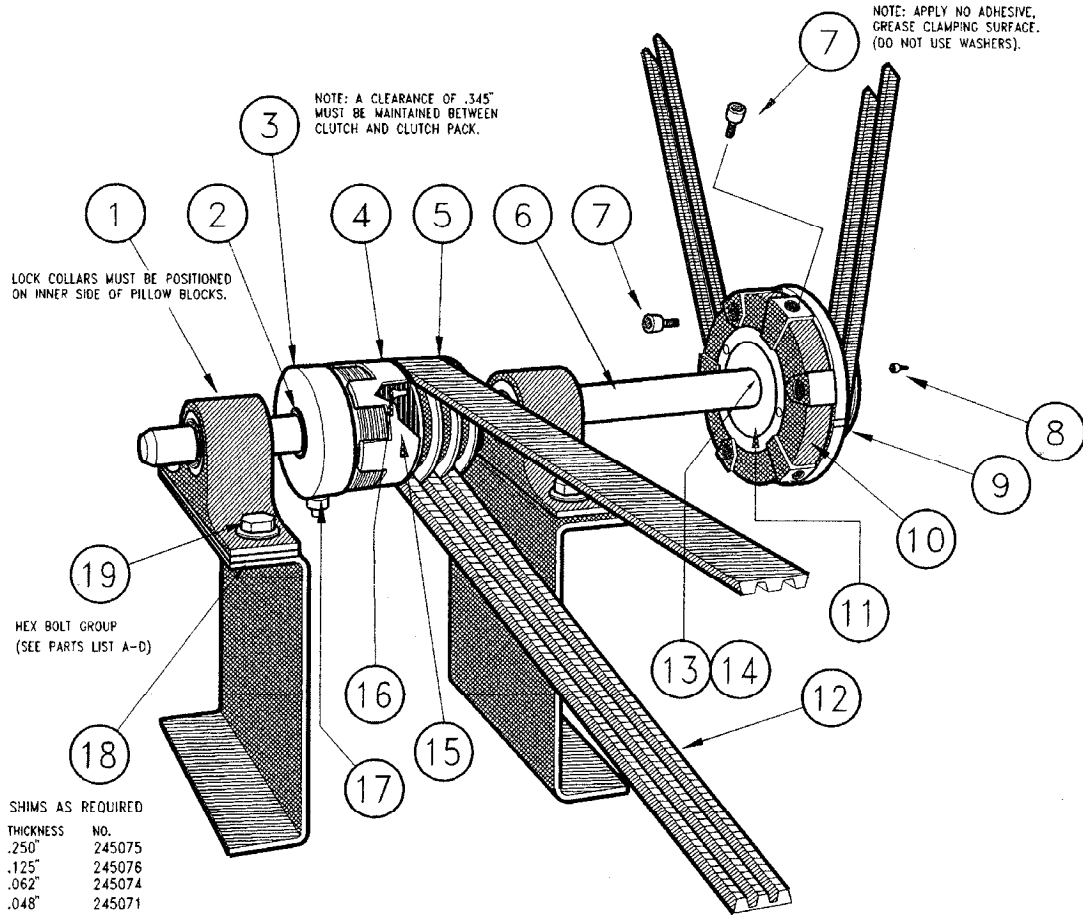
A163143



A163144
(Face: 4" Dia. X 3.44"W)

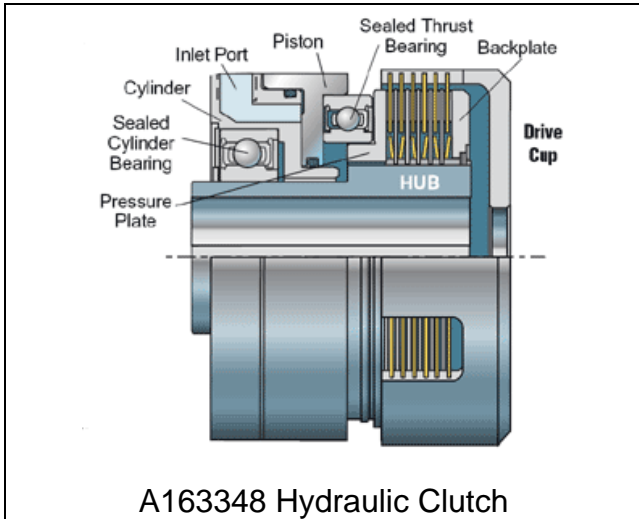


B3 Water Pump Drive Components



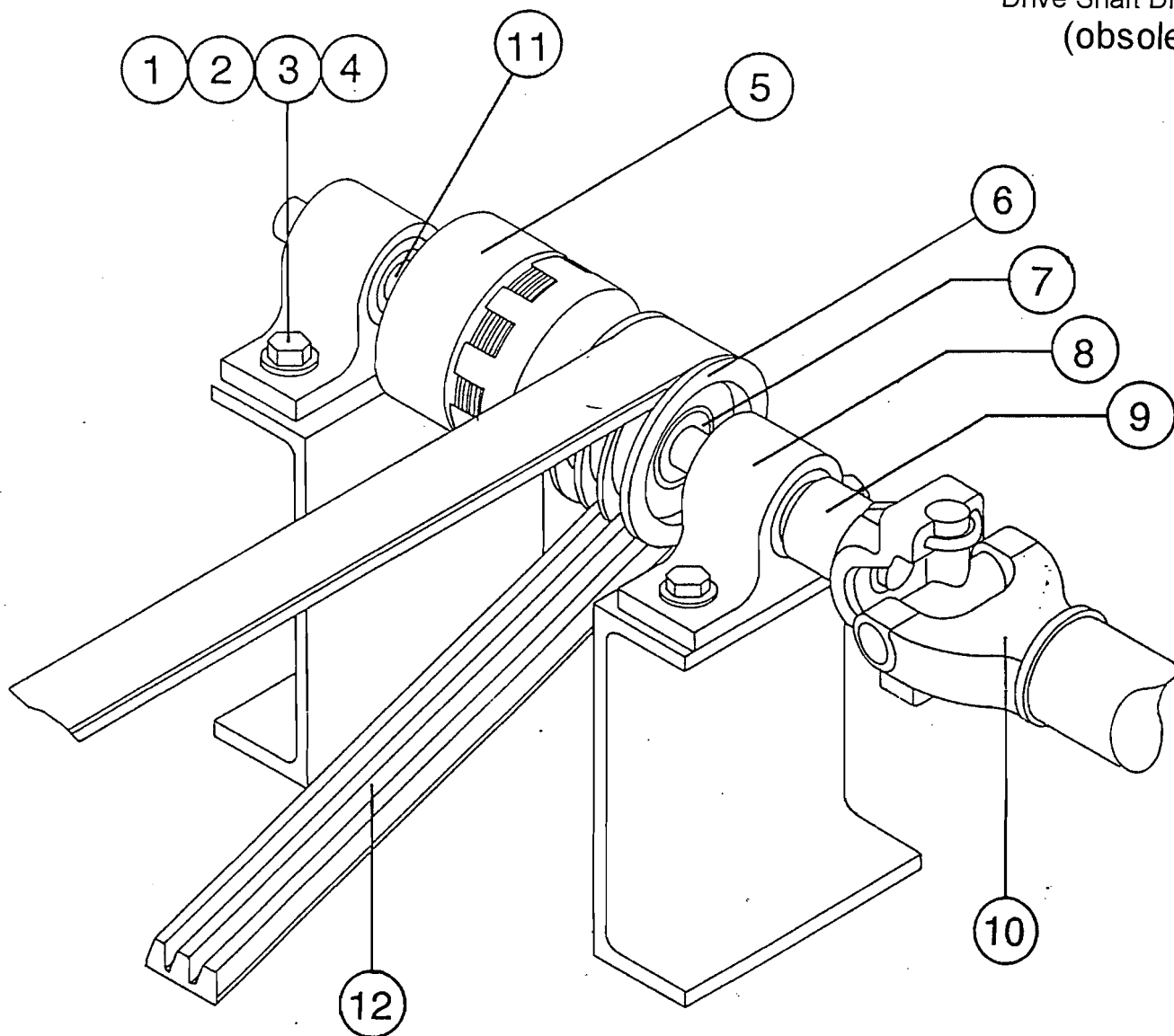
ITEM	PART NO.	DESCRIPTION	QTY
1	A162994	Bearing, Pillow Block	2
2	A103531	Snap Ring, 1-3/8"	2
3	A163348	Hydraulic Clutch	1
4	A163346	Drive Cup	1
5	A160333 / A162995	Idler Pulley / Pulley Bushing	1 & 1
6	A245094	Jack Shaft	1
7	NSS	Part of A160411	6
8	A104446	Socket Head Cap Screw	3
9	A245090	Adaptor Plate	1
10	A160411	Centraflex Coupling	1
11	NSS	Part of A160411	1
12	A163030	Belt, Water Pump Drive	1
13	A238066	Key, 5/16" x 5/16" x 2-1/2"L	1
14	A107350	Set Screw	1
15	A238065	Key, 3/8" x 3/8" x 3"L	1
16	A107439	Cap Screw, 3/8"-16 x 1-3/4"	3
17	A135318	Adapter Fitting	1
18	See Above	Shim	A.R.
19	Misc Hardware	1/2"-13 x 2" Bolts w/nuts, LW	4

B3 Water Pump Drive Components



WATER PUMP DRIVE SYSTEM

Drive Shaft Driven
(obsolete)



ITEM	PART NO.	DESCRIPTION	REQ'D
1	105192	1/2-13 x 2 HEX HEAD BOLT (GRADE 8)	4
2	107098	1/2-13 HEX NUT	4
3	107298	1/2 LOCKWASHER	4
4	107226	1/2 FLAT WASHER	8
5	163345	CLUTCH, HYDRAULIC	1
6	162965	PULLEY	1
7	160906	BUSHING, IDLER	1
8	162994	BEARING, PILLOW BLOCK	2
9	161632	YOKE	1
10	161631	DRIVE SHAFT	1
11	245224	JACKSHAFT	1
12	163026	BELT, WATER PUMP DRIVE	1