



TYPE 2 PNEUMATIC PTO

INSTALLATION AND MAINTENANCE MANUAL



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1.0 INTRODUCTION

- 1.1 The WPT Power Corporation PTO is the most rugged PTO available on the market today. Follow the procedures detailed in this Installation Maintenance Manual for years of service.
- 1.2 When ordering parts, use the part number from the Bill of Materials supplied with this unit. Also, please include the assembly number and the serial number from the unit itself. These will be found on a metal tag riveted to the bell housing. Your WPT Distributor can provide a copy of the Bill of Materials if the one provided should become lost.
- 1.3 When performing installation and maintenance functions, refer to the drawing at the back of this manual. The references on the drawing in this manual DO NOT correspond to the references on the assembly drawing and Bill of Materials. Do not use the item numbers from the drawing in this manual for ordering parts.

2.0 SPECIFICATIONS

- 2.1 See Chart 3 for flywheel and flywheel housing dimensions.
- 2.2 The maximum RPM is listed in Chart 2 for your PTO size.
- 2.3 Flywheel and flywheel housing alignment tolerances, see 3.0 Installation

3.0 INSTALLATION

3.1. Flywheel and flywheel housing alignment inspection.

It is strongly recommended that these dial indicator checks be made prior to installation of the PTO, especially on new engines or when a previous PTO failure might indicate an alignment problem.

3.1.1 Check flywheel to housing face runout. (See Figure 1)

Mount the indicator base on the face of the flywheel and position the dial indicator tip perpendicular to the flywheel housing mounting face. Rotate the flywheel 360 degrees while holding pressure against the crankshaft thrust bearing.

The total indicator reading should not exceed:

SAE #1 Housing: 0.012 inches (0.305 mm)
SAE #1/2 Housing: 0.014 inches (0.356 mm)
SAE #0 Housing: 0.016 inches (0.406 mm)
SAE #00 Housing: 0.019 inches (0.483 mm)

3.1.2 Check flywheel housing bore runout. (See Figure 2)

Mount the indicator base on the face of the flywheel and position the dial indicator tip so its movement is perpendicular to the pilot bore of the flywheel housing. Rotate the flywheel through 360 degrees.

The total indicator reading should not exceed:

SAE #1 Housing: 0.012 inches (0.305 mm)
SAE #1/2 Housing: 0.014 inches (0.356 mm)
SAE #0 Housing: 0.016 inches (0.406 mm)
SAE #00 Housing: 0.019 inches (0.438 mm)

3.1.3 Check flywheel face runout. (See Figure 3)

Mount the indicator base on the flywheel housing and position the dial indicator tip so that its movement is perpendicular to the face of the flywheel. Position the indicator tip near the drive ring mounting bolt circle diameter. Rotate the flywheel 360 degrees while holding pressure against the crankshaft thrust bearing.

The total indicator reading should not exceed:

14" Clutch 0.009 inches (0.23 mm)
18" Clutch 0.011 inches (0.28 mm)
21" Clutch 0.013 inches (0.37mm)

3.1.4 Check flywheel pilot bore runout. (See Figure 4)

Mount the indicator base on the flywheel housing and position the dial indicator tip so its movement is perpendicular to the pilot bore of the flywheel. Rotate the flywheel through 360 degrees.

The total indicator reading should not exceed:

For all flywheels 0.005 inches (0.13 mm)

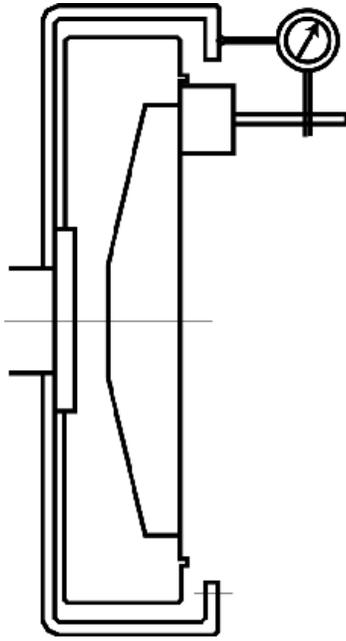


FIGURE 1

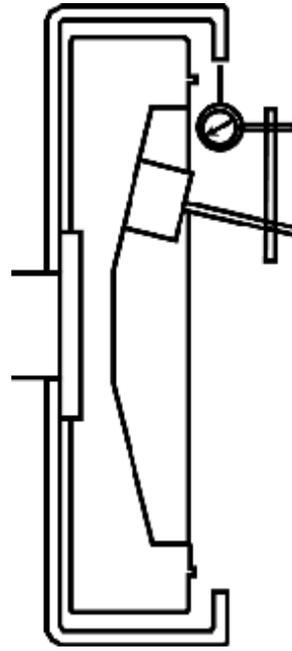


FIGURE 2

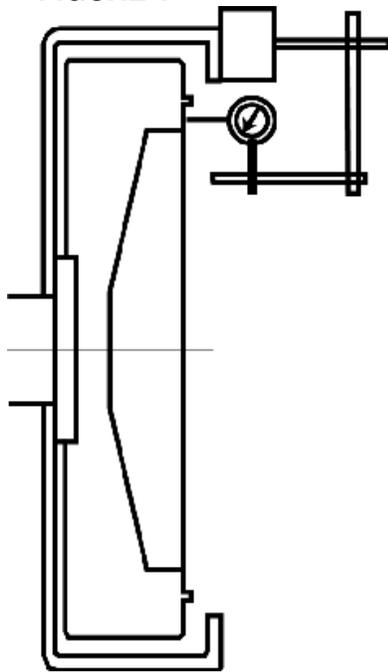


FIGURE 3

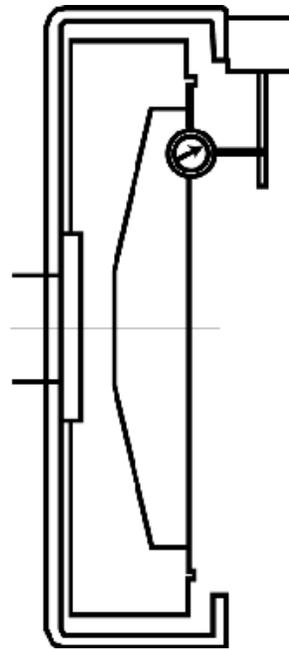


FIGURE 4

3.2 Lubrication prior to installation

3.2.1 PTO's with Grease Lubrication: The WPT PTO is lubricated at the factory with Lubriplate® 1200-2 lithium based grease and should require no further lubrication prior to being placed in service.

3.2.2 PTO's with Oil Lubrication: Use only Mobil – Exxon SHC 85w-140 synthetic oil.



WARNING:

PTO is shipped without oil and must be filled with oil prior to being placed in service.

3.2.3 See **Section 5** for specific lubricating instructions.

3.3 Mounting the PTO on the engine

Alternate methods are described to align the friction discs.

3.3.1 (Requires air supply) Use the **drive ring (1)** provided with the PTO or remove the drive ring from the engine flywheel to use as an alignment gauge. Place the drive ring over the friction discs. Center the drive ring relative to the outside diameter of the clutch body. Engage the clutch with 100 psi compressed air. Be sure there is adequate hose length to reach the back of the engine.

3.3.2 Remove the drive ring.

3.3.3 (No Air Required) Use a long handled screwdriver or other tool to align the friction disc teeth with the teeth of the drive ring.



WARNING:

Use caution when installing the PTO to avoid damaging the teeth of the friction discs

3.3.4 Install the drive ring on the engine flywheel making sure that the ring is seated in the locating bore. Use SAE Grade 5 bolts (or equivalent) with lockwashers and torque to the specifications in Chart 1 or to the engine manufacturers torque recommendation. Use the engine manufacturer's torque recommendation if different from that in Chart 1.

3.3.5 Slowly draw the PTO toward the engine. This can be done by installing 3 or 4 equally spaced lengths of all-thread with nuts into the flywheel housing and tightening these while supporting the weight of the PTO with a hoist or cribbing.

3.3.6 When the PTO is fully in place, remove the studs if used and replace with SAE Grade 5 bolts (or equivalent) with lockwashers and torque to the value in Chart 1. Use the engine manufacturer's torque recommendation if different from that in Chart 1.

3.3.7 Install belts and adjust belt tension.



WARNING:

Do not exceed belt tension shown on WPT assembly drawing. Re-check and adjust belt tension after the first several hours of operation.

3.4 Air Connection

- 3.4.1 Mount **rotary coupling (40)** to shaft only after the PTO is mounted to the engine and sheave and belts have been installed.
- 3.4.2 A flexible hose must be used to connect air to the rotary coupling. Assemble rotary coupling to fittings and hose, before mounting to the shaft.
See Figure 6



WARNING:

Insure that there is no side load placed on the rotary coupling. The rotary coupling is delicate and extremely sensitive to damage by side load.

4.0 OPERATION

4.1 Clutch engagement procedure

- 4.1.1 Insure that hose or pipe sizes are adequate to supply the air to the clutch. Hoses or pipe size of 1/2 inch should be a minimum for short runs. Use 3/4 inch size if runs are longer than 15 feet.
- 4.1.2 Where high inertia loads must be started, engaging the clutch at idle speed may stall the engine. High inertia loads may be brought up to speed by engaging the clutch for short periods (1 second) at intervals long enough to prevent excessive heat buildup in the friction discs. With extremely high loads, the engine may have to be operated at higher speeds while engaging the clutch. See Figure 6 for a suggested valve arrangement to engage the clutch gradually.
- 4.1.3 Once the load is turning with the clutch fully engaged, the engine RPM may be increased.



WARNING:

UNDER NO CIRCUMSTANCES should the clutch be slipped for more than several seconds without either fully engaging the clutch or completely disengaging the clutch to allow it to cool.



WARNING:

Any excessive vibration in the PTO should be cause for investigation. All rotating parts of the WPT PTO are balanced at the factory.

5.0 LUBRICATION

5.1 Grease specification

The WPT PTO is lubricated at the factory. The lubricant type is specified on a tag affixed to the PTO. Grease specified on tag will serve under normal ambient conditions up to 2300 RPM at a maximum bearing temperature of 225° F (93.3° C).

5.2 Grease specification for cold conditions

For any PTO with a lube label naming 1200-2, use Lubriplate® MAG-1 below -25° F (-32° C). If 1200-2 Lubriplate® is not called out on label contact WPT for substitute.



WARNING:

Do not mix sodium or calcium based greases with lithium based grease.

5.3 Grease lubrication intervals.

There are only two places on the WPT PTO that require lubrication. Each is connected to the bearing cavity with the excess grease being forced out of a relief valve on the bottom of the unit. The small amount of grease expelled is an indication that enough grease is being provided.

These lubrication intervals are suggested. The operator is responsible for establishing lubrication intervals according to the duty cycle and operating conditions in which the equipment is used.

5.3.1 Every 75 hours of operation, add enough grease to expel a small amount from the relief valves.

5.3.2 Every 300 hours of operation, flush the bearing with approximately 7.5 oz. (1/2 tube) of grease.

5.4 Oil specification

Use only Mobil – Exxon SHC 85w-140 synthetic oil.



WARNING:

WPT PTO is shipped without oil and must be filled with oil prior to being placed in service.

5.5 Oil lubrication intervals

These lubrication intervals are suggested. The operator is responsible for establishing lubrication intervals according to the duty cycle and operating conditions in which the equipment is used.

5.5.1 Check oil levels periodically. Add oil to bottom edge of sight plug, Do Not overfill.

5.5.2 Drain and refill every 1,000 hours of operation.

5.5.3 **CLUTCH:** No lubrication is required.

5.5.4 **ROTO-COUPLING (50):** Normally no lubrication is required. If equipped with grease fittings or oil cups, any good bearing oil or grease can be used, but care should be taken not to over lubricate.

5.6 Bearing operating temperature.

Operating temperature range is normally between 170 deg. F. and 200 deg. F. (76.7 to 93.3deg. C.). Higher ambient temperatures will cause the bearings to run hotter. More frequent lubrication intervals and/or lubricant designed for higher operating temperatures will be required if the unit is to be used in this environment. Consult the factory for lubricant recommendations where ambient temperatures are consistently above 100 deg. F.(38 deg. C.)



CAUTION:

Do not rely on checking bearing temperature with the hand. Acceptable bearing temperatures are normally hotter than the hand can stand for more than a second. A contact type thermometer should be used to take accurate temperature measurements.

6.0 MAINTENANCE

The WPT PTO uses an air operated clutch which does not need frequent adjustment. It does however, require periodic inspection to determine if friction discs and/or drive plates have worn, increasing clutch clearance. The clutch should be adjusted if the movement of the pressure plate is more than the value for that clutch found in Chart 2.

6.1 Clutch Inspection Procedure

- 6.1.1 Remove power (stop the engine) and tag any remote start devices.
- 6.1.2 Remove hand hole covers.
- 6.1.3 With a flashlight and short scale, measure the movement of the pressure plate as the clutch is engaged and disengaged. Compare this measurement to that shown in Chart 2.
- 6.1.4 To adjust the clutch without removing the PTO from the engine, proceed to step 6.2. To remove the PTO and rebuild the clutch, proceed to step 7.1

It is good to periodically remove dirt and accumulated dust from the clutch. Wear a mask and eye protection while doing this. WPT friction material is asbestos free.

6.2 Clutch Adjustment on the Engine

- 6.2.1 Remove the **air hoses (23)** connecting the shaft to the airtube.
- 6.2.2 Remove the **hose adapters (22)**
- 6.2.3 Remove the 4 **socket head cap screws (17)** in the **airtube holding plate (25)**.
- 6.2.4 Slide the **airtube holding plate (25)** and **airtube (26)** back to expose the **shims (15)**.
- 6.2.5 With snips or saw, cut the necessary number of shims and remove them.
- 6.2.6 Replace the airtube and airtube holding plate. Torque the four socket head cap screws to the value from Chart 1.
- 6.2.7 Replace fittings and hoses.
- 6.2.8 Check clutch clearance per 6.1.3 above.
- 6.2.9 Replace hand hole covers and remove tags from remote starting devices.

6.3 Clutch Adjustment with PTO Removed from the Engine

- 6.3.1 Using compressed air, engage and disengage the clutch while measuring movement of the **pressure plate (27)**. Compare this value with that in Chart 2 and adjust the number of **shims (15)** accordingly.

NOTE:

Whenever the PTO is removed from the engine, it is recommended that the hub and drive ring teeth be checked for wear. To do this, lay a straight edge along the side of the teeth. Any groove worn .015" (.38mm) should indicate replacement of that part.

Examine the friction surfaces of the center plates(10) and floating plate(11) for heat checking and surface flatness. Flatness should be within .005" (.13mm) and the two sides of the centerplates should be parallel within the same amount.



WARNING:

Most damage to WPT clutches is a result of misalignment or low operating pressure. Misalignment will cause premature wear of teeth (friction disc, center plates, hub and drive ring), and if extreme, may cause breakage of these parts. Low air pressure may cause the clutch to slip. Low air pressure or low air volume may cause the clutch to engage slowly. Slippage generates heat, which if excessive, will shorten the life of friction discs, pressure plate and airtube. A clutch that is suspected of slipping should be removed from service for examination or repair.

7.0 DISASSEMBLY

Refer to PTO Illustration at the back of this manual

7.1 Removing the PTO from the engine.

- 7.1.1 Use a hoist or other suitable lifting equipment to support the weight of the power take-off. Attach lifting devices at several places or use cribbing to support the PTO in a horizontal position during removal.

CAUTION:

The PTO weighs in excess of 500 lbs. (227 Kg.) Use approved lifting eyes and procedures to prevent accident or injury.

- 7.1.2 Remove air hoses and other connections to the PTO
- 7.1.3 Remove **roto-coupling (40)** to prevent damaging it
- 7.1.4 Remove the mounting bolts between PTO and flywheel housing, removing those located near the top last. The PTO should separate from the flywheel housing. If the PTO doesn't separate, gently pry the flanges apart until the housing is removed from the engine flywheel housing pilot diameter.
- 7.1.5 Use care when removing the PTO from the engine to avoid damage to grease fittings, friction disc teeth, and other components.

7.2 Removing the Bell Housing

- 7.2.1 Place the PTO on the floor, clutch down, supported by wood blocks under the bell housing. Use adequate support to keep the PTO from tipping.
- 7.2.2 Remove **socket head cap screws** and remove any support bracket.
- 7.2.3 Remove 12 **socket head cap screws (44)** and lift the bell housing off the **bearing housing (34)**. If the bell housing does not lift off easily, insert jack bolts in the threaded holes provided and tighten these evenly to separate the two.

7.3 Remove the clutch from the PTO

- 7.3.1 Position the shaft with the clutch at the top and resting on the **bearing housing (34)**.
- 7.3.2 Bend the tab out of the slot on the **bearing lock nut (6)** and remove the nut and washer.
- 7.3.3 Remove the **hoses (23)** and **hose adapters (22)**.
- 7.3.4 Remove the **4 hex head cap screws (8)** holding the **backplate (3)** and remove the backplate.
- 7.3.5 Remove the **friction discs (2)**, **center plates (10 & 11)**, **springs (4)**, **pressure plate (27)**, and **airtube (26)**.
- 7.3.6 Use a puller in the threaded holes in the **hub (9)** to pull the hub. The shaft has a 1-14 UNS tapped hole in the end.
- 7.3.7 Remove the **set screw (19)** in the **clutch spacer (18)** if equipped.

7.3.8 Remove the **clutch spacer (18)**.

7.4 Remove the Shaft from the Bearing Housing

7.4.1 Remove the sheave if still on the shaft.

7.4.2 Remove 6 **bolts (45)** from the **outboard seal housing (35)**.

7.4.3 The **shaft (37)** may now be drawn out of the **housing (34)**.

7.4.4 Remove 6 **bolts (41)** from the **inboard seal housing (16)** and remove it.

7.4.5 Remove the **seal spacers (20)**, **bearings (30 & 33)** and **bearing spacer (32)** from the shaft.

8.0 ASSEMBLY

8.1 Preparing the shaft

8.1.1 Clean the shaft. Remove all dirt or corrosion.

8.1.2 Check the shaft to see that it is free of burrs.

8.1.3 Inspect threads to see that there is no damage.

8.1.4 Keyways should not be worn. Keys should be a snug fit in the keyway.

8.2 Assemble the clutch

It is easier to assemble and test the clutch outside the PTO. These instructions detail assembly in that manner.

8.2.1 Place the **hub (9)** on a workbench with the back plate end up. Attach the **backplate (3)** with **hex head cap screws (8)**.

8.2.2 Invert the hub and backplate so the backplate is on the workbench.

8.2.3 Attach the **pressure plate (27)** to the **floating plate (11)** with **roll pins (28)** if it is not already done.

8.2.4 Place the centerplates, friction discs and floating plate with pressure plate attached on the hub as shown in the diagram. Be sure the release **springs (4)** are properly seated in their counterbores.

8.2.5 Place the **shims (15)** on the hub.

8.2.6 Insert the **airtube (26)** in the **airtube holding plate (25)** and set this assembly on the hub. Be careful not to damage the airtube or brass spuds.

8.2.7 Attach the airtube holding plate using **4 socket head cap screws (17)** and torque to values from chart 1.

8.2.8 Plug all but 1 spud and install fittings to connect this spud to a supply of compressed air (60 PSI minimum).

- 8.2.9 Using compressed air, engage and disengage the clutch while measuring movement of the **pressure plate (27)**. Compare this value with that in Chart 2 and adjust the number of **shims (15)** accordingly.
 - 8.2.10 Invert the clutch so the airtube holding plate is on the workbench.
 - 8.2.11 Remove the backplate, friction discs, center and floating plates, pressure plate and airtube.
 - 8.2.12 The hub with attached shims and airtube holding plate will be installed on the shaft as an assembly.
- 8.3 Assemble the PTO
- 8.3.1 Install the **seals (36)** in the **bearing end caps (16 & 35)** using a sealant and set these aside.
 - 8.3.2 Support the shaft vertically with the clutch end up.
 - 8.3.3 Slide an **end cap (35)** with seal over the shaft with the seal facing up.
 - 8.3.4 Slide a **oil seal spacer (20)** on the shaft until it stops against the raised diameter.
 - 8.3.5 Heat the **outboard bearing (33)** using an appropriate heat source and slide it on the shaft until it seats against the seal spacer.
 - 8.3.6 Slide the **bearing spacer (32)** over the shaft and install the second **bearing (30)** as done in 8.3.5. Install remaining **oil seal spacer (20)**.
 - 8.3.7 Apply axial force to secure location of bearings and spacers while assembly cools to room temperature.
 - 8.3.8 Coat the **oil seal spacers (20)** with a light film of grease.
 - 8.3.9 Support the **bearing housing (34)** with the clutch end down.
 - 8.3.10 Invert the shaft and slide this assembly into the bearing housing being careful to avoid damaging the **seals (36)**.
 - 8.3.11 Install **6 bolts (45)** in the **outboard bearing end cap (35)** using thread locking compound. Torque to the value from Chart 1.
 - 8.3.12 Invert the shaft/bearing housing assembly so the clutch end is once more at the top.
 - 8.3.13 Install the **inboard bearing end cap (16)** with **seal (36)** using **bolts (41)** and thread locking compound. Torque to the value from Chart 1.
 - 8.3.14 Slide the **clutch spacers (18)** over the shaft until it seats against the seal spacer. Rotate this to expose the ports in the shaft and install the **hose adapters (22)** and **set screw (19)** if equipped.
 - 8.3.15 Install the **hub key (7)** in its slot and measure the distance from the top of the key to the opposite side of the shaft. Compare this measurement to the corresponding measurement in the hub and adjust the key height if necessary.
 - 8.3.16 Heat the hub with the airtube holding plate attached using an appropriate heat source and install on the shaft with airtube holding plate end first. Use an anti-sieze compound and have equipment available to push the hub on the shaft if necessary.

- 8.3.17 After installing the hub, the hub should be pressed onto the shaft using 25-35 tons of force to verify all components are seated firmly.
- 8.3.18 Allow the hub to cool and install the clutch components as shown in the diagram being sure the **release springs (4)** are properly seated in their counterbores.
- 8.3.19 Use thread locking compound on the 4 **hex head cap screws (8)** holding the **backplate (3)** and torque to values from Chart 1.
- 8.3.20 Install **air hoses (23)** between shaft and airtube. Airtest these connections before continuing.
- 8.3.21 Install the **bearing lockwasher (5)** and **bearing nut (6)**.
- 8.3.22 Install the nut until tight, then advance $\frac{1}{4}$ - $\frac{1}{2}$ turn after that.
- 8.3.23 Lock the bearing nut with one of the tabs of the lockwasher.
- 8.3.24 Invert the PTO so the sheave end is up. Be sure the shaft and clutch are adequately supported.
- 8.3.25 Slide the bell housing over the bearing housing and install 12 **socket head cap screws (44)**. Use thread locking compound and torque to values from Chart 1.
- 8.3.26 Fit sheave key into keyway and mount sheave if necessary.
- 8.3.27 Install **hand hole covers (12)**.
- 8.3.28 Install **rotary coupling adapter (39)** and **adapter gasket (38)** to end to end of shaft.
- 8.3.29 Install **rotary coupling (40)** to shaft only after the PTO is mounted to the engine and sheave and belts have been installed.

A flexible hose must be used to connect air to the rotary coupling. Assemble rotary coupling to fittings and hose, before mounting to the shaft.

See Figure 6



WARNING:

Insure that there is no side load placed on the rotary coupling. The rotary coupling is delicate and extremely sensitive to damage by side load.

BOLT SIZE IN INCHES	TORQUE VALUES FOR SOCKET HEAD AND HEX HEAD CAPSCREWS								
	SOCKET HEAD CAP SCREWS			HEX HEAD CAP SCREWS - GR 8			HEX HEAD CAP SCREWS - GR 5		
	lb.ft.	lb.in.	Nm	lb.ft.	lb.in.	Nm	lb.ft.	lb.in.	Nm
	1/4	13	150	17	8	100	11	6	71
5/16	23	305	34	17	200	23	12	142	16
3/8	45	545	62	30	360	41	22	260	29
7/16	70	840	95	48	570	64	34	410	46
1/2	108	1300	147	83	990	112	53	636	72
9/16	155	1860	210	107	1285	145	74	890	101
5/8	211	2530	286	143	1714	194	104	1250	141
3/4	367	4400	497	256	3070	347	183	2200	249
7/8	583	7000	791	417	5000	565	298	3570	403
1	867	10400	1175	625	7500	848	440	5280	597
1 - 1/8	1242	14900	1684				553	6640	750
1-1/4	1750	21000	2374				775	9300	1051
1-3/8	2317	27800	3142				1012	12140	1372
1 - 1/2	3042	36500	4125				1350	16200	1831
1-3/4	4950	59400	6714						
2	7492	89900	10161						

CHART 1

Clutch Size (inches)	MAX. RPM	Minimum Clearances		Minimum Clearances		Total Maximum Clearance Allowed (w/o shims)	
		2 DISC UNITS		3 DISC UNITS			
		inches	mm	inches	mm	inches	mm
14 & 14H	2300	3/32 - 5/32	2.38 - 3.97	1/8 - 5/32	3.18 - 3.97	7/16	11.11
18	2100	1/8 - 5/32	3.18 - 3.97	5/32 - 3/16	3.97 - 4.76	7/16	11.11

CHART 2

**FLYWHEEL AND FLYWHEEL HOUSING DIMENSIONS
SEE FIGURE 5**

Clutch size						Housing size				
	"A"	"B"	"C"	N1	H1	"D"	"E"	N2	H2	
14"	16.12 (409.4)	17.250 (438.15)	18.375 (466.72)	8	1/2 - 13 NC	"1"	20.125 (511.17)	20.875 (530.22)	12	7/16 - 14 NC
18"	19.62 (498.3)	21.375 (542.92)	22.500 (571.50)	6	5/8 - 11 NC	"1/2"	23.000 (584.20)	24.375 (619.12)	12	1/2 - 13 NC
21"	23.00 (584.2)	25.250 (641.35)	26.500 (673.10)	12	5/8 - 11 NC	"0"	25.500 (647.70)	26.750 (679.45)	16	1/2 - 13 NC
						"00"	31.000 (787.40)	33.500 (850.90)	16	1/2 - 13 NC

CHART 3

FLYWHEEL AND FLYWHEEL HOUSING

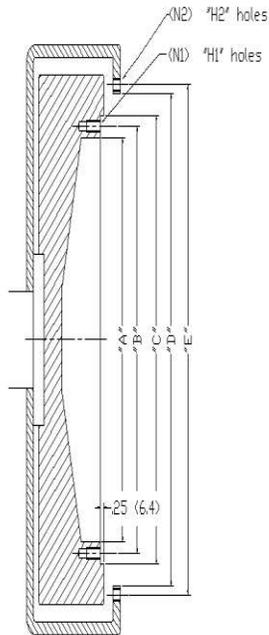


FIGURE 5

AIR CONNECTIONS

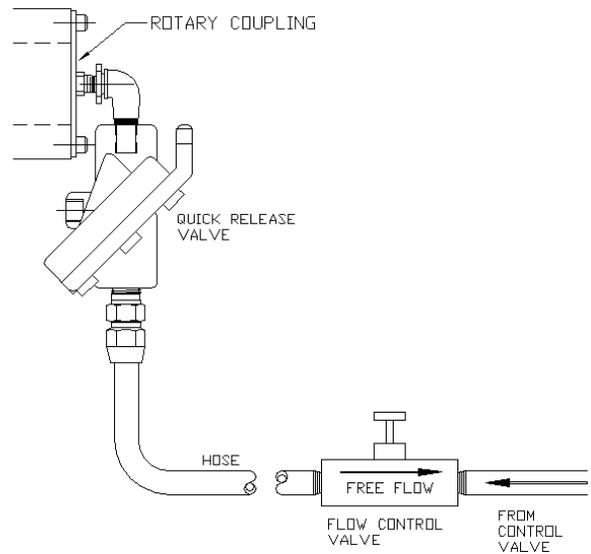
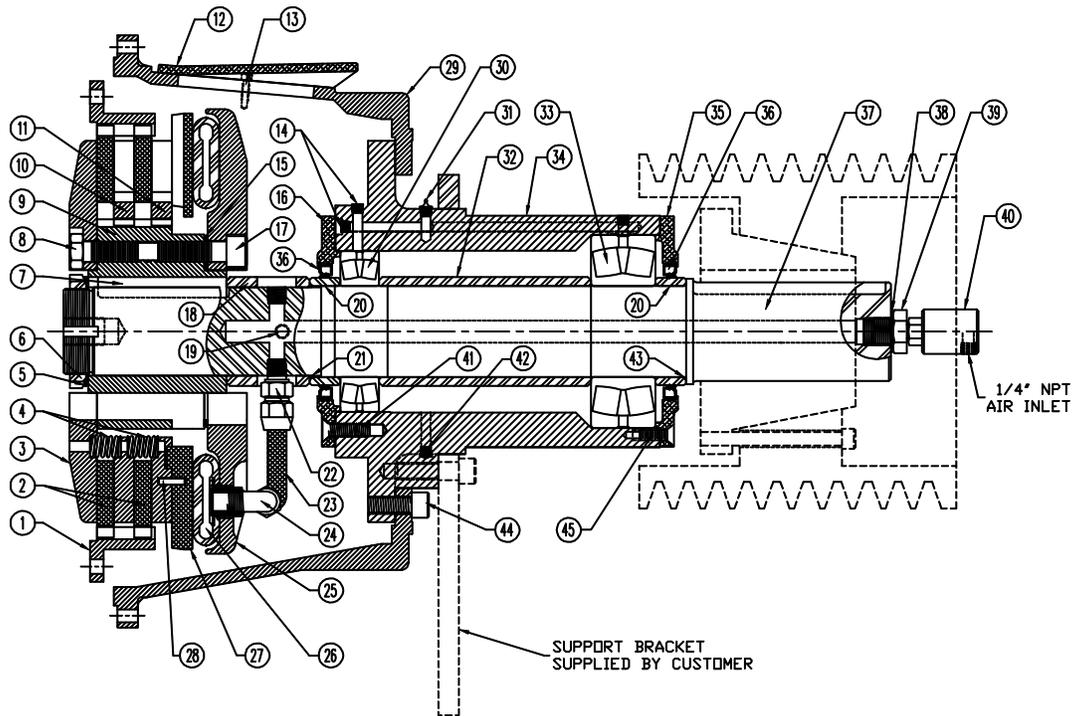


FIGURE 6

Typical Drawing and Parts List



Item	Description	Qty	Item	Description	Qty
1.	Driving Ring	1	24.	Elbow, Hose	2
2.	Friction Disc	2	25.	Plate, Airtube Holding	1
3.	Backplate	1	26.	Airtube	1
4.	Spring, Coil	16	27.	Pressure Plate	1
5.	Washer, Lock, Bearing Nut	1	28.	Pin, Slotted Spring	4
6.	Lock Nut, Bearing	1	29.	Bellhousing	1
7.	Key, Clutch	1	30.	Bearing	1
8.	HHCS	4	31.	Grease Zerk	2
9.	Hub, Demountable	1	32.	Spacer, Bearing	1
10.	Center Plate	1	33.	Bearing	1
11.	Floating Plate	1	34.	Bearing Carrier	1
12.	Cover, Hand Hole	2	35.	End Cap, Oil Seal	1
13.	SHCS	4	36.	Oil Seal	2
14.	Pipe Plug	4	37.	Shaft	1
15.	Shims	3	38.	Gasket, Adapter	1
16.	End Cap, Oil Seal	1	39.	Adapter, Roto-Coupling	1
17.	SHCS	4	40.	Roto-Coupling	8
18.	Spacer, Clutch	1	41.	FHSCS	6
19.	Set Screw	1	42.	Relief Valve	8
20.	Spacer, Oil Seal	2	43.	O-Ring	1
21.	O-Ring	1	44.	SHCS	12
22.	Adapter, Hose	2	45.	FHSCS	8
23.	Hose Assembly	2			
NOTE: For actual drawing and parts list, contact WPT. Use assembly no./serial no. to identify your unit.					