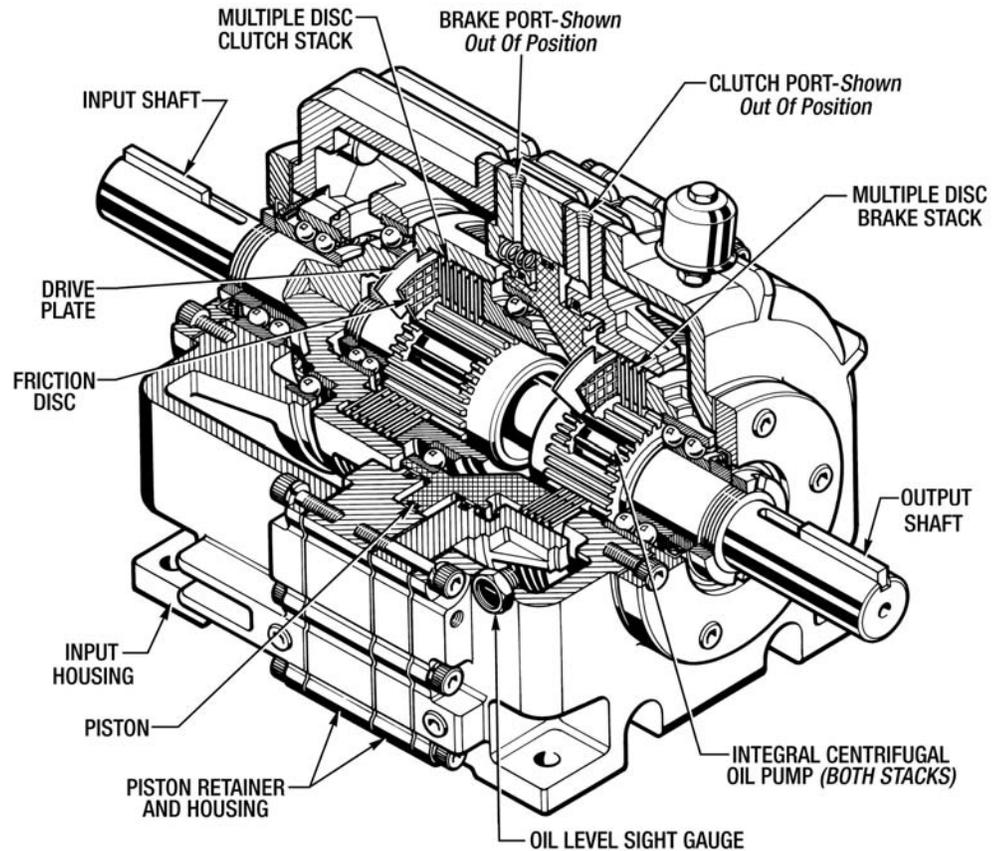




Sizes 02-30 Posidyne Clutch/Brake INSTALLATION MANUAL



The *Posidyne* Clutch/Brake comes in 9 sizes ranging from Size 02 up to Size 30. The *Posidyne* is the backbone of the Force Control line of Clutch/Brake products. The basic *Posidyne* is a combination of a clutch and a brake in a single totally enclosed unit that is unaffected by outside contaminants and temperatures. An ideal workhorse for the industrial world with a long service life and low maintenance.



DESCRIPTION

In the *Posidyne* Clutch/Brake, the friction surfaces consist of alternate carbon steel plates and advanced friction material on steel discs. The oil control grooves are molded into the friction material disc surfaces. The discs have internal teeth which mate with a spline on the output shaft for both clutch and brake applications. The steel plates are keyed to the input shaft in the clutch and to the housing for the brake when used. The splined sections of the *Posidyne* output shaft contain centrifugal impellers to maintain a positive flow of oil between the discs and plates.

As noted in Specifications, standard *Posidyne* units may be equipped with a clutch and a brake, or a clutch only. The Clutch is normally operated by compressed air, although hydraulic pressure can be used. The *Posidyne* brake may be pressure operated, or it may be spring loaded to operate automatically when the clutch is released, or a combination of both springs and pressure.

OPERATION

The *Posidyne* cross-section above shows the drive with the Brake engaged. A nominal braking force is provided by springs located in the Piston Retainer. Heavier springs are used to provide a greater braking force, when needed. Air Assist (as shown), controlled by external valves, also provides a greater braking force. The drive is normally in the Brake Position. The Drive Plates are keyed to the Output Housing and the Friction Discs are splined to the Output Shaft. The Output Shaft is not able to rotate in this Brake Position.

The Clutch is engaged when the air pressure is exhausted from the Brake Port and applied to the Clutch Port. The Piston moves to compress the Clutch Stack on the Input Shaft. The Drive Plates are keyed to the Input Shaft and the Friction Discs are splined to the Output Shaft. This allows both shafts to rotate at the same speed.

INSTALLATION

A. RECEIVING THE DRIVE

Check the drive for shortage or damage immediately after arrival. Prompt reporting to the carrier's agent, with notations made on the freight bill, will expedite satisfactory adjustment by the carrier. When unloading or handling the drive, keep it upright. All Drives are filled with oil, ready to run, when shipped. However, before placing the unit in service or storage, check the oil level to make sure none has spilled out in transit. Add oil if necessary (Refer to Lubrication Section). Remove the red plastic plug and install the Air Breather (#45).

WARNING - Failure to install the Air Breather (#45) as directed may cause serious damage to the Drive Unit and void the warranty.

If the drive is not to be installed and operated soon after arrival, store it in a clean, dry place having slow, moderate change in ambient temperature.

B. MOUNTING THE DRIVE

Installation of the Drive should be made in much the same manner, and receive the same care for a precision gear reducer. Standard Drives are designed for horizontal operation only. (Vertical, ceiling and side wall installed units are available.) Note the following precautions when mounting the drive:

1. The Drive should be mounted on a firm, level base or foundation, common with both the driving and driven components.
2. Use SAE Grade 5 Hex Hd. Cap Screws to bolt the drive securely into place. Before tightening down the bolts, check alignment with both the driving and driven machinery, then recheck after tightening.
3. If the input or output shaft is to be directly coupled, use only a flexible coupling (with horsepower service factor 3 to 1) to take care of maximum torque requirements. Make sure that the shafts to be coupled are concentric within 0.005 in. TIR. Check for horizontal, vertical and angular misalignment. Use shims as necessary to correct.

CAUTION:

Do not drive couplings or bushings on shaft.

4. If the Drive is to be connected through a belt, chain or gear drive, locate as close as possible to the housing to minimize overhung loads. Make sure that the sheaves, sprockets or gears are in line and that the shafts are parallel.
5. After the machinery has been in operation for a few hours, make sure that all mounting bolts are tight and recheck the alignment of all components.
6. After machinery has been in operation for 40 hours check the mounting bolts and tighten if necessary.

C. COMPRESSED AIR CONNECTIONS

Figures 1, 2, 3 and 4 illustrate typical compressed air systems for the Posidyne drives:

See Pneumatic Control Valves Service Manual for more information on pneumatic control valves.

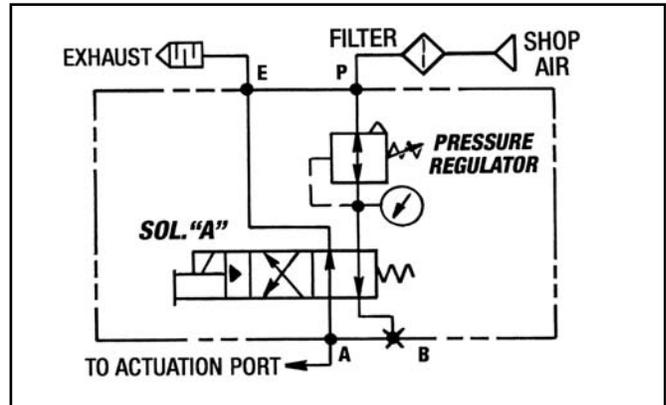


Figure 1 - 1PC Control Valve with Sandwiched Regulator - Air operated clutch, Spring-set Brake. (A, B and C Logics)

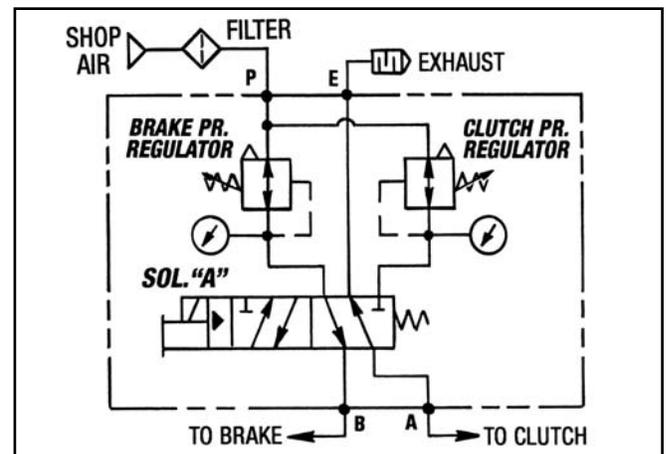


Figure 2 - 2PC-3/8 Control Valve with Sandwiched Regulators - Air operated clutch, Spring-set Brake with air assist. (S and SA Logics)

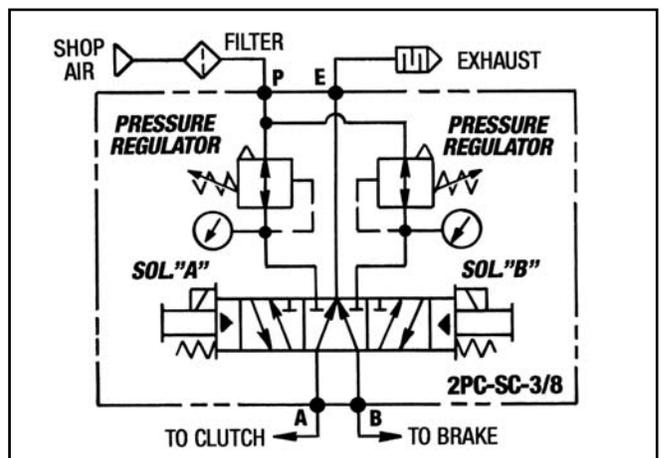


Figure 3 - 2PC-SC-3/8 Control Valve with Sandwiched Regulators - Spring Centered Piston, Air operated clutch and brake. (SCP Logic)

Note the following when planning and installing the air system:

1. Use direct acting solenoid air valves or pilot operated valves to give the response speed required. Locate the valves as close as possible to the air inlets on the drive. The valves may be installed directly on the drive if they are supported.
2. Be sure to use valves of at least 1.0 Min. Cv size for the 02 to 10 *Posidyne* and 2.0 Min Cv for 11, 20 & 30 *Posidyne*.
3. The optional accumulators should be used for quick response, particularly if the air line loss and the nature of the air supply is such that recovery is slow. Accumulators can only be used in pneumatic systems where the pressure regulators are installed before the accumulators as shown in *Figure 4* for the 2PI-3/8 Control Valve. Size the accumulator to be at least 10 times the air required per engagement. (See Specification Chart in the appropriate Service Manual.)
4. The air pressure regulator should be sized and set to provide the required torque. (See Specification Chart in the appropriate Service Manual.)
5. Pressure is directly proportional to torque. Use only the pressure necessary. (The clutch is not a variable speed drive. Do not let it slip for extended periods.) This will give additional life to the clutch-brake.
6. After using the drive for a few weeks the acceleration time may increase. Increasing the air pressure will restore the acceleration.

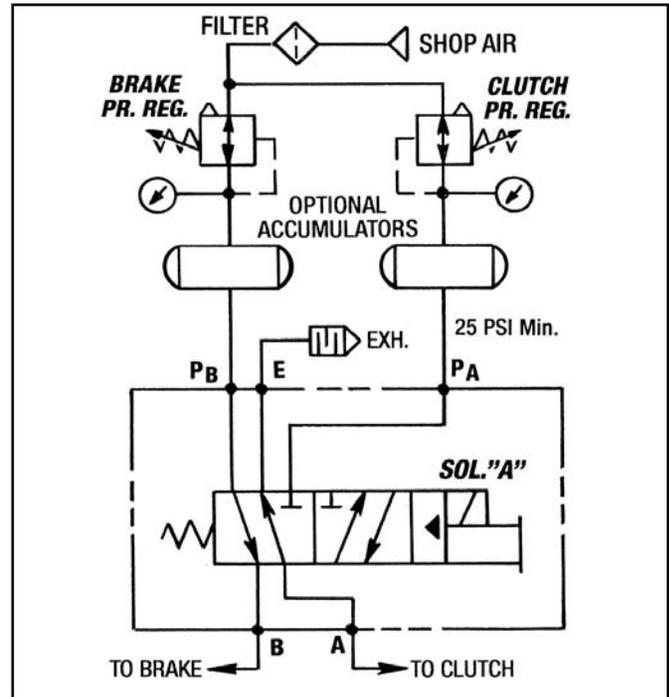


Figure 4 - 2PI-3/8 Control Valve with External Regulators
Air operated clutch, Spring-set Brake with air assist. (S, P and SA Logics)

7. The air supply should be dry and free of all contaminants. Lubricated air will make the valve last a little longer, but too much oil will fill the Posidyne piston chamber.

LUBRICATION

A. CHECKING THE OIL LEVEL

When the drive is installed and weekly thereafter, or until experience dictates otherwise, check the oil level. Always check the oil level with the drive at room temperature and while it is not running.

The drive has an oil sight gauge located at the output end of the drive. The oil level is to be at the center of the gauge.

B. OIL CAPACITY

Oil Capacity for the 02-30 *Posidyne* Units are as follows:

<i>Posidyne</i> Size	Horizontal Installation (Quarts)	Vertical Installation (Quarts)
02	2	3
2.5	2.5	4
03	3	4
05	8	10
10	10	13
11	10	13
14	10	13
20	25	30
30	15	CF

CF = Consult Factory

C. CHANGING THE OIL

IMPORTANT: Open the disconnects to the drive motors before attempting to change the oil.

After the first 30 days of operation completely drain the oil from the drive using the drain plugs provided. If the oil sight glass is dirty it should be removed and cleaned.

Reinstall the drain plugs and refill the drive to the center of the sight glass with fresh oil.

After the first oil change check the oil level and color of the oil at least once per month. Maintain the oil level to the center of the sight glass by adding oil as needed. The oil should be changed after every 12 months of operation or sooner if the oil color darkens. High energy applications will usually darken the oil sooner and require more frequent oil changes. Low energy applications will usually not darken the oil.

CAUTION: Do not overfill the Drive Unit. Excess oil will cause the unit to overheat.

D. TYPE OF OIL

Use only Mobil Automatic Transmission Fluid ATF Type F or Mobil Multi-purpose Automatic Transmission Fluid for most drives. Other fluids may be specified for special applications. **Always use the type of fluid specified on the Name Plate.**

AVAILABLE OPTIONS FOR THE *Posidyne* CLUTCH/BRAKE

Posidyne Clutch/Brakes with Optical Encoder and Manifold Mounted Valve

The *Posidyne* Clutch/Brake size 02 through 20 can be furnished with a Manifold Mounted Valve, which mounts directly on a machined surface on the unit. This feature eliminates hoses to the clutch and brake ports, reduces assembly time and improves response time.

An Encoder can also be furnished for improved positioning, when used with one of the CLPC Series Closed Loop Positioning Controls. The Encoder mounts on the output shaft, and includes a home position for single revolution applications.



Piggyback Posidyne

Posidyne sizes 02 thru 10 are available with a piggyback mounting frame that will accept NEMA motor sizes from 56 through 356U depending on the drive size.



Fan Cooled Units

Fan cooled *Posidyne* clutch/brake units may be required for those applications where thermal requirements are somewhat above average. The fan and shroud may be easily added in the field to any standard unit when required.



Posidyne C-Face Clutch/Brakes

Posidyne C-Face Clutches and Clutch / Brakes are available for up to 10 HP - 256UC Frame applications. Sizes 02, 2.5 and 03 can be equipped with provisions for NEMA C-Face input mounting, NEMA C-Face output mounting, or both. All units incorporate the Force Control Oil Shear Drive principle. Basic or Water Cooled Options are available with the C-Face input option. Fan Cooling is not available.



2.5 *Posidyne* with C-Face Input



2.5 *Posidyne* with C-Face Output

Water Cooled Units

For applications with extremely high inertia loads or cyclic requirements, the water cooled *Posidyne* clutch/brake unit may be required. The internal Heat Exchanger and necessary fittings may easily be installed in the field to most standard units when increased duty cycles are required.

View showing the coiled tube heat exchanger mounted in the input housing. The oil lubricating the clutch stack is cooled prior to returning to the sump. (Water Flow Requirements in GPM = 0.01 x calculated thermal HP)



Posidyne Clutch/Brake with C-Face Long Coupled Input

Sizes 02, 2.5 and 03 is available with a C-Face Long Coupled Input for NEMA motor frame sizes 143T to 256T and 182U to 256U. Fan cooling is not available with this option.



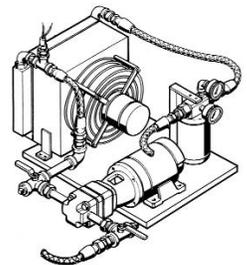
External Cooling System - "Oil to Air" Shown

This External Cooling System is available for all sizes of *Posidyne* Clutch/Brakes. The typical cooling configuration is "Oil to Air" as shown, but "Oil to Water" is also available.

The External Cooling System filters the oil so the life of the Clutch/Brake is in turn increased.

The Thermal Capacity is increased so in some applications the max. operating RPM can also be increased.

Consult the Force Control Factory for additional information.



FACTORY REBUILD SERVICE, MAINTENANCE & MANUALS

A Factory Rebuild Service is offered by Force Control Industries, Inc. Contact our service and sales department at Force Control for additional information.

A complete Service Manual can be downloaded and printed off of our web site or ordered directly from Force Control.

Go to: www.forcecontrol.com

All of our Catalogs and Service Manuals on the web site are in PDF format and will require Adobe Acrobat Reader 5.0 or later to open them. This Adobe Acrobat Reader can be downloaded from our web site if you do not have it installed on your computer.



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