



# 1.5 Posidyne "Quick Mount" Clutch/Brake INSTALLATION MANUAL



## SPLIT CLAMPED QUILL INPUT

Available for 1/2 HP to 3 HP drive units with easy access C-Face Mounting Spool Design. The new Split Clamped Quill Input eliminates key and keyway problems associated with competitive clutch/brakes. By splitting the quill shaft and using a locking collar the quill is clamped tightly 360° on the motor shaft.

### OIL SHEAR PRINCIPLE

Conventional clutches and brakes depend on the friction between solid surfaces operating in air to transmit torque. Friction does the job, but produces a great amount of heat and wear. The *Posidyne* Clutch/Brake units are oil shear drives, with the friction surfaces operating in a bath of oil, the oil molecules tend to cling to each other and to the friction surfaces. As moving and stationary elements are brought together, a thin, but positive film of oil is maintained between them, controlled by the clamping pressure and carefully designed grooves in the elements. Torque is transmitted from one element to the other through the viscous shear of the oil film. So long as there is relative motion between the elements, they are protected by the oil, thus greatly reducing wear. The oil bath also effectively transmits heat away from the friction elements.

### DESCRIPTION

(See Figure 1)

In the *Posidyne* Clutch/Brakes, 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 pinned to the input shaft in the clutch and 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.

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.

### OPERATION

The *Posidyne* cross-section (Figure 1) shows the drive with the Brake engaged. A nominal braking force is provided by springs located in the Piston Housing. 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 pinned to the Output Housing and the Friction Discs are splined to the Output Shaft. The Output Shaft is not able to rotate in the 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 pinned to the Input Shaft and the Friction Discs are splined to the Output Shaft. This allows both shafts to rotate at the same speed.

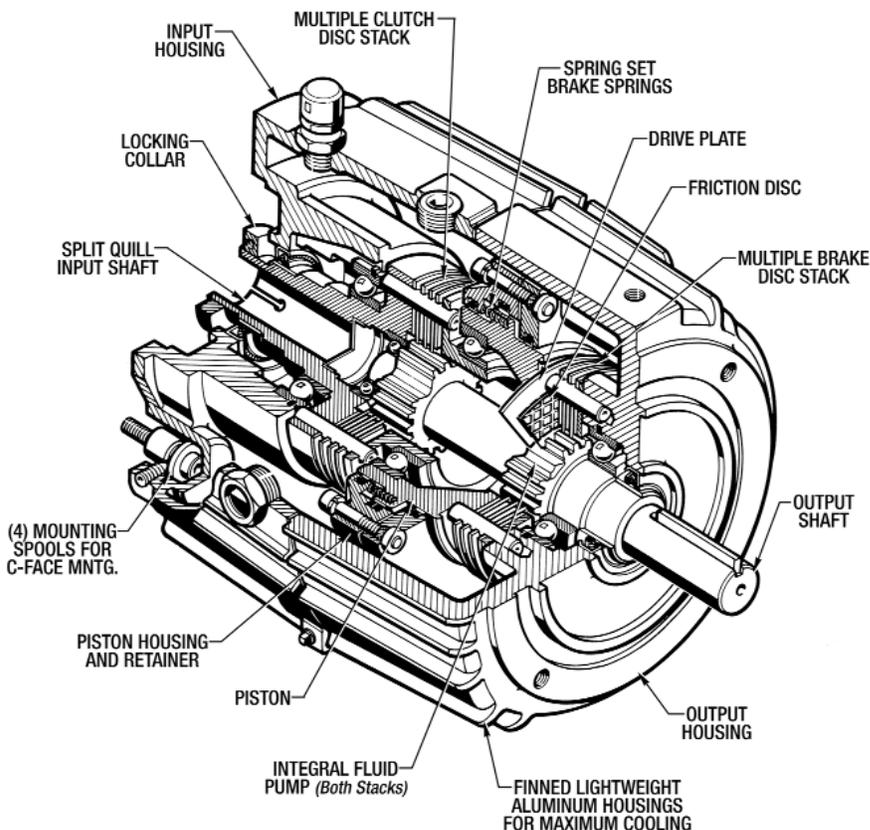


Figure 1 - 1.5 Posidyne "Quick Mount" Clutch/Brake Assembly

# Installation

## A. RECEIVING THE DRIVE UNIT

Check the Drive Unit for shortages or damages immediately after arrival. Prompt reporting to the Carrier's Agent, with notations made on the Freight Bill, will expedite any adjustment made by the Carrier.

When unloading or handling the Drive Unit, keep it upright. All Drive Units are filled with oil, ready to run, when shipped. However, before placing the Drive 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 pipe plug from the Reducer Bushing (#73) in the top of the Input Housing and install the Air Breather (#45). **Do not remove the Reducer Bushing** on units with Key Type Quill Input Shaft.

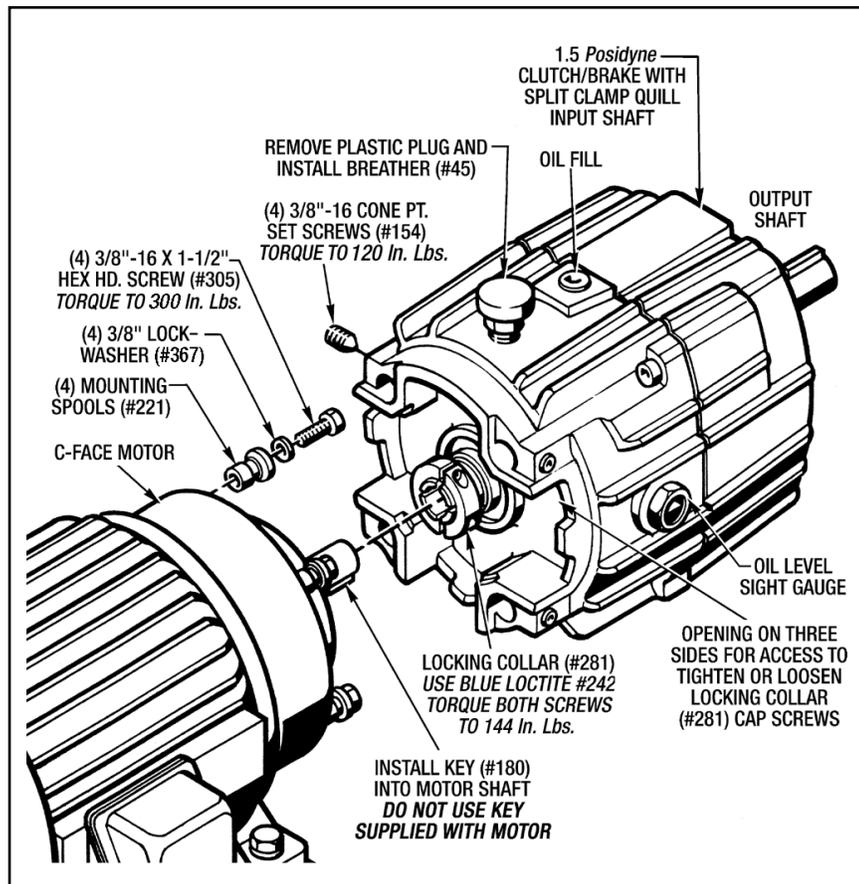
**WARNING - Failure to install the Air Breather (#45) as directed could cause serious damage to the Clutch/Brake and void the warranty.**

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

## B. MOUNTING THE DRIVE UNIT

(With Split Clamp Quill Input Shaft)

(See Figure 2)



1. First make sure that the pilot diameter and mating surfaces of the C-Face Flange is clean and free of all nicks, burrs or anything that would not allow the Drive Unit to seat properly.
2. Install the (4) Mounting Spools (#221), (4) Lockwashers (#367) and (4) Hex Hd. Screws (#305) to the C-Face mounting surface. Apply Blue Loctite to the Screws (#305) and only finger tighten at this time.
3. Loosen the Locking Collar (#281) which is only hand tightened on the Split Quill Input Shaft (#2).
4. Remove the drive motor key if there is one on the motor shaft and install Key (#180), which is supplied with the Posidyne.
5. Loosen the (4) Set Screws (#154) and slip the Posidyne onto the motor shaft with the Key (#180) aligned with the keyway in the Input Shaft (#2). Push the Drive Unit until it seats on the motor pilot diameter and the (4) Mounting Spools (#221) are seated in the mounting cavities.
6. Carefully remove the Drive Unit without moving the position of the spools. **Torque the Screws (#305) to 300 In. Lbs.**
7. Remove the (2) Screws in the Locking Collar (#281) and apply Blue Loctite #242 to them. Reinstall them back into the Locking Collar (#281) loosely with the Locking Collar (#281) in position on the Input shaft (#2).

**IMPORTANT - Make sure that the motor shaft is thoroughly cleaned but do not lubricate the shaft with any oil. Torque transfer depends on friction between the motor shaft and the split quill input shaft.**

8. Reposition the unit back on the C Face motor flange and tighten the (4) Set Screws (#154). **Torque to 120 In. Lbs.**

Visually check to see if the C Face mounting surfaces are snug and tight all the way around.

9. Torque the (2) Screws in the Locking Collar (#281) to **144 In. Lbs.**

**IMPORTANT NOTE - Whether or not you have an optional 8-1/2" AK C-Face Flanges or Fan Cooling, this spool alignment procedure must be maintained to assure proper mounting spool alignment and position.**

## C. PNEUMATIC HOOKUP

**Figures 3 and 4 illustrate typical compressed air systems for the 1.5 Posidyne Clutch/Brake Unit.**

**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

Figure 2 - 1.5 Posidyne Installation

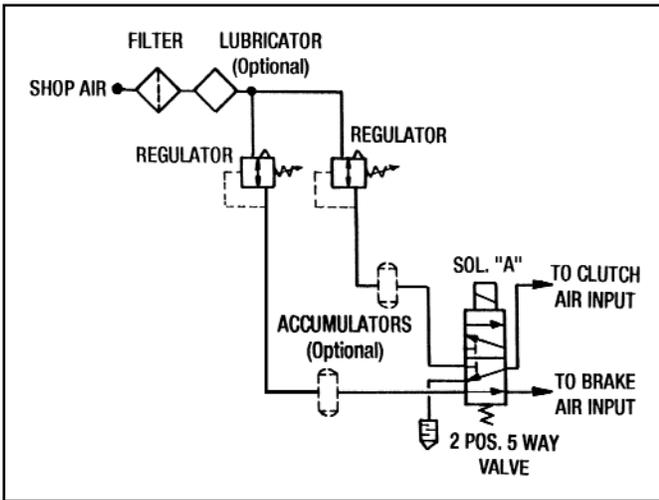


Figure 3 - Air operated clutch and brake. (**Posidyne - S and SA Logics**) with different actuation pressures for the clutch and the brake.

installed directly on the drive if they are supported. Manifold mounted control valves are available as an option from the factory. Consult your representative or the Force Control factory.

2. Be sure to use valves of at least .4 Cv.
3. The optional accumulator 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. Size the accumulator to be at least 10 times the air required per engagement.
4. 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.
5. The air pressure regulator should be sized and set to provide the required torque.

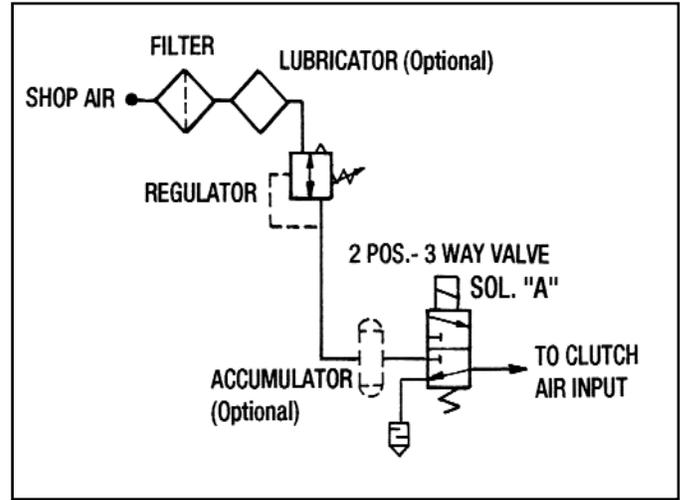


Figure 4 - Air operated clutch only and spring set brake. (**Posidyne A, B and C Logics**)

6. Pressure is directly proportional to torque. If 80 PSI is not required to drive the machine, use only the air pressure necessary. This will give additional life to the Clutch/Brake Unit. (**See the Service Manual #502-CV-001-00 for Pneumatic Control Valves.**)
7. After using the drive for a few weeks the acceleration time may increase. Increasing the air pressure will restore the acceleration time.

## D. ELECTRICAL HOOK-UP

### (For Mac 82 Series Control Valves Only)

Use the (2) yellow wires marked "A" for Solenoid "A". The (2) red wires marked "B" are not used for a single clutch unit. They can be cut off and capped.

# Lubrication

## A. CHECKING THE OIL LEVEL *(See Figure 5)*

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 input end of the drive. The oil level is to show at the center of the gauge.

## B. CHANGING THE OIL *(See Figure 5)*

**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 additional 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.

## C. TYPE OF OIL

Use only Mobil Automatic Transmission Fluid ATF-210 (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.**

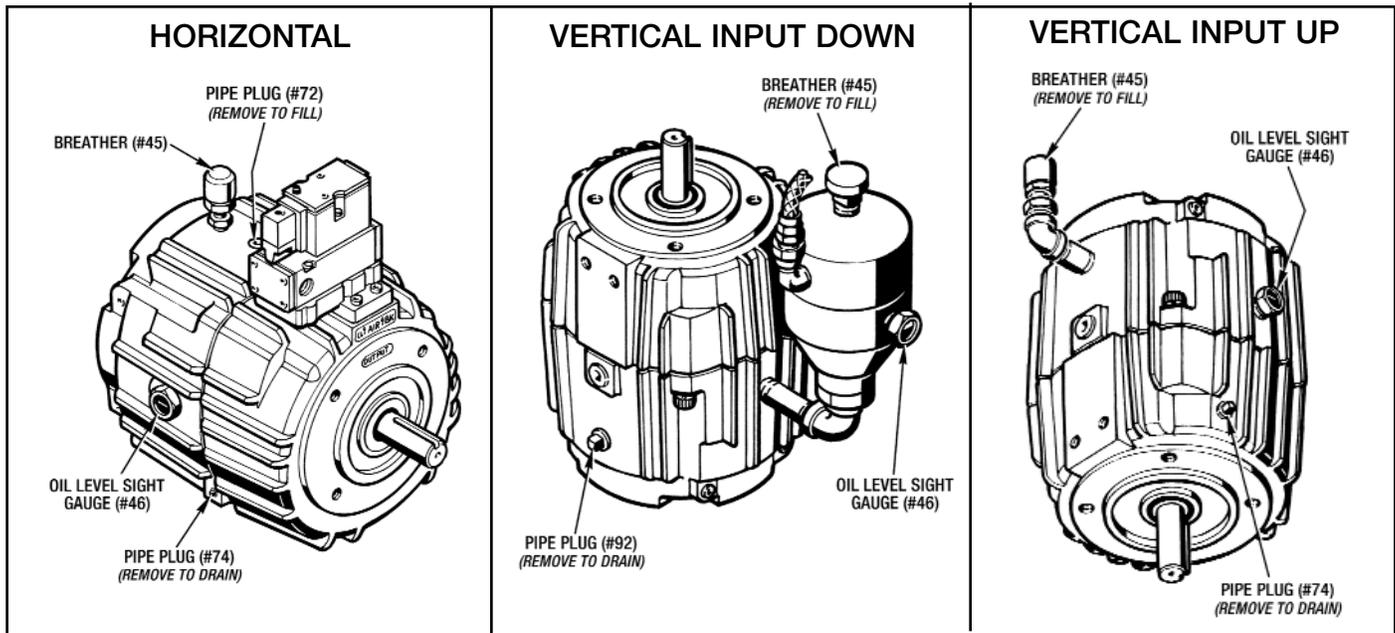


Figure 5 - Lubrication

## Factory Rebuild Service, Maintenance & Manuals

### A. FACTORY REBUILD SERVICE

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

### B. MAINTENANCE & MANUALS

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

The Pneumatic Control Valve Service Manual can also be downloaded and printed off of our web site or ordered directly from Force Control.

Go to: [www.forcecontrol.com](http://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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