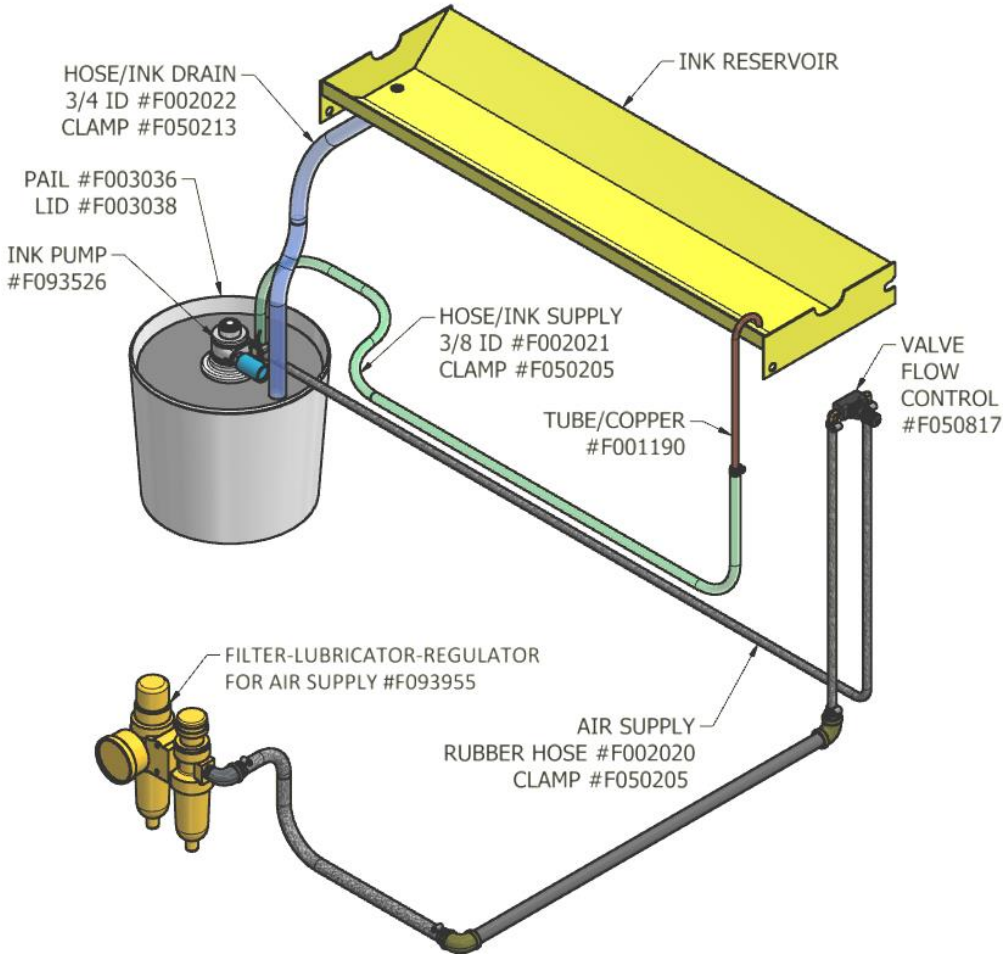
REPLACEMENT OR
ADDITIONAL MANUALS
AVAILABLE AT
EXTRA COST

WARNING

USE OF INKS OTHER THAN KIWI ON THIS EQUIPMENT WILL RENDER THE WARRANTY NULL AN VOID

KIWI CODERS CORPORATION
INK PUMP CIRCULATION SYSTEM



KIWI CODERS CORPORATION - 265 E. MESSNER DRIVE, WHEELING, IL 60090-6495 USA
PHONE: 847-541-4511 FAX: 847-541-6332
E-MAIL: info@kiwicoders.com INTERNET: www.kiwicoders.com

GIVE SERIAL NUMBER OF YOUR PRINTER WHEN ORDERING PARTS.
ORDER PARTS BY FULL DESCRIPTION AND PART NUMBER.

CAUTION

DO Read these instructions before operating the machine. Be sure you understand them. If you do not, ask a supervisor to explain them.

DO NOT Become over-confident; most accidents occur when people are over-confident, tired or distracted.

It is the purchaser's responsibility to request or implement specific design changes in the equipment to comply with any special safety regulations, procedures or operational conditions required by the purchaser's corporate policies.

AIR INK PUMP/CIRCULATING SYSTEM

The circulating system is composed of the following components:

1. Air-driven ink pump (*Figure 12*).
   For more information see Graymills Operation and Maintenance attachment.

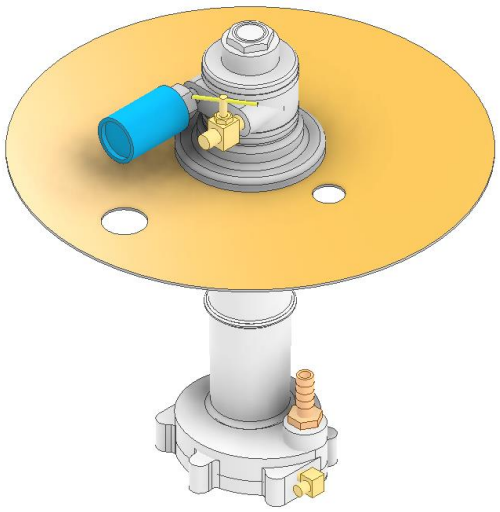


Figure 12

2. A 3-gallow ink pail for the pump.
3. One extra 3-gallow pail for thinner.
4. 3/8” ID feed hose.
5. 3/4” ID drain hose.
6. An air flow control valve, located on the operator’s side of the machine (*Figure 13*).

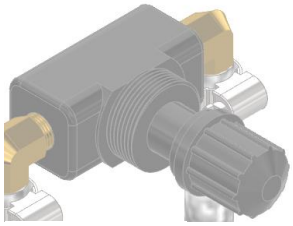


Figure 13

7. An F-L-R (filter-lubricator-regulator) for the air supply (*Figure 14*).

Figure 14

8. Miscellaneous fittings and hardware.

A. Set-up and Operation

An air flow control valve, which is located on the operator's side of the machine, should be checked to be sure it is closed before connecting the air supply to the F-L-R assembly. Attach the air supply and set the regulator to 30 psi +/- 10 psi. Now open the flow control valve slowly until a steady stream of ink is being pumped into the ink tank. Only circulation is required, too much flow will cause the tank to eventually overflow. Maintain a uniform ink level in the tank.

Machines equipped with a by-pass ink system, there is a second valve on the by-pass hose going back to the 3-gallon ink pail. This valve should be open slightly at all times to eliminate pulsating of the ink, spurting of the ink into the tank when starting and to give a more uniform flow of ink into the tank.

B. Ink Level Control

The ink tanks are equipped with an ink level control on a hinged arm. This control can be raised to drain the remaining ink from the tank when shutting down the machine.

C. Clean-up Procedure

CAUTION: **NEVER ATTEMPT TO CLEAN ANY PART OF THIS MACHINE WHILE IT IS RUNNING.**

NEVER PLACE YOUR HANDS, FINGERS, ETC. INTO THIS MACHINE WHILE IT IS RUNNING.

NEVER USE RAGS, BRUSHES, ETC. TO CLEAN ANY PART OF THIS MACHINE WHILE IT IS RUNNING.

NEVER OVERRIDE ANY INTERLOCK SWITCHES AT ANY TIME.

1. Shut off the machine and the air flow control valve.
2. Drain the ink tank by raising the ink level control arms.
3. Place a KD carton under the ink pump pail.
4. Remove the ink pump from the ink and place it in the pail of Kiwi thinner.
5. All guards and interlocks must be in place before the pump and/or machine is turned on.
6. Turn on the air flow control valve and the machine. Circulation of the thinner will clean the face of the type and the ink rollers.
7. Shut off the air flow control valve and the machine.
8. Drain the thinner from the ink tank.
9. The printing head assembly is now ready to the next production run.

Thinner may be re-used indefinitely for cleaning. Do not discard. Thinner may be used to thin the ink when required.

NOTE: KEEP THINNER AND INK CONTAINERS COVERED AT ALL TIMES TO MINIMIZE EVAPORATION.

Graymills

INSTRUCTIONS for OPERATION and MAINTENANCE

AGS **TOR®** PUMPING **SYSTEMS**

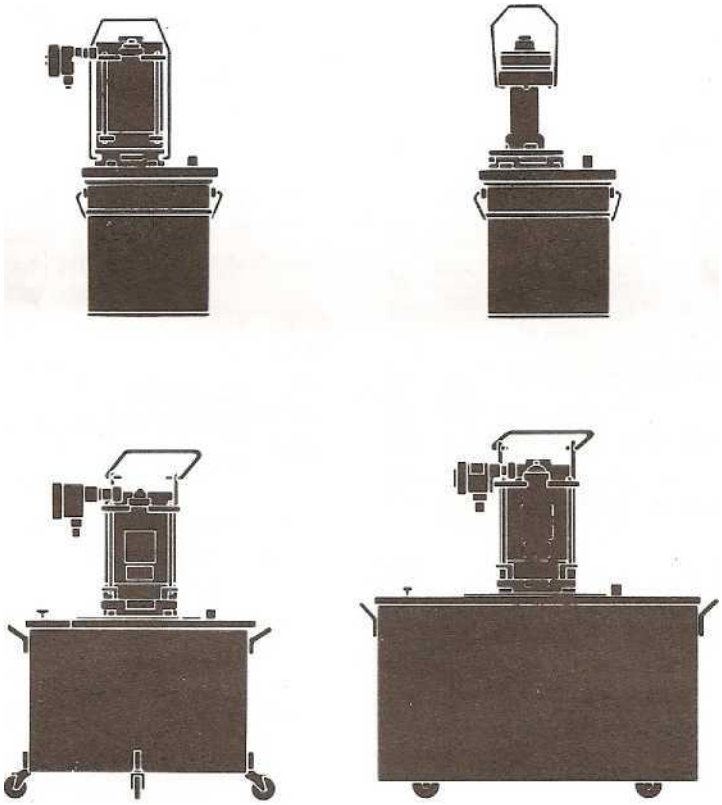


TABLE OF CONTENTS:

INSTRUCTIONS for OPERATION and MAINTENANCE
GRAYMILLS
AGITOR® PUMPING SYSTEMS

I. GENERAL

For complete information on Agitor® Pumps, Filters, Viscosity Controls, Hose, Accessories, etc. see Catalog GM 300-93.

Graymills Agitor®Pumping Systems are used for circulating, mixing, conditioning and applying flexographic and rotogravure inks, varnishes, light adhesives and coatings.

A. Facts about Fluid Flow: Different elements will have an affect on the rate of flow through your system. Therefore, when deciding on a system to pump fluids, the following must be taken into consideration:

1. **Height to which liquid is raised (pumped).** The higher a pump has to pump the fluid the lower the flow rate. Therefore, the same pump with the same viscosity ink will pump more into a fountain 3 ft. high than into a fountain 5 ft. high.
2. **Viscosity of the liquid.** Thicker inks offer more resistance to flow; therefore, as viscosity increases, flow will decrease if all other factors remain the same. This accounts for a gradually diminishing flow as solvent evaporates and ink viscosity increases. It can also account for the sudden increase in flow when solvent is "dumped" into the reservoir to thin out the ink.

   Thixatropic inks have a false body or viscosity when stagnant. After they are pumped and conditioned for fifteen minutes or so, they thin out to running viscosity. If Thixatropic inks are not pre-conditioned before they are directed to the fountain, an increasing rate of flow can be expected as the ink reaches its operation (thinner) viscosity. A good idea for pre-conditioning such inks is to circulate them for fifteen minutes within the ink container before pumping them into the fountain.
3. **Type of fittings and length of hose.** Flow of fluid through hoses, fittings and bends causes friction which will decrease flow. The longer the hose or the greater the number of bends or fittings, the greater the friction. If the hose is looped or draped around the floor (and is therefore unnecessarily long), flow will be reduced even though ink is pumped only a few feet high.

B. Affect of Hose Size and Viscosity: The following changes can be made to change the flow using the same pump for different viscosities.

1. Series 30 and 40 pumps use 3/4″ discharge hoses and 1-1/4″ return hoses. HR and HV Series use 1/2″ discharge and 3/4″ or 1″ return. This arrangement has proven more than adequate for thousands of pumps in use. However, in cases where greater flow to the fountain is needed, a simple increase in the hose size will help, particularly with inks of heavier viscosity.
2. H53, H103, and H553 pumps have a 3/4″ discharge. However a 1″ I.D. hose will increase ink flow.
3. H104, H204, H304, and H554 pumps have a 1″ discharge reduced to 3/4″. For increased flow, remove the 3/4″ reducer and substitute a 1″ discharge hose and fittings. Note the following table.

EFFECT OF HOSE SIZE AND VISCOSITY ON FLOW RATE *

Hose Size	G.P.M. Water	G.P.M. 20 sec. Zahn No. 2 150 SSU.	G.P.M. 40 sec. Zahn No. 2 470 SSU.	G.P.M. 60 sec. Zahn No. 2 660 SSU.
1/2 in.	4.80	1.05	.50	.36
3/4 in.	10.00	4.00	1.40	.85
1 in.	18.00	10.00	3.60	2.40
1-1/4 in.	30.00	19.00	6.75	4.80

* No. 2 Zahn Cup

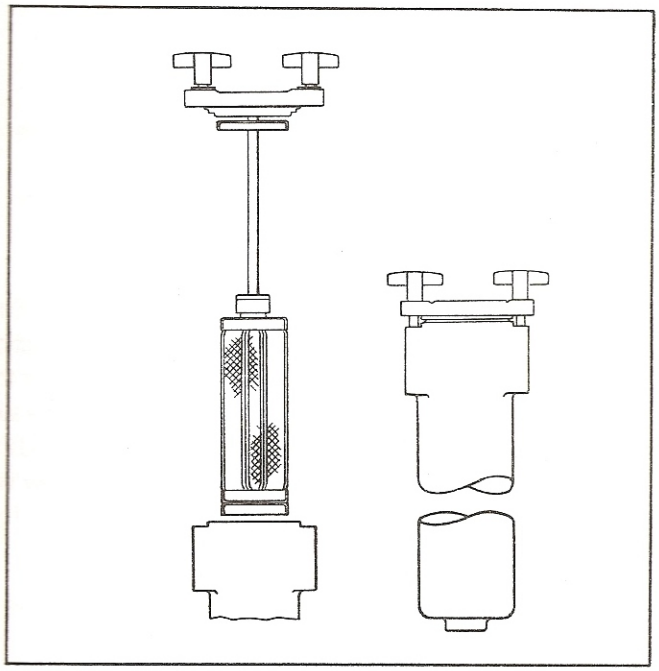


Figure 1. Superflo Filters

C. Filters and Screens (Figure 1): Paper particles, trimmings, undissolved solids, metal chips, "skin" and dirt should be removed from ink to assure quality printing, to prevent faulty operation of viscosity controls, and to avoid damage to cylinders, anilox rollers and doctor blades.

Straining the ink before it is poured into the pump container is a good practice.

Graymills Superflo Filters, designed specifically for ink systems, are available (see Catalog GM 300-93). These filters are easily serviced without removal from the line; accept larger amounts of solids without causing a pressure drop; trap ferrous particles which could cause costly damage; and are self draining.

D. Special Piping or Hose Systems: Graymills offers special piping or hose systems other than their standard system. When special systems are required, remember the following:

1. If special hose or pipe systems are required, use the largest hose size practical and avoid unusual restrictions and crimping.
2. Use pinch valves, butterfly valves, or ball valves to regulate flow. Gate valves, because they can accumulate pigment, should only be used for shutoff.
3. Do not use street elbows in piping: they restrict the flow excessively.

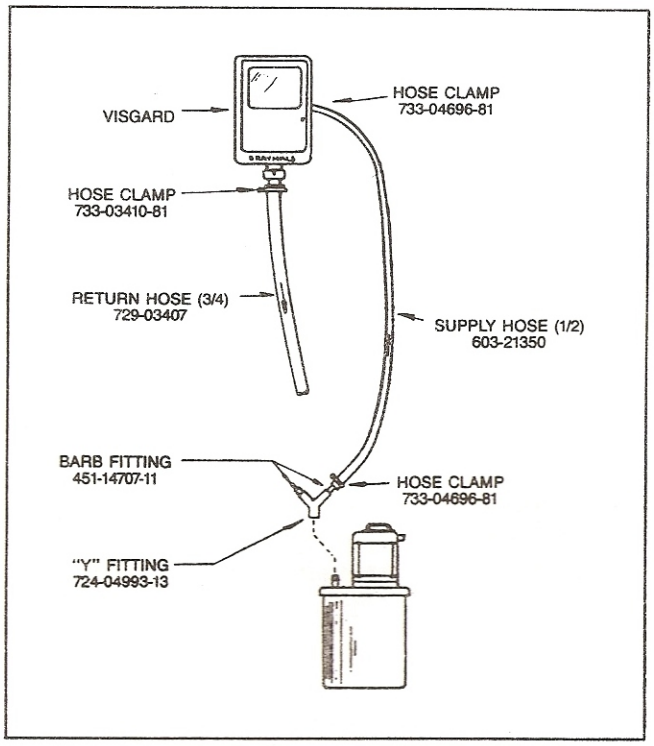


Figure 2. Graymills Visgard 3-Plus Hose and Fitting Kit.

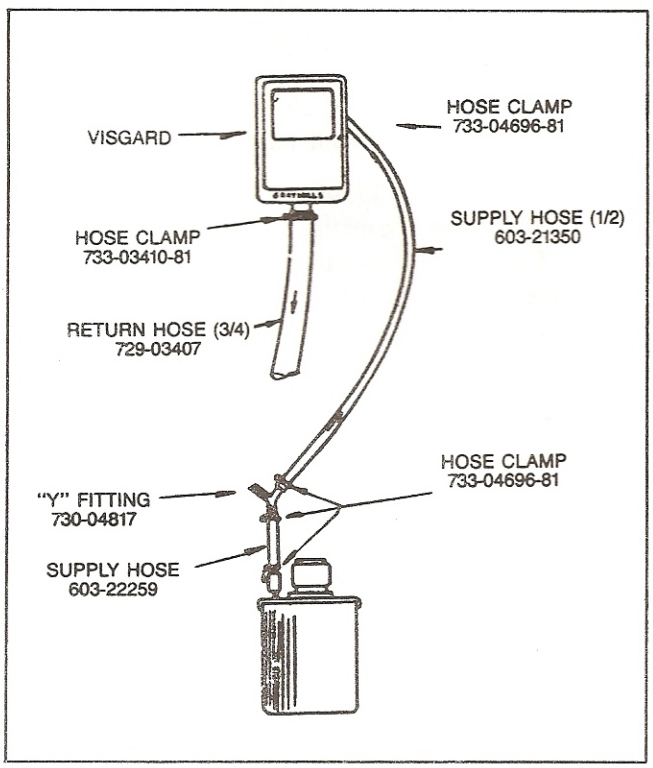


Figure 3. Graymills Visgard 3-Plus Hose and Fitting Kit.

II. SAFETY INFORMATION

Installation of this equipment must be in accordance with National and Local codes.

A. Explosion Proof Motors (Figure 4): The following safety requirements are required when installing and using Explosion Proof Motors:

1. Electrical installation must be performed by qualified electricians familiar with codes and regulations for the type of environment in which these units will be used.

2. Installation of electrical junction boxes on the motor is extremely important to the electrical integrity of the motor and the electrical wiring system. When installed, the junction box and the nipple connecting the box to the motor should not show any sign of movement. Refer to Figure 4. If there is any movement, DO NOT PUT INTO SERVICE until corrected. USE COULD RESULT IN A SEVERE SHOCK HAZARD.

3. Junction boxes should NEVER be used to lift or move the pump and/or motor.

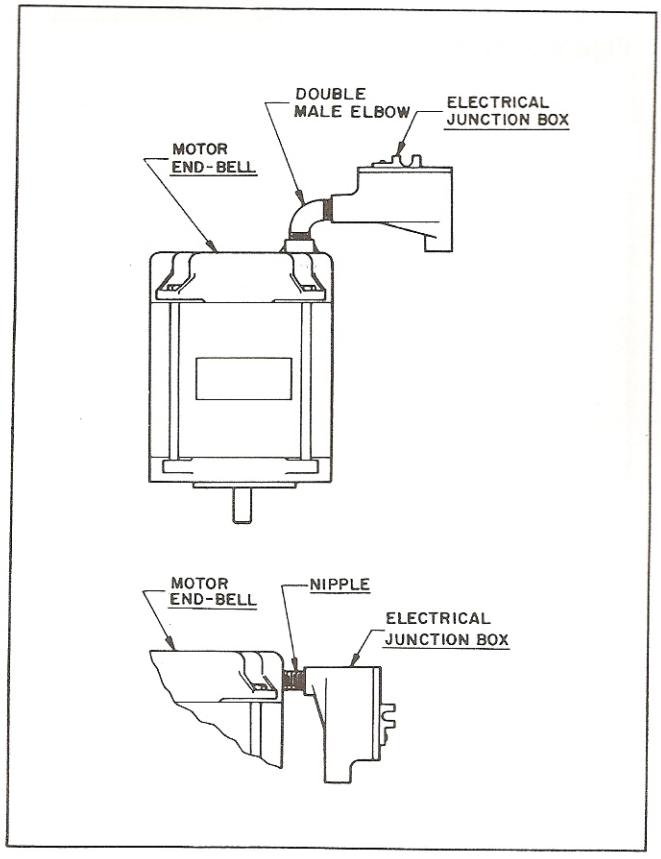


Figure 4. Junction Box and Connecting Nipple

4. Once installed, regular inspections should be made of the electrical system and junction boxes. If movement is found, take out of service and correct.

5. If you have a fan cooled motor, NEVER remove the fan cover during operation. Replace broken fan blades immediately.

6. Always operate this equipment in a safe manner.

B. "QD" and "QE" Series Pumps: Graymills "QD" and "QE" series pumps are unique in that the motor can be quickly removed from the pump. In order to ensure the safe operation of these pumps be sure the following safety instructions are followed:

1. Never operate the system without the motor flange and bearing housing flange fitting flush against each other. This ensures proper engagement of the motor coupling.

2. Never operate the system without the swivel-lock fastener snug against the flange.

III. PUTTING PUMPS INTO SERVICE:

A. General:

1. Be sure all hoses, valves and connections are tight.

2. If using filters, be sure covers are tight.

B. Electric Motor Pumps:

1. Review all electrical safety instructions. If operating in an explosive atmosphere, be sure you have an explosion-proof motor and follow all installation regulations and codes.

NOTE: Explosion Proof Motors should be installed by a qualified electrician to code. No movement should exist at junction box connections.

2. Review the name plate on the motor to make sure the motors' cycle, phase and voltage matches your plants' electrical source.

3. 3-Phase motors will run backwards if wired incorrectly. Although you will still pump ink, the flow will be greatly reduced. All Agitor® motors run counter-clockwise when looking down at the top of the motor.

WARNING: When using EXPLOSION PROOF MOTORS, do not use the electrical junction box as a carrying handle or lifting handle. This could result in loose electrical connections and a possible serious electrical hazard to the equipment and a SEVERE SHOCK HAZARD TO PERSONNEL.

C. Air Motor Pumps:

1. Air driven motors require clean, lubricated air. An air pressure regulator for each motor will prevent variations in speed due to a change in line pressure.

2. To operate, set pressure regulator to the desired pressure, then adjust speed of pump with needle valve supplied on air motor.

D. Flow Control Systems:

1. Models H53, H103, H104, H204, H304, and QH Series:

There are two basic flow control systems: Straight Line (Type SL) and By-Pass (Type B2, B2GV, FB2, FB2GV). If flow to the fountain is maintained at near pump capacity, the Straight Line (Type SL) flow control system is satisfactory. With the By-Pass type, valves direct flow not needed at the fountain through the By-Pass and back into the ink tank. With the By-Pass, a greater volume of ink is constantly exposed to the conditioning and blending process.

a. **Type SL (Figure 5):** Consists of 3/4" coupling, 3/4" slip-on hose fitting, 2 (two) stainless hose clamps, 8" steel wire spring to prevent hose kinking, hook over nozzle.

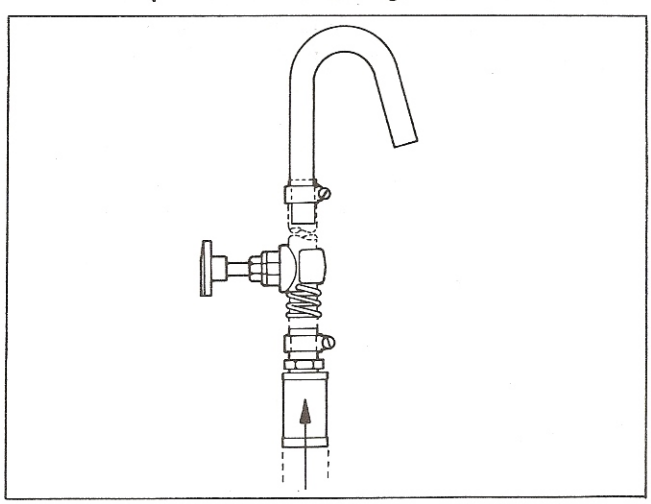


Figure 5. Type SL System

b. **Type B2 By-Pass (Figure 6):** Consists of tee, return piping to tank with 1/2" butterfly valve, 3/4" slip-on hose fitting, 8" steel wire spring to prevent kinking, pinch valve, 2 (two) stainless hose clamps, hook-over nozzle. All parts nickel plated.

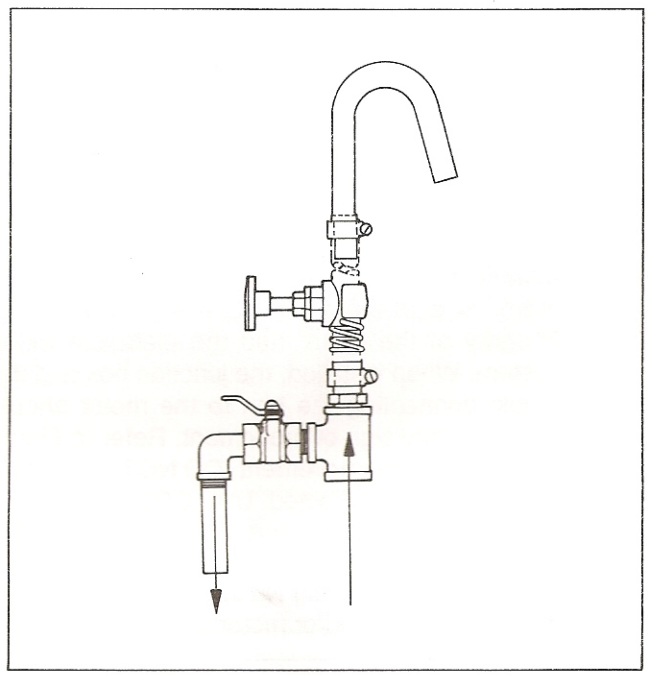


Figure 6. Type B2 System

c. **Type B2GV By-Pass (Figure 7):** Same as B2 except gate valve substituted for pinch valve.

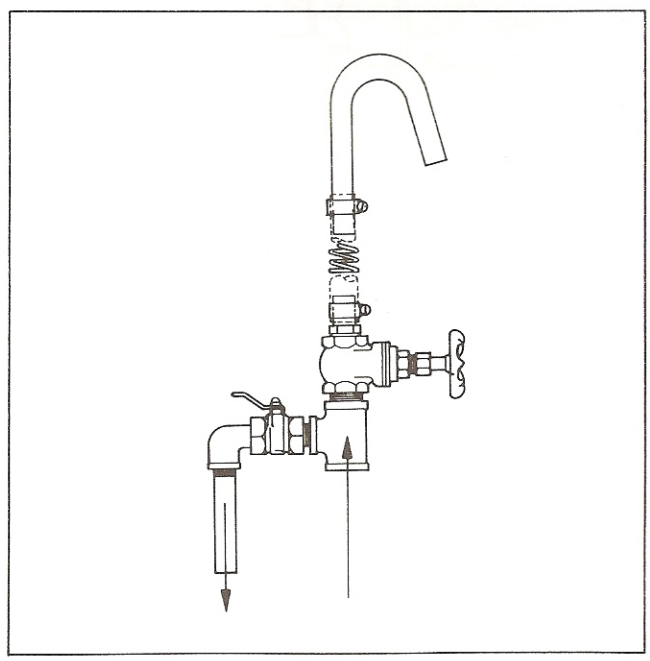


Figure 7. Type B2GV System

d. **Type FB2 By-Pass (Figure 8):** Filter By-pass complete with HFST filter. Specify 30, 60, 100 or 150 mesh filter screen.

Filter attaches to 3/4" discharge of pump with a quick-coupler. Using the dual discharge ports, piping is by-passed back down into the tank on one side, while the other port is used for flow into the fountain. Flow through the by-pass back to the tank is controlled by a butterfly valve. Flow to the fountain is controlled by a pinch valve. Piping is plated.

e. **Type FB2GV By-Pass (Figure 8):** Same as FB2 except gate valve supplied instead of pinch valve.

2. **Models H553,and H554:**

a. **Type SL:** For straight line flow a 3/4" hose should be used between the pump and the point of application, along with a pinch valve or gate valve to regulate the flow.

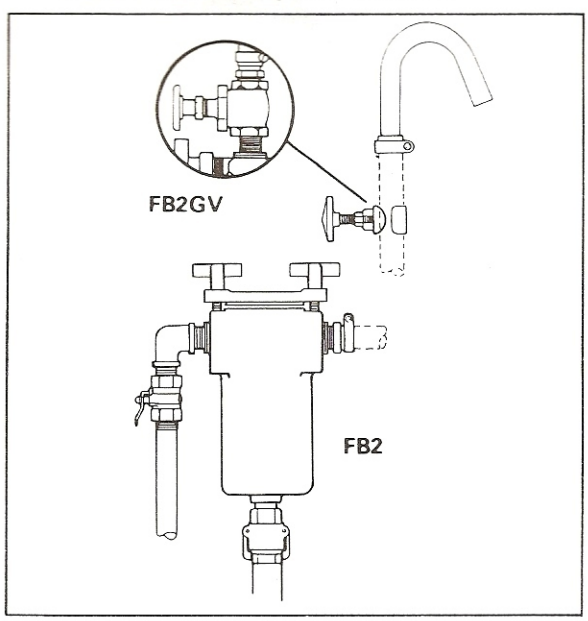


Figure 8. Type FB2 and FB2GV Systems

b. **Type B2 By-Pass:** The B2 by-pass system used on Model H53 pump may be used with this system. However, if the flow to the fountain is substantial, creating an equally copious return flow from the fountain, a by-pass system may be un-necessary because there will be enough agitation.

3. **Models HR22:**

a. **Type SL:** For straight line flow a 1/2" hose will slip over the discharge, secured by a hose clamp. A pinch valve regulates flow, and a "Hookover" nozzle directs flow to the fountain.

b. **Type BPH2 By-Pass:** This system attaches to the 1/2" discharge pipe with a valve on the by-pass line to the container and a pinch valve or gate valve on the hose to the fountain.

4. **Models HVOS:**

The recommended flow control systems for the Model HVOS is a 1/2" I.D. hose slipped over the discharge tube from the pump.

5. **Models HV1 and HV2:**

a. **Type SL:** For straight line flow, slip a 1/2" hose over the barb fitting. (Valve supplied with pump).

b. **Type BPVP By-Pass:** Remove ball valve and barb fitting from the pump discharge and screw in "T" fitting. Assemble short nipple, elbow, return tube in that order. Insert ball valve and barb fitting in top of "T".

E. **Piping to Water-Jacketed Tanks:**

1. **NEVER** use Graymills jacketed tanks for steam or hot water applications where steam may be generated. Pressure developed can cause rupture and hazards. Maximum pressure 3 psi.

2. **NO** valves should be installed on outlet side of tanks. To keep the jacketed area filled, connect a riser pipe so that the outlet pipe is **above** the jacketed area.

3. Install one or two valves on water line going into the jacketed area. One valve can be used for regulating the volume of water going through the tank or tanks. The second valve can be used for full "off and on" without disturbing the regulating valve.

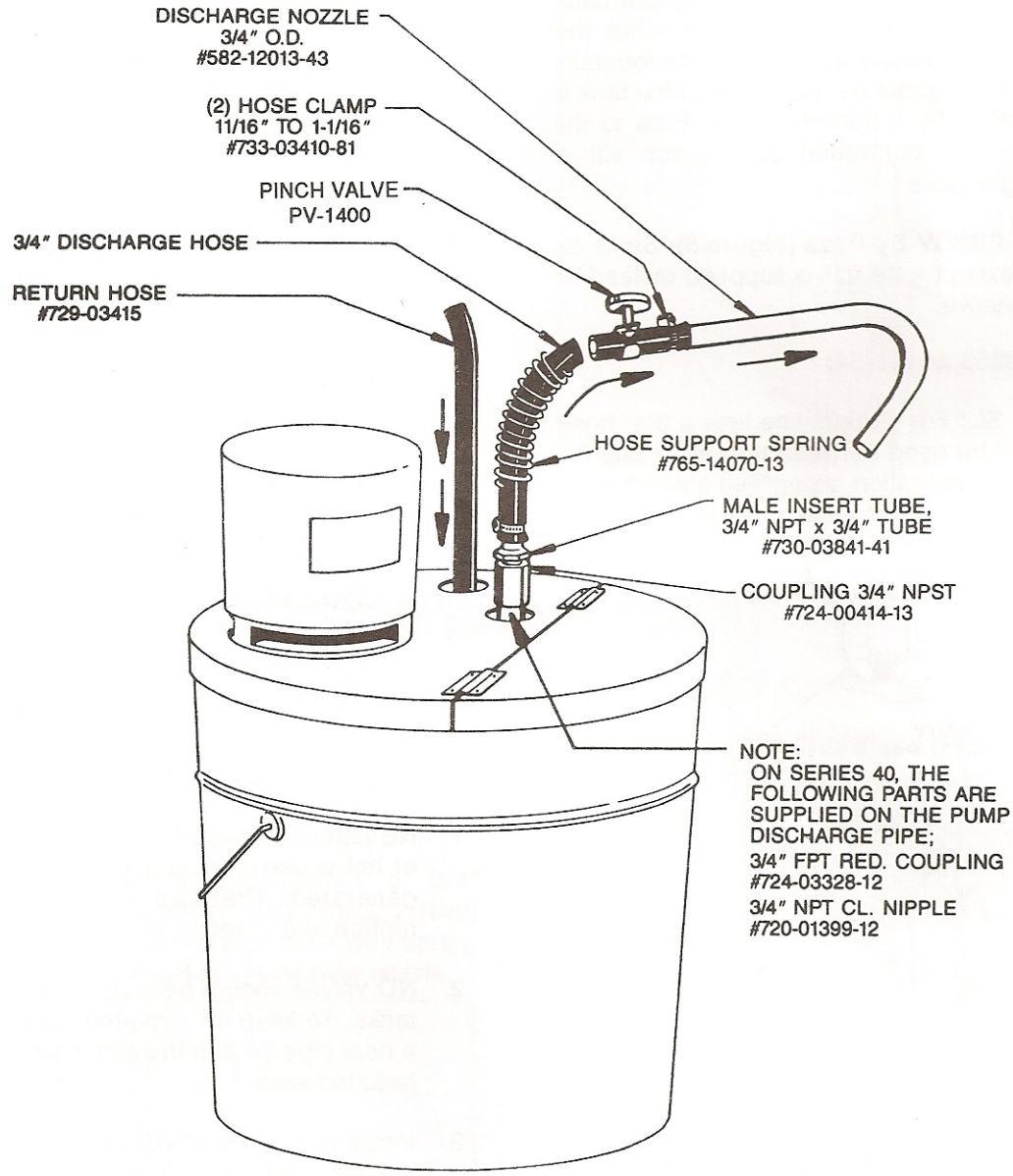


Figure 9. Complete Flow Control System, Type SL (Series 30 & 40 Pumps)

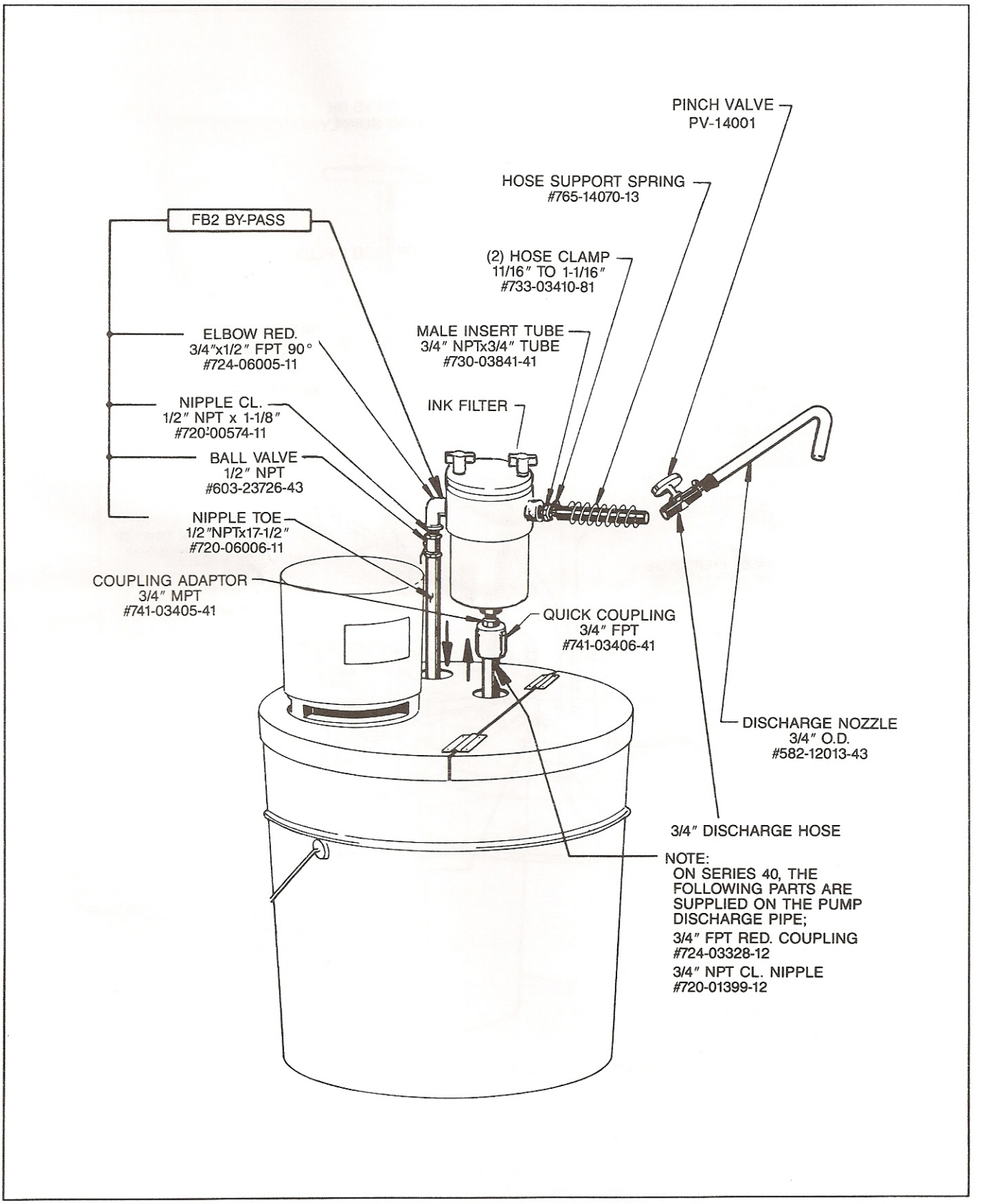


Figure 10. Complete Flow Control System, Type FB2(Series 30 & 40 Pumps)

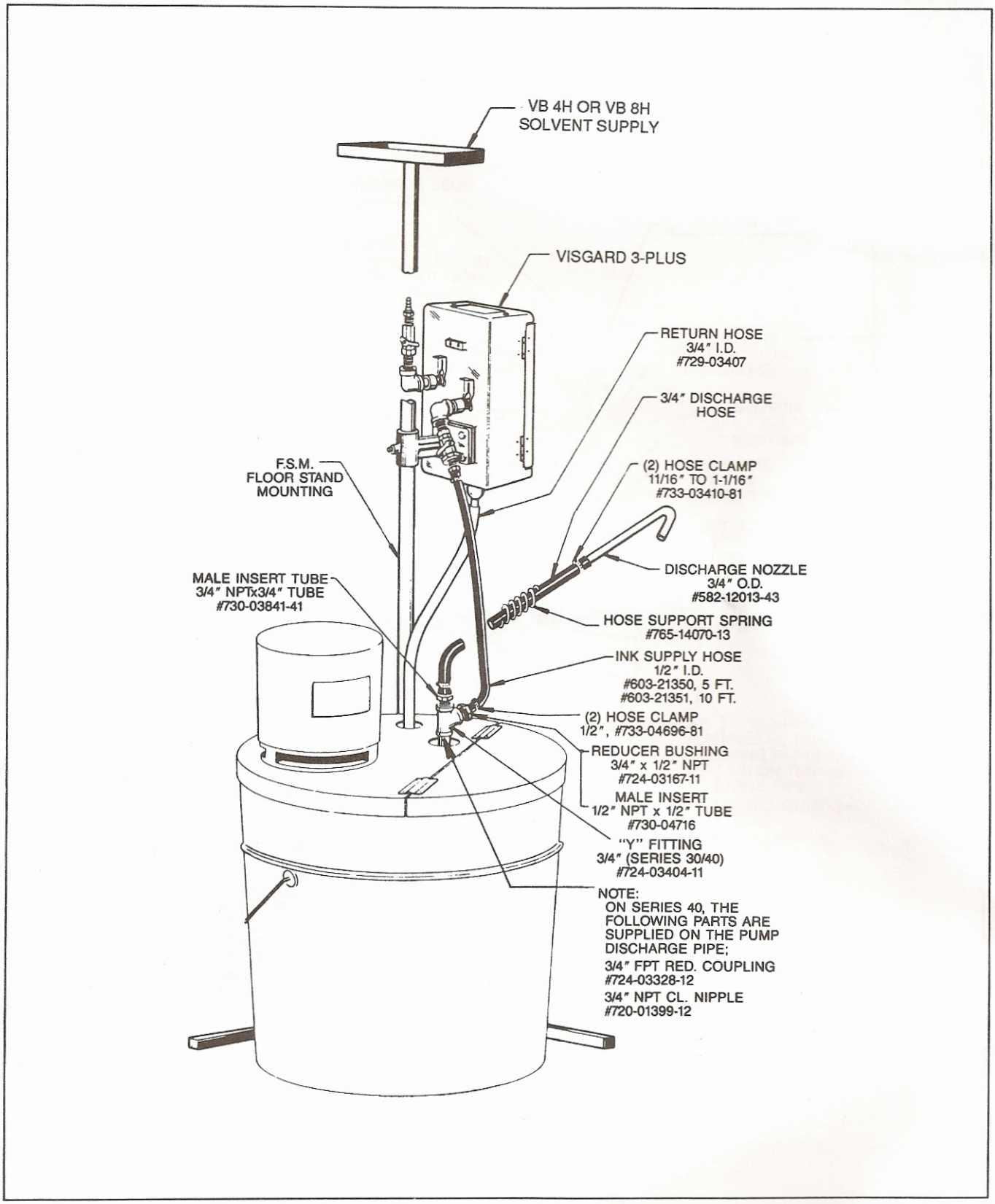


Figure 11. Complete Flow Control System, When installing Visgard-3-PLUS (includes VSK-B) (Series 30 & 40 Pumps)

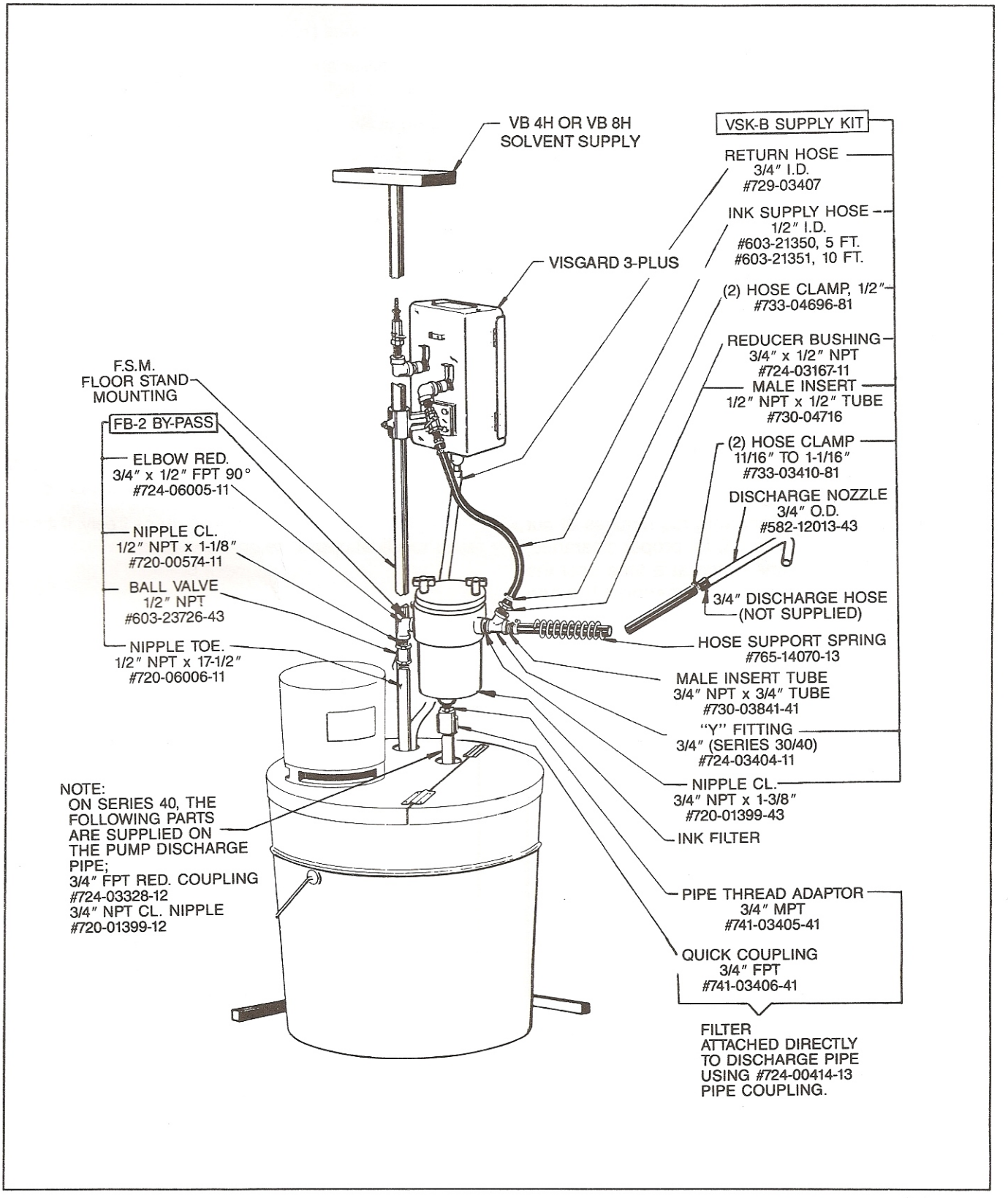


Figure 12. Complete Flow Control System, When installing Super Flo Filter, Filter By-Pass (FB-2) and Visgard-3-PLUS (includes VSK-B) (Series 30 & 40 Pumps)

IV. MAINTENANCE

A. Replacing Impeller:

1. **Double Suction Impellers (Figure 13):**
(A double suction impeller has blades on the top and bottom.)

NOTE: Be sure motor is attached to pump on Q Series.

a. Remove bolts (10), volute cover plate (9), and gasket (8).

b. Remove cotter pin (6), nut (7), impeller (5), washer (4) and spring (3).

c. With the pump upside down, place spring (3) and washer (4) on shaft (1).

d. Slide new impeller (5) on shaft. The words "Top" and "Bottom" are embossed on the impeller. Be sure the top of the impeller is towards the motor.

e. Replace nut (7). Tighten the nut until impeller (5) is against the casting (2). Shaft (1) has a cotter pin hole that aligns with the notches of nut (7). To adjust impeller (5) for proper clearance, back off nut (7) one notch at a time until the impeller does not rub on casting (2) when turned.

f. Replace pin (6) to lock the nut.

g. Replace gasket (8) and cover plate (9). Secure with bolts (10).

NOTE: Impeller should now turn freely without rubbing top or bottom.

2. **Single Suction Impellers (Figure 14):**

a. Remove bolts (6), volute cover plate (5), and gasket (4).

b. Align hole in upper casting (1) with set screw (2). Loosen set screw and remove old impeller (3).

c. Slip new impeller (3) with Teflon washer on shaft with hub towards the motor until the impeller touches casting (1), then back off slightly so there is no contact between casting and impeller.

d. Align set screw (2) with hole in upper casting (1) and tighten set screw.

e. Replace gasket (4) and volute cover plate (5). Secure with bolts (6).

f. Check to see that impeller turns freely. If it rubs, adjust clearance.

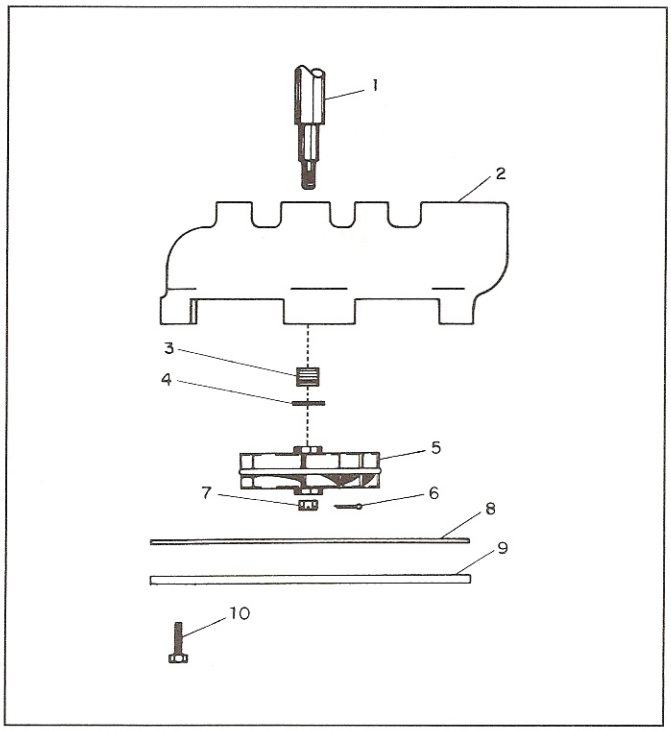


Figure 13. Double Suction Impellers

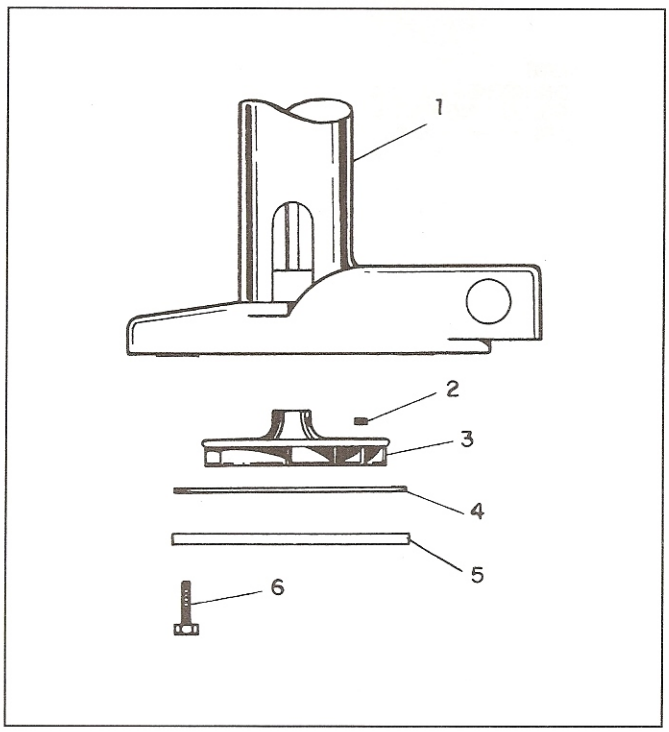


Figure 14. Single Suction Impellers

B. "QD" and "QE" Series Motors (Figures 15 & 16):

1. Installation:

a. Make sure swivel-lock handle is positioned so that the handle is in line with the axis of the connector (Fig. 16a).

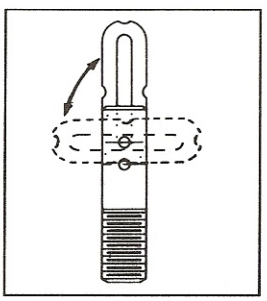


Figure 16a.

b. Position motor over the bearing housing flange.

c. Guide swivel-lock fastener into bearing housing flange holes.

d. Self-aligning coupling may require minor twisting of motor to align.

e. Guide motor straight down until the motor face mounts flush against the bearing housing flange.

f. Flip the swivel-lock handle 90°. Tighten handle finger tight only! Use of a wrench may damage handle.

2. Removal:

a. Loosen the swivel-lock fasteners 1/2 to 1 turn.

b. Flip the swivel-lock fastener handle 90°, until the detent is engaged with the spring-ball.

c. Lift motor straight-up.

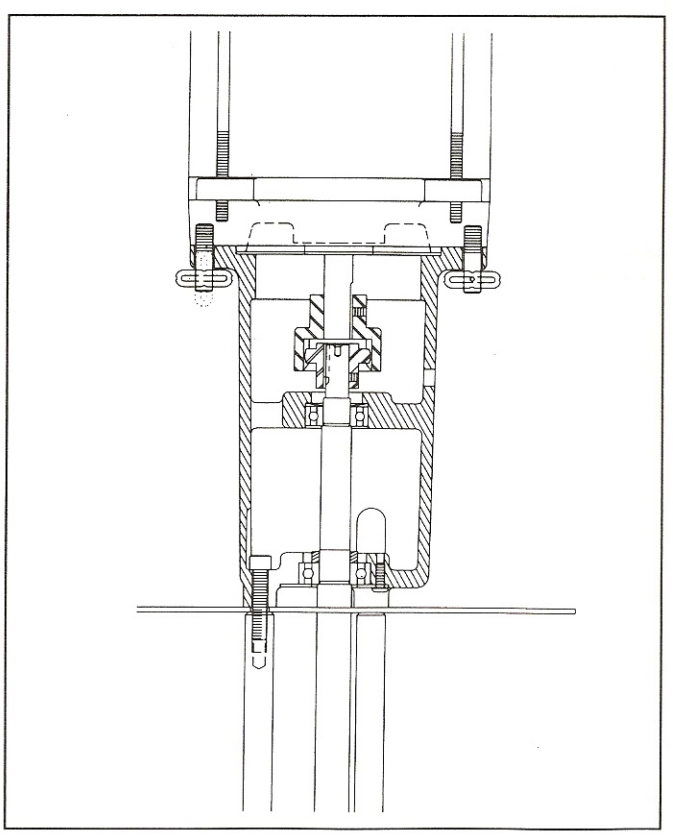


Figure 15. "QD" Series Motor

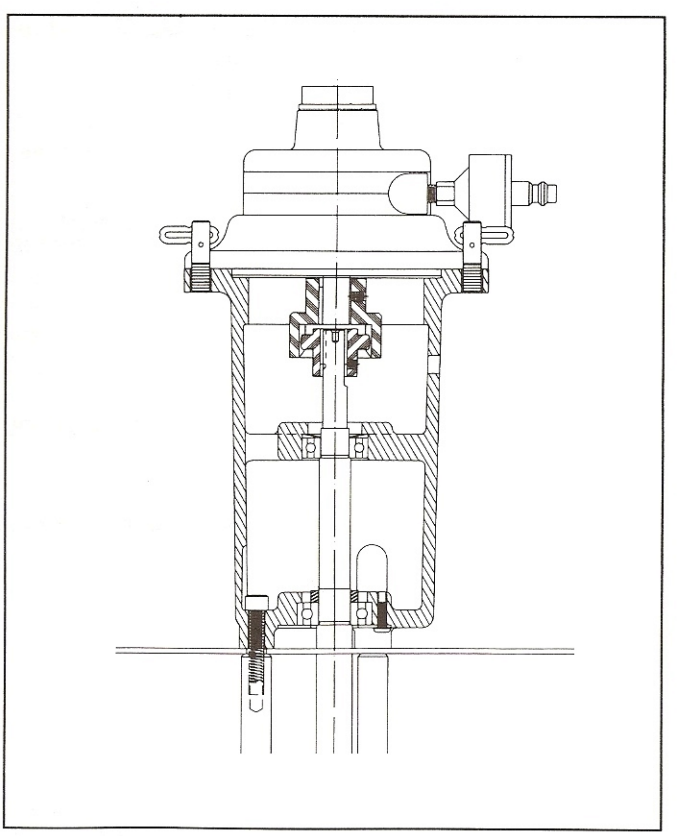


Figure 16. "QE" Series Motor

C. "QH" Series Motor (Figure 17):

1. Removal:

a. Free safety wire (1) from safety cap (2) and remove the cap.

b. Hold shaft (9) with tool (5) provided on motor handle, unscrew knob (3), and lift off driver (4).

c. Remove plastic thread protector (6) from motor handle and install on shaft (9). Slip driver (4) on motor handle and screw know (3) on the handle for safe keeping.

d. Spin knurled motor bolt knobs (11) to disengage studs (10).

e. Lift motor straight off. Do not tilt motor or force remove. Set motor on stand or on its side to protect hollow shaft (7).

f. Position safety cap (2) on motor and secure with safety wire (1). DO NOT LEAVE SHAFT UNPROTECTED. Place shaft protector over exposed shaft and secure with spin nuts.

2. Installation:

Remove shaft protector.

a. Free safety wire (1) from safety cap (2) and remove the cap.

b. Lower motor carefully straight down over shaft (9). Do not tilt or force. Locating pins (8) will center motor in correct position.

c. Spin knurled motor bolt knobs (11) to engage studs (10) and hand tighten.

d Remove knob (3) and driver (4) from motor handle.

e. Remove plastic thread protector (6) from shaft (9) and install on motor handle for safe keeping.

f. Position driver (4) on shaft (9). **Do not force.** Driver will fall into proper position if slot of shaft is in correct alignment. **DRIVER MUST ENGAGE SHAFT CORRECTLY.**

g. Spin on knob (2). Using tool (5) to hold shaft (9), hand tighten knob (2).

h. Spin shaft by hand to make sure it turns freely (if driver (4) has not engaged, the impeller will rub at the bottom). Replace safety cap (2) and secure with safety wire (1).

NOTE: Shaft must be pulled up all the way. If motor is run in wrong direction (on 3 phase) knob may loosen. Rotation of pump is counter clockwise looking down on top of motor.

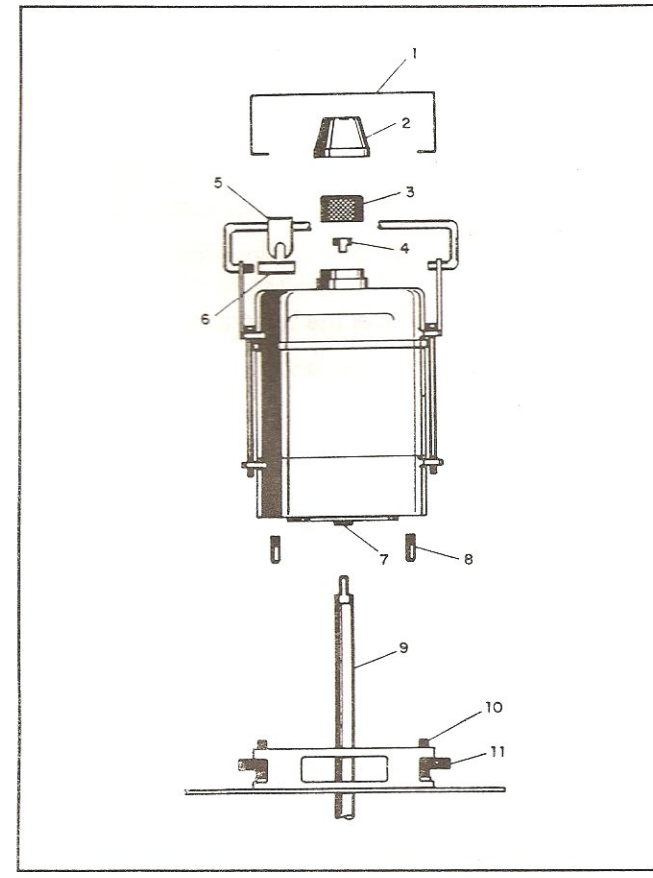


Figure 17. "QH" Series Motor

D. Disassembly of Tri-Rod Pumps:

1. Remove pump cover plate (one piece casting only) or bottom volute (two piece casting).

2. Remove cotter pin, then impeller nut.

3. Remove impeller and spring. Note direction of blades and mark bottom for aid in assembly.

4. Remove pump body and Tri-Rod column assembly from the motor. Do not disassemble pump-motor shaft unless shaft is damaged.

E. Servicing Shaft:

Make sure shaft is straight. If shaft has excessive runout (.010 TIR), disassemble pump. Lay motor with shaft attached, horizontally on a flat surface. Rotate shaft manually, check with a gauge for run-out. If shaft runs out, block coupling securely, then tap shaft with a soft hammer to straighten.

F. Servicing Lower Bearing:

H553 and H554 pumps have a lower bearing housing that is easily serviced should the bushing wear out.

1. Remove the bottom bearing housing and using a suitable driver, tap the bushing out of the housing.

2. Press the new bushing into the housing until it bottoms.

3. If the shaft sleeve is worn, remove the sleeve and install a new sleeve on the shaft.

NOTE: Use care so the shaft is not damaged during disassembly

4. Reinstall the bottom bearing housing.

G. Cleaning Pump:

Periodic cleaning of pump in a solvent or water base cleaner is advisable. Be sure to protect the lower part of the motor from solvent, water or steam. Otherwise, the lower motor bearing may be contaminated with solvent. Flushing in the container will suffice for some color changes or short shut downs.

Extra pumps and hoses permit cleaning at leisure with minimum labor.

Use pumps for color ranges like dark blue, black and deep brown. Use other pumps for light pastels, etc. It will not be necessary to clean pumps so thoroughly if this practice is followed.

Liners for ink tanks are also available and will help the cleaning process.

H. Inspecting Explosion Proof Motors:

Inspect the connections between the motor and bell, nipple and electrical junction box (refer to Figure 4). No movement should exist at these connections.

Warning: **If any movement is found, the motor must be taken out of service immediately and serviced by a qualified repair service licensed to repair explosion proof motors. Failure to follow these instructions could create a serious electrical hazard to the equipment and a SEVERE SHOCK HAZARD to personnel.**

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