



2" Cast Iron Self-Priming Centrifugal Pump Instruction Manual

222 Series

Read these instructions and the instructions covering operation of the pump drive unit. Do not operate the gas engine (if so equipped) until you have put oil in the engine. Do not run the pump dry. Always fill the pump with water or the liquid being pumped before starting the drive unit to avoid premature pump seal failure.

The gas engine (if so equipped) is shipped with no oil. Consult your owners manual for specific oil recommendations, maintenance procedures, schedules, and troubleshooting. The maximum angle of operation for gas engine drive units is 25° in all directions. For engine warranty service contact your local engine dealer.

Do not use flammable liquids. This pump is not designed or produced to pump flammable liquids of any kind. Failure to follow this warning can result in explosion, serious bodily injury or death.

Do not run the pump dry. Serious damage to the mechanical seal or complete failure of the mechanical seal can result from running the pump dry. Always fill the pump with water or the liquid being pumped before starting the drive unit.

Make certain that all hose and pipe connections are airtight. An air leak in the suction line may prevent priming and will reduce the performance of the pump.

Do not restrict the pump inlet. High volume pumps such as the Banjo 222 Series pumps should not have the inlet port or line restricted. If the pump is equipped from the factory with a 2" inlet flange, the pump should be plumbed with a 2" inlet line. Failure to follow these instructions can result in pump cavitation and pump failure.

Always place the pump as close to the liquid to be pumped as possible. Keep the suction line short and with few bends. Keep the pump and engine on a level foundation. A poor foundation and a heavy suction hose (made heavier when "primed" full of liquid) could result in a pump "down the hole". It is not necessary to drain the pump body after use, unless there is a danger of freezing.

There are important instructions regarding the preparation of the engine for long periods without use. (Reference the engine owners manual). Before long periods of storage, the pump should be flushed with clean water and drained. Leave all plugs (fill and drain) out of the pump. Always store the pump in a heated and dry building.

There are no points on the pump that need lubrication. The pump seal is cooled and lubricated by the fluid being pumped. When pumping dirty water or liquids containing solids, always use a basket strainer on the end of the suction line.

Engine warranty service available at authorized Honda & Briggs and Stratton Dealers.

Disassembly Instructions:

Tools required:

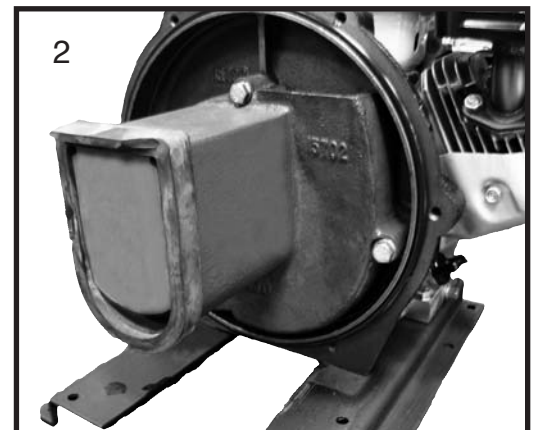
5/16" Box End Wrench

5/16", 13/16" & 5/8" Socket

1. Remove the (6) bolts (12715A) and lock washers (V10118) that hold the pump body assembly onto the rear bracket. Remove the body from the remaining pump assembly.

2. Remove the (3) bolts (12715A) and lock washers (V10118) holding the volute to the rear bracket. Remove the volute (15702) from the remaining pump assembly. Replace checkvalve if needed.

3. Remove the impeller bolt (12765A) from the impeller (15772).



Disassembly Instructions:

4. Screw the supplied 7/16" -14 hex head cap screw into the threaded hole in the impeller snout. As the bolt is tightened the impeller will be pulled off the shaft of the drive unit. Remove the 7/16"-14 hex head cap screw once the impeller has been removed from the drive unit.

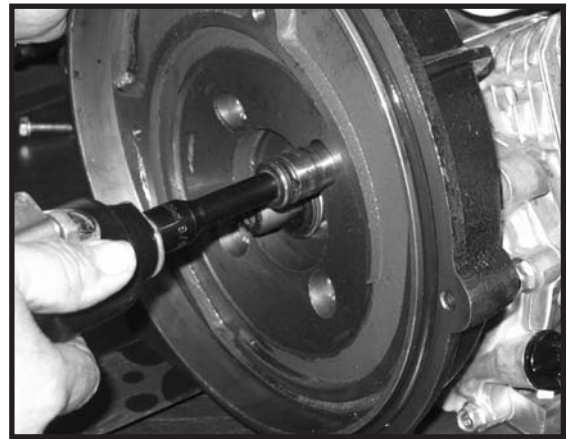
If the pump impeller is going to be reused, the primary ring of the seal (12733V) should be removed at this time. The impeller key (12902A) located behind the primary ring of the seal should also be removed.



4

5. Remove the (4) bolts (12715A) and lock washers (12901) that hold the rear bracket to the drive unit. With the 4 bolts removed the rear bracket can be removed from the drive unit. With the pump completely disassembled, clean all of the reusable parts thoroughly removing any traces of gasket material with a scraper or wire brush. Remove any corrosion on the sealing surfaces of the pump components.

When removing the rear bracket from the drive unit, check if there are any bracket shims (15751) installed between the two parts. If bracket shims have been installed from the factory, the same number of shims will need to be reinstalled during the reassembly of the pump.



5

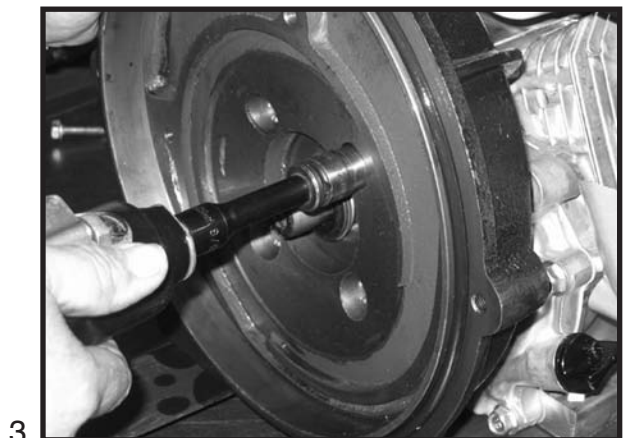
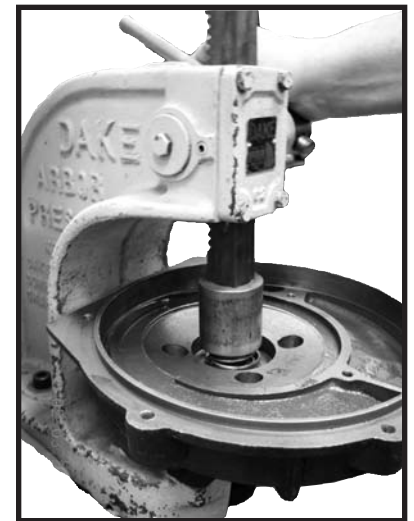
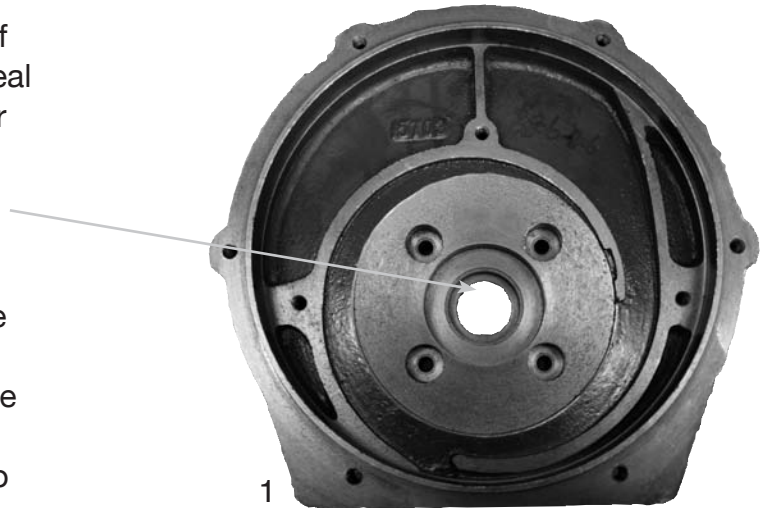
Assembly Instructions:

1. Place the seal O-ring (12710) behind the lip of the cup half of the seal. The cup half of the seal (12733V) should now be installed into the rear bracket as shown at right.

2. To install the cup half of the seal into the rear bracket, use a tool such as a 1" socket to give even pressure on the metal flange of the seal housing during installation. The seal should be pressed into its bore. Do not strike the seal with a sharp blow such as from a hammer. Do not press on the seal faces because they are brittle and will fracture from impact.

3. Install the rear bracket (15703) onto the drive unit using the (4) bolts (12715A) and lock washers (12901) originally used to attach the rear bracket to the drive unit. Be sure to install the correct number of bracket shims (15751) if the pump was assembled with shims from the factory. The handle of the rear bracket should be to the top of the drive unit. Tighten the rear bracket screws (12715A).

If the impeller originally had impeller shims (15751) in the impeller bore, install these shims now. Use the same number of shims that were originally in the pump from the factory. Place the impeller key (12902A) in the slot located inside the impeller snout.



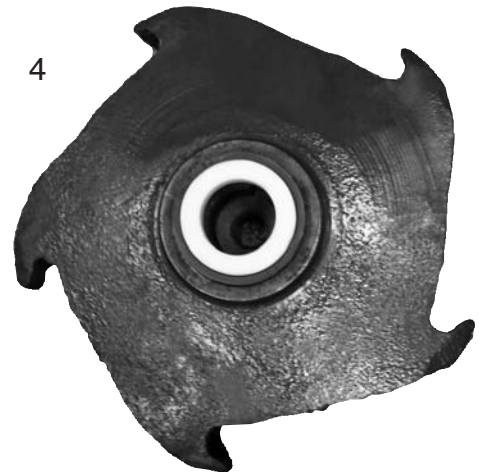
Assembly Instructions:

4. Install the primary ring seal half into the impeller. The seal half is pressed into the hub of the impeller by using both thumbs (shown in photo at left). The outside diameter of the primary ring may be sparingly coated with silicone to ease installation. The lapped or polished seal face must be installed face up.

Be absolutely sure that the primary ring seal half is bottomed out and installed squarely. If the installation is not square, seal wobble will occur leading to seal failure. Care must be used when handling the seal to not scratch or crack the seal surface. The seal surfaces must be kept oil and contaminant free.

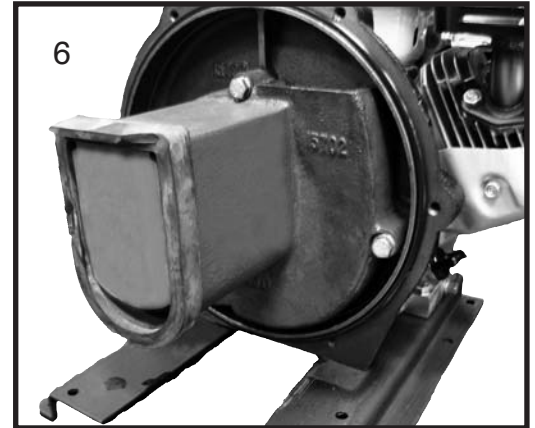
5. The impeller (15772 or 15773) is now ready to be slid onto the drive shaft unit. Be sure to align the impeller key with the keyway of the drive unit shaft. Secure the impeller to the drive unit shaft with the impeller bolt gasket (12774VA) and impeller bolt (12765A). Tighten the impeller bolt (12765A).

The impeller bolt will pull the impeller into its final position on the drive unit output shaft.



Assembly Instructions:

6. Install the volute (15702) onto the rear bracket using (3) bolts (12715A), and (3) lock washers (V10118). Tighten the (3) bolts (12715A) There should be .080" to .100" clearance between the impeller face and the volute face. If the minimum clearance is not achieved a bracket shim (15751) will have to be installed in the impeller bore to achieve the proper clearance. Install the volute checkvalve.



7. Place the main pump body o-ring (12719A) on the outside flange of the rear bracket. The gasket should be aligned with and placed over the two dowell pins on the rear bracket. The gasket may be lubricated with chapstick or petroleum jelly. Lubricating the gasket in this manner will help the parts not to stick to the cast iron parts it is sealing against.



8. Install the pump body (15712) onto the rear bracket aligning the pump body with the dowell pins on the rear bracket. Secure the pump body to the rear with six bolts (12715A) and (6) lock washers (V10118).

Pump is ready for operation.



TROUBLESHOOTING GUIDE:

1. GAS ENGINE WILL NOT START.

- a. Verify that there is no external damage to the engine.
- b. Verify that engine has the manufacturer's recommended amount and grade of oil in the engine.
- c. Verify that the engine gas tank has been filled with a minimum of 87 octane unleaded gasoline. Verify that the gasoline is fresh and clean.
- d. Verify that the spark plug wires are properly connected to the spark plugs.
- e. Verify that the battery cables are tight and properly connected to both the battery and engine.
- f. Verify that the battery is fully charged and in good condition.
- g. Review starting procedures and/or trouble-shooting guide in engine owners manual.
- h. Contact the engine manufacturer for warranty assistance and repair information.

Honda: 800-426-7701

www.honda.com

Briggs and Stratton: 414-259-5262 www.briggsandstratton.com

2. PUMP WILL NOT PRIME.

- a. Verify that the customer is filling the pump with fluid prior to start up via the fill hole located on the top of the pump.
- b. Verify that the customer is not trying to lift fluid more than 15 vertical feet.
- c. Verify that the customer does not have any kinks in the suction line.
- d. Verify that the pump inlet or suction line is not clogged.
- e. Verify that the suction line does not have any vacuum leaks at any of the connections.
- f. Verify that the pump is operating at a minimum of 3450 RPM for lifting and self-priming applications. Banjo pump will not prime while operating below 1750 RPM.
- g. Verify correct pump rotation if an electric motor or hydraulic motor is being used. A counter clockwise rotation (right hand rotation) is required from the motor.
- h. Verify that the impeller spacing is no more than .110".

3. PUMP LOOSES PRIME DURING OPERATION.

- a. Verify that the customer is not trying to lift fluid more than 15 vertical feet.
- b. Verify that the customer does not have any kinks in the suction line.
- c. Verify that the pump inlet or suction line is not clogged.
- d. Verify that the suction line does not have any vacuum leaks at any of the connections.
- e. Verify that the pump is operating at a minimum of 3450 RPM for lifting and self-priming applications. Banjo pump will not prime while operating below 1750 RPM.

4. ENGINE RUNS BUT PUMP DOES NOT TRANSFER LIQUID.

- a. Verify that the pump is operating at a minimum of 1750 RPM. Banjo pumps may not operate below this RPM.
- b. Verify correct pump rotation if an electric motor or hydraulic motor is being used. A counter clockwise rotation (right hand rotation) is required from the motor.
- c. Verify that the impeller spacing is no more than .110".
- d. Verify that the impeller is secured to the engine shaft with a shaft key. This verification can be done by turning the impeller (via the impeller bolt) on the pump by using a 5/8" socket attached to a 6" extension. If the impeller turns without spinning drive unit the impeller the shaft key is broken or missing. Replace shaft key.
- e. Verify that the customer does not have any kinks in the suction or discharge lines.
- f. Verify that the pump inlet, outlet, suction line or discharge line is not (partially) blocked.
- g. Verify all plumbing system valves are open.

5. MOTOR RUNS BUT PUMP DOES NOT PERFORM ADEQUATELY.

- a. Verify that the pump is operating at a minimum of 1750 RPM. Banjo pumps may not operate below this RPM.
- b. Verify correct pump rotation if an electric motor or hydraulic motor is being used. A counter clockwise rotation (right hand rotation) is required from the motor.
- c. Verify that the impeller spacing is no more than .110".
- d. Verify that the impeller is secured to the engine shaft with a shaft key. This verification can be done by turning the impeller (via the impeller bolt) on the pump by using a 5/8" socket attached to a 6" extension. If the impeller turns without spinning drive unit the impeller the shaft key is broken or missing. Replace shaft key.
- e. Verify that the customer does not have any kinks in the suction or discharge lines.
- f. Verify that the pump inlet, outlet, suction line or discharge line is not (partially) blocked.
- g. Verify all plumbing system valves are open.

6. ENGINE BOGS DOWN DURING PUMP OPERATION / ELECTRIC MOTOR TRIPS CIRCUIT BREAKER DURING START UP OR OPERATION.

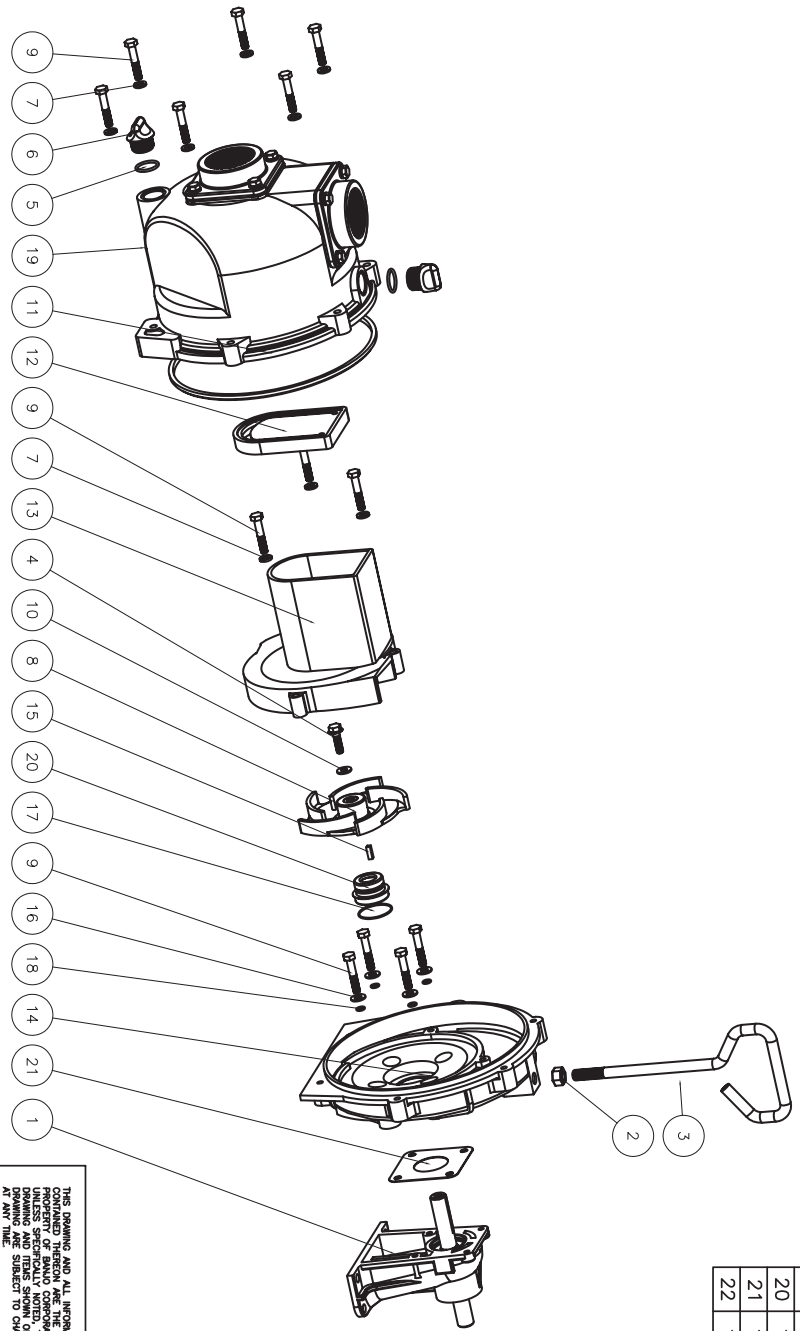
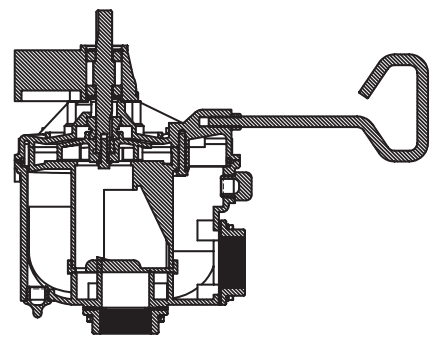
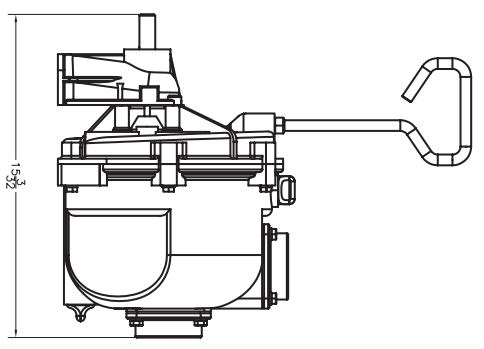
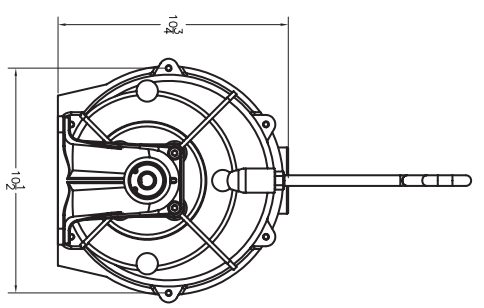
- a. Verify that the customer does not have any kinks in the suction or discharge lines.
- b. Verify that the pump inlet, outlet, suction line or discharge line is not (partially) blocked.
- c. Verify that the impeller spacing is no less than .080". The impeller should not be touching the wear plate/volute.
- d. Verify the weight of fluid being transferred. Make sure that the drive unit is properly sized for the pump and its application. If you are unsure of the application consult with engineering.

7. GRINDING, TICKING OR WHIRRING SOUND DURING PUMP OPERATION THAT IS UNUSUAL.

- a. Verify that the impeller bolt has not loosened, letting the impeller pull itself into the volute. The impeller spacing should be no less than .080". The impeller should not be touching the wear plate/volute.
- b. Verify that outside diameter is not hitting on the pump housing or volute. Have the customers slowly rotate the pump several times by hand. If the customer can feel the pump dragging on the housing or volute, or hear a scraping sound, the impeller may be hitting on the pump body or volute. The impeller can be removed from the pump and either filed down or turned down slightly on a lathe.
- c. Remove the pump housing and inspect for internal debris such as rocks, sticks or other foreign material stuck inside of pump. With the pump housing and volute removed the customer can then inspect the impeller face and outside diameter for signs of contact between the impeller and other pump components.

8. PUMP/ENGINE RAN FOR A WHILE, THEN QUIT & THE PUMP/ENGINE WILL NOT RESTART.

- a. Verify that there is no external damage to the engine.
- b. Verify that engine has the manufacturers recommended amount and grade of oil in the engine.
- c. Verify that the engine gas tank has been filled with a minimum of 87 octane unleaded gasoline. Verify that the gasoline is fresh and clean.
- d. Verify that the spark plug wires are properly connected to the spark plugs.
- e. Verify that the impeller bolt has not loosened, letting the impeller pull itself into the volute. The impeller spacing should be no less than .080". The impeller should not be touching the wear plate/volute.



Parts List		
Item	Qty	PART NO. DESCRIPTION
1	1	12882A BEARING PEDESTAL
3	1	15022 2" PUMP HANDLE
4	1	12765A HHFS 5/16-24X1.13
5	2	13778 2-119 ORING
6	2	13777 PRIME/DRAIN PLUG
7	9	V10118 5/16" LOCKWASHER
8	1	15772 5 VANE IMPELLER
9	13	12715A HHCS 5/16-24X1.75
10	1	12774VA IMPELLER BOLT GASKET
11	1	12719A 2-375 ORING
12	1	12705 CHECK VALVE
13	1	15702 VOLUTE
14	1	15703 REAR BRACKET
15	1	12902A 3/16 SQ X 5/8 KEY
16	4	12901 5/16" FLAT WASHER
17	1	12710 2-029 ORING
18	4	12717 2-011 ORING
19	1	15712 PUMP BODY ASSY.
20	1	12733V MECH. SEAL ASSY.
21	1	15751 REAR BRKT SHIM
22	1	12910 PUMP DECAL (N/S)

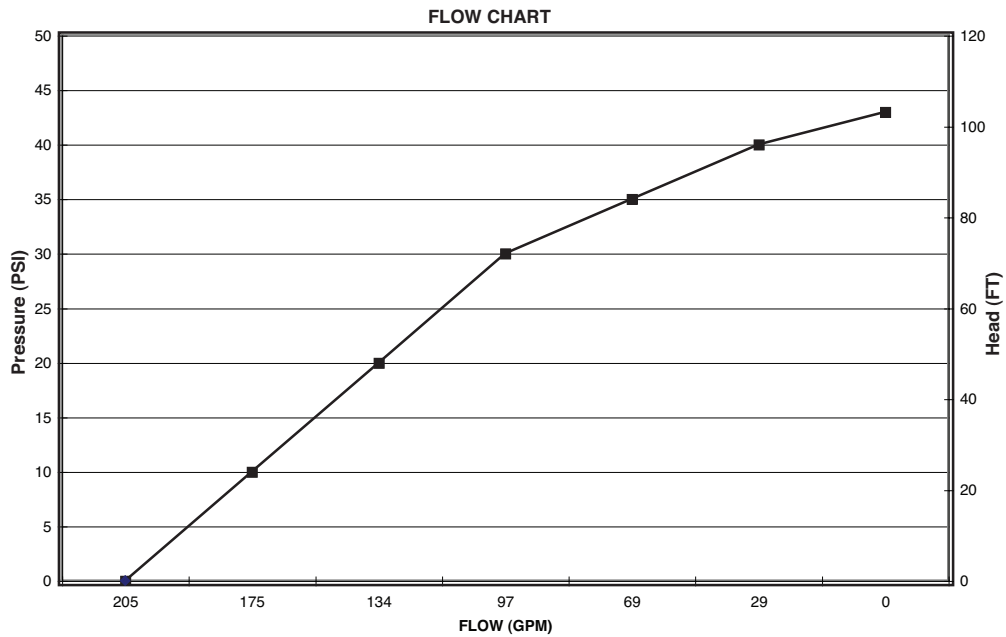
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PART NO. 222PBI

TITLE 15000 SERIES PUMP W/ BEARING PEDESTAL



222PIH5



222PI6PRO

222 Series
 222PI6PRO
 222PIH5
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222PBI

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