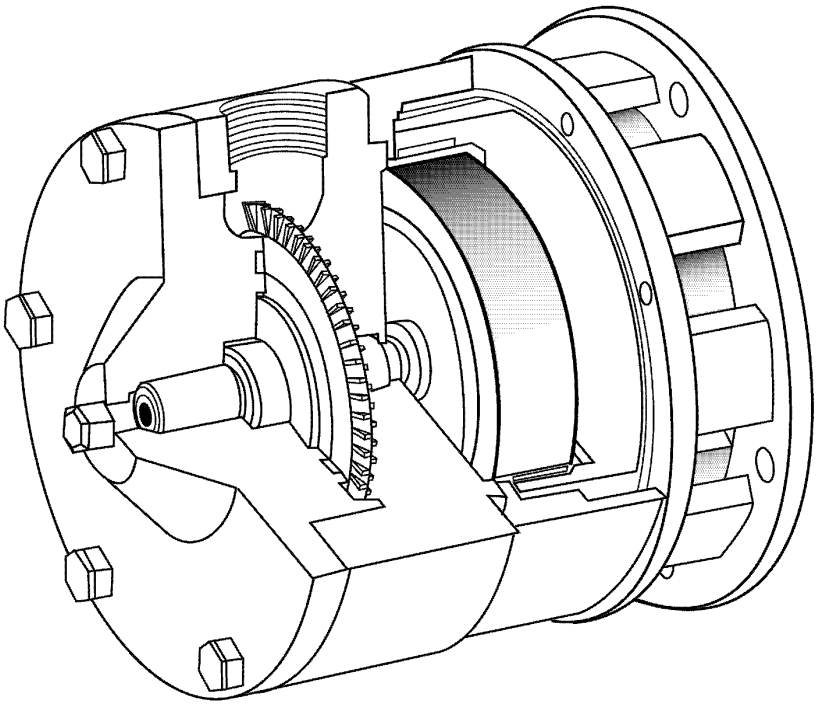
PULSAFEEDER®

A Unit of IDEX Corporation

Isochem®

Regenerative Turbine Pump

Installation
Operation
Maintenance
Instruction



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PULSAFEEDER®

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Controls and Systems

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ISOCHEM RGT FACTORY SERVICE POLICY

If you are experiencing a problem with your Isochem pump, first review the troubleshooting guide. If the problem is not covered or cannot be solved, please contact your local authorized Sales Representative or our Technical Service Department at (585) 292-8000 for further assistance.

Trained individuals are available to diagnose your problem and arrange a solution. Solutions may include purchasing a replacement unit or returning the pump to the factory for inspection and repair. All returns require a Return Material Authorization (RMA) number to be issued by Pulsafeeder. Replacements purchased under a possible warranty situation may be credited after an examination of the original equipment by Pulsafeeder personnel.

All components may be purchased for field replacement. Refer to the appropriate IOM section for more information and part numbers. Parts purchased to correct a warranty issue may be credited after examination of the original parts by Pulsafeeder personnel. Parts returned for warranty consideration that test satisfactorily, will be sent back to the originator via freight collect.

Any field modifications will void the Pulsafeeder warranty. Out-of-warranty repairs will be subject to Pulsafeeder's standard bench fees and testing costs associated with replacement components.

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Conventions

For the remainder of this bulletin, the following Conventions are in effect.

A WARNING DEFINES A CONDITION THAT COULD CAUSE DAMAGE TO BOTH THE EQUIPMENT AND THE PERSONNEL OPERATING IT. PAY CLOSE ATTENTION TO ANY WARNING.

Notes are general information meant to make operating the equipment easier.

Change History

Rev #	Date	Author	Section	Nature of Change
A	5/22/00	RM	Appendix E	Updated Performance Curves.
		CA	Appendix D	Updated Bill of Materials.
B	7/26/00	RM	5.0	Updated Disassembly & Reassembly Procedures.
	7/26/00	CA	Appendix B	Updated Exploded Drawings.
			Appendix D	Updated Bill of Materials.
			Appendix E	Updated Performance Curves.
C	6-30-2005	BMJ	Misc	Verbiage updates
			Section 2	Added safety information
			Section 6	Updated reassembly instructions specific to shimming of front cover for proper clearances

1. Introduction

The Isochem® Regenerative Turbine pump (RGT) is uniquely different from the more familiar types of pumps. As the pumped liquid progresses from suction to discharge, it is continuously circulated between the impeller vanes and the walls of the flow passage in a helical path, the axis of which coincides with the flow passage. This process results in a significantly higher buildup of pressure than that which occurs in the similar but simpler centrifugal pump.

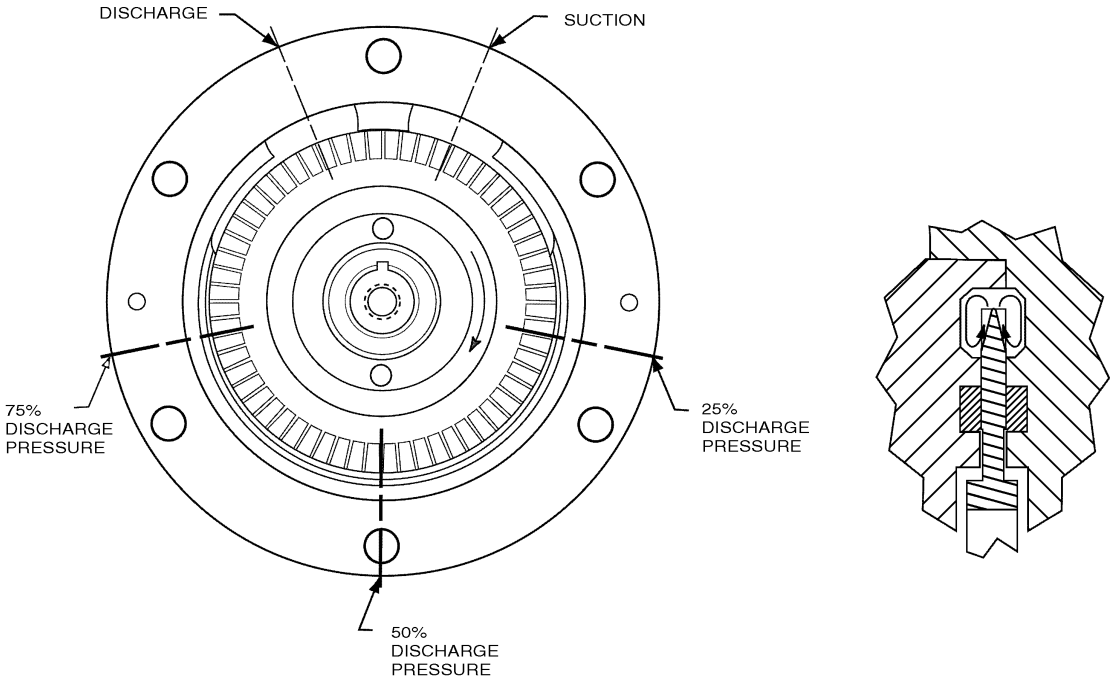


Figure 1

The turbine pump is in many ways an intermediate between the centrifugal and positive displacement types. As discharge pressure increases, flow decreases and the power required to drive the pump increases.

Flow is directly controlled by discharge pressure: the greater the pressure, the lower the flow rate. This can be most readily achieved by throttling the discharge; however care must be taken to not exceed the power level of the motor. Flow can be regulated using a variable bypass system, allowing operation at reduced pressure and power draw by dumping excess flow, usually back to a supply tank.

A very small clearance is maintained between the impeller, wear plates, and other internal surfaces. Since the impeller floats freely in the axial direction relative to the pump, a film of fluid is present on either side of the impeller so that there is no contact and negligible wear between impeller and wear plates.

Isochem RGT pumps use magnetic coupled, sealless technology, which eliminates the need for a rotary mechanical seal and enables the pump to handle hazardous fluids safely with zero leakage.

Standard Isochem RGT pumps are close-coupled (motor mounted directly to the rear of the pump) which provides greater assembled strength, enclosure of moving parts, and compact design. An optional power frame unit is available if required for motor compatibility (see ***Appendix G***).

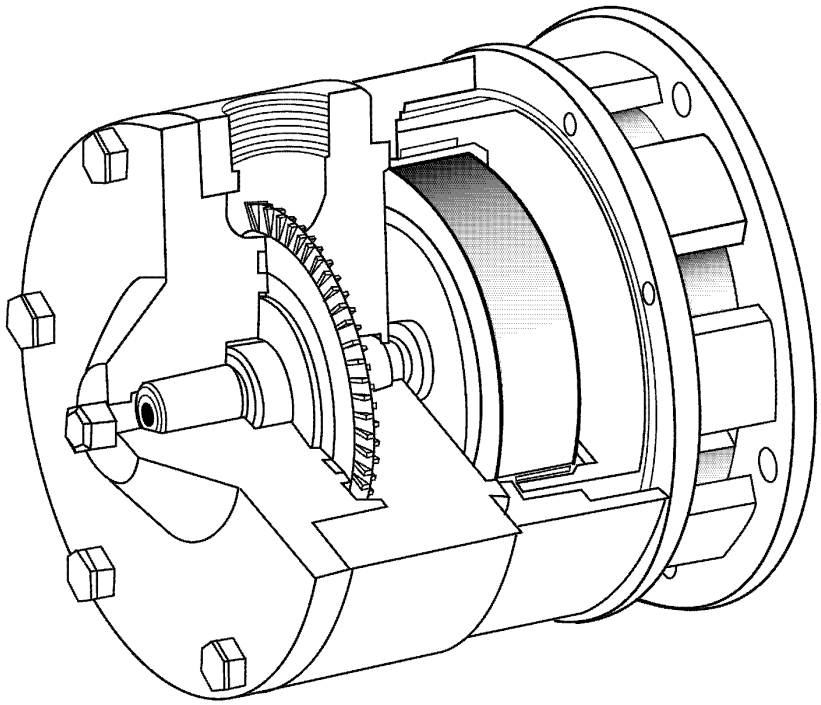
All Isochem pumps transmit rotation from the motor shaft to the impeller shaft by means of a magnetic drive coupling. An encapsulated driven magnet assembly is installed on the end of the impeller shaft. It is surrounded by a containment can, which constitutes the rearmost part of the pump enclosure. A drive magnet installed on the motor shaft rotates around the containment can. Drive torque is transferred through the containment can by magnetic attraction between the drive and driven magnet assemblies, causing the pump shaft to rotate. The containment can acts as a fluid barrier, eliminating the need for a dynamic seal.

The magnetic coupling has an inherent characteristic that causes it to "decouple" if the coupling torque limit is exceeded. This could happen if a piece of foreign material were to jam the pump impeller or if unusually high torque was developed for any reason.

The magnets can operate decoupled for short periods of time without losing their magnetic strength provided that temperature does not exceed specified limits (refer to ***Appendix A – Pump Specifications***).

The Isochem RGT pump is available in several different materials, and care should be taken that all pump components (housing, wearplates, bearings) are compatible with the process liquid.

Consult with the factory for applications involving a specific gravity or viscosity greater than that of water.



2. Safety Considerations

- Read and understand all related instructions and documentation before attempting to install or maintain this equipment
- Keep this and all documents (specification sheets, shipment records, maintenance records) in a safe place which is accessible to those who operate or maintain this equipment.
- Observe all special instructions, notes, and cautions.
- Act with care and exercise good common sense and judgment during all installation, adjustment, and maintenance procedures.
- Ensure that all safety rules, work procedures, and standards that are applicable to your company and facility are followed during the installation, maintenance, and operation of this equipment.
- Use for any application other than as described within this documentation is considered unsafe and voids all certification markings and warranties.
- Always ensure that all factory supplied guards and covers are in place before operating this equipment.
- The Isochem series of pumps relies on strong magnets to transfer power from the drive to the pump system. Users are cautioned to keep magnetically sensitive items such as watches, credit cards and ID badges, and medical equipment away from the pump and drive mechanisms.
- See additional maintenance precautions listed in ***Section 6.***

3. Equipment Inspection

Check all equipment for completeness against the order and for any evidence of shipping damage. Shortages or damage must be reported immediately to the carrier and to your Isochem supplier.

If immediate installation is not scheduled, the following steps should be taken:

1. Leave pump in the original shipping carton.
2. Store indoors in a dry environment. Avoid temperature variations.
3. Leave all shipping plugs in place.
4. Contact the motor manufacturer for specific motor storage information.

Occasionally during shipment, storage, or installation. misalignment or other damage can occur. For this reason it is recommended that each unit be tested with water in some convenient area prior to piping into the actual process system.

4. Installation Requirements

The pump installation site should provide easy access for routine maintenance and when possible to protect the pump from the elements and from leaks or drips from nearby process equipment.

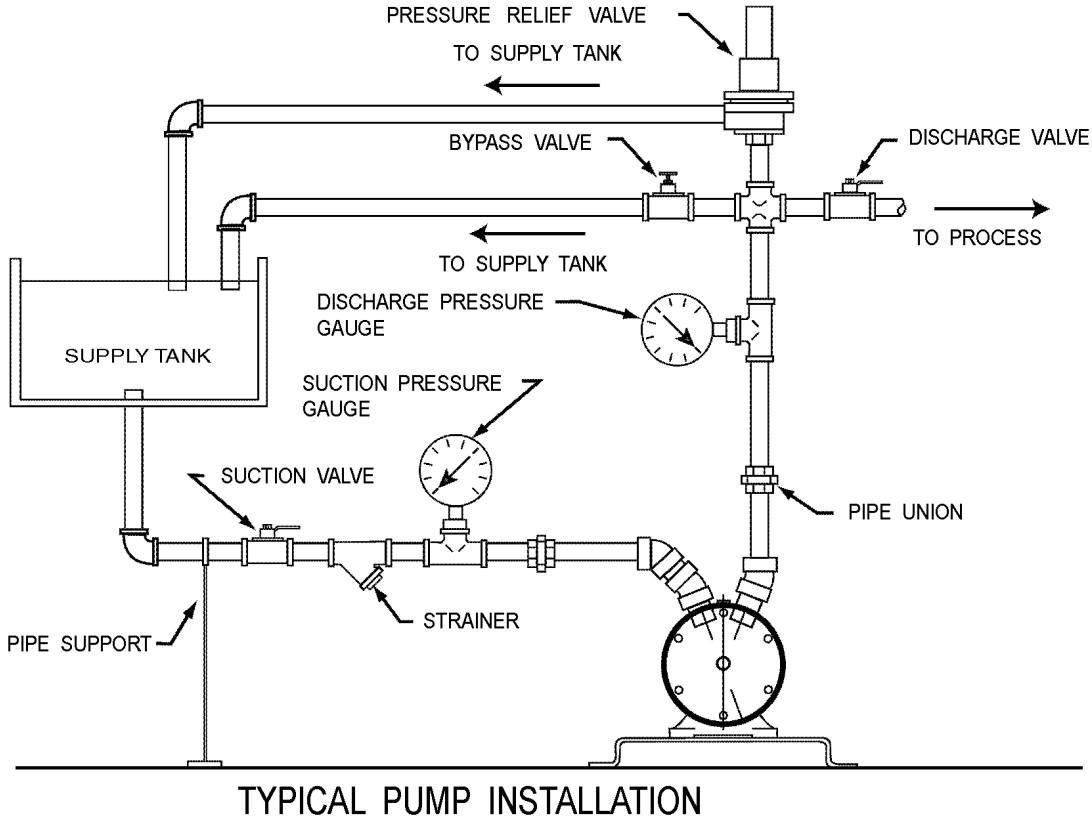


Figure 2

NOTE

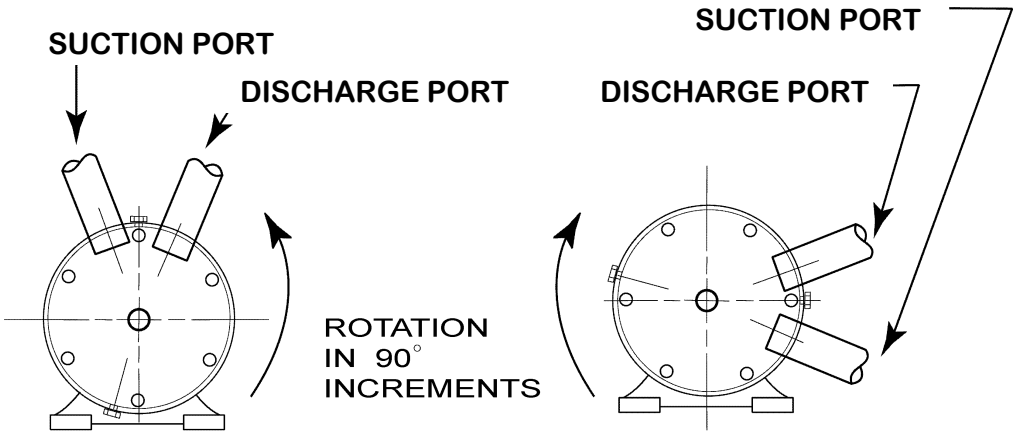
IN A POWER FRAME (THAT IS, NOT CLOSE-COUPLED) INSTALLATION, THE USE OF A LOW-BACKLASH OR RELATIVELY RIGID MOTOR COUPLING IS RECOMMENDED TO PREVENT MAGNETIC DE-COUPLING AT STARTUP OR UNDER WIDELY VARYING PROCESS CONDITIONS.

THE PROVISION OF A "SOFT-START" MOTOR STARTER WILL REDUCE THE POSSIBILITY OF MAGNETIC DE-COUPLING AT STARTUP WITH A FAST-STARTING OR OVERSIZED MOTOR.

AS THE PUMP IS SUPPORTED BY THE MOTOR MOUNT, TAKE CARE THAT THE SUCTION AND DISCHARGE PIPING DOES NOT APPLY FORCES OR MOMENTS (TWISTING) TO THE PUMP.
FOR OPTIMUM PERFORMANCE, A MINIMUM 1-1/2 INCH SUCTION LINE SIZE IS RECOMMENDED

1. Bolt the pump down firmly to the mounting surface. Provide for air movement over the electric motor as required.

   The pump is functionally symmetrical so that the suction and discharge ports can be reversed (with direction of rotation) and the housing (with cover) can be rotated to suit the installation if required. Refer to ***Figure 3***, for typical installation and the required relation between rotation and direction of flow.



TYPICAL PUMP PORT ORIENTATION

Figure 3

2. It is recommended to install vacuum/pressure gauges in the suction and discharge lines to monitor system operation.

3. Keep suction lines short and straight to minimize friction loss to the pump. Make sure that the pump will not starve or run dry. Flooded suction or gravity feed of fluid to the pump inlet is preferred and eliminates manual priming.

4. Use only full-bore ball valves or gate valves in the suction piping. If suction strainers are used, size them to minimize pressure drop and select a type that is easily cleaned. Strainers should be regularly inspected and cleared of debris as required during operation.

NOTE

THE ISOCHEM RGT PUMP SHOULD BE USED TO PUMP CLEAN, CLEAR LIQUIDS ONLY. THIS PUMP CANNOT HANDLE SOLIDS OR PARTICULATES IN THE PROCESS STREAM.

5. Arrange all suction piping and fittings to prevent formation of air pockets. Make sure all joints are air tight.

6. Flush all suction lines prior to mating up to the pump. Use unions or other appropriate fittings for ease of maintenance.

7. Do not spring piping, either suction or discharge, when mating up to the pump. Use supports or hangers at intervals as required. When necessary, provide for thermal expansion and contraction so that no strain is placed upon the pump.

8. Check all bolts and nuts for tightness. Correct any conditions that could cause destructive vibration or leakage.

9. When required, provide a proper system for containment can flush and/or drain.

10. If start-up screens are used, be sure they do not clog and starve the suction system. Start-up screens should be removed prior to placing the system into regular operation.

11. If a flexible suction line is used, select the materials and install them so that they do not collapse (causing a starved condition).

12. When taking suction from a tank or vessel, avoid entry of sludge, solids, etc. into the suction line by placing the suction line inlet above maximum level of solids.

13. When a bypass system is used to control flow from the pump, the bypassed fluid should be piped back to the suction vessel to prevent heat build-up due to recirculation. If it is absolutely necessary to pipe bypass back to the pump suction line, the point of entry should be at least 10 pipe diameters away from the suction inlet. Provision for cooling should be made in the event of excessive heat buildup caused by fluid recirculation.

14. Where pumped fluids may solidify, crystallize, precipitate etc., provision should be made to thoroughly flush the pump and associated piping prior to periods of shutdown. Pay particular attention to proper flushing and draining of the magnetic coupling area because this area will not self drain. There is a drain plug in the rear housing for access to this area.

5. Startup and Operation

- **DO NOT DEAD-HEAD**
- **DO NOT RUN DRY**
- **DO NOT OPERATE AT FLOW RATES BELOW 2-3 GPM EXCEPT MOMENTARILY**

Prior to operation, recheck the suction system to be sure NPSH available to the pump is adequate. Reference ***Appendix G – Performance Curves*** for more information. Make sure all suction piping is air tight and clean.

If the pump is equipped with a Power Frame motor mounting arrangement, consult ***Appendix F*** for oil fill instructions.

Turn the pump over by hand. If any mechanical binding or other trouble is detected, determine the cause and correct.

Check that electrical service to the motor agrees with the name plate ratings. Jog to check rotation and reconnect the motor if necessary.

THE PUMP SHOULD NEVER BE RUN DRY. DAMAGE TO IMPELLER, BEARINGS AND WEAR PLATES WILL RESULT. PUMPS SHOULD NEVER BE OPERATED CONTINUOUSLY AT FLOW RATES BELOW 2 GPM (SIZE 10) OR 3 GPM (SIZE 12). LOCALIZED HEATING WILL REDUCE OPERATING CLEARANCES AND CAN CAUSE DAMAGE TO THE IMPELLER, COVER, AND/OR REAR HOUSING.

The pump must be primed before operation and any **air must be vented** from the casing. If foot valves are used, the valve should be of the flapper type and sized to minimize friction loss. Threaded and plugged vents in the pump casing can be provided as an option.

Do not operate the pump against a closed discharge, as this can cause the magnetic drive to decouple. Decoupled operation causes high temperatures that can boil the fluid or damage the magnet assemblies. Should de-coupling occur, stop the motor and restart after the stoppage has been cleared. As a safety precaution, a pressure relief valve bypass system is recommended. Ideally, the pressure relief valve can be set at a low-pressure trip point for startup, ensuring that fluid rapidly and fully floods the pump casing.

Start the pump with the discharge valve slightly open and check for proper operation. Excessive noise or vibration is an indication of harmful cavitation caused by insufficient NPSH. Stop the pump, and correct the issue as required.

6. Maintenance

The timing for maintenance of the pump is established primarily on past performance. Each installation is different. Therefore detailed maintenance records of past performance can be invaluable for determining future preventative maintenance intervals. During routine pump inspections pay particular attention to the bearings, wearplates, and impeller, as those areas will determine future maintenance intervals. For motor maintenance instructions consult the motor manufacturer.

Before performing any maintenance requiring pump disassembly, be sure to flush and drain pump and magnetic drive sections thoroughly with a neutralizing fluid. Wear protective clothing and handle equipment with proper care.

1. When changing a pump from one service to another, be sure to check that all wetted parts of the pump are compatible with the fluid to be handled and that the motor is sufficiently sized for the application. If in doubt contact your Isochem supplier.
2. All magnetic drive couplings have a specific maximum torque limit. If this torque is exceeded the drive will decouple. Operation in the decoupled mode should be avoided as high temperatures could be generated.
3. Should the pump exhibit reduced flow rate or pressure capability, noise, or otherwise abnormal operation, first refer to the troubleshooting section. If the problem cannot be found, inspect the pump for wear or damage. It can be easily opened for partial wet end cleaning and inspection without disturbing piping connections by removing just the front cover.

6.1 Maintenance Precautions

1. Drain and flush pump and magnetic drive before any pump disassembly. Access to the magnetic drive area is provided by a drain plug in the pump housing. Use caution as this section of the pump will not fully self-drain.
2. The exposed magnets on the drive magnet assembly are very fragile and will chip easily. Use extreme care while handling them. Keep wristwatches, credit cards, ID badges, and other sensitive items away from the magnetic fields.
3. Take care to avoid particles or objects from attaching themselves to the drive magnets. It is difficult to remove small particles and larger objects could be attracted with enough force to break the magnets.
4. Be careful during disassembly and re-assembly of the drive and driven magnet assemblies. The attraction forces are high and when the magnets come close together there is a strong tendency to snap together suddenly, possibly causing pinching or worse to fingers. Get help, often two people may be required to safely separate or re-attached the drive and driven sections of the pump.

DO NOT MACHINE THE MAGNETS IN THE DRIVE OR DRIVEN MAGNET ASSEMBLIES. THE DUST THAT WOULD BE PRODUCED IS HIGHLY FLAMMABLE.

5. The model number stamped on the pump nameplate identifies the pump type and other details. Refer to the model number chart if you are unsure of exactly what type of pump you have. Always refer to the full model and serial number in any correspondence with your Isochem supplier.

6.2 Disassembling the No. 10 Pump

The item numbers listed in parenthesis refer to the exploded drawings found in *Appendix B*.

1. Close the suction and discharge valves.
2. Disconnect the power source from the motor.
3. Flush and drain the pump, and disconnect the piping.
4. Drain the containment can through the rear housing drain plug (item 27) (refer to ***Figure 4***).
5. Remove the cover bolts (items 15) and remove the front cover (item 2) by carefully withdrawing it straight back to avoid damage as the drive shaft (item 4) is withdrawn from the cover bearing (item 9).
6. The two housing pins (items 13) should remain in place in the rear housing (item 1).
7. Remove the thin plastic shims (item 3), if any, between the cover and the housing. (The standard shim is plastic. Metal shims are used at higher temperatures.)
8. Remove the rear housing screws (item 26) and separate the rear housing (item 1) from the casing (item 20). This will require physical force to overcome the magnetic attraction between the drive and driven magnet assemblies. Do not pry on one edge, but carefully withdraw it straight back to avoid damage. The magnets are fragile and easily damaged by rough handling. Two people may be required to separate the magnets safely.
9. Use a small screwdriver to remove the retaining ring (item 14) from the impeller assembly (item 6) shaft at the rear of the driven magnet assembly (item 18) and withdraw the driven magnet assembly (item 18) from the impeller assembly shaft, taking care to retain the magnetic coupling drive key (item 8).
10. The spool is removed by removing the motor bolts (item 23) and withdrawing it back from the motor.
11. Remove the retaining ring (item 14) at the rear of the rear housing (item 1) from the impeller assembly (item 6) shaft.
12. Remove the impeller assembly from the front of the rear housing.

NOTE **Do not remove the drive magnet assembly unless it or the motor is to be replaced.**

13. If removal of the drive magnet is required, perform the following steps:

    a) Remove the guard screw (item 37) from the guard.

    b) Remove the guard (item 38) from around the spool.

    c) Remove the casing bolts (items 35) and withdraw the casing (item 20).

    d) Loosen the drive magnet assembly set screw (item 24).

Rotate the drive magnet assembly until the set screw is visible through one of the slots in the spool (item 29). Use a 1/8-inch Allen wrench to loosen the set screw. A second hole has been added to the drive magnet assembly for balance purposes. This "balance hole" is located 180° from the set screw

    e) Slide the drive magnet assembly off the motor shaft.

14. The spool is removed by removing the motor bolts (items 23) and withdrawing it back from the motor.

15. Thoroughly clean all parts before reassembly.

6.3 Disassembling the No. 12 Pump

The item numbers listed in parenthesis refer to the exploded drawings found in *Appendix B*.

1. Close the suction and discharge valves.
2. Disconnect the power source from the motor.
3. Flush and drain the pump, and disconnect the piping.
4. Drain the containment can through the rear housing drain plug (item 27) (refer to ***Figure 4***).
5. Remove the cover bolts (items 15) and remove the front cover (item 2) by carefully withdrawing it straight back to avoid damage as the drive shaft (item 4) is withdrawn from the cover bearing (item 9).
6. The two housing pins (items 13) should remain in place in the rear housing (item 1).
7. Remove the thin plastic shims (item 3), if any, between the cover and the housing. (The standard shim is plastic. Metal shims are used at higher temperatures.)
8. Remove the rear housing screws (items 26) and separate the rear housing (item 1) from the casing (item 20). This will require physical force to overcome the magnetic attraction between the drive and driven magnet assemblies. Do not pry on one edge, but carefully withdraw it straight back to avoid damage. The magnets are fragile and easily damaged by rough handling. Two people may be required to separate the magnets safely.
9. Use a small screwdriver to remove the retaining ring (item 14) from the impeller assembly (item 6) shaft at the rear of the driven magnet assembly (item 18).
10. The containment can (item 19) can be withdrawn from the casing (item 20). The containment can "O"-ring (item 28) will normally remain in position on its rabbet on the back of the rear housing (item 1).

NOTE **Do not remove the drive magnet assembly unless it or the motor is to be replaced.**

11. If removal of the drive magnet is required, perform the following steps:

    a) Remove the guard screw (item 37) from the guard.

    b) Remove the guard (item 38) from around the spool.

    c) Remove the casing bolts (items 35) and withdraw the casing (item 20).

    d) Loosen the drive magnet assembly set screw (item 24).

Rotate the drive magnet assembly until the set screw is visible through one of the slots in the spool (item 29). Use a 1/8-inch Allen wrench to loosen the set screw. A second hole has been added to the drive magnet assembly for balance purposes. This "balance hole" is located 180° from the set screw.

    e) Slide the drive magnet assembly off the motor shaft.

12. The spool is removed by removing the motor bolts (items 23) and withdrawing it back from the motor.

13. Thoroughly clean all parts before reassembly.

6.4 Inspection

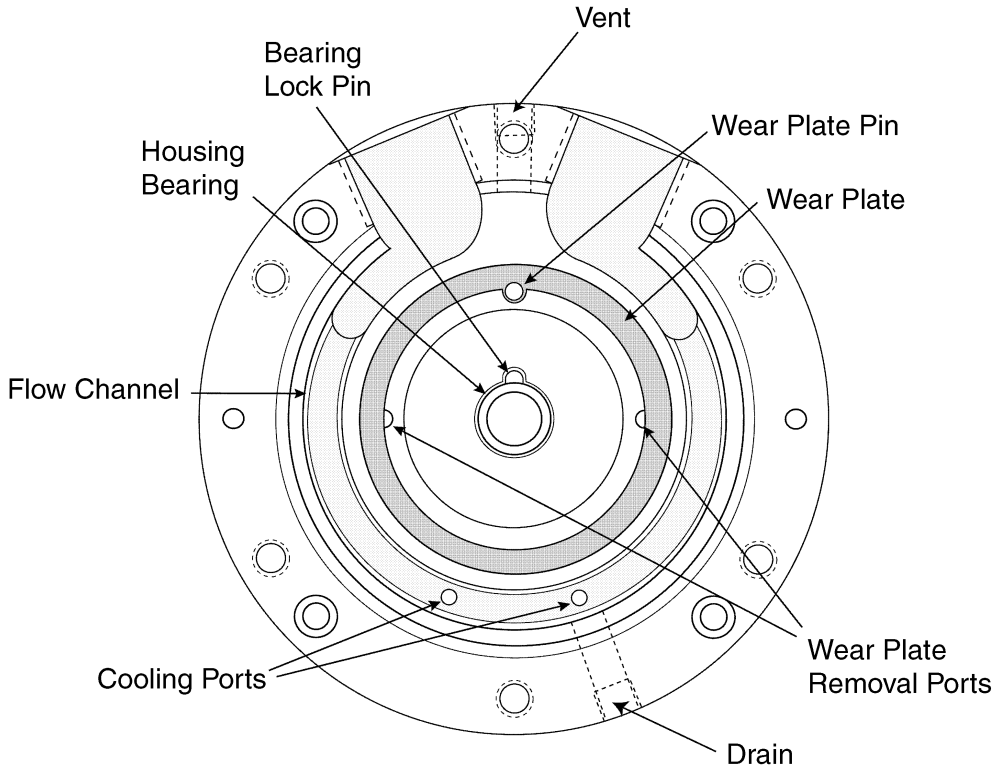


Figure 4

6.4.1 Flow Channel Inspection

The rear housing has two cooling ports located in the flow channel that divert essential cooling fluid to the magnetic drive chamber. Check and clear these ports if necessary using a piece of wire or a drill bit of appropriate size

NOTE

The Cooling Port size in standard pumps is 5/32” (4 mm).

6.4.2 Wear Plate Inspection

Inspect the two wear plates (items 11) for damage or wear.

The carbon wear plates are identical and are recessed in the front cover and rear housing. They should protrude slightly above the surfaces in which they are mounted (Verify this by dragging your fingernail across the mounting surface. Your fingernail should catch slightly as it passes over the wear plate.) If the wear plate does not protrude above the housing, replace it. Over time friction will cause a deterioration of the wear plates and a resultant reduction in pressure capability, which is cause for replacement of the wear plate in the absence of another known cause of pressure reduction.

Use of wearplates that do not meet original specifications may result in contact between the impeller and housings, causing damage to both components.

6.4.3 Shaft Bearing Inspection

Inspect the Cover bearing (item 9) and the Housing bearing (item 9) for damage or wear. The maximum diametrical clearance (bearing ID minus shaft OD) is 0.006 inches (0.15mm)

6.4.4 Choke Point Inspection

The “Choke Point” is the area between the two ports, and is the only place where the impeller and housing run closely together. A near-contact clearance is required in this area to maintain maximum pressure capability.

Perform an internal inspection as follows:

a) Inspect the outer diameter of the impeller (item 6).

b) Inspect inner surface of the cover (item 2) at the choke point, paying special attention to the area between the inlet and the outlet ports.

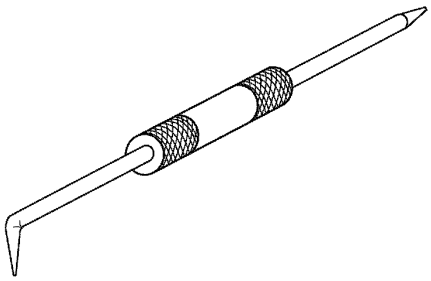
c) Inspect inner surface of the rear housing (item 1) at the choke point, paying special attention to the area between the inlet and the outlet ports.

Examine this area for evidence of scoring, corrosion, and any other physical damage or wear.

6.5 Parts Replacement

The item numbers listed in parenthesis refer to the exploded drawings found in *Appendix B*.

A dental–type tool such as the one shown to the right works well when removing the wear plates and bearings.



6.5.1 Wear Plates

1. Two small opposed holes are provided in the housing and cover adjacent to the outer surface of each wear plate (refer to ***Figure 4***). To remove the wear plate, insert a small tool in each hole and pry evenly between the two to facilitate plate removal without breakage.
2. Thoroughly clean all parts before reassembly.
3. To replace the wear plates, first ensure that both plates and grooves are **absolutely clean** and free of debris since the plates must seat fully.
4. Insert the replacement plate and press lightly all around to ensure uniform bottoming and to avoid breaking the carbon wear plates, which are relatively brittle. Ensure that the anti-rotation pin (item 12) remains in place; replacement of this part is not normally required. This part is identical to that used for both bearings in the Size 10 pump, but in the Size 12 pump, the bearing pin is different from the wearplate pin.

6.5.2 Bearings

When replacing bearings, ensure that the anti-rotation pin (item 12) remains in place; replacement of this part is not normally required.

6.5.3 Reassembling the No. 10 Pump

Trial fit new magnet assemblies on the shaft prior to final assembly. The magnet assembly must be free to move axially along the shaft between the retaining rings. Sharp edges especially around key ways may require hand dressing with a fine file so that this free movement is achieved.

1. If the motor has been removed or replaced, position it on its mounting bracket and tighten.
2. Position the spool (item 29) so that access to the guard screw hole is provided (refer to ***Appendix B***) and install and tighten the four (4) motor bolts (items 23).
3. Coat the motor shaft with a small amount of anti-seize compound.
4. Slide the drive magnet assembly onto the motor shaft.
5. Align the keyways in the motor shaft and the drive magnet assembly.
6. Slide the shaft key onto the shaft/drive magnet assembly. Position it axially so that the end of the motor shaft is **exactly flush** with the face of the drive magnet assembly.
7. Position the casing (item 20) on the spool (item 29).
8. Install and tighten the casing bolts (items 35) to 72 in. –lb (810 N-cm).
9. Move the drive magnet assembly by hand to verify free movement throughout its travel.

   If any clearance problem is noted, position the drive magnet assembly accordingly.
10. Coat the set screw with removable thread locking compound.
11. Start the set screw (item 24) in the drive magnet assembly (item 21).
12. Tighten the set screw through a hole in the spool (item 29) to 35 in.-lb (400 N-cm). The screw socket fits a 1/8” Allen wrench.

Because of the distortion usually applied during removal, all retaining rings should be replaced for reassembly.

13. Position the guard (item 36) around the spool (item 29) and insert and tighten the guard screw (item 37).
14. Insert the keyway end of the impeller assembly (item 6) shaft into the front of the rear housing (item 1), taking care to avoid damage to the housing bearing (item 9).

15. Install the Driven Magnet Assembly (item 18) on the drive shaft (item 4).

    a) Install the Driven Magnet Assembly inner retaining ring (item 14) by carefully expanding it over the end of the impeller assembly (item 6) and pushing it along the shaft past the front groove for the outer retaining ring, which will require that the ring be carefully expanded no more than necessary to pass the groove before arriving and seating fully in the back groove.

    b) Position the Driven Magnet drive key (item 8) in its keyway.

    c) Slide the Driven Magnet Assembly (item 18) on the impeller assembly (item 6). (The flat side towards the rear housing.)

    d) Install the Driven Magnet outer retaining ring (item 14) by carefully expanding it over the end of the impeller assembly (item 6) and pushing it into the its groove. Verify that the Magnet Assembly floats freely back and forth between the retaining rings. This requires that both retaining rings be fully seated in their respective grooves.

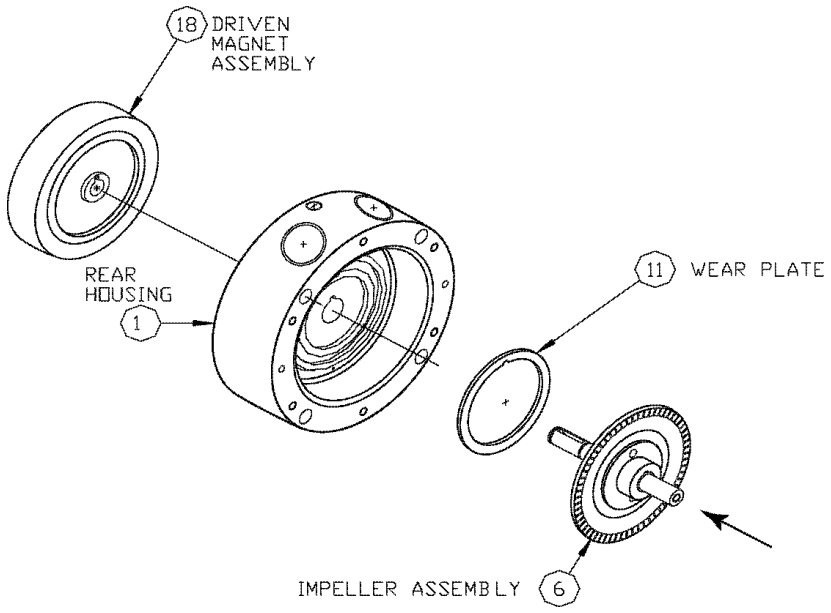


Figure 5

16. Install the containment can (item 19) in the casing.

17. Install a new containment can "O"-ring (item 28) on the back of the rear housing (item 1). Placing the "O"-ring in warm water prior to installation will momentarily soften the material making installation easier.

THE MAGNETIC ATTRACTIVE FORCE IS CONSIDERABLE. TAKE CARE NOT TO CHIP THE MAGNETS AND TO AVOID PINCHING OF FINGERS WHEN THE ASSEMBLY SNAPS TOGETHER.

18. Install the rear housing (item 1) to the casing (item 20).

    Magnetic attraction will draw the rear housing and the casing together. The use of four assembly guide pins screwed into the rear housing is recommended. These pins can be made from 1/4-28 threaded rod or cut-off bolts.

19. Install the rear housing screws (items 26). Tighten evenly to 72 in. –lb (810 N-cm) in an "X" pattern in small intervals (**do not** tighten one side excessively and then tighten the opposite side, as this will tend to crush the TFE "O"-ring and cause a leak).

20. Omitting the front cover "O"-ring, trial assemble the front cover with no shims (item 3).

    a) Install and hand tighten the cover bolts (items 15) evenly.

    b) Using feeler gauges, measure and record the gap between the rear housing and the front cover around the circumference of the pump, between each set of cover bolts.

    c) Add the six measurements and divide by six to determine the average clearance between the two surfaces.

    d) Reove the bolts and the front cover. Add shims equal to the measurement obtained in step "c" above. Red shims are 0.002" thick, and green shims are 0.003" thick. Use no more shims than necessary, as the pressure capability of the pump is directly related to the internal clearances between the impeller and the housings.

    e) After the shims are in place, install the O-ring (item28) over the inner barrel of the front cover, seating it fully and smoothly against the shoulder.

    f) Install the cover, taking care to avoid damage to the outer bearing (item 9) and ensuring that the O-ring seats in the rabbet in the rear housing without pinching. Install the cover bolts (item 15) and tighten to 220 in-lb. (2490 N-cm) using the pattern shown in ***Appendix B***.

g) Remove the pipe plug (item 27) from the central face of the front cover to expose the tapped hole in the end of the shaft and thread a 1/4-20 screw into the shaft to rotate the shaft (refer to ***Figure 6***). With the screw bottomed hand-tight in the shaft, free axial play of the shaft relative to the impeller can be confirmed by alternately pushing and pulling the screw. This condition is essential since it confirms that the impeller floats axially on the shaft. If there is significant resistance to rotation, additional shimming is required, using a starting value of 0.002".

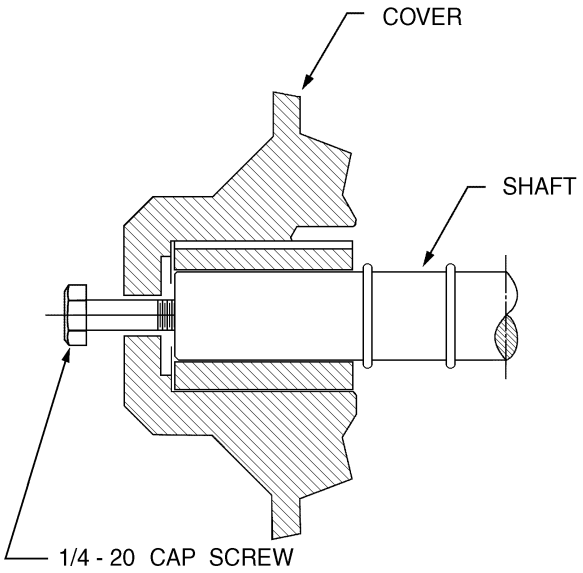


Figure 6

h) Remove the screw, and replace the access pipe plug (item 27) using pipe joint compound or tape.

21. Verify that the rear housing drain plug (item 27) is installed; if not, do so using pipe joint compound or tape.
22. Refer to the Installation and Startup instructions to return the pump to service.

6.5.4 Reassembling the No. 12 Pump

NOTE

Trial fit new magnet assemblies and impellers on the assorted shafts prior to final assembly. The magnet assembly and impeller must be free to move longitudinally along the shaft between the retaining rings. Sharp edges especially around key ways may require hand dressing with a fine file so that this free movement is achieved.

1. If the motor has been removed or replaced, position it on its mounting bracket and tighten.
2. Position the spool (item 29) so that access to the guard screw hole is provided (refer to ***Appendix B***) and install and tighten the four (4) motor bolts (items 23).
3. Coat the motor shaft with a small amount of anti-seize compound.
4. Slide the drive magnet assembly onto the motor shaft.
5. Align the keyways in the motor shaft and the drive magnet assembly.
6. Slide the shaft key onto the shaft/drive magnet assembly. Position it axially so that the end of the motor shaft is **exactly flush** with the face of the drive magnet assembly.
7. Position the casing (item 20) on the spool (item 29).
8. Install and tighten the casing bolts (items 35) to 72 in. –lb (810 N-cm).
9. Rotate the drive magnet assembly by hand, to verify free movement.

   If any clearance problem is noted, position the drive magnet assembly accordingly.
10. Coat the set screw with removable thread locking compound.
11. Start the set screw (item 24) in the drive magnet assembly (item 21).
12. Tighten the set screw through a hole in the spool (item 29) to 35 in.-lb (400 N-cm). The screw socket fits a 1/8” Allen wrench.

NOTE

Because of the distortion usually applied during removal, all retaining rings should be replaced for reassembly.

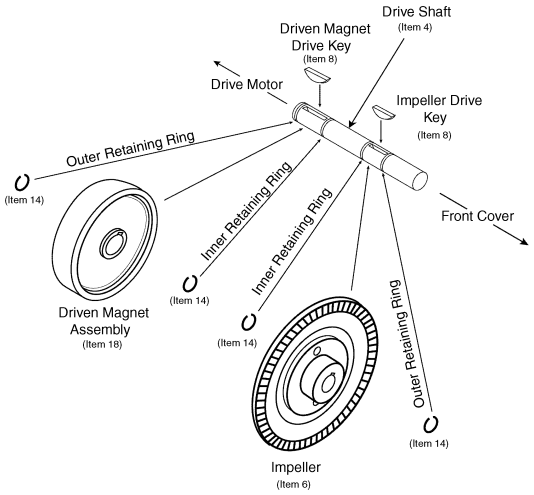


Figure 7

13. Position the guard (item 36) around the spool (item 29) and insert and tighten the guard screw (item 37).

14. Install the Driven Magnet Assembly (item 18) on the drive shaft (item 4).

    a) Install the Driven Magnet Assembly inner retaining ring (item 14) by carefully expanding it over the end of the drive shaft (item 4) and pushing it along the shaft past the front groove for the outer retaining ring, which will require that the ring be carefully expanded no more than necessary to pass the groove before arriving and seating fully in the back groove.

    b) Position the Driven Magnet drive key (item 8) in its keyway.

    c) Slide the Driven Magnet Assembly (item 18) on the driveshaft (item 4). (The flat side towards the rear housing.)

    d) Install the Driven Magnet outer retaining ring (item 14) by carefully expanding it over the end of the drive shaft (item 4) and pushing it into the its groove.

    Verify that the Magnet Assembly floats freely back and forth between the retaining rings. This requires that both retaining rings be fully seated in their respective grooves.

15. Insert the Drive Shaft (item 4) with the Driven Magnet Assembly (item 18) attached into the back of the rear housing (item 1), taking care to avoid damage to the housing bearing (item 9).

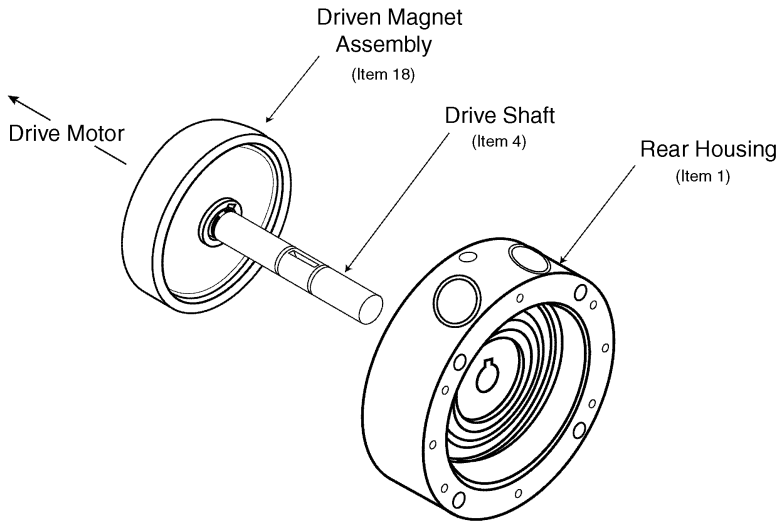


Figure 8

16. Install the Impeller (item 6) on the drive shaft (item 4).

    a) Install the Impeller inner retaining ring (item 14).

    Carefully expand the retaining ring over the end of the drive shaft (item 4) and push it along the shaft past the front groove for the outer retaining ring, which will require that the ring be carefully expanded no more than necessary to pass the groove before arriving and seating fully in the back groove.

    b) Position the Impeller drive key (item 8) in its keyway.

    c) Slide the Impeller (item 6) on the drive shaft (item 4).

d) Install the Impeller outer retaining ring (item 14) by carefully expanding it over the end of the drive shaft (item 4) and pushing it into the its groove.

Verify that the Impeller floats freely back and forth between the retaining rings. This requires that both retaining rings be fully seated in their respective grooves.

17. Install the containment can (item 19) in the casing.
18. Install a new containment can "O"-ring (item 28) on the back of the rear housing (item 1). Placing the "O"-ring in warm water prior to installation will momentarily soften the material making installation easier.

THE MAGNETIC ATTRACTIVE FORCE IS CONSIDERABLE. TAKE CARE NOT TO CHIP THE MAGNETS AND TO AVOID PINCHING OF FINGERS WHEN THE ASSEMBLY SNAPS TOGETHER.

19. Install the rear housing (item 1) to the casing (item 20).

Magnetic attraction will draw the rear housing and the casing together. The use of four assembly guide pins screwed into the rear housing is recommended. These pins can be made from 1/4-28 threaded rod or cut-off bolts.

20. Install the rear housing screws (items 26). Tighten evenly to 72 in. –lb (810 N-cm) in an "X" pattern in small intervals (**do not** tighten one side excessively and then tighten the opposite side, as this will tend to crush the TFE "O"-ring and cause a leak).
21. Omitting the front cover "O"-ring, trial assemble the front cover with no shims (item 3).

e) Install and hand tighten the cover bolts (items 15) evenly.

f) Using feeler gauges, measure and record the gap between the rear housing and the front cover around the circumference of the pump, between each set of cover bolts.

g) Add the six measurements and divide by six to determine the average clearance between the two surfaces.

h) Reove the bolts and the front cover. Add shims equal to the measurement obtained in step "c" above. Red shims are 0.002" thick, and green shims are 0.003" thick. Use no more shims than necessary, as the pressure capability of the pump is directly related to the internal clearances between the impeller and the housings.

i) After the shims are in place, install the O-ring (item28) over the inner barrel of the front cover, seating it fully and smoothly against the shoulder.

j) Install the cover, taking care to avoid damage to the outer bearing (item 9) and ensuring that the O-ring seats in the rabbet in the rear housing without pinching. Install the cover bolts (item 15) and tighten to 220 in-lb. (2490 N-cm) using the pattern shown in ***Appendix B***.

k) Remove the pipe plug (item 27) from the central face of the front cover to expose the tapped hole in the end of the shaft and thread a 1/4-20 screw into the shaft to rotate the shaft (refer to ***Figure 9***). With the screw bottomed hand-tight in the shaft, free axial play of the shaft relative to the impeller can be confirmed by alternately pushing and pulling the screw. This condition is essential since it confirms that the impeller floats axially on the shaft. If there is significant resistance to rotation, additional shimming is required, using a starting value of 0.002".

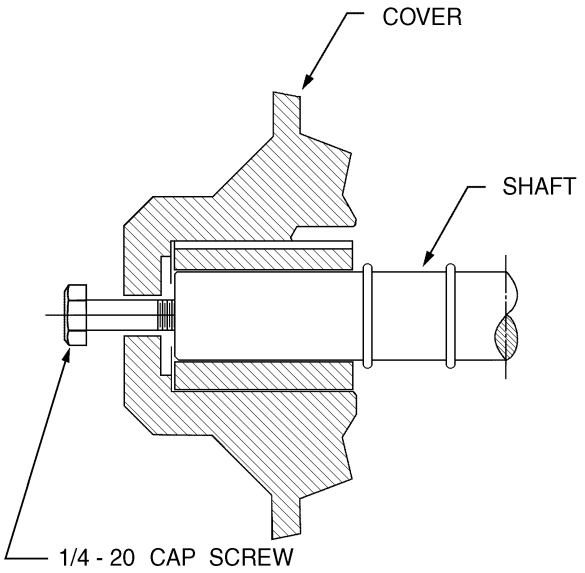


Figure 9

l) Remove the screw, and replace the access pipe plug (item 27) using pipe joint compound or tape.

22. Verify that the rear housing drain plug (item 27) is installed; if not, do so using pipe joint compound or tape.

23. Refer to the Installation and Startup instructions to return the pump to service.

7. Troubleshooting Guide

Symptom	Probable Cause	Remedy
No Liquid Delivered	Pump not primed.	Prime pump.
	Motor Incorrectly wired.	Check wiring diagram.
	Air leak in suction.	Locate and repair.
	Rotation direction incorrect.	Reverse rotation.
	Suction and/or discharge valves closed.	Open valves.
	Suction lift too high.	Do not exceed vapor pressure of liquid.
	Magnetic coupling decoupled.	Stop motor, eliminate blockage or jamming and restart. If no blockage exists verify that operating conditions do not exceed capabilities of the pump. If de-coupling persists upon startup, a "soft-start" motor starter may be required to accommodate a fast-starting or oversized motor.
Low Liquid Delivery	Discharge head higher than calculated.	Reduce discharge restrictions eg: Open throttle valve.
	Air leak in suction.	Repair leak.
	Rotational speed incorrect.	Check speed and wiring.
	Rotation direction incorrect.	Reverse rotation.
	Suction lift too high.	Increase suction pressure.
	Impeller or housing worn.	Inspect and repair as required.
	Wear plates worn.	Inspect and repair as required.
Low Discharge Pressure	Rotational speed incorrect.	Check Speed.
	Air leak in suction.	Repair leak.
	Air or gas in liquid.	Eliminate air or gas.
	Impeller or Housing worn.	Inspect and repair as required.
	Wear plates worn.	Inspect and repair as required.
Pump Gradually Loses Prime	Air pocket in suction line.	Eliminate pocket.
	Air entering suction line.	Keep suction inlet submerged at all times.
Pump Noisy	Pump worn or damaged.	Inspect and repair as required.
	Air or gas in liquid.	Eliminate air or gas.
Motor runs hot or Overloads	It is normal for motors to feel hot even when not overloaded.	Check the actual temperature of the motor housing with suitable instrumentation. Verify the figures with the motor manufacturer.
	Motor wired incorrectly.	Check wiring diagram.
	Voltage or frequency low.	Correct condition.
	Motor not sized correctly for the flow.	Higher pressures may require more power than the motor is capable of.
	Heavy or viscous liquid being pumped.	Pumping fluids heavier or more viscous than water requires a larger motor.
	Binding internal pump parts.	Inspect and correct condition.

Appendix A – Specifications

Pump Model	RGT 10	RGT 12
Maximum Flow, GPM (LPM) @ 3450 RPM	14.5 (55.0)	23.3 (88.3)
Maximum Flow, GPM (LPM) @ 2875 RPM	11.0 (41.7)	19.0 (72.0)
Maximum Flow, GPM (LPM) @ 1725 RPM	4.5 (17.1)	9.8 (37.1)
Maximum Head, FT (METERS)	427 (130)	693 (211)
Maximum Discharge Pressure, PSIG (Bar)	300 (20.7)	300 (20.7)
Maximum Suction Pressure, PSIG (Bar)	100 (6.9)	100 (6.9)
Suction Size	1" FNPT/FBSPT	1" FNPT/FBSPT
Discharge Size	1" FNPT/FBSPT	1" FNPT/FBSPT
Temperature Range, Neodymium	-150º to +300º F -101º to +149º C	-150º to +300º F -101º to +149º C
Temperature Range, Samarium	-150º to +450º F -101º to +232º C	-150º to +450º F -101º to +232º C
Maximum Viscosity* cp	100	100
Speeds RPM	3450, 2875, 1725	3450, 2875, 1725
Weight, LBS, (KG)	36 (16.40)	40 (18.1)
Maximum Power	5 HP	7-1/2 HP

*Consult factory for viscosity requirements higher than 100 cp

Appendix B – Bolt Pattern

1. Torque all six fasteners to 110 in-lbs (12.4 N-m) first, following the sequence in the ***Figure 10*** below.
2. Then torque all fasteners to the final value of 220 in-lbs (24.8 N-m), again following the same sequence.

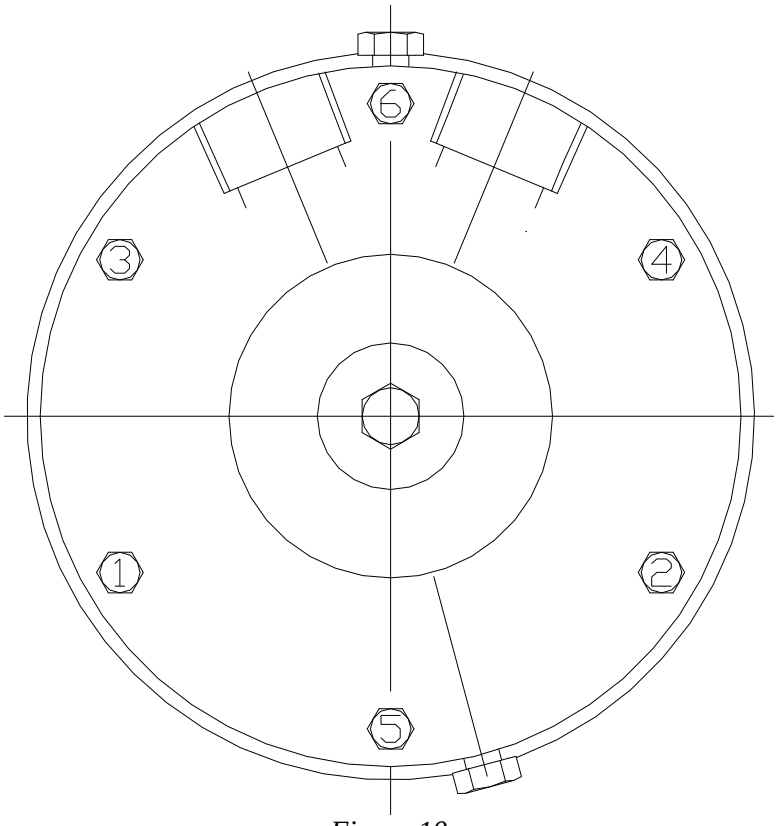
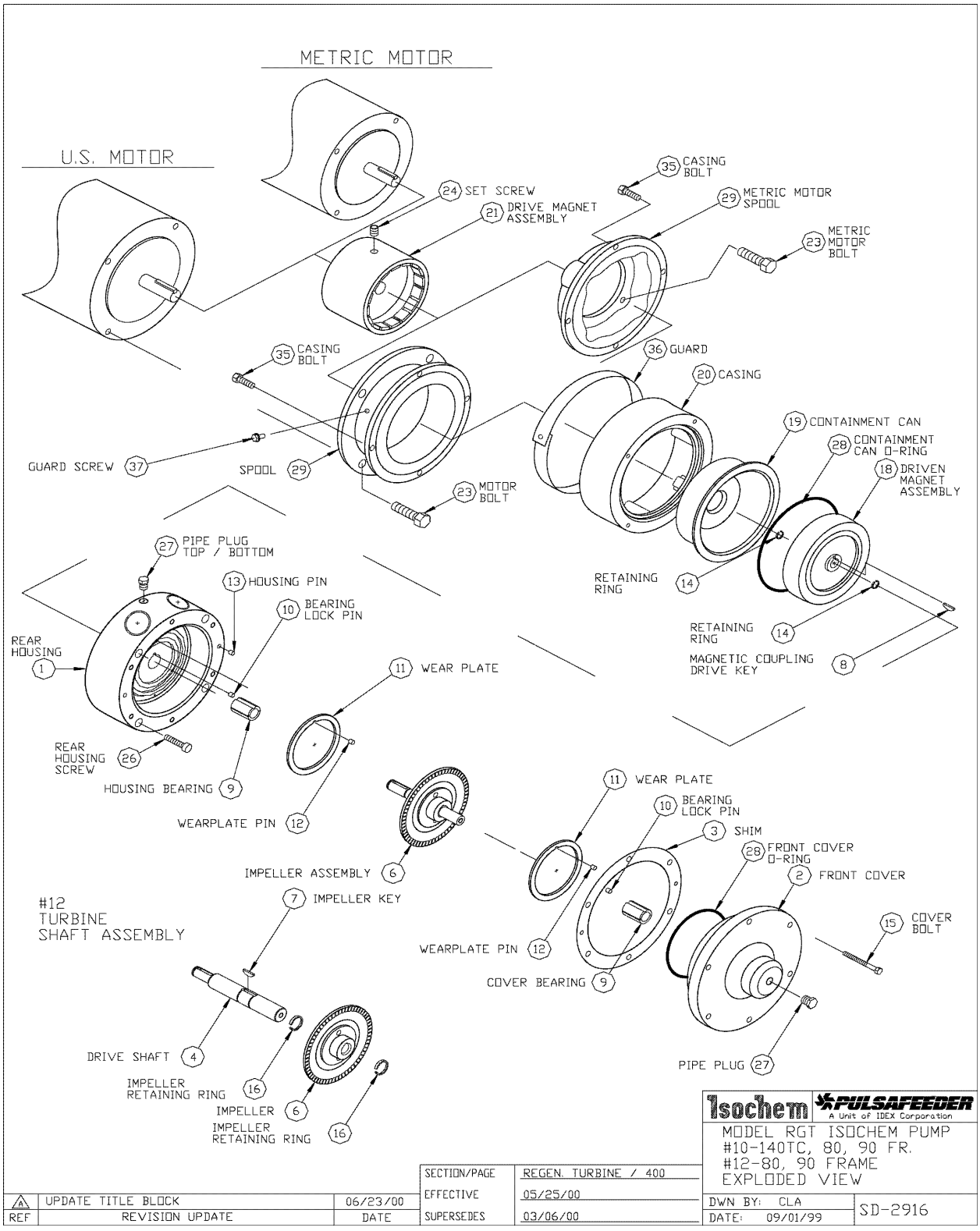
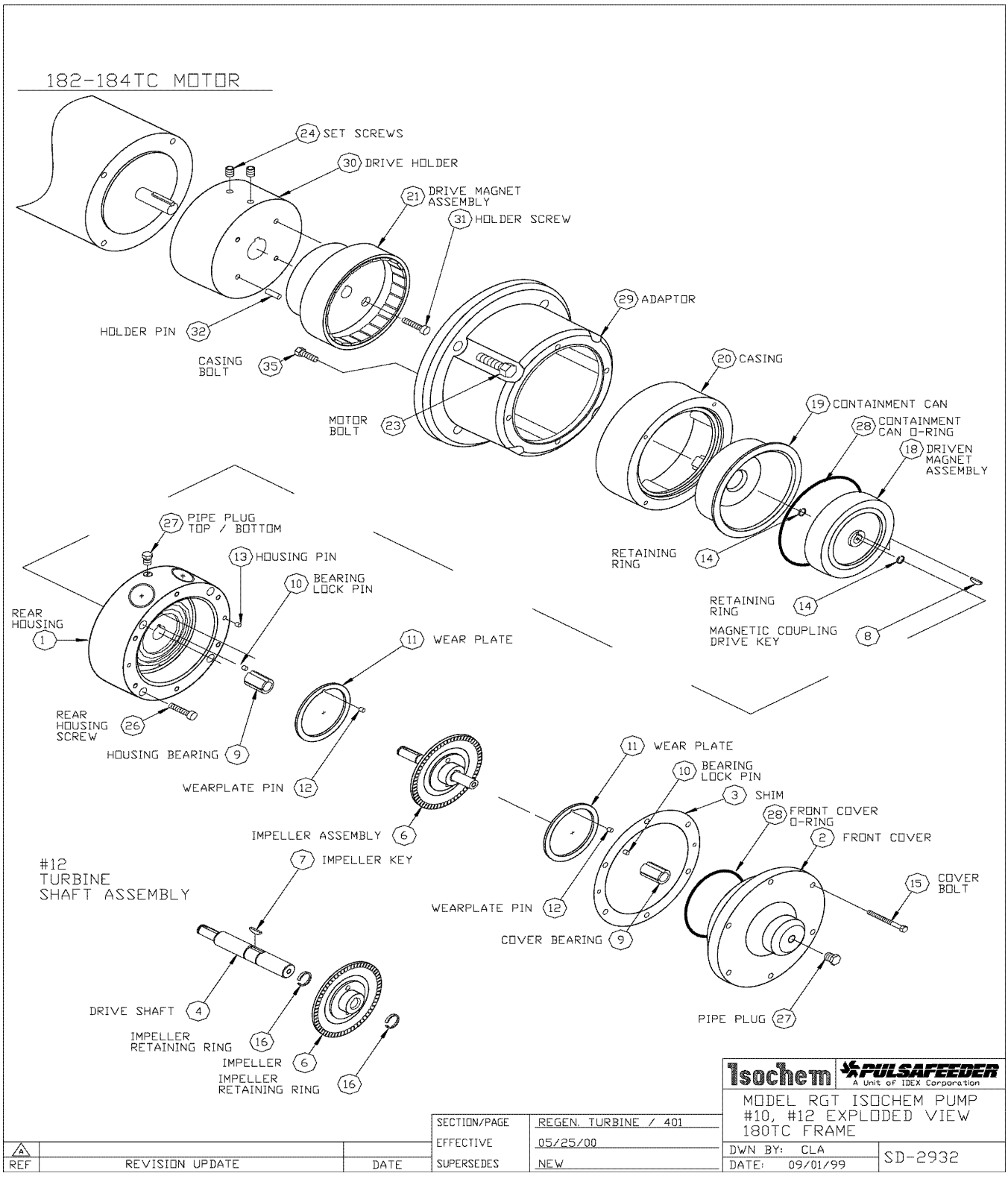


Figure 10

Appendix C – Exploded Drawing





REF	REVISION UPDATE	DATE
A		

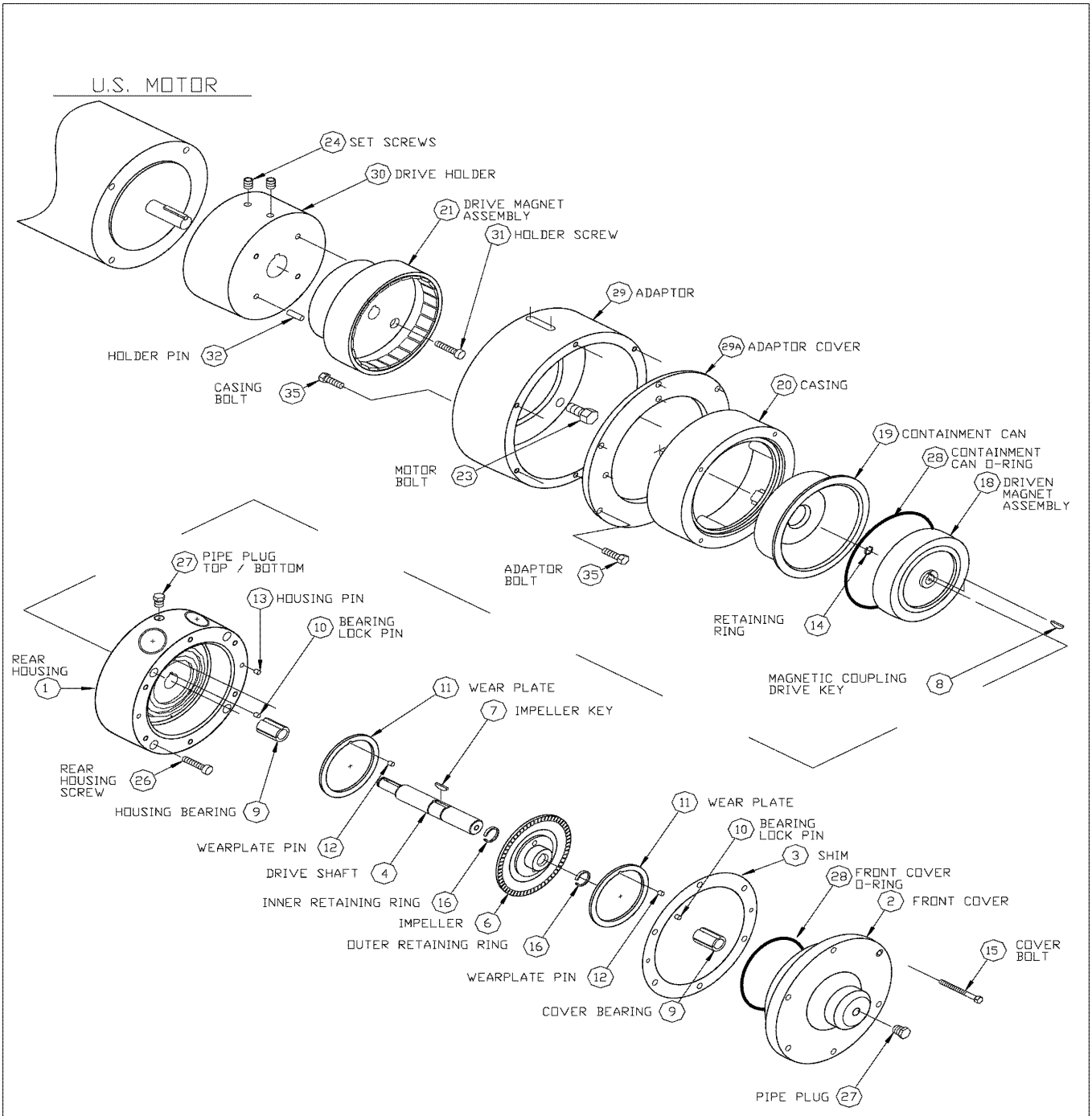
SECTION/PAGE	REGEN. TURBINE / 401
EFFECTIVE	05/25/00
SUPERSEDES	NEW

Isochem | PULSAFEEDER A Unit of IDEX Corporation

MODEL RGT ISOCHEM PUMP
#10, #12 EXPLODED VIEW
180TC FRAME

DWN BY: CLA
DATE: 09/01/99

SD-2932



REF	REVISION UPDATE	DATE
A		

SECTION/PAGE	REGEN. TURBINE / 402
EFFECTIVE	06/15/00
SUPERSEDES	NEW

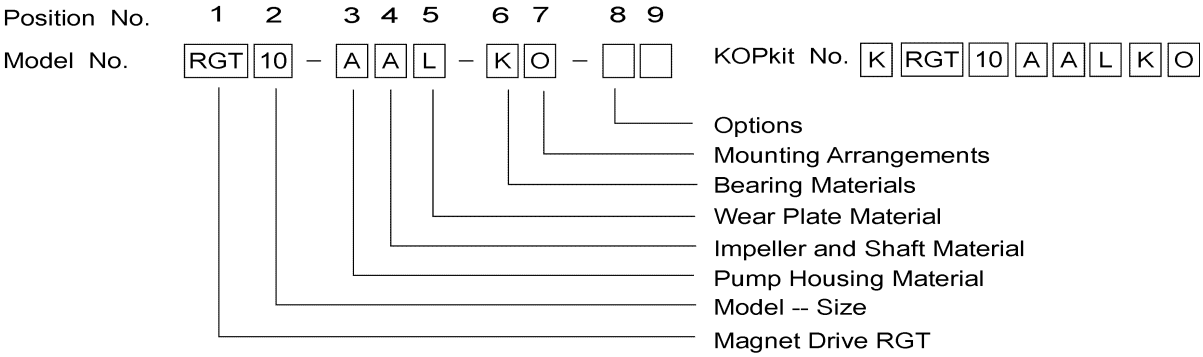
Isochem | PULSAFEEDER A Unit of IDEX Corporation

MODEL RGT ISOCHEM PUMP
#12 EXPLODED VIEW
140TC FRAME

DWN BY: CLA
DATE: 06/15/00

SD-2935

Appendix D – Options



POSITION 1	REGENERATIVE TURBINE MAGNETICALLY DRIVEN SEALLESS RGT = C-FACE MOTOR MOUNTING ASSEMBLY. (1) – 10, 12		
POSITION 2	PUMP SIZE	10	12
	Port Size Inches FNPT/BSPT	1.00”	1.00”
	Capacity MAX. GPM (M^3/H)	14.5 (3.29)	23.3 (5.29)
	Differential Head MAX. Ft. (M)	427 (130)	693 (211)
POSITION 3	AVAILABLE PUMP METAL AND TYPE PORT CONNECTION		
	A = 316SS FNPT	X	X
	C = ALLOY C FNPT	X	X
	K = 316SS FBSPT	X	X
	M = ALLOY C FBSPT	X	X
POSITION 4	IMPELLER AND SHAFT MATERIAL		
	A = 316SS	X	X
	C = ALLOY C	X	X
POSITION 5	WEAR PLATE MATERIAL		
	L = Carbon	X	X
	T = TFE (Glass Filled) (2)	X	X
POSITION 6	BEARING MATERIAL		
	K = Standard Carbon	X	X
	L = Extended Life Carbon	X	X
	T = TFE (Glass Filled) (2)	X	X
POSITION 7	MAG DRIVE MOUNTING ARRANGEMENT		
	0 = 143TC– 184C FRAME (U.S.) (3)	X	X
	R = 182-184TC FRAME (U.S.)	X	X
	W = 213-215TC FRAME (U.S.)		X
	K = 80 FRAME, (∅100mm B.C.) (Metric)	X	X
	L = 90 FRAME, (∅115mm B.C.) (Metric)	X	X
POSITION 8	OPTIONS		
	B = PFA Coated SS Hsg O-Rings, Metallic Bearing, Wearplate Lock Pins, and Spacer Shim Assembly. (Required for temperatures above 200°F (93°C)	X	X
	H = PFA Coated SS Hsg O-Rings / Metallic Bearing, Wearplate Lock Pins and Spacer Shim Assembly. Samarium Cobalt Magnets (Required for temperatures above 300°F (149°C)	X	X
	M = Alloy C Containment Can (For 316SS Construction Pumps)	X	X
	S = Samarium Cobalt Magnet	X	X
	W = Welded Driven Magnet Assy (Samarium Cobalt Magnets ONLY)	X	X
POSITION 9	OPTIONS Consult your local representative for options to meet your special requirements.		

Notes:

1.) All pumps require motors with feet..
2.) Only for temperatures below 110°F (43°C).
3.) Pedestal assembly A123208 with a foot-mounted motor is optional.
Use “O” in position 7 of the pump model number. Pedestal to be ordered as a separate line item.

Appendix E – Bill of Materials

ISOCHEM RGT SERIES PUMP
CONSOLIDATED BILL OF MATERIALS

SECTION: **REGENERATIVE TURBINE**
PAGE: **200**
EFFECTIVE: **06/27/00**
SUPERSEDES: **03/06/00**

				POSITION 3 STANDARD PUMP METALLURGIES, PORT CONN				
				316SS (A) OR (K)		ALLOY C (C) OR (M)		
	DESCRIPTION		QTY	PART No.	MATL	PART No.	MATL	ITEM
POSITION 2 PUMP SIZE – NON-VARIABLE COMPONENTS								
10	COVER, FRONT		1	Y0202100-316	316SS	Y0202100-HCO	ALLOY C	2
	HOUSING, REAR	(A, C) FNPT	1	Y0502300-316	316SS	Y0502300-HCO	ALLOY C	1
	HOUSING, REAR	(K, M) BFNPT		Y0502500-316	316SS	Y0502500-HCO	ALLOY C	
12	COVER, FRONT		1	Y0202200-316	316SS	Y0202200-HCO	ALLOY C	2
	HOUSING, REAR	(A, C) FNPT	1	Y0502400-316	316SS	Y0502400-HCO	ALLOY C	1
	HOUSING, REAR	(K, M) BFNPT		Y0502600-316	316SS	Y0502600-HCO	ALLOY C	
STANDARD PUMP – NON-VARIABLE COMPONENTS								
	+ SPACER, SHIM ASSY		1	Y1400300-000	POLYEST	Y1400300-000	POLYEST	3
	+ RING, RETAINING DRV. MAG.	#10	*2	46713	ALLOY 20	46701	ALLOY C	14
		#12	1	46713	ALLOY 20	46701	ALLOY C	
	+ KEY, MAGNETIC CPLG – DRIVEN		1	41933	ALLOY 20	41934	ALLOY C	8
	+ PIN, BEARING LOCK	#10	*2	41801	TFE	41801	TFE	10
		#12		41811	TFE	41811	TFE	
	+ PIN, WEARPLATE LOCK		*2	41801	TFE	41801	TFE	12
	+ O-RING, COVER		*1	W209729-TFE	TFE	W209729-TFE	TFE	28
	PIN, HOUSING		*2	41802	ALLOY 20	41802	ALLOY 20	13
	SCREW, REAR HOUSING		4	W770269-STA	STL	W770269-STA	STL	26
	BOLT, FRONT COVER		6	W770426-188	188SS	W770426-188	188SS	15
	PLUG, 1/8" NPT		3	W772565-316	316SS	52301	ALLOY C	27
	NAMEPLATE		1	41210	188SS	41210	188SS	--
POSITIONS 8, 9 OPTIONS – DELETE CORRESPONDING STANDARD PUMP COMPONENT FROM THE BILL OF MATERIALS								
	B	+ PIN, BEARING LOCK	#10	*2	41802	Alloy 20	41806	Alloy C	10
			#12		41812	Alloy 20	41813	Alloy C	
		+ PIN, WEARPLATE LOCK		*2	41802	Alloy 20	41806	Alloy C	12
		+ 0-RING, COVER / CNTNMNT CAN		2	41112	SS/PFA	41112	SS/PFA	28
	M	CONTAINMENT CAN		1	49605	Alloy C	– – –	– – –	19
W	S	+ SPACER, SHIM ASSY		1	Y1400400-000	188SS	Y1400400-000	188SS	3
		DRVN MAG ASSY (O-RING) / (SAMAR)		1	49616	316SS	49643	Alloy C	18
		DRV MAG ASSY 140TC FR (S)	#10	1	Y1900900-000	STL	Y1900900-000	STL	21
		DRV MAG ASSY 140-80TC FR (S)	#12		49604-3	STL	49604-3	STL	
		DRV MAG ASSY, 80 FR (S)			49735	STL	49735	STL	
		DRV MAG ASSY 90 FR (S)			49736	STL	49736	STL	
		DRVN MAG ASSY (WELDED) / (SAMAR)		1	49660	316SS	49659	Alloy C	18
	H	HIGH TEMPERATURE APPLICATION			COMBINE PUMP OPTIONS B AND S				

* COMPONENT QUANTITY MAY BE CUMULATIVE OVER THE ENTIRE BILL OF MATERIALS
\+ DENOTES RECOMMENDED SPARE PART.

ISOCHEM RGT SERIES PUMP
CONSOLIDATED BILL OF MATERIALS

				POSITION 3 STANDARD PUMP METALLURGIES				
				316SS (A) OR (K)		ALLOY C (C) OR (M)		
	DESCRIPTION	QTY		PART No.	MATL	PART No.	MATL	ITEM
POSITION 4 IMPELLER AND SHAFT MATERIAL								
A	+ IMPELLER ASSEMBLY	#10	1	Y0101000-316	316SS	----------	-------	6
	IMPELLER			Y0100800-316	316SS	----------	-------	
	SHAFT, DRIVE			Y0704100-316	316SS	----------	-------	
	KEY, IMPELLER			41933-1	Alloy 20	----------	-------	
	RING, RETAINING			46713	Alloy 20	----------	-------	
	+ IMPELLER	#12	1	Y0100900-316	316SS	----------	-------	6
	+ SHAFT, DRIVE		1	Y0704200-316	316SS	----------	-------	4
	+ KEY, IMPELLER		1	41933-1	Alloy 20	----------	-------	7
	+ RING, RETAINING		*2	46710	Alloy 20	----------	-------	16
C	+ IMPELLER ASSEMBLY	#10	1	Y0101000-HCO	Alloy C	Y0101000-HCO	Alloy C	6
	IMPELLER			Y0100800-HCO	Alloy C	Y0100800-HCO	Alloy C	
	SHAFT, DRIVE			Y0704100-HCO	Alloy C	Y0704100-HCO	Alloy C	
	KEY, IMPELLER			41931-1	Alloy C	41934-1	Alloy C	
	RING, RETAINING			46701	Alloy C	46701	Alloy C	
	+ IMPELLER	#12	1	Y0100900-HCO	Alloy C	Y0100900-HCO	Alloy C	6
	+ SHAFT, DRIVE		1	Y0704200-HCO	Alloy C	Y0704200-HCO	Alloy C	4
	+ KEY, IMPELLER		1	41934-1	Alloy C	41934-1	Alloy C	7
	+ RING, RETAINING		*2	46711	Alloy C	46711	Alloy C	16
POSITION 5 WEAR PLATE MATERIAL								
L	+ WEAR PLATE		2	Y2000100-000	EWCBN	Y2000100-000	EWCBN	11
T	+ WEAR PLATE			Y2000100-FTF	TFE(GF)	Y2000100-FTF	TFE(GF)	
POSITION 6 BEARING MATERIAL								
K	+ BEARING, SHAFT	#10	2	40426	CARBON	40426	CARBON	9
		#12		40436	CARBON	40436	CARBON	
L	+ BEARING, SHAFT	#10	2	40430	EWCBN	40430	EWCBN	
		#12		40437	EWCBN	40437	EWCBN	
T	+ BEARING, SHAFT	#10	2	40425	TFE (GF)	40425	TFE (GF)	
		#12		40438	TFE (GF)	40438	TFE (GF)	

* COMPONENT QUANTITY MAY BE CUMULATIVE OVER THE ENTIRE BILL OF MATERIALS
\+ DENOTES RECOMMENDED SPARE PART.

ISOCHEM RGT SERIES PUMP
CONSOLIDATED BILL OF MATERIALS

			POSITION 3 STANDARD PUMP METALLURGIES				
			316SS (A) OR (K)		ALLOY C (C) OR (M)		
	DESCRIPTION	QTY	PART No.	MATL	PART No.	MATL	ITEM
POSITION 7 NEODYMIUM MAGNETIC COUPLING COMPONENTS							
COMMON PARTS	DRIVEN MAGNET ASSY (0-RING)	1	49738	316SS	49739	ALLOY C	18
	CONTAINMENT CAN	1	49672	316SS	49605	ALLOY C	19
	CASING	1	49610-1	ALU	49610-1	ALU	20
	BOLT, CASING	*4	16722	STL	16722	STL	35
	+ O-RING, CNTNMNT CAN	*1	W209729-TFE	TFE	W209729-TFE	TFE	28
140TC FRAME COMPONENTS **							
O	DRIVE MAGNET ASSY, 140TC FR	1	Y1900600-000	STL	Y1900600-000	STL	21
	SET SCREW, DRIVE MAGNET ASSY	1	W771004-019	STL	W771004-019	STL	24
#10	MOTOR SPOOL	1	49750	ALU	49750	ALU	29
#10	GUARD	1	Y9601600-000	ABS	Y9601600-000	ABS	36
#10	SCREW, GUARD	1	W208894-STL	STL	W208894-STL	STL	37
#10	BOLT, MOTOR	4	W770424-STL	STL	W770424-STL	STL	23
#12	DRIVE MAGNET ASSEMBLY	1	49731-3	STL	49731-3	STL	21
#12	DRIVE MAGNET, HOLDER	1	Y1901200-STL	STL	Y1901200-STL	STL	30
#12	SET SCREW, HOLDER	2	W771004-019	STL	W771004-019	STL	24
#12	SCREW, HOLDER	2	W770027-STA	STL	W770027-STA	STL	31
#12	DOWEL PIN, HOLDER	2	W771209-003	STL	W771209-003	STL	32
#12	MOTOR ADAPTOR COVER	1	Y1101200-ALU	ALU	Y1101200-ALU	ALU	29A
#12	MOTOR ADAPTOR	1	Y1101300-ALU	ALU	Y1101300-ALU	ALU	29
#12	BOLT, ADAPTOR COVER	*6	16722	STL	16722	STL	35
#12	BOLT, MOTOR	4	W770424-STL	STL	W770424-STL	STL	23
180 – 210 TC FRAME COMPONENTS							
COMMON PARTS	DRIVE MAGNET ASSEMBLY	1	49731-3	STL	49731-3	STL	21
	MOTOR, ADAPTOR	1	Y1101100-ALU	ALU	Y1101100-ALU	ALU	29
	SCREW, HOLDER	2	W770027-STA	STL	W770027-STA	STL	31
	DOWEL PIN, HOLDER	2	W771209-003	STL	W771209-003	STL	32
180TC FRAME COMPONENTS							
R	DRIVE MAGNET HOLDER	1	Y1901100-STL	STL	Y1901100-STL	STL	30
	SET SCREW, HOLDER	2	W771004-030	STL	W771004-030	STL	24
	SCREW, MOTOR	4	W770070-STA	STL	W770070-STA	STL	23
210TC FRAME COMPONENTS							
W	RING, ADAPTOR 180TC-210TC	1	Y1101400-ALU	ALU	Y1101400-ALU	ALU	38
	DRIVE MAGNET HOLDER	1	Y1901300-STL	STL	Y1901300-STL	STL	30
	SET SCREW, HOLDER	2	W771004-046	STL	W771004-046	STL	24
	SCREW, MOTOR	4	W770072-STA	STL	W770072-STA	STL	23

* COMPONENT QUANTITY MAY BE CUMULATIVE OVER THE ENTIRE BILL OF MATERIALS
\+ DENOTES RECOMMENDED SPARE PART.
** USE THESE MOTOR FRAME COMPONENTS WHEN USING POWER FRAME ASSEMBLY A123208

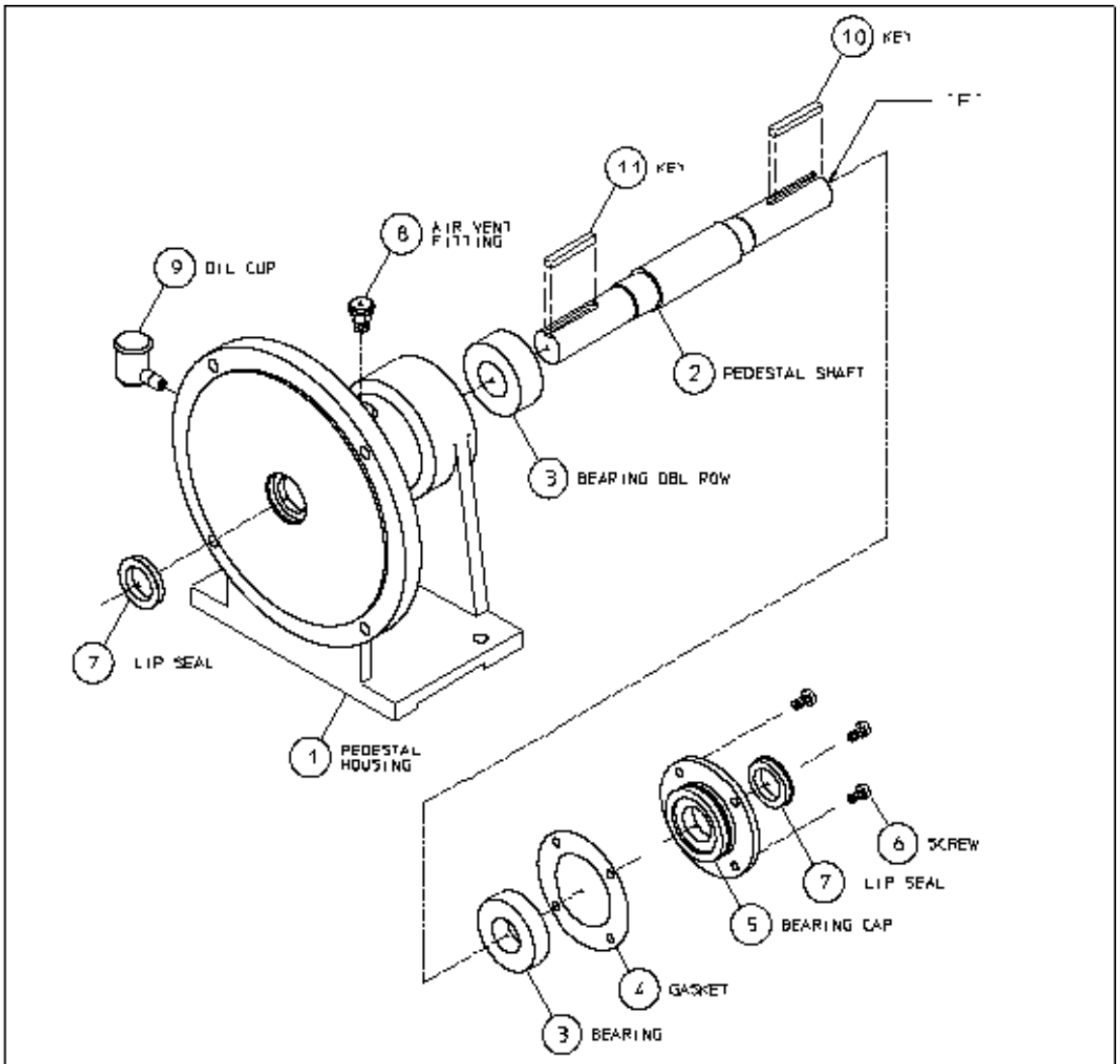
ISOCHEM RGT SERIES PUMP
CONSOLIDATED BILL OF MATERIALS

POSITION 7 NEODYMIUM MAGNETIC COUPLING COMPONENTS (CONT)

			POSITION 3 STANDARD PUMP METALLURGIES				
			316SS (A) OR (K)		ALLOY C (C) OR (M)		
	DESCRIPTION	QTY	PART No.	MATL	PART No.	MATL	ITEM
COMMON PARTS	DRIVEN MAGNET ASSY (0-RING)	1	49738	316SS	49739	ALLOY C	18
	CONTAINMENT CAN	1	49672	316SS	49605	ALLOY C	19
	CASING	1	49610-1	ALU	49610-1	ALU	20
	BOLT, CASING	*4	16722	STL	16722	STL	35
	+ O-RING, CNTNMNT CAN	*1	W209729-TFE	TFE	W209729-TFE	TFE	28
80 METRIC FRAME COMPONENTS							
K	DRIVE MAGNET ASSY, 80 FR	1	49733	STL	49733	STL	21
	MOTOR SPOOL	1	49727	ALU	49727	ALU	29
	BOLT, MOTOR	4	NP990415-STL	STL	NP990415-STL	STL	25
90 METRIC FRAME COMPONENTS							
L	DRIVE MAGNET ASSY, 90 FR	1	49734	STL	49734	STL	21
	MOTOR SPOOL	1	49728	ALU	49728	ALU	29
	BOLT, MOTOR	4	NP990478-STL	STL	NP990478-STL	STL	25

* COMPONENT QUANTITY MAY BE CUMULATIVE OVER THE ENTIRE BILL OF MATERIALS
\+ DENOTES RECOMMENDED SPARE PART.

Appendix F – Power Frame Assembly



PART NUMBER	QTY	DESCRIPTION OR MATERIAL	ITEM
W773098-011	1	.19 X 1.50 SQUARE KEY STL	11
W773098-007	1	.19 X 1.00 SQUARE KEY STL	10
53800	1	ELBOW CUP.OIL 1/8NPT GMC/B/B	9
27219	1	VENT.AIR GMC/C10	8
Y1501100-000	2	SEAL.LIP C.H	7
54101	6	#10-32X .50 RD HD SCREW 18-8SS	6
53903	1	CAP.BEARING PED 140TC GMC/RGT	5
52400	3	GASKET.PEDESTAL GMC/C10	4
53902	2	BEARING.PED #205 (FR-RR.AFB)	3
120409	1	SHAFT.PED 7/8" 140TC 1141STL	2
123205	1	PEDESTAL.C.I. 140TC GMC/RGT	1
A123208	XX	PEDESTAL ASSY.140TC GMC/RGT	XX

ALL DIMENSIONS ARE IN INCHES

Isochem — PULSAFEEDER (A Unit of IDEX Corporation)

PEDESTAL ASSEMBLY
A123208
EXPLODED VIEW

DWN BY CLA
DATE 09/01/99
SD-2930

SECTION/PAGE DRIVE / 52
EFFECTIVE 05/09/00
SUPERSEDES 03/06/00

REF	REVISION UPDATE	DATE
⚠	UPDATE. P/N 53902 WAS 53903	05/09/00

Power Frame Maintenance

General Maintenance:

Fill power frame oil cup (item 9) to the "oil level" line, about ½" from the top edge of the cup. Use standard motor oil, SAE-10W-40, 10W-30, SW-30, or equivalent.

Drain and change oil after every 2,000 hours of operation. Increase frequency of oil changes if operating in an adverse environment, for example high moisture, very high or low temperatures, etc.

Disassembly:

1. Remove bearing cap bolts (item 6)
2. Slide bearing cap (item 5) out of housing and over the end of the shaft (item 2)
3. Remove shaft/bearing assembly by sliding out of housing

Reassembly:

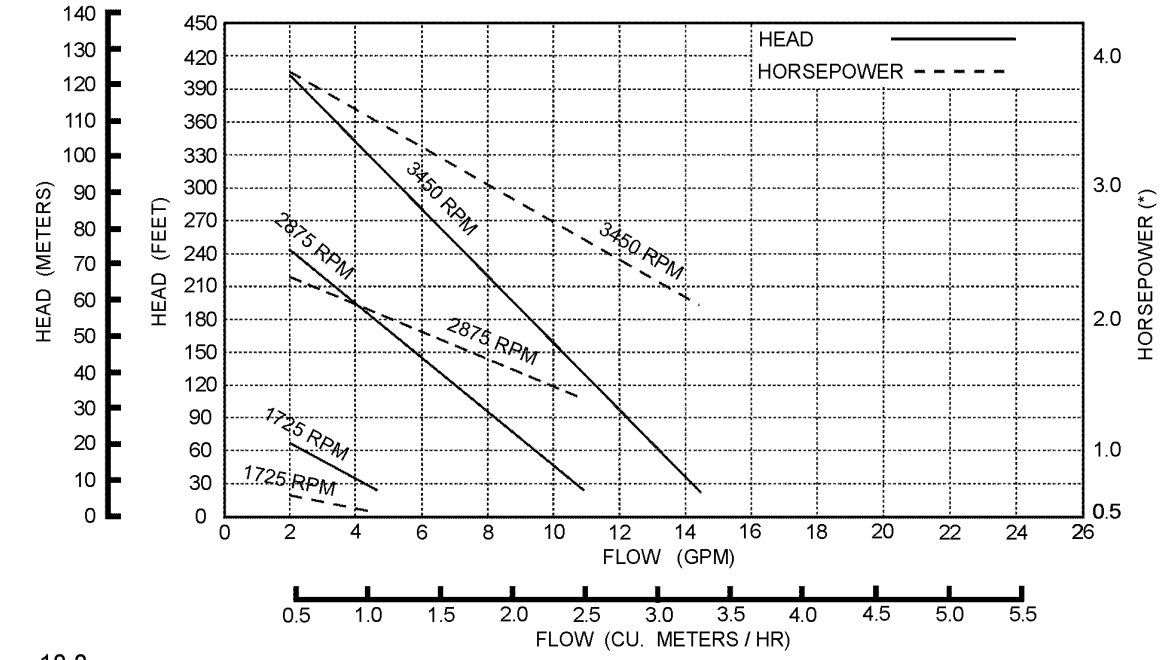
1. Press new bearings (item 3 both ends) onto shaft if replacement is required
2. Inspect the surface of the shaft (item 2) for burrs and scratches, clean and smooth as required.
3. Press new lip seals (item 7) into housing and bearing cap. Apply grease to the inside diameter of the lip seals.
4. Install a new gasket (item 4) on the bearing cap.
5. Slide the shaft/bearing assembly into the power frame housing. The end stamped "F" must be towards the bearing cap.
6. Shim if required to obtain shaft end-play of 0.000 – 0.004 inches.
7. Replace the bearing cap bolts (item 6) and tighten.
8. Refill with oil as per instructions above.

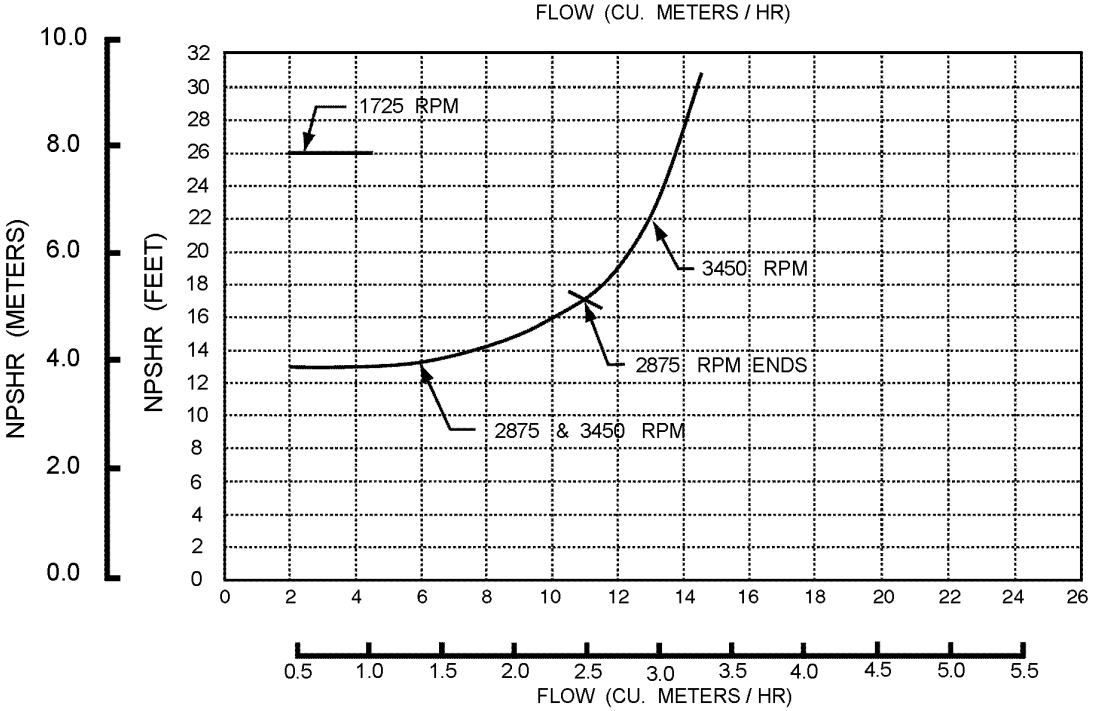
Appendix G – Performance Curves

ISOCHEM REGENERATIVE TURBINE #10

INLET : 1"
OUTLET : 1"

TEST MEDIA : WATER
RPM: 3450, 2875, 1725



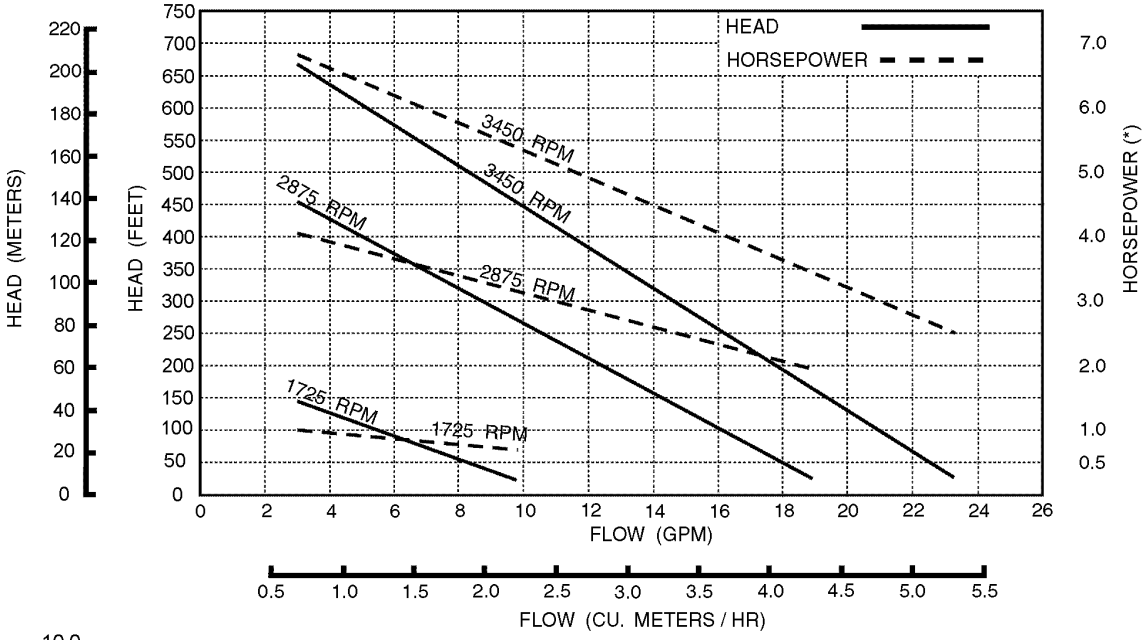


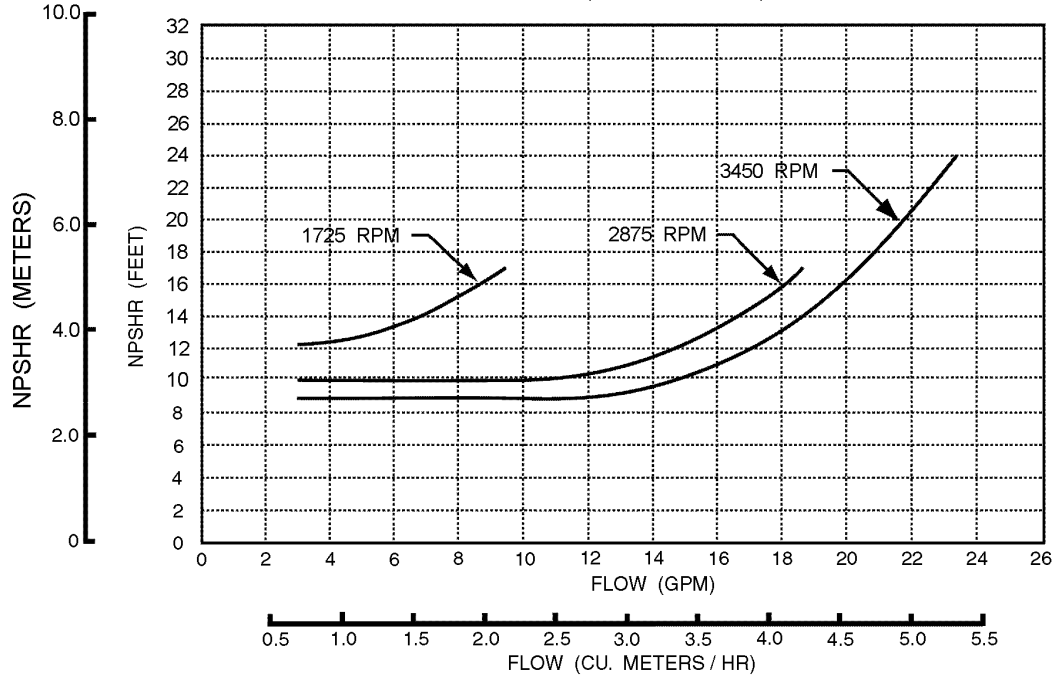
(*) DENOTES HORSEPOWER IS PLOTTED AGAINST FLOW

ISOCHEM REGENERATIVE TURBINE #12

INLET : 1"
OUTLET : 1"

TEST MEDIA : WATER
RPM: 3450, 2875, 1725





(*) DENOTES HORSEPOWER IS PLOTTED AGAINST FLOW

Bulletin #: IOM – RGT0700 - Rev. C

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