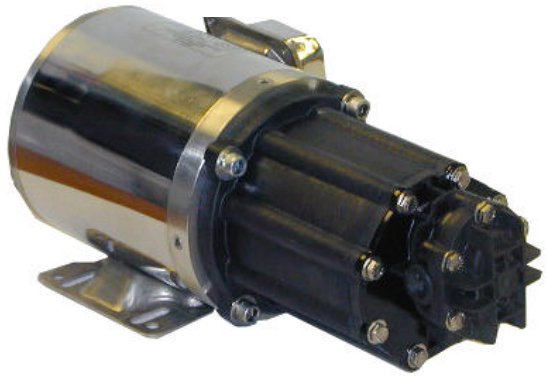
PULSAFEEDER®

A Unit of IDEX Corporation

Eclipse Series





Installation, Operation & Maintenance Instruction

Bulletin #: IOM-NMG-0804 – Rev D

PULSAFEEDER
A Unit of IDEX Corporation

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Pulsafeeder® Factory Service Policy

Should you experience a problem with your *Eclipse Series* pump, first consult the troubleshooting guide in your operation and maintenance manual. If the problem is not covered or cannot be solved, please contact your local Pulsafeeder Distributor or our Technical Services Department for further assistance.

Trained technicians are available to diagnose your problem and arrange a solution. Solutions may include purchase of replacement parts or returning the unit to the factory for inspection and repair. All returns require a Return Authorization number to be issued by Pulsafeeder. Parts purchased to correct a warranty issue may be credited after an examination of original parts by Pulsafeeder. Warranty parts returned as defective, which test good, will be sent back freight collect. No credit will be issued on any replacement electronic parts.

Any modifications or out-of-warranty repairs will be subject to bench fees and costs associated with replacement parts.

Safety Considerations:

1. Read and understand all related instructions and documentation before attempting to install or maintain this equipment
2. Observe all special instructions, notes, and cautions.
3. Act with care and exercise good common sense and judgment during all installation, adjustment, and maintenance procedures.
4. Ensure that all safety and work procedures and standards that are applicable to your company and facility are followed during the installation, maintenance, and operation of this equipment.

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Conventions:

The following Conventions are used in this document.



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.

Revision History:

Rev A	Release Date August 2005, first revision
Rev B	Release Date December 2005
	Updates and corrections to various text throughout
	New *figure 47* showing motor adaptor
	Update Specifications and add information on page 44
	Update BOM, all models
	Add motor rotation vs. flow direction diagram (*figure 2b*)
	Add o-ring reference chart (*Section 18*)
Rev C/C2	Release Date December 2006
	Added new information for model E10
	Updated flow curves for all models
	Minor updates to Specification pages, remove KalRez O-ring options
Rev D	Release December 2006
	Model E10 now upgraded to E12, new flow curves, update text

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1. Introduction

1.1 General Description

Pulsafeeder's Eclipse Series pumps safely handle hazardous, highly corrosive, explosive or toxic chemicals. They provide safe, leak-free service because the magnetic coupling eliminates the need for traditional sealing methods, such as mechanical seals or packing.

Eclipse Series gear pumps mount to standard NEMA 56C, 143/145TC and 182/184TC motors and IEC 63, 80, 100 and 112 B14 metric flanged (C-face) motors. This enables the pumps to be close coupled, which provides greater assembled strength, complete isolated enclosure of all moving parts, and compact design. This also eliminates the need for special base plate mounting, shaft couplings and guards, complicated drives, and pump bearing lubrication and maintenance, while minimizing plant real estate for optimum pump installation.

All Eclipse Series pumps transmit rotational torque from the motor shaft to the pump shaft by means of a magnetic drive coupling. The principle of operation of the magnetic drive coupling is that an encapsulated driven magnet assembly is mounted on the end of the pump shaft. It is then contained by a closed end containment shell or "containment can" which seals against the pump center housing with a static o-ring. A drive magnet assembly attached to an electric motor shaft rotates around the containment can. When the drive magnet assembly rotates, lines of magnetic flux or force cause the driven magnet assembly to rotate which in turn causes the pump shaft to rotate.

All magnetic drive couplings are designed for satisfactory operation of the pump. The magnetic couplings have an integral safety feature that allows them to "decouple" if the coupling torque limit is exceeded. This situation might occur if foreign material were to jam the pump gears or if unusually high torque was developed on pump start-up. Eclipse Series pumps use permanent rare earth Neodymium Iron magnets that can run decoupled without losing their magnetic strength provided magnet temperatures do not exceed 450^0F (232^0C).



IF THE PUMP IS ALLOWED TO RUN FOR AN EXTENDED PERIOD OF TIME DECOUPLED, HIGH TEMPERATURES COULD BE GENERATED THROUGH OPPOSING MAGNETIC FORCES THAT ULTIMATELY WOULD CAUSE THE LOSS OF MAGNETIC STRENGTH.

Eclipse Series pumps feature continuous operation over wide temperature and pressure variations, constant volume pulsation free flow, the ability to handle wide viscosity variations, and ease of inspection and maintenance. Specific limitations are covered in this manual and summarized in ***Section 11****, Specifications.*

To achieve successful operation and maximum life from your pump, make sure that the pump selection and materials are compatible with the service and operating conditions of your application.

2. Equipment Inspection and Storage

NOTE **Check all equipment for completeness and accuracy against the order and for any evidence of shipping damage. Shortages or damage should be reported immediately to the freight carrier and to your Pulsafeeder representative.**

If the pump is not going to be installed immediately, the following steps should be taken:

- Leave pump in original shipping carton.
- Store indoors in a dry ambient atmosphere. Avoid temperature variations.
- Leave all shipping plugs in place.
- Contact the motor manufacturer for specific motor storage information.

These instructions should be read carefully by the personnel responsible for installation, operation and maintenance of the equipment and kept in a convenient place for ready reference. It is recommended that a copy of the order documents be kept with this manual as well as a written record of the pump model and serial number, which is on the nametag attached to the pump.



Figure 1

3. Installation

NOTE **Pump installation site should provide easy access for routine maintenance and protect the pump from environmental elements and from leaks or drips from nearby process equipment. See *Figure 2* for typical installation diagram.**

- Bolt the pump motor down firmly to mounting surface. Provide for air movement and circulation over electric motor to enhance proper cooling.
- While looking at the pump from the magnetic drive end, the suction port is to the right when the pump drive shaft rotates clockwise and is located below the ports. Reversing drive shaft rotation reverses flow and thus suction and discharge ports. Since the Eclipse series pumps can be installed both vertically and horizontally, it is very important to verify proper motor rotation before final piping is established.
- When installed horizontally, make sure the pump housing drain is on the bottom of the pump. If the pump is installed with the drain facing upwards, the rotation of the motor will be incorrect and either needs to be reversed or the pump orientation corrected. Reference the pump drawings in Section 18 of this manual for drain location.
- Installation of vacuum or pressure gauges in the suction and discharge piping is recommended to properly monitor system operation.
- Keep suction piping system short and straight to minimize friction loss to the pump. Make sure that the pump will not run dry. Flooded suction or gravity fed fluid to pump inlet is generally preferred.
- 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 those of a type that are easily cleaned and maintained.
- Arrange all suction piping and fittings to prevent formation of air pockets. Make sure all joints are airtight.
- Flush and blow out all suction lines prior to mating to pump. Use nipples and unions, for ease of maintenance.

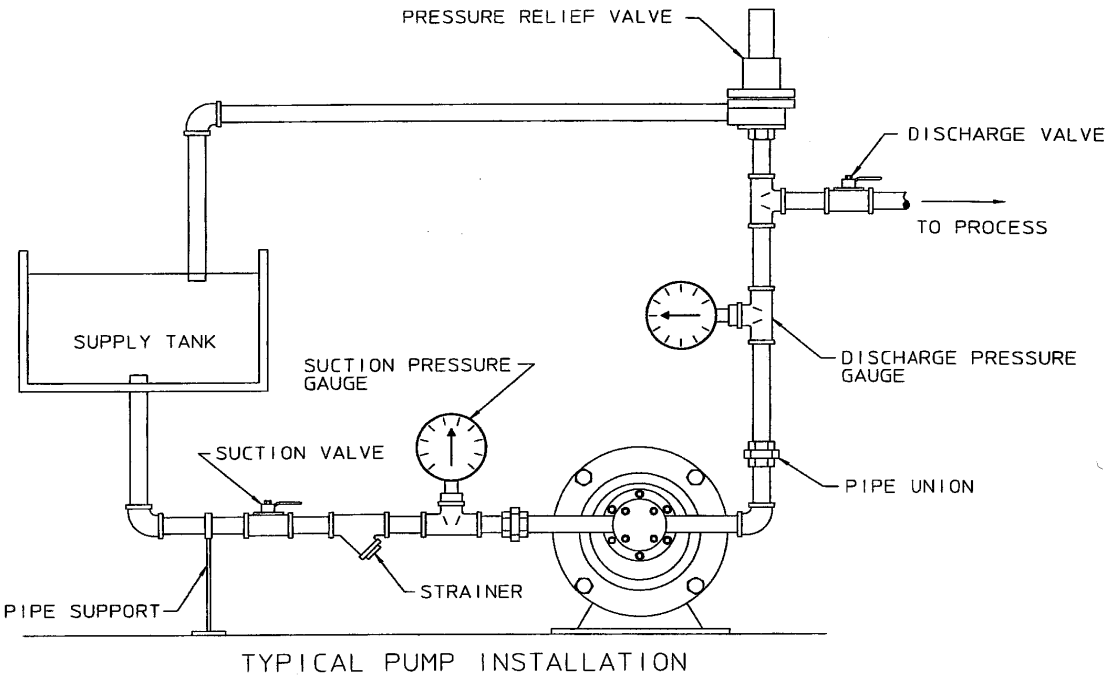


Figure 2a – General Installation

- Do not force, bend, or spring either suction or discharge piping when mating up to the pump. Use supports or hangers at intervals as required in an effort to compensate for piping strain due to vector forces and bending forces. When necessary, install thermal expansion joints or accessories so minimal piping strain is placed upon the pump.

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

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

- If flexible suction lines are used, be sure their selection and installation will prevent wall collapse and thus a starved suction condition.

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

- Discharge line should be fitted with properly sized pressure relief valve to protect both pump and discharge system. Pressure relief valve outlet should be piped back to the supply tank.

- When a by-pass 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 cavitation. If it is absolutely necessary to pipe by-pass back to the pump suction line, the point of entry should be at least one foot away from the suction inlet. Provision for cooling should be made in the event of excessive heat buildup through fluid recirculation.

- Where pumped fluids may solidify, crystallize, or precipitate, provisions should be made to thoroughly flush pump and piping prior to periods of shutdown. Pay particular attention to proper flushing and draining of the magnetic coupling area because this area may not completely self drain.

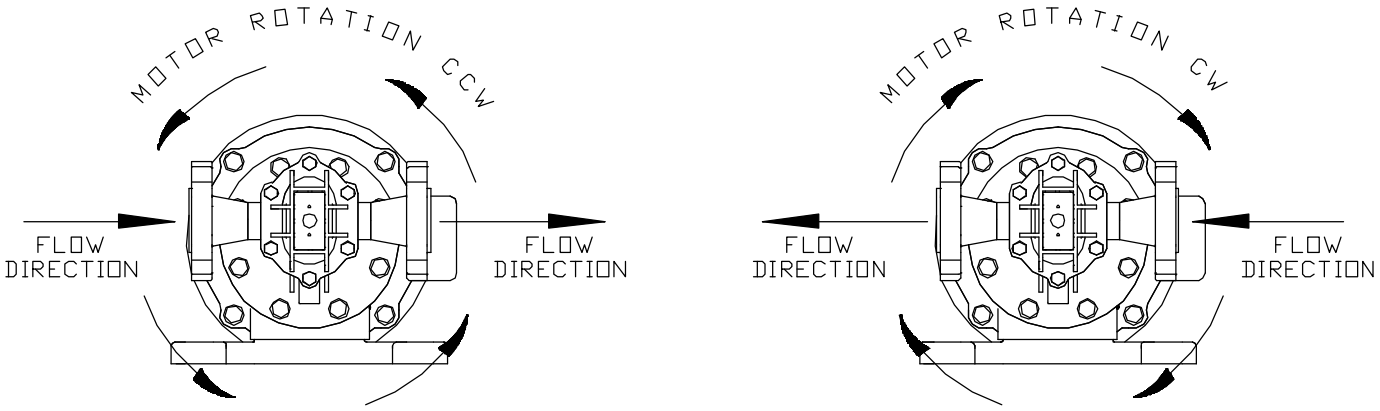


Figure 2b – Flow vs. Motor Rotation

4. Equipment Setup and Operation

Prior to operation, make sure all suction piping is air tight and clean. Check that electrical service to motor agrees with nameplate ratings. Jog the motor to check rotation and for signs of binding. To check rotation, observe the motor fan. Rewire motor if necessary. As noted in ***Section 3, Installation***, Eclipse Series pumps are bi-directional, the direction of flow is determined by the direction of motor rotation.



ALTHOUGH THE ECLIPSE SERIES PUMPS ARE DESIGNED WITH SOME RUN-DRY CAPABILITY, IT IS NOT RECOMMENDED THAT ANY MAGNETICALLY DRIVEN PUMP BE RUN DRY. THIS CONDITION CAN CAUSE SIGNIFICANT TEMPERATURE INCREASES RESULTING IN PREMATURE DAMAGE TO WEAR SURFACES FROM LACK OF LUBRICATION AND/OR VAPORIZATION OF LIQUID IN THE PUMP.

Pumping fluids containing abrasives should be avoided, as accelerated pump wear will result. Eclipse Series gear pumps are designed to handle clear fluids at viscosities up to 10,000 cps.

The pump will self prime if fluid is supplied at the pump inlet. If foot valves are used, the valve should be of the flapper type and sized to minimize friction loss.

If the pump operates near the boiling point of the pumped fluid, a recirculation loop can be set up between the discharge and suction connections with provisions for flow control in the recirculation loop.

Power Monitors are strongly recommended for optimum protection of all magnetically driven pumps. Consult factory for selection and support.

Do not operate the pump against a closed or blocked discharge. Doing so can cause the magnetic drive to decouple. If decoupling occurs, stop the motor and restart after the obstruction has been cleared.

Operation against closed or blocked discharge can also result in casing pressure that exceeds the pump's published safe limits. This can result in damage to the casing parts and/or containment can.

As a safety precaution, a pressure relief valve by-pass system is highly recommended. Ideally, the pressure relief valve is set for a low pressure at start-up to allow the pump to flood with liquid and evacuate air quickly. It can then be re-adjusted to a setting appropriate to the application.

Hardware and fasteners can loosen during transportation and installation. All pump hardware should be checked and verified tight before placing the pump in operation. Consult the table in ***Section 12*** for the recommended torque values for all pump hardware.

Pump hardware should be checked on a regular basis, especially if the pump is subject to temperature variations or cycling that might cause it to loosen during operation.

Start pump with discharge and suction valves open and check for proper operation. Excessive noise or vibration is an indication of harmful cavitation, which may be due to insufficient NPSH (Net Positive Suction Head).

5. Maintenance Overview

The timing for maintenance of the pump is established primarily on past performance. Each installation is different. Therefore, regular inspections, and detailed maintenance records of past performance can be invaluable for determining future preventative maintenance intervals. For motor maintenance instructions consult the motor manufacturer.



BEFORE PERFORMING ANY MAINTENANCE REQUIRING PUMP DISASSEMBLY, BE SURE TO FLUSH AND DRAIN PUMP THOROUGHLY WITH A NEUTRALIZING FLUID. WEAR PROTECTIVE CLOTHING AND HANDLE EQUIPMENT WITH PROPER CARE.

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 Pulsafeeder representative for assistance.



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.

Whenever gear pumps exhibit reduced flow rates, inability to maintain pressures, noisy or otherwise abnormal operation, first refer to the troubleshooting section at the end of this manual. If the problem cannot be resolved the pump must be inspected for wear or damage. Eclipse Series gear pumps can be easily opened for cleaning and inspection without disturbing piping connections by removing the pump front housing cover.

Where inspection shows wear, rebuilding the pump using a KOPkit is strongly recommended. Quite often, original hydraulic performance can be restored by simply changing the KOPkit alone.



Magnets (both drive and driven) can attract small particles of debris during handling. Always visually inspect the magnetic parts of the pump for cleanliness during re-assembly. Wipe carefully to remove debris, particles, or other small parts without damaging the surface of the magnets.

5.1 Recommended Spares

KOPkits – The basic Eclipse Series KOPkit consists of the following parts, which are recommended as typical spare parts. The KOPkit provides an easy means to keep the right parts for your Eclipse Series pump close at hand.

- **Drive Gear and Shaft Assembly** **1 each**
- **Idler Gear and Shaft Assembly** **1 each**
- **Housing Liner** **1 each**
- **Bearings** **2 each**
- **O-Rings** **3 or 4 each**

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, or when ordering parts or KOPkits.

Always refer to the full model and serial number in any correspondence with your Pulsafeeder representative. Drawings and consolidated bill of materials for each size pump are included in this manual. Recommended spare parts are identified on the consolidated bill of materials.

5.2 Maintenance precautions for magnet-driven equipment:

- **Non-magnetic tools and non-magnetic work surfaces are recommended to perform any disassembly or maintenance of the pump.**
- **Do not wear a wristwatch in the vicinity of the drive or driven magnets, wristwatches may be damaged by the transmission of magnetic flux.**
- **The strong magnetic field will damage credit cards, security badges, or other magnetic data strips. Keep them a safe distance from the magnets.**
- **Take precautions in handling pump magnets if you have prosthetic devices or other metal inserts installed in your body. Consult your physician for guidance in handling magnets.**
- **Completely flush and drain pump before any pump disassembly.**
- **The exposed magnets on the drive magnet assembly are very fragile and will chip easily. Use extreme care in handling them.**
- **Take care to avoid magnetic 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.**



BE CAREFUL DURING DISASSEMBLY AND REASSEMBLY OF THE DRIVE AND DRIVEN MAGNET ASSEMBLIES. THE MAGNETIC ATTRACTION FORCES ARE HIGH, AND WHEN THE MAGNETS COME CLOSE TOGETHER THERE IS A STRONG TENDENCY TO SNAP TOGETHER SUDDENLY, POTENTIALLY CAUSING INJURY TO FINGERS OR FLESH.

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

5.3 KOPkit Maintenance, All Models

All Eclipse gear pumps are designed for easy access to the regularly serviced internal components. These components are part of the KOPkit described in ***Section 5.1.***

The KOPkit for an Eclipse pump can be installed without removing the pump from service. The pump can be disassembled in the horizontal position while still connected to the process lines. Obviously, special precautions must be taken to ensure the pump is safe to work on.

WARNING

BEFORE PERFORMING ANY MAINTENANCE REQUIRING PUMP DISASSEMBLY, BE SURE TO RELIEVE PRESSURE FROM THE PIPING SYSTEM, ISOLATE THE PUMP FULLY USING THE APPROPRIATE SHUTOFF/BLOCKING DEVICES, AND, WHERE HAZARDOUS PROCESS MATERIALS ARE INVOLVED, RENDER THE PUMP SAFE TO PERSONNEL AND THE ENVIRONMENT BY CLEANING AND CHEMICALLY NEUTRALIZING AS APPROPRIATE. WEAR PROTECTIVE CLOTHING AND EQUIPMENT AS REQUIRED.

The following sections of the IOM review disassembly and assembly of the Eclipse pump on the service bench. If you are working on your Eclipse pump in the field, the same procedures are used except that your pump will be horizontally mounted, whereas the illustrations in the IOM sections show the pumps in a vertical position.

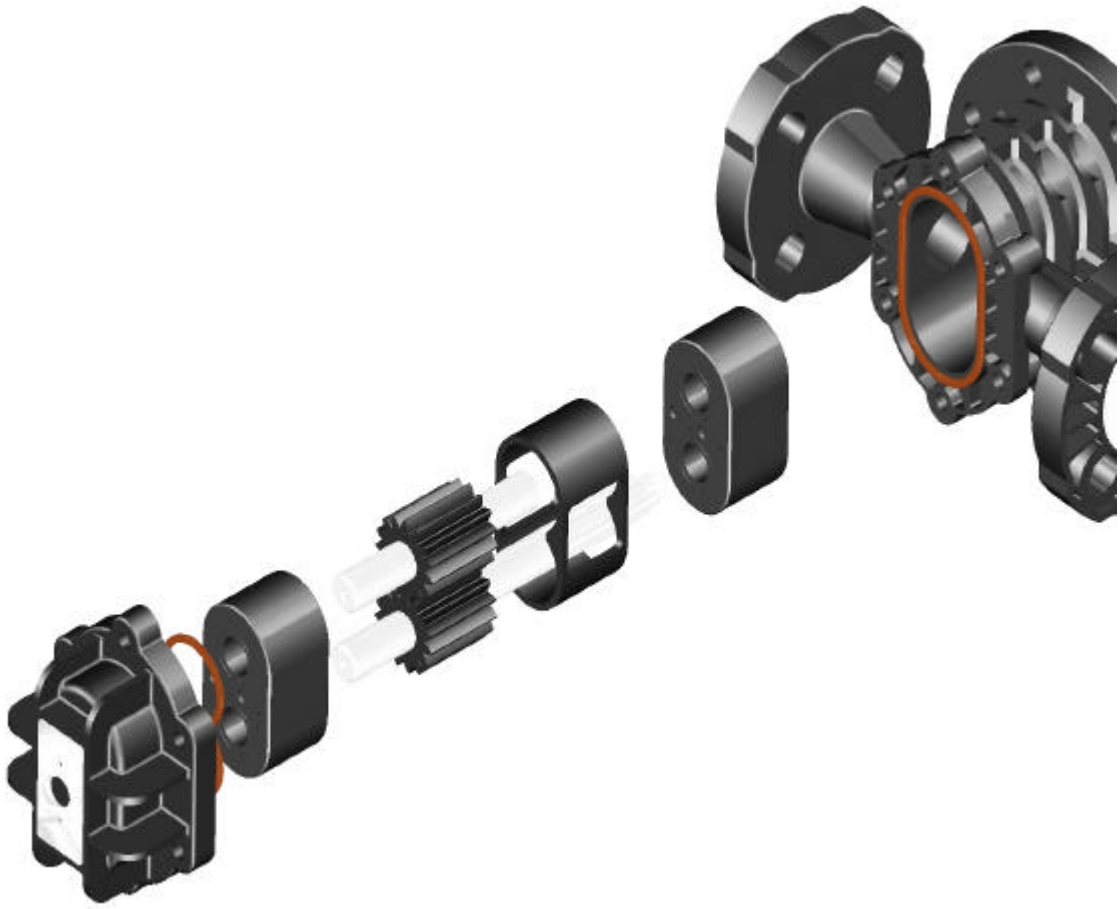


Figure 3

6. Disassembly/Assembly, Eclipse 2

WARNING

BEFORE PERFORMING ANY MAINTENANCE REQUIRING PUMP DISASSEMBLY, BE SURE TO RELIEVE PRESSURE FROM THE PIPING SYSTEM AND, WHERE HAZARDOUS PROCESS MATERIALS ARE INVOLVED, RENDER THE PUMP SAFE TO PERSONNEL AND THE ENVIRONMENT BY CLEANING AND CHEMICALLY NEUTRALIZING AS APPROPRIATE. WEAR PROTECTIVE CLOTHING AND EQUIPMENT AS APPROPRIATE.

6.1 Disassembly

- **Close all suction and discharge valves.**
- **Disconnect power source to motor.**
- **Flush and drain pump**
- **Remove piping (optional for KOPkit).**
- **NOTE: The can area will not fully drain and will contain some process fluid.**

1. Remove the four motor bolts and washers (items 22, 23) and slide the entire pump straight off the motor.

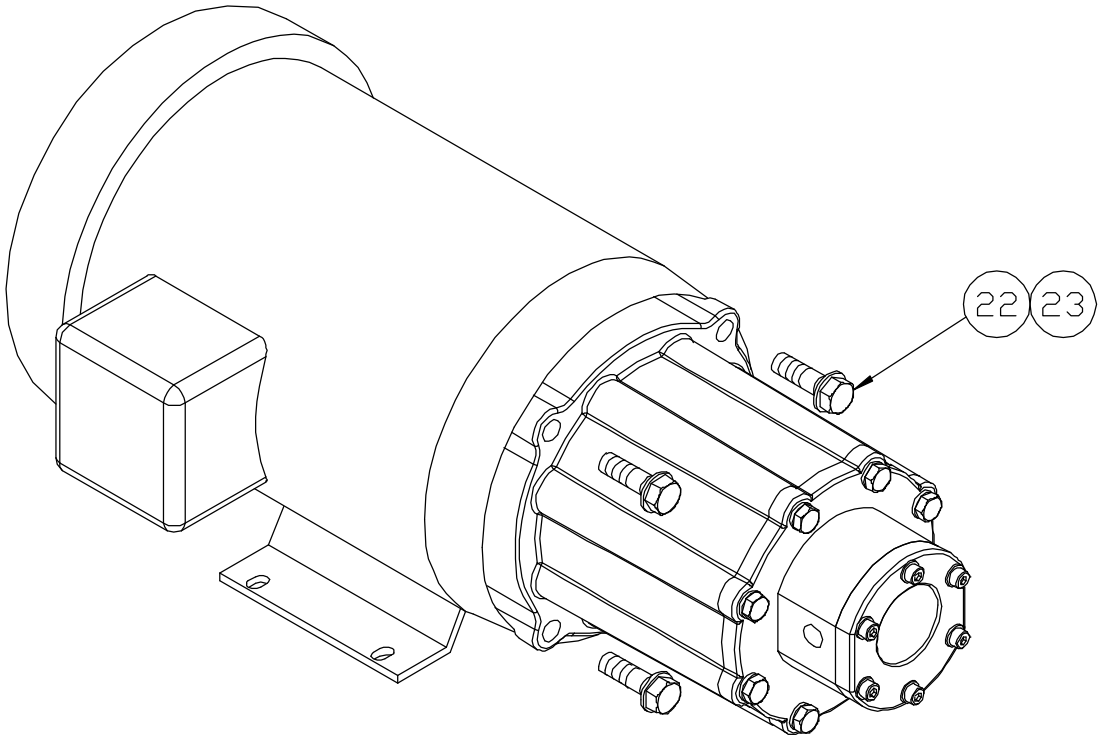


Figure 4

2. Place pump assembly (motor spool down) on the work surface.

3. Remove the six bolts and flat washers (items 3, 4) and remove front cover (item 5) as shown.

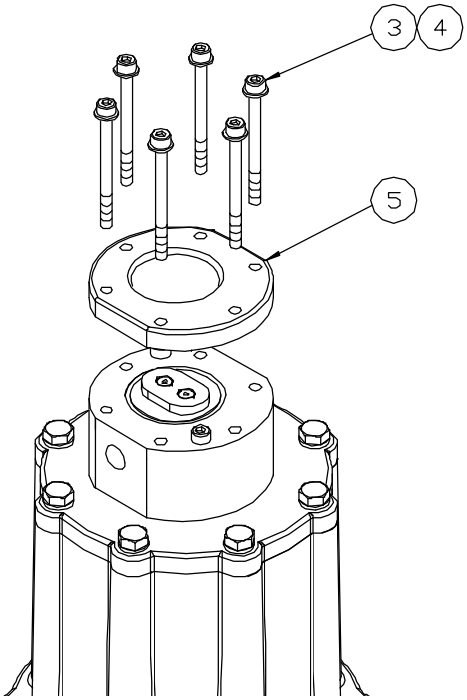


Figure 5

4. Remove bearings (item 10), gear/shaft assemblies (items 12, 13) and housing liner (item11) as shown. These parts, along with the three o-rings make up a standard Eclipse Series KOPkit. Check parts for wear and replace with a KOPkit as required.

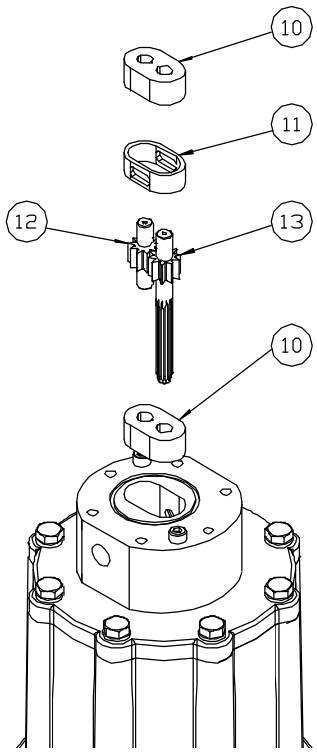


Figure 6

5. Remove the two remaining bolts (item 7) to detach the center housing (item 14).
6. Remove all o-rings from the center housing and front cover. There are two in the center housing (items 6 and 15) and one in the front cover (item 9) as shown.

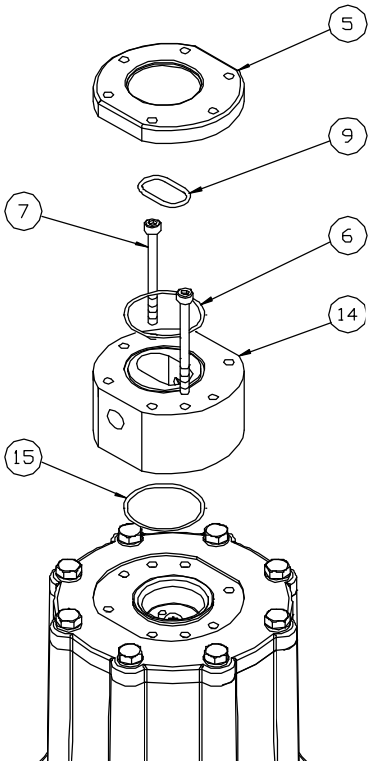


Figure 7

7. Remove the eight mounting bolts and washers (items 16, 17) holding the adapter plate (item 18) to the motor spool (item 20) and detach the adapter plate.
8. Remove driven magnet assembly (item 21) and containment can (item 19) from adapter plate as shown.

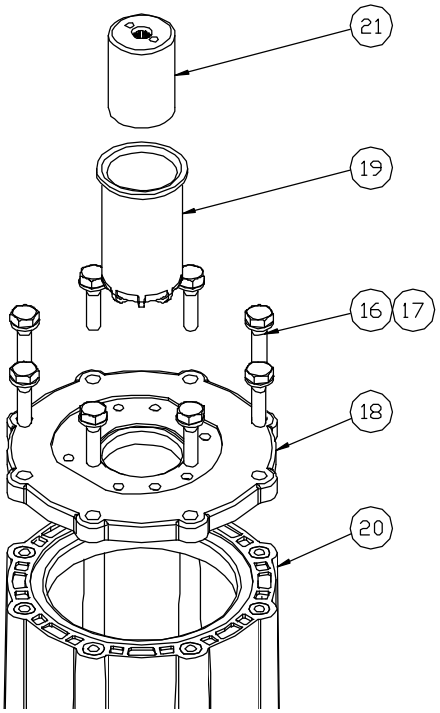


Figure 8

9. Remove drive magnet assembly (item 24) from the motor by loosening the setscrew (item 26) in the magnet hub and slide off the motor shaft. Retain the key from the motor shaft.
10. If required, the magnet hub (item 25) can be separated from the drive magnet (item 24) by removing the four screws (item 27) and detaching.

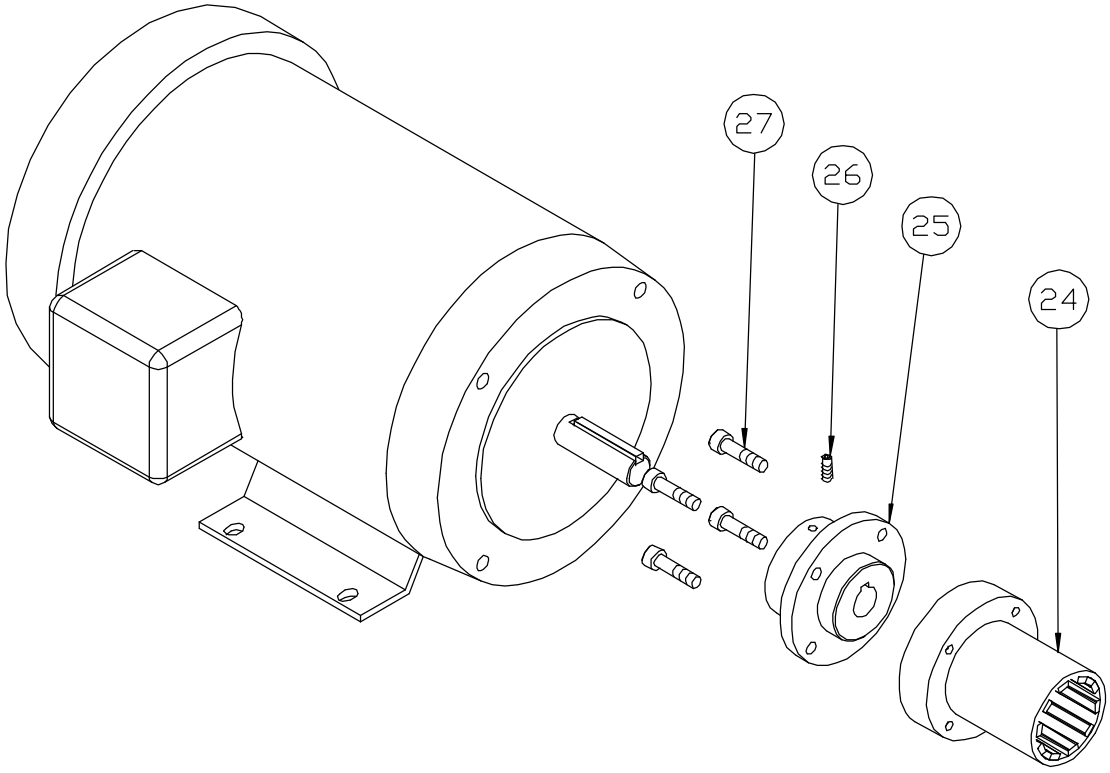


Figure 9

6.2 Inspection

Refer to ***Section 9, Inspection and Wear Limits***, for details.

6.3 Assembly

1. Place motor spool (item 20) flat on work surface. Align “molded-in” flats on the spool adapter plate (item 18) with any two of the motor mounting bolt holes on the motor spool as shown.
2. Set in place and install eight mounting bolts and washers (items 16, 17). Tighten these bolts to the torque specified in ***Section 12.*** Always tighten fasteners in a progressive “crisscross” pattern.
3. Install the containment can (item 19) into the spool adapter plate until it is properly seated into the assembly.
4. Install the driven magnet assembly (item 21) into the containment can. The driven magnet is symmetrical and can be inserted with either end facing out (orientation does not matter).

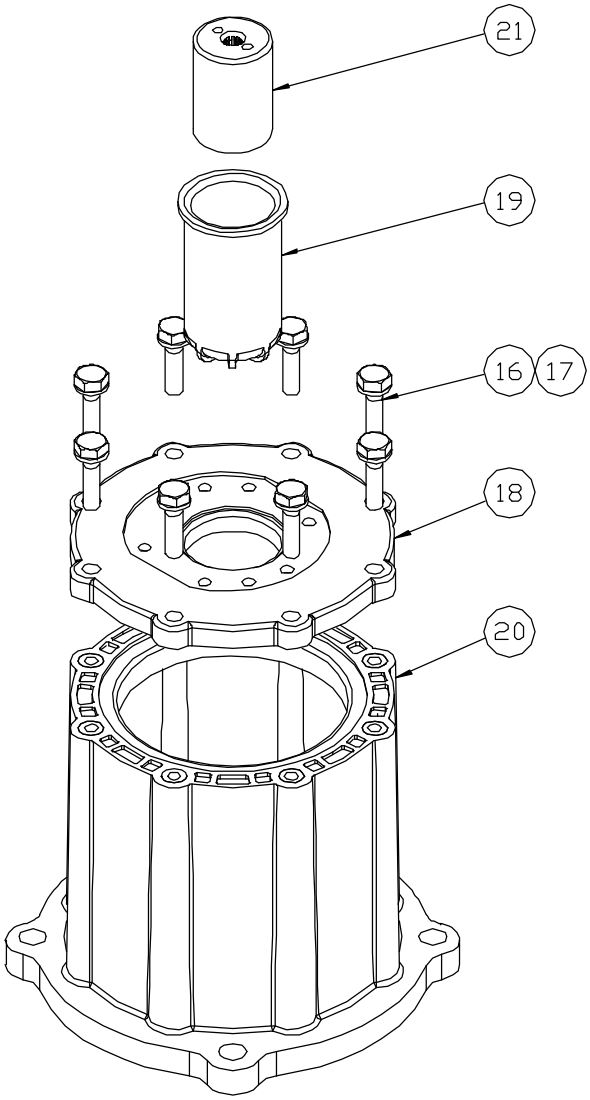


Figure 10

5. Inspect all o-rings to be sure there is no damage such as pinching prior to assembly.

6. Install o-rings (items 6, 15) into grooves on both sides of the center housing. Some o-ring lubricant may help keep the o-rings in place during assembly. Be sure both o-rings are fully seated into housing grooves.

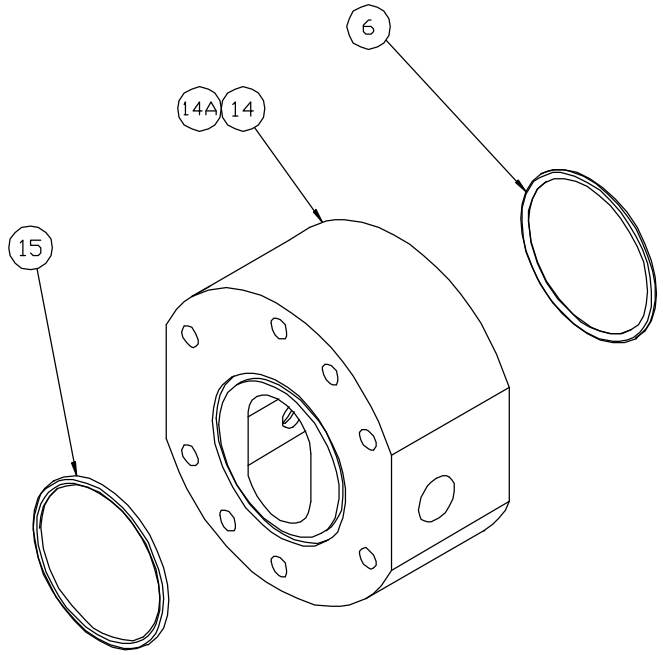


Figure 11

7. Place the center housing (item 14) with o-rings installed onto the spool adapter plate (open bore facing out), aligning the flat sides on the center housing to the flat sides on the spool adapter plate as shown. If the center housing does not sit flat, rotate 180º until it seats into place.
8. Secure the center housing using 2 bolts (item 7) in holes as shown. Tighten these bolts to the torque specified in ***Section 12.*** Always tighten fasteners in a progressive "crisscross" pattern.

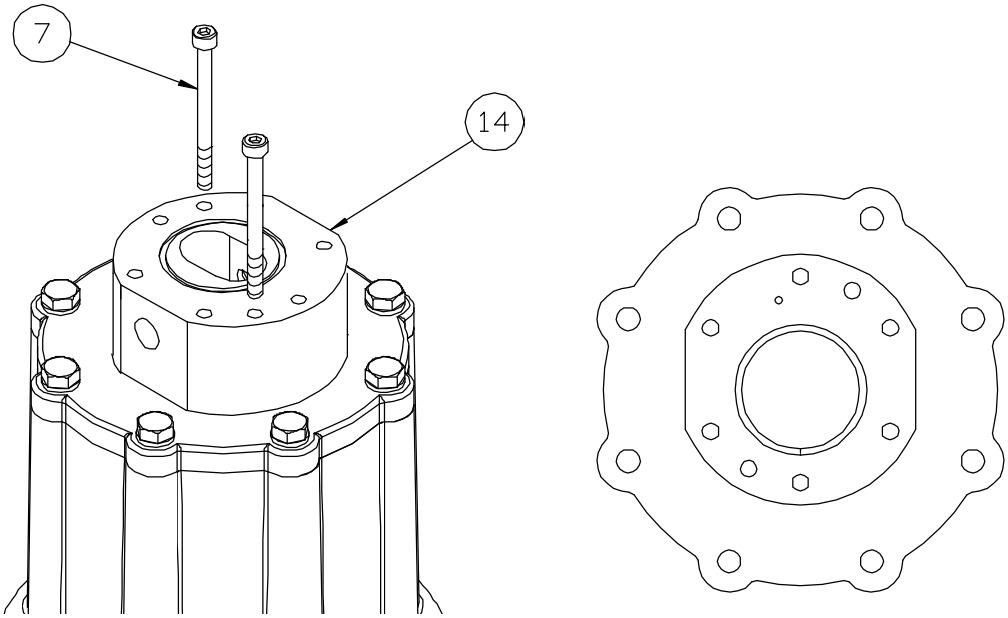


Figure 12

9. Insert a bearing (item 10) into the center housing (item 14) and slide to the bottom of the housing. Bearings are symmetrical and orientation does not matter.
10. Install the housing liner (item 11) and slide until it seats against the first bearing. Install the idler gear (item 12) into the top hole in bearing until the gear seats against the first bearing.
11. Install the drive gear (item 13), splined-end first, into the assembly until it bottoms out against the bearing. The shaft may have to be rotated slightly to properly fit the splined-end into the drive magnet and gear to the idler gear assembly.
12. Insert the second bearing (item 10) into the housing bore until it rests against the housing liner. Bearings are symmetrical and orientation does not matter.

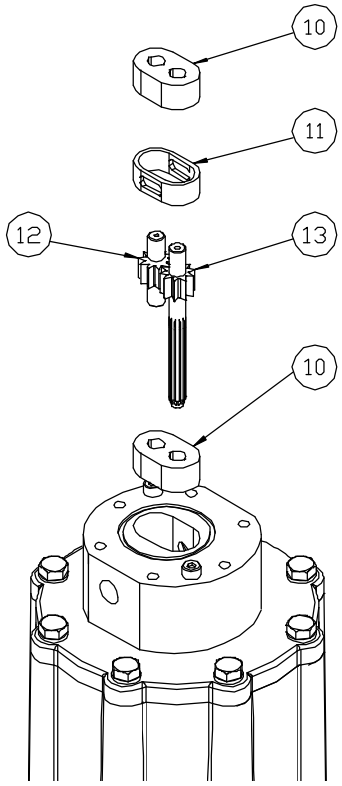


Figure 13

13. Install the spacer o-ring (item 9) into front cover as shown. Some o-ring lubricant may help keep the o-rings in place during assembly.

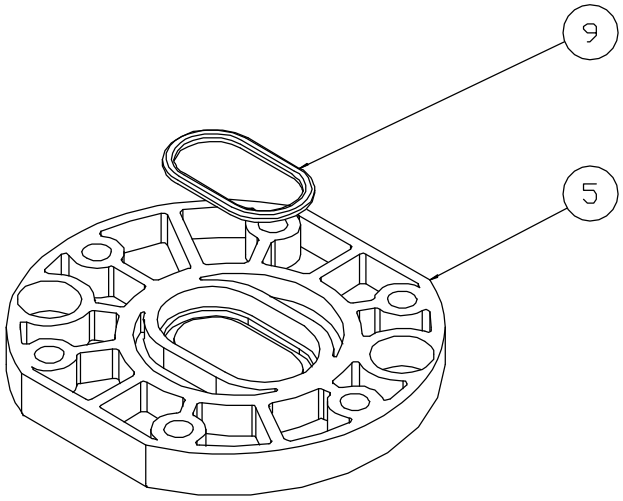


Figure 14

14. Install front cover with spacer o-ring using the six bolts and washers. Tighten these bolts to the torque specified in ***Section 12.*** Always tighten fasteners in a progressive "crisscross" pattern.

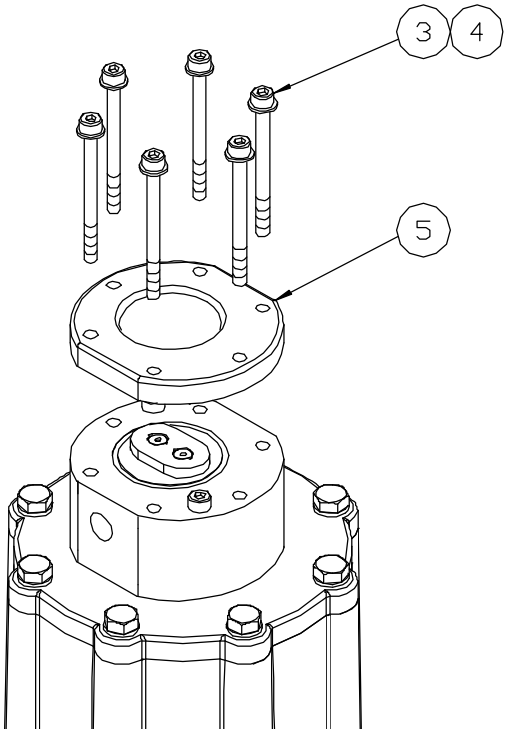


Figure 15

15. For IEC frame motors only, if it was removed, install the motor adaptor plate (item 31) onto the motor face using the four bolts and washers (items 29 and 30). Always tighten fasteners in a progressive "crisscross" pattern.

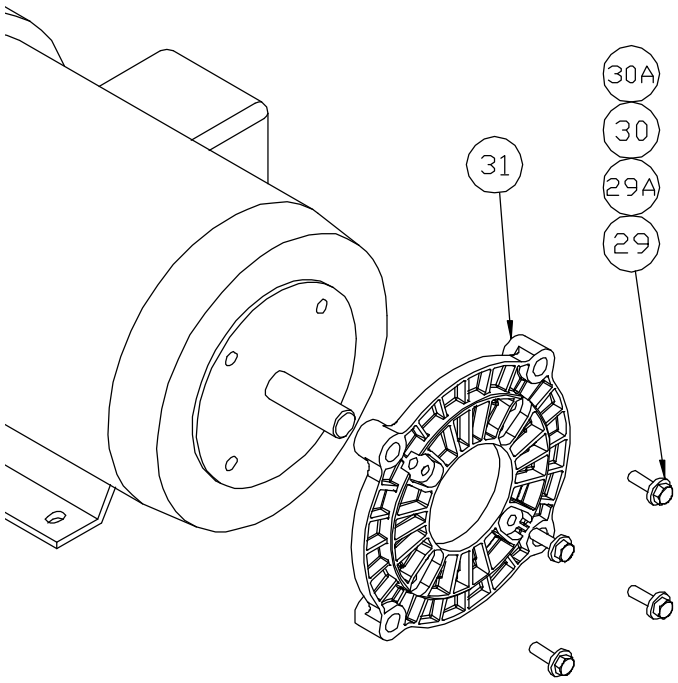


Figure 16

16. Secure the magnet hub (item 25) to the drive magnet (item 24) using the four screws (item 27). Always tighten fasteners in a progressive “crisscross” pattern.

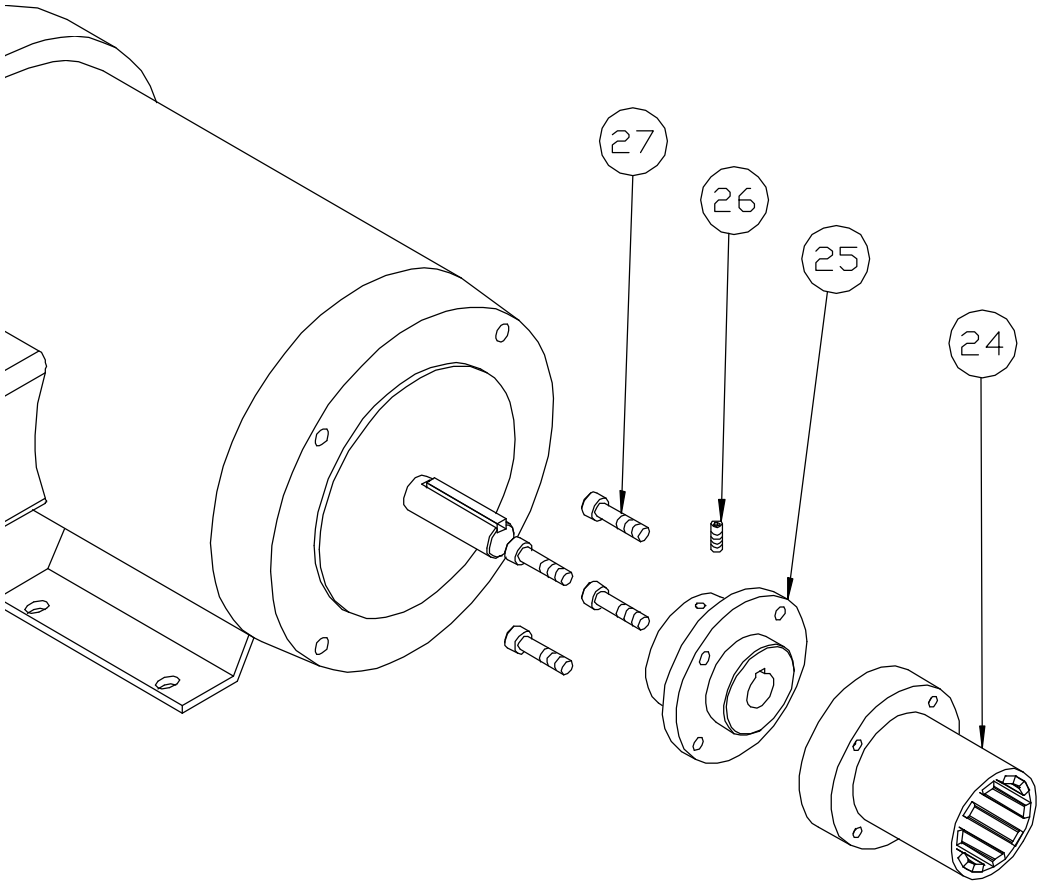


Figure 17

17. Align the keyway, and slide the drive magnet onto the motor shaft until the end of the motor shaft aligns with faces of the drive magnet motor hub as shown below. Secure with the setscrew (item 26). Application of a no-seize compound on the shaft and key will make future maintenance easier.
18. Complete assembly by replacing the assembled pump onto the motor, using care not to allow fingers to get pinched when the magnets attract. Secure the pump to the motor with the four bolts and washers (items22, 23). Always tighten fasteners in a progressive "crisscross" pattern.

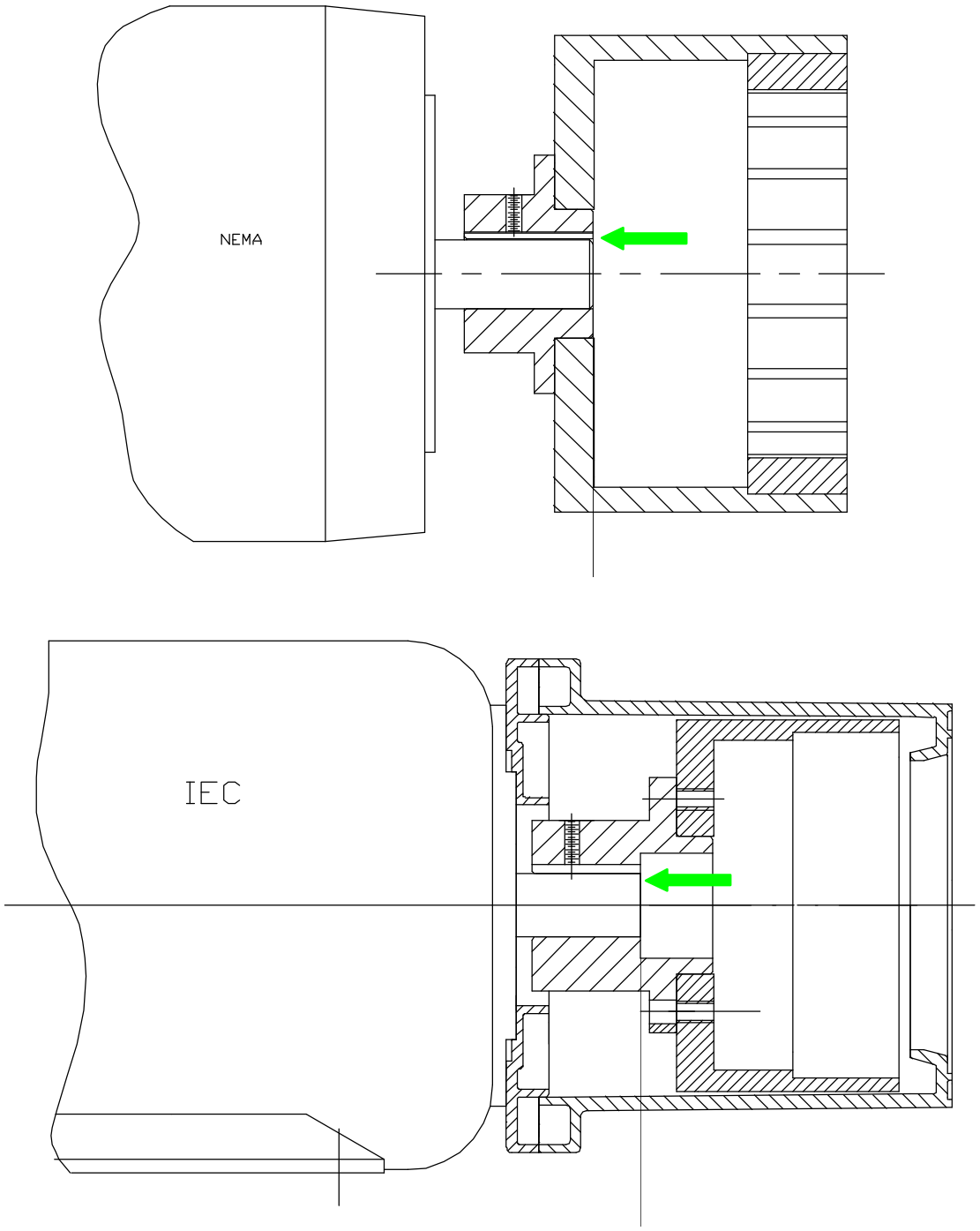


Figure 18

7. Disassembly/Assembly, Eclipse 5 and 12

WARNING

BEFORE PERFORMING ANY MAINTENANCE REQUIRING PUMP DISASSEMBLY, BE SURE TO RELIEVE PRESSURE FROM THE PIPING SYSTEM AND, WHERE HAZARDOUS PROCESS MATERIALS ARE INVOLVED, RENDER THE PUMP SAFE TO PERSONNEL AND THE ENVIRONMENT BY CLEANING AND CHEMICALLY NEUTRALIZING AS APPROPRIATE. WEAR PROTECTIVE CLOTHING AND EQUIPMENT AS APPROPRIATE.

7.1 Disassembly

- **Close all suction and discharge valves.**
- **Disconnect power source to motor.**
- **Flush and drain pump**
- **Remove piping (optional for KOPkit).**
- **NOTE: The can area will not fully drain and will contain some process fluid.**

1. Remove the four motor bolts and washers (items 22, 23) and slide the entire pump straight off the motor.

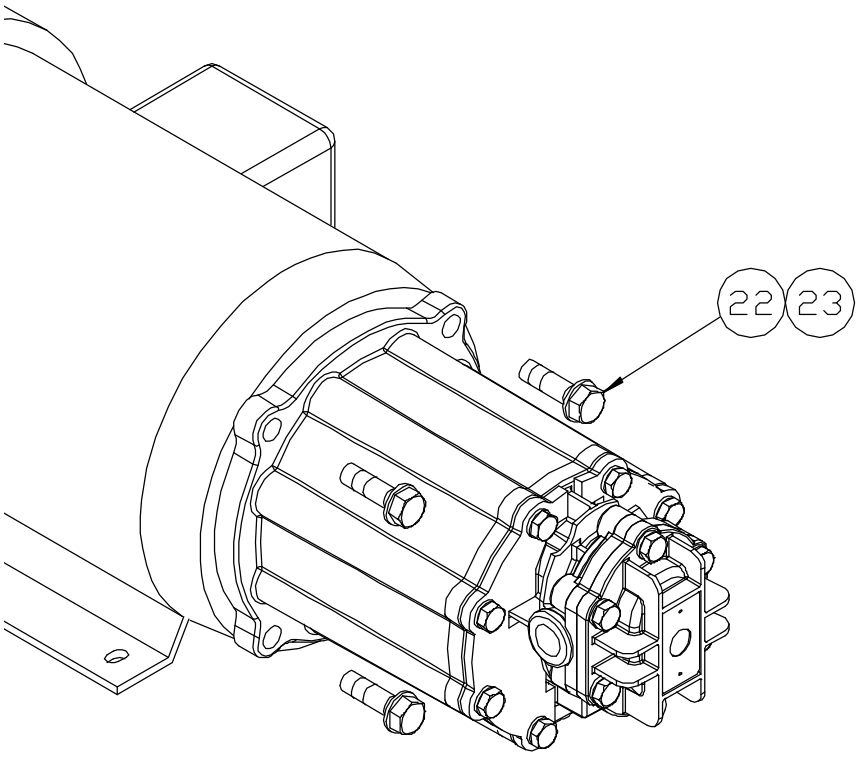


Figure 19

2. Place pump assembly (motor spool down) on the work surface.

3. Remove the six bolts and washers (items 3, 4), remove front cover (item 5) and nut plates (item 28) as shown.

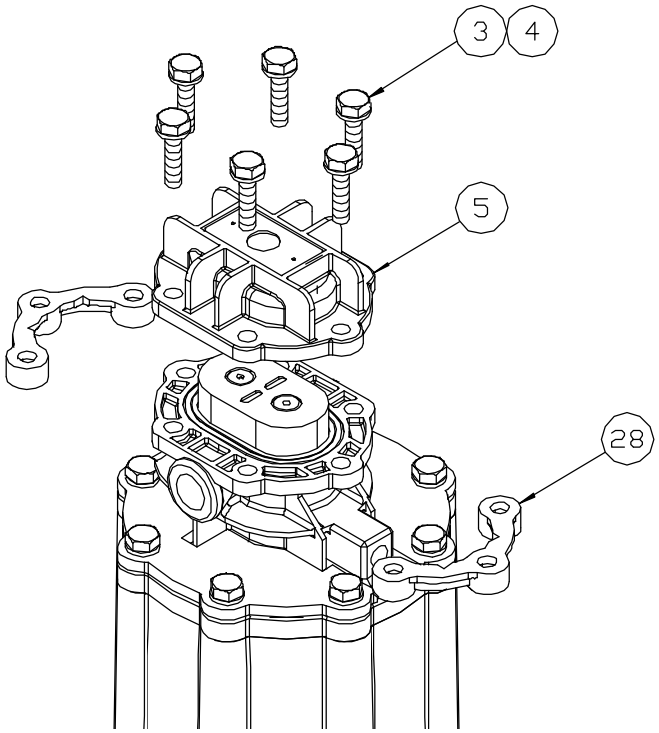


Figure 20

4. Remove bearings (item 10), gear/shaft assemblies (items 12, 13) and housing liner (item 11) as shown. These parts, along with the four o-rings make up a standard Eclipse Series KOPkit. Check parts for wear and replace with a KOPkit as required.

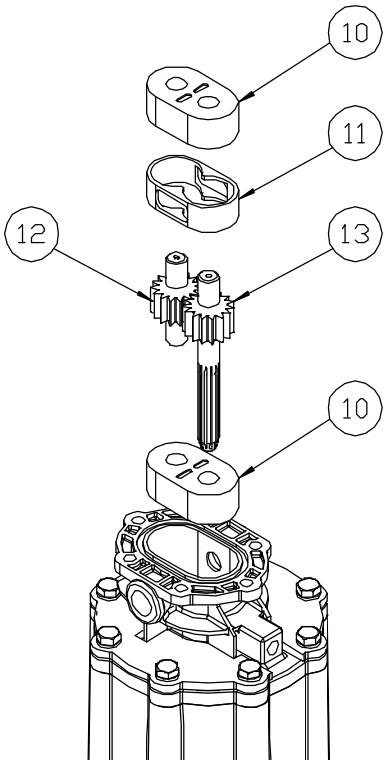


Figure 21

5. Remove the eight mounting bolts and washers (items 16, 17) holding the center housing (item 14) to the motor spool (item 20). Remove the center housing and retaining plates (item 32).
6. Remove all o-rings from the center housing and front cover. There are two o-rings in the center housing (items 6, 15) and one in the front cover (item 9) as shown.

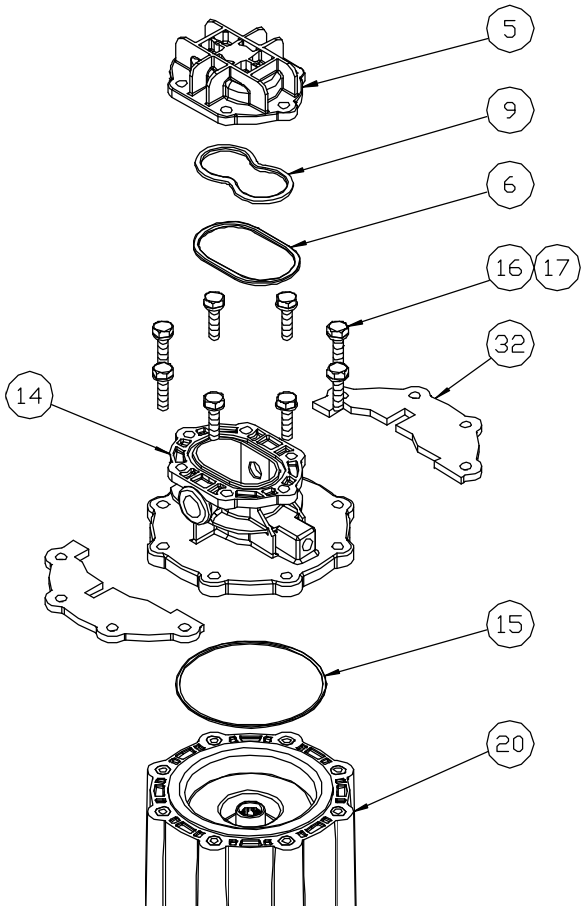


Figure 22

7. Remove driven magnet assembly (item 21) and containment can (item 19) from the motor spool (item 20) as shown.

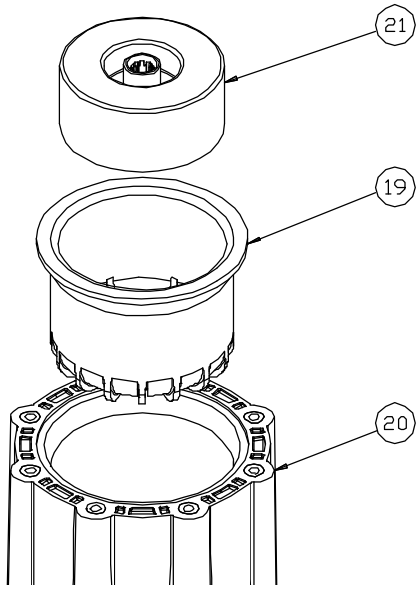


Figure 23

8. Remove drive magnet assembly from the motor by loosening the setscrew (item 26) in the magnet hub (item 25) and slide off the motor shaft. Retain the key from the motor shaft.
9. If required, the magnet hub (item 25) can be separated from the drive magnet (item 24) by removing the four screws (item 27) and detaching.

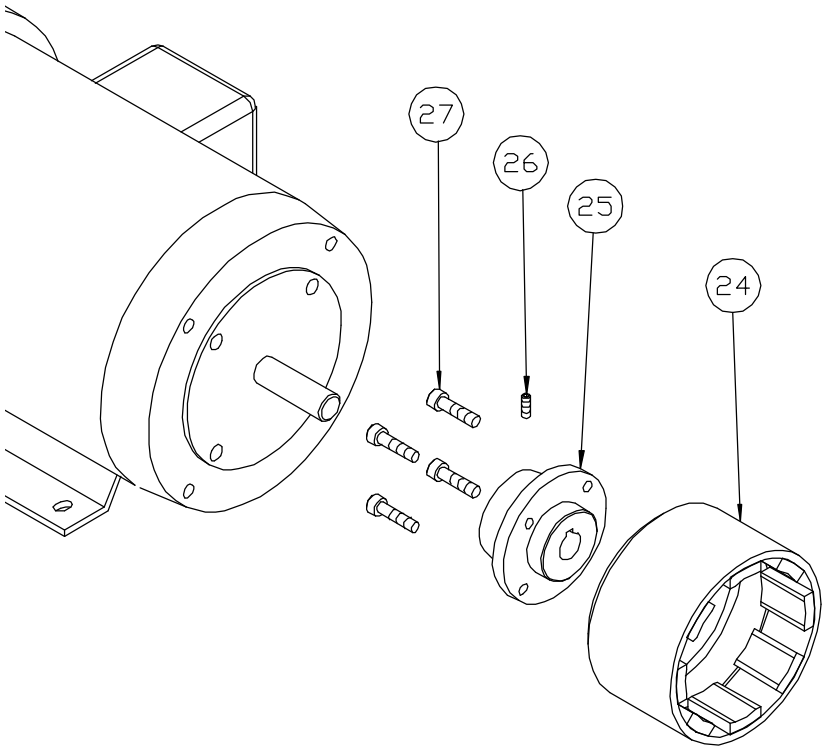


Figure 24

7.2 Inspection

Refer to ***Section 9, Inspection and Wear Limits***, for details.

7.3 Assembly

1. Place motor spool (item 20) flat on work surface.
2. Insert the containment can (item 19) and driven magnet (item 21) into the motor spool as shown. The driven magnet is symmetrical and orientation does not matter.

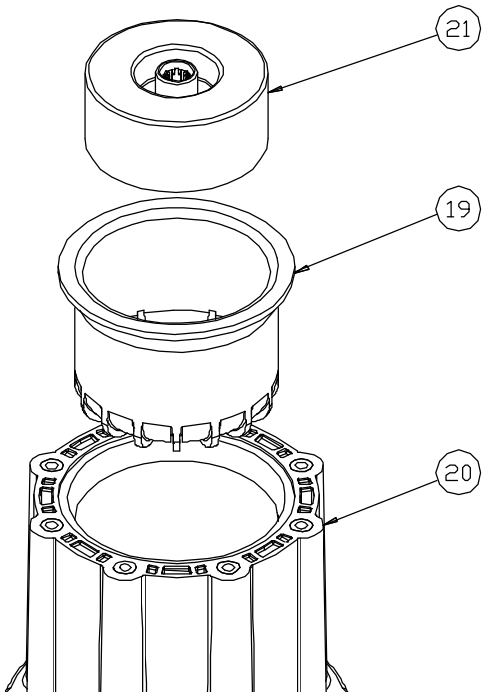


Figure 25

3. Inspect all o-rings to be sure there is no damage such as pinching prior to assembly.

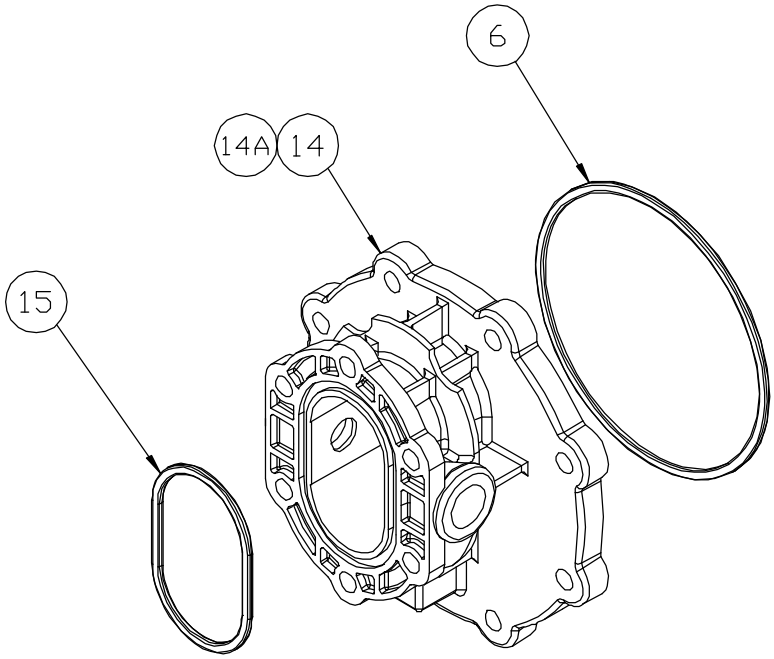


Figure 26

4. Install o-rings (items 6, 15) into each side of the center housing (item 14) as shown. Some o-ring lubricant may help keep the o-rings in place during assembly. Be sure both o-rings are fully seated into housing grooves.

5. Place the center housing, with o-rings, onto the motor spool, aligning the port connections between any set of motor spool bolt holes as shown. Add the retaining plates (item 32). Secure with eight bolts and washers (items 16, 17). Tighten these bolts to the torque specified in ***Section 12.*** Always tighten fasteners in a progressive "crisscross" pattern.

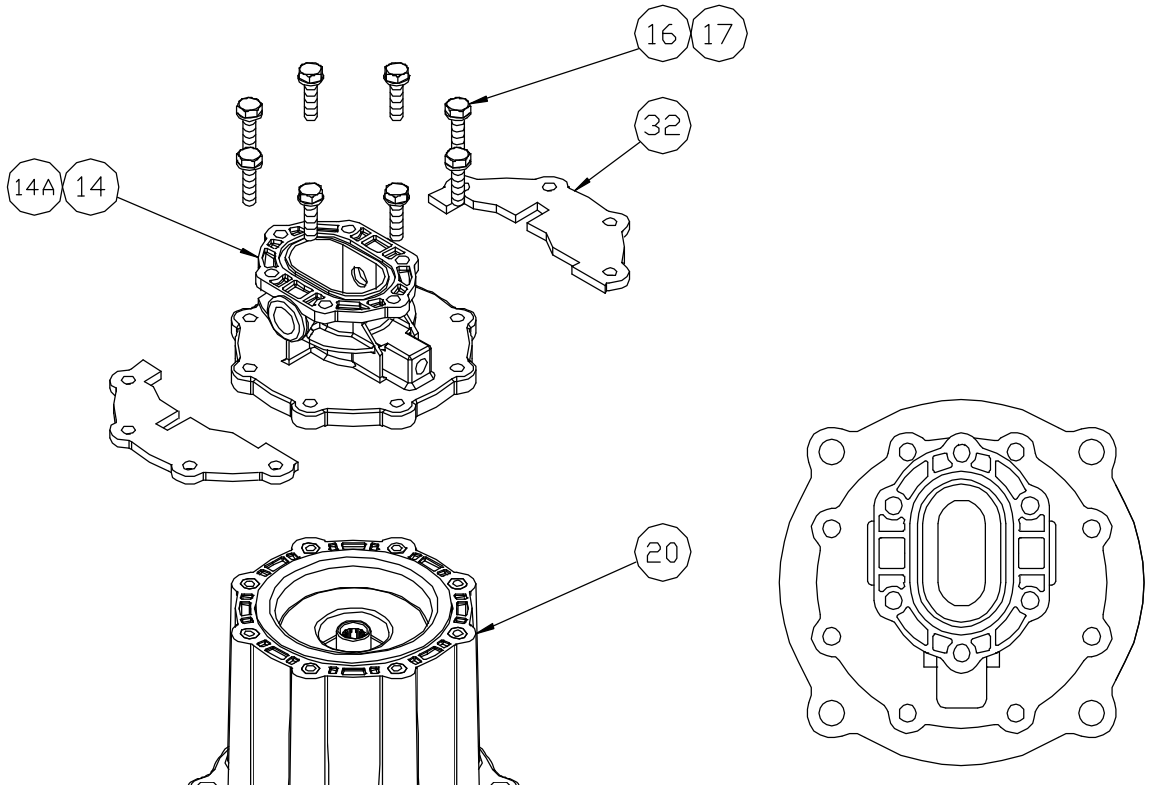


Figure 27

6. Insert a bearing (item 10) into center housing and slide to bottom of bore. Bearings are symmetrical and orientation does not matter. Install the housing liner (item 11) and slide until it seats against the first bearing. Install idler gear (item 12) into the top hole in bearing until the gear seats against the first bearing.

7. Install the drive gear (item 13), splined-end first, into the assembly until it bottoms out against the bearing. The shaft may have to be rotated slightly to properly fit the splined-end into the drive magnet and mesh gear teeth with the idler gear.

8. Insert the second bearing (item 10) into the housing bore until it rests against the housing liner. Bearings are symmetrical and orientation does not matter.

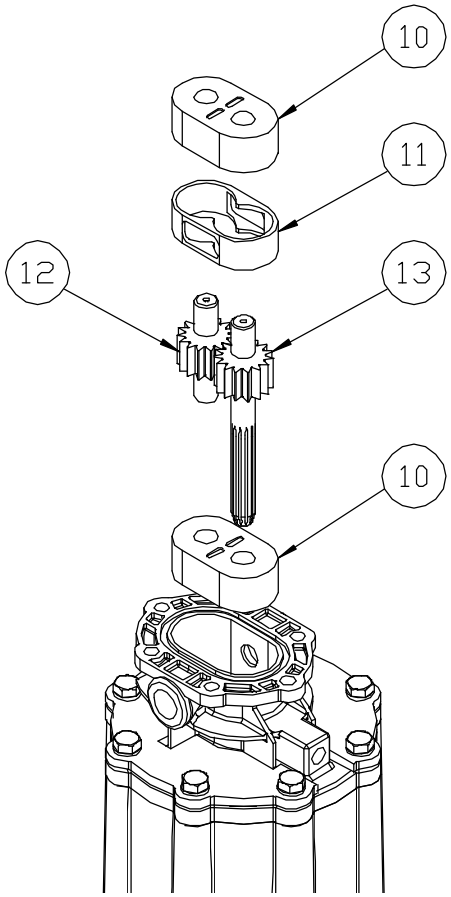


Figure 28

9. Install the spacer o-ring (item 9) into the front cover (item 5) as shown. Some o-ring lubricant may help keep the o-rings in place during assembly.

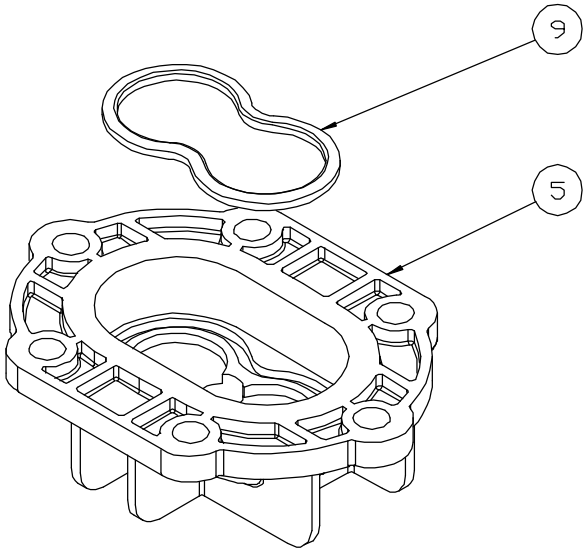


Figure 29

10. Place the front cover (item 5) with o-ring onto the assembled pump. Secure the front cover using the six bolts and washers (items 3, 4) and two nut plates (item 28) as shown. The flat side of the nut plates mate against the back of the center housing flange. Tighten these bolts to the torque specified in ***Section 12.*** Always tighten fasteners in a progressive "crisscross" pattern.

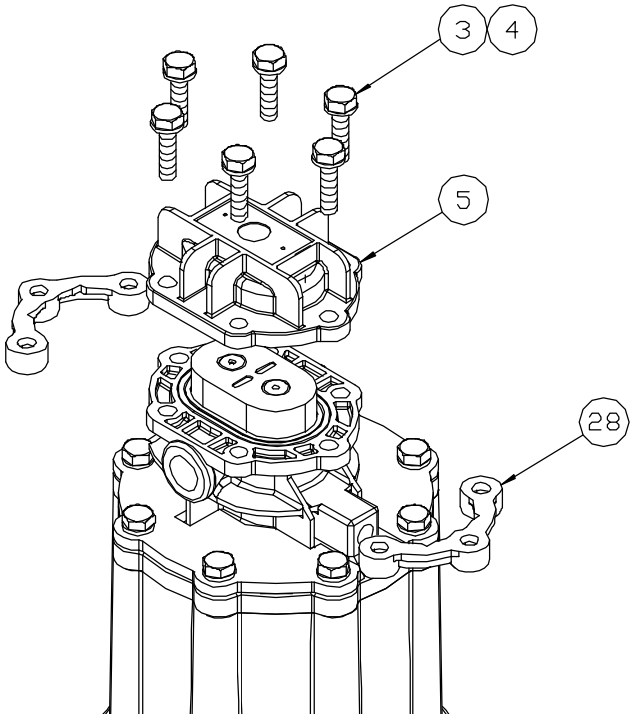


Figure 30

11. For IEC frame motors only, if it was removed, install the motor adaptor plate (item 31) onto the motor face using the four bolts and washers (items 29 and 30). Always tighten fasteners in a progressive "crisscross" pattern.

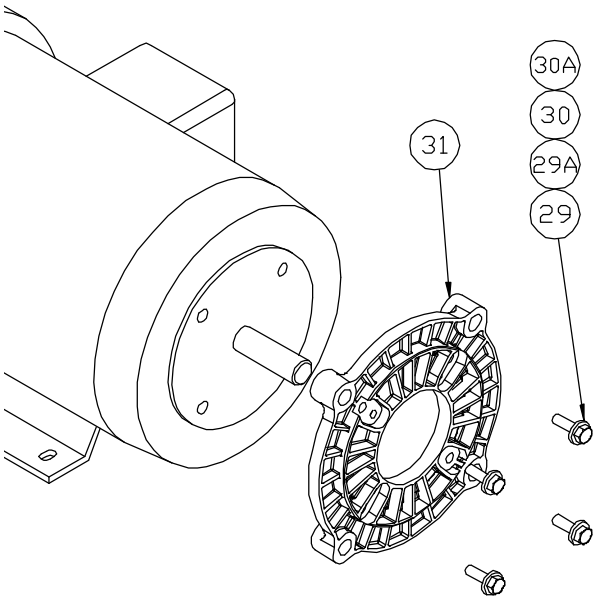


Figure 31

12. Secure the magnet hub (item 25) to the drive magnet (item 24) using the four screws (item 27). Always tighten fasteners in a progressive “crisscross” pattern.

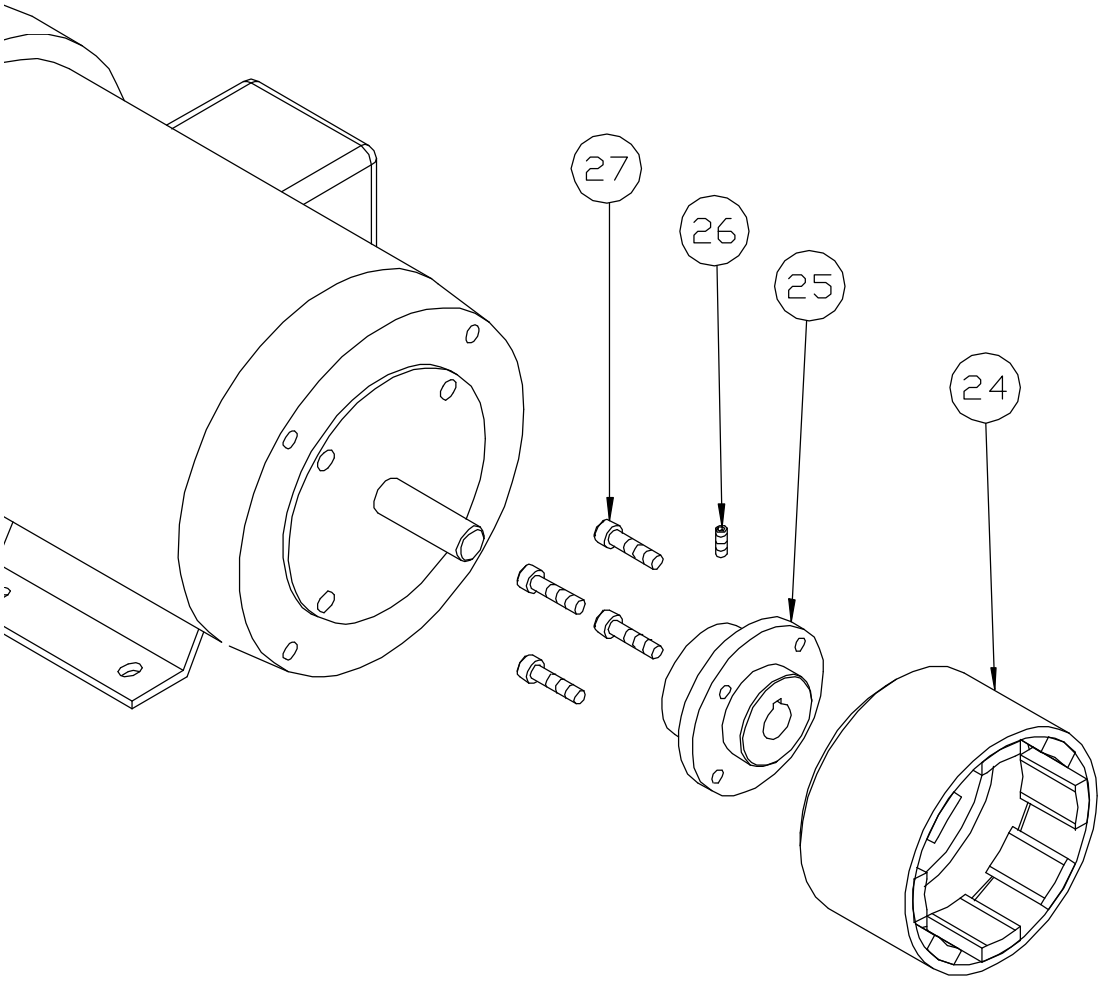


Figure 32

13. Align the keyway, and slide the drive magnet onto the motor shaft until the end of the motor shaft aligns with faces of the drive magnet motor hub as shown below. Secure with the setscrew (item 26). Application of a no-seize compound on the shaft and key will make future maintenance easier.
14. Complete assembly by replacing the assembled pump onto the motor, using care not to allow fingers to get pinched when the magnets attract. Secure the pump to the motor with the four bolts and washers (items 22,23). Always tighten fasteners in a progressive "crisscross" pattern.

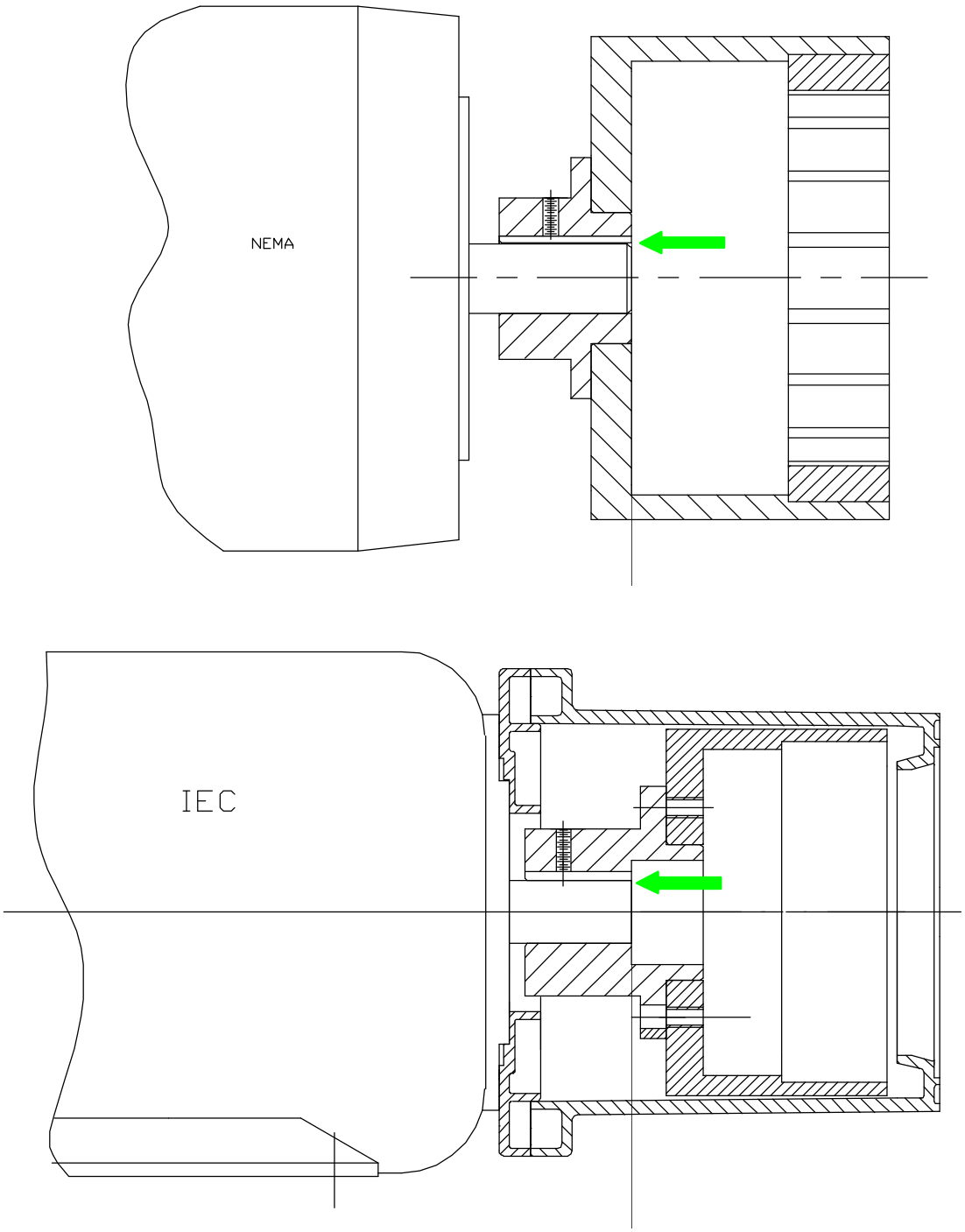


Figure 33

8. Disassembly/Assembly, Eclipse 25 & 75

WARNING

BEFORE PERFORMING ANY MAINTENANCE REQUIRING PUMP DISASSEMBLY, BE SURE TO RELIEVE PRESSURE FROM THE PIPING SYSTEM AND, WHERE HAZARDOUS PROCESS MATERIALS ARE INVOLVED, RENDER THE PUMP SAFE TO PERSONNEL AND THE ENVIRONMENT BY CLEANING AND CHEMICALLY NEUTRALIZING AS APPROPRIATE. WEAR PROTECTIVE CLOTHING AND EQUIPMENT AS APPROPRIATE.

8.1 Disassembly

- **Close all suction and discharge valves.**
- **Disconnect power source to motor.**
- **Flush and drain pump**
- **Remove piping (optional for KOPkit).**
- **NOTE: The can area will not fully drain and will contain some process fluid**

1. Remove the four motor bolts and washers (items 22, 23) and slide the entire pump straight off the motor.

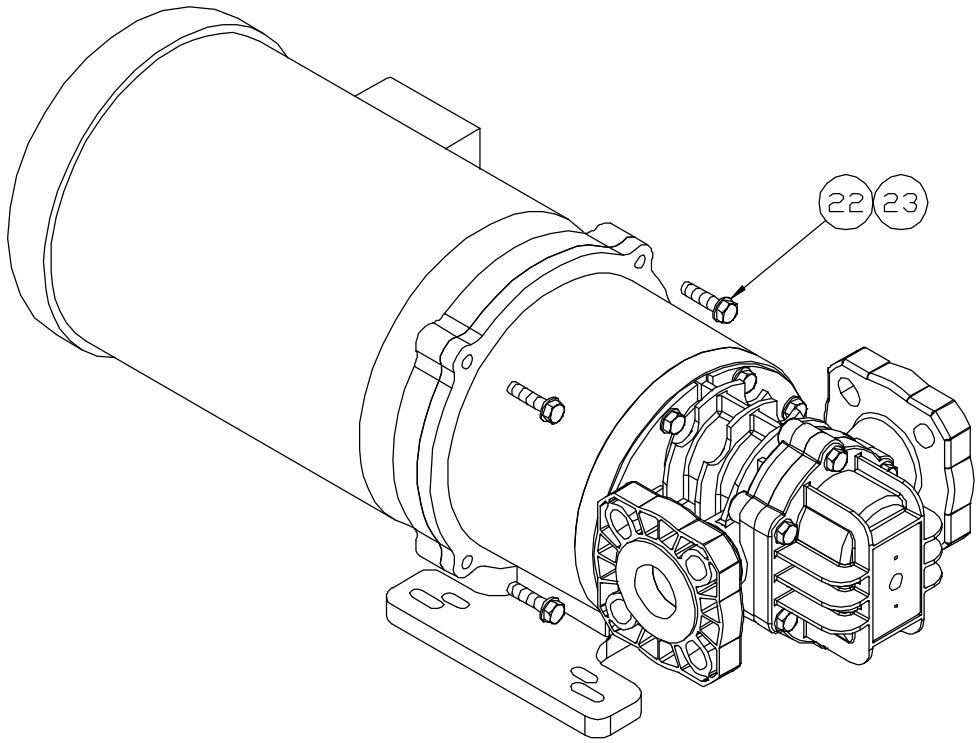


Figure 34

2. Place pump assembly (motor spool down) on the work surface.

3. Remove the six bolts and washers (items 3, 4), remove front cover (item 5) and nut plates (item 28) as shown.
4. If required, the mounting base (item 32) can be detached by removing the four bolts and washers (items 33, 34) as shown.

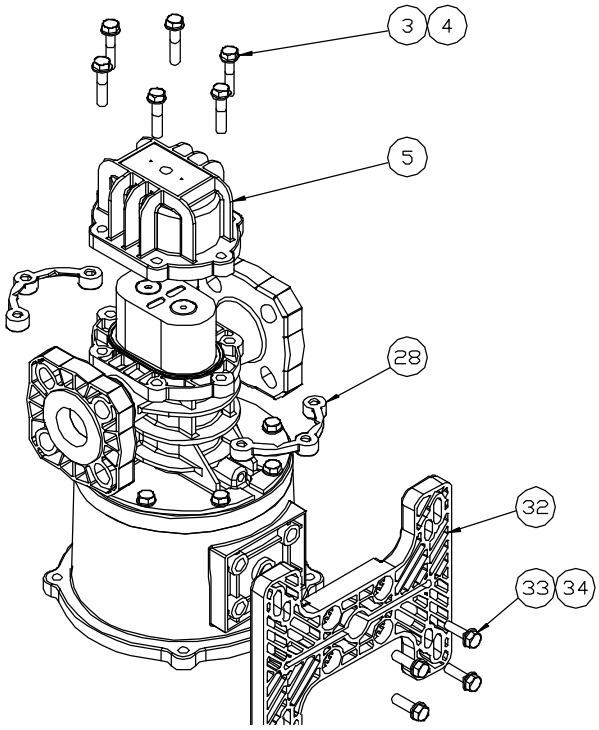


Figure 35

5. Remove bearings (item 10), gear/shaft assemblies (items 12, 13) and housing liner (item 11) as shown. These parts, along with the four o-rings make up a standard Eclipse Series KOPkit. Check parts for wear and replace with a KOPkit as required.

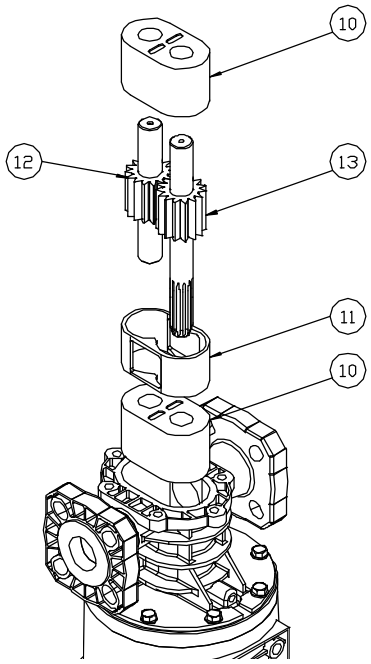


Figure 36

6. Remove the eight mounting bolts and washers (items 16, 17) holding the center housing (item 14) to the motor spool (item 20). Detach the center housing and retaining plates (item 35).
7. Remove all o-rings from the center housing and front cover. There is one o-ring in the center housing (item 15) and two in the front cover (items 6, 9) as shown.

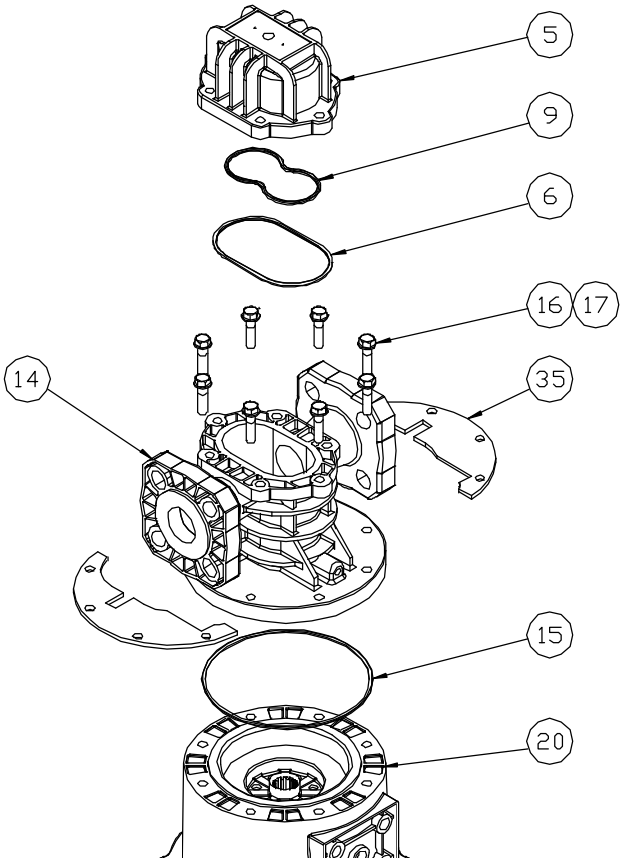


Figure 37

8. Remove driven magnet assembly (item 21) and containment can (item 19) from the motor spool (item 20) as shown.

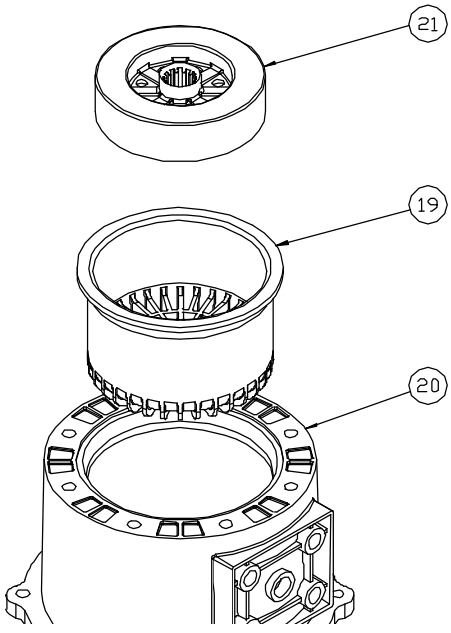


Figure 38

9. Remove drive magnet assembly from the motor by loosening the setscrew (item 26) in the magnet hub (item 25) and slide off the motor shaft. Retain the key from the motor shaft.
10. If required, the magnet hub (item 25) can be separated from the drive magnet (item 24) by removing the four screws (item 27) and detaching.

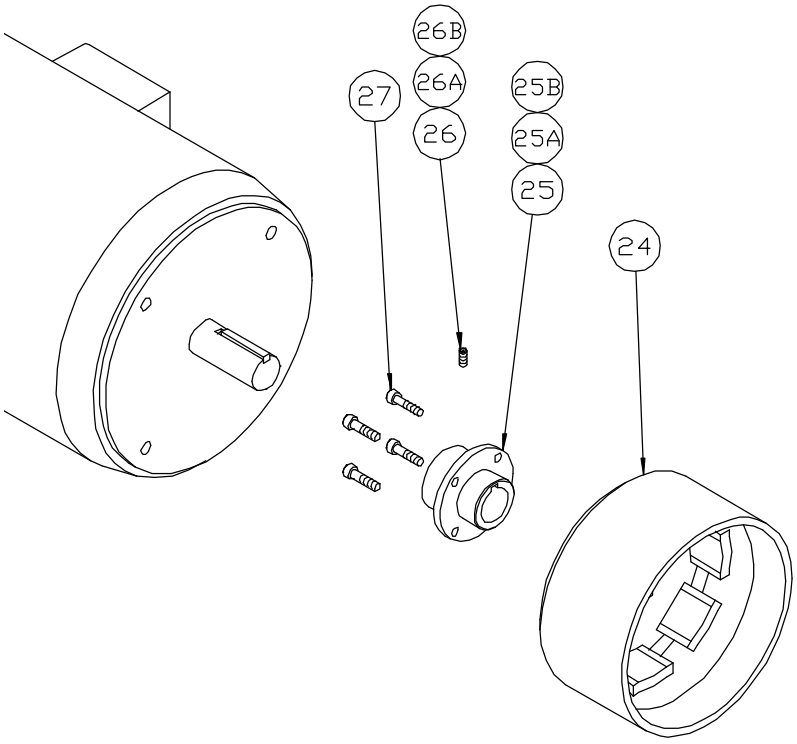


Figure 39

8.2 Inspection

Refer to ***Section 9, Inspection and Wear Limits***, for details.

8.3 Assembly

1. Place motor spool flat on work surface.
2. Insert containment can (item 19) and driven magnet (item 21) into motor spool (item 20) as shown. The driven magnet is symmetrical and orientation does not matter.

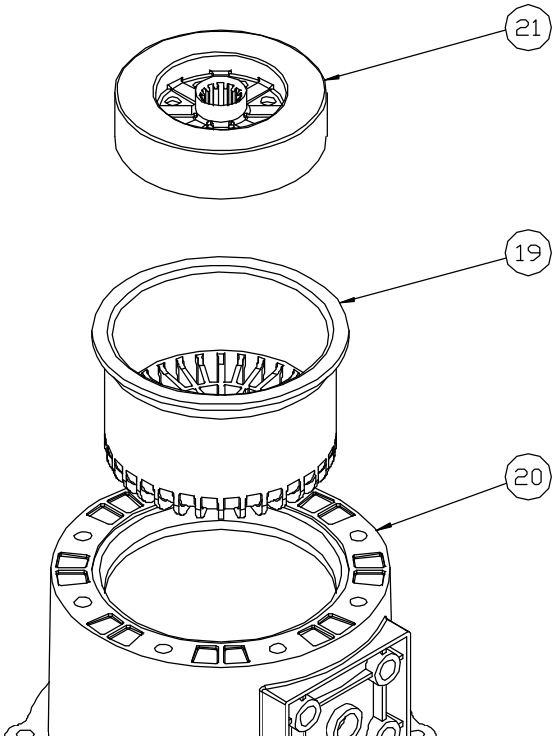


Figure 40

3. Inspect all o-rings to be sure there is no damage such as pinching prior to assembly.

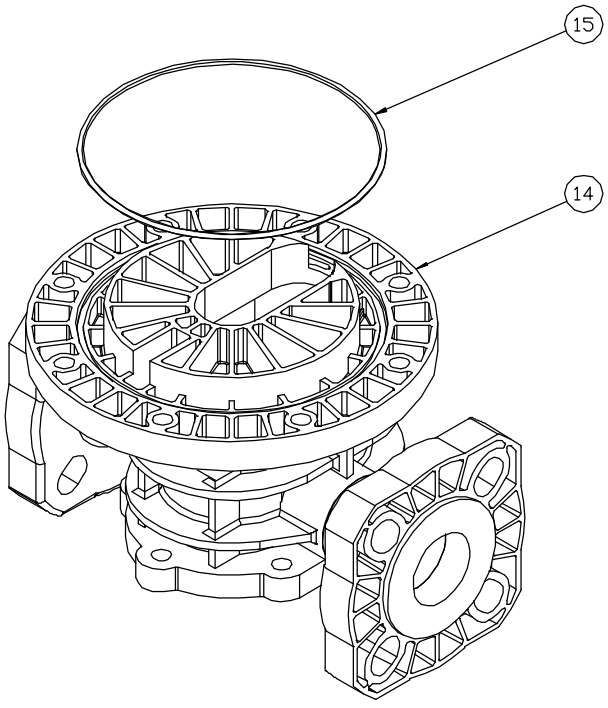


Figure 41

4. Install o-ring (item 15) into the back side of the center housing (item 14) as shown. Some o-ring lubricant may help keep the o-rings in place during assembly. Be sure the o-ring is fully seated into housing groove.

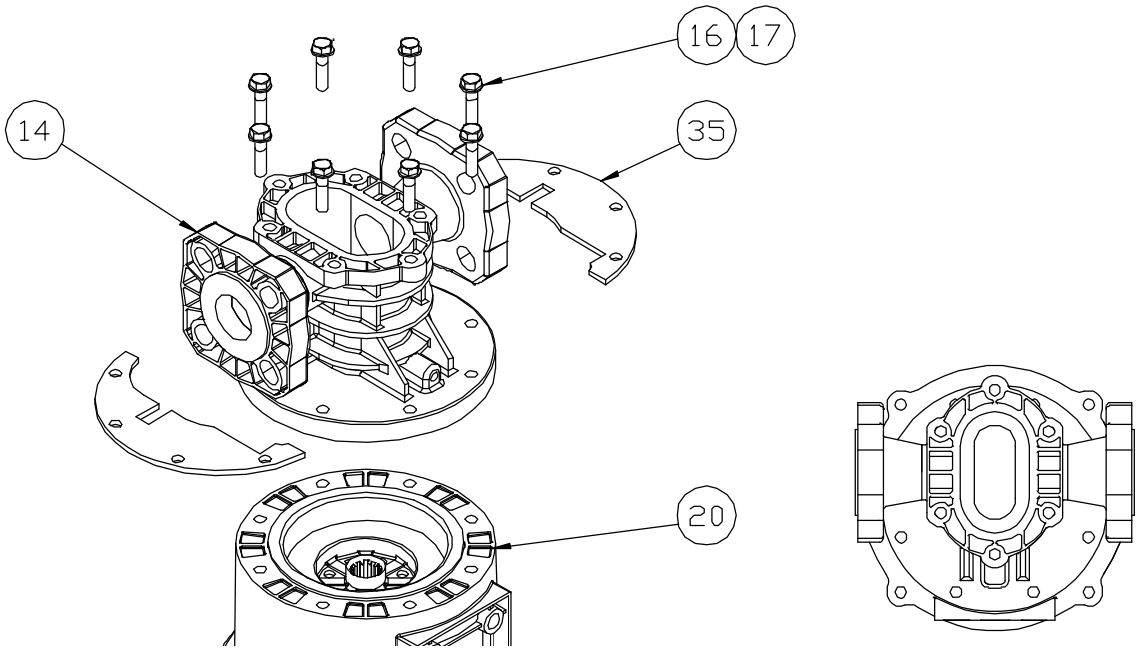


Figure 42

5. Place the center housing (item 14) onto the motor spool, aligning the port connections with the pump baseplate as shown. Place the two retaining plates (item 35) onto the center housing and secure with eight bolts and washers (items 16, 17). Tighten bolts to the torque specified in ***Section 12***. Always tighten fasteners in a progressive "crisscross" pattern.

6. Insert a bearing (item 10) into center housing (item 14) and slide to bottom of bore. Bearings are symmetrical and orientation does not matter. Install the housing liner (item 11) and slide until it seats against the first bearing. Install idler gear (item 12) into the top hole in the bearing until the gear seats against the first bearing.

7. Install the drive gear (item 13), splined-end first, into the assembly until it bottoms out against the bearing. The shaft may have to be rotated slightly to properly fit the splined-end into the drive magnet and mesh gear teeth with the idler gear.

8. Insert the second bearing into the housing bore until it rests against the housing liner. Bearings are symmetrical and orientation does not matter.

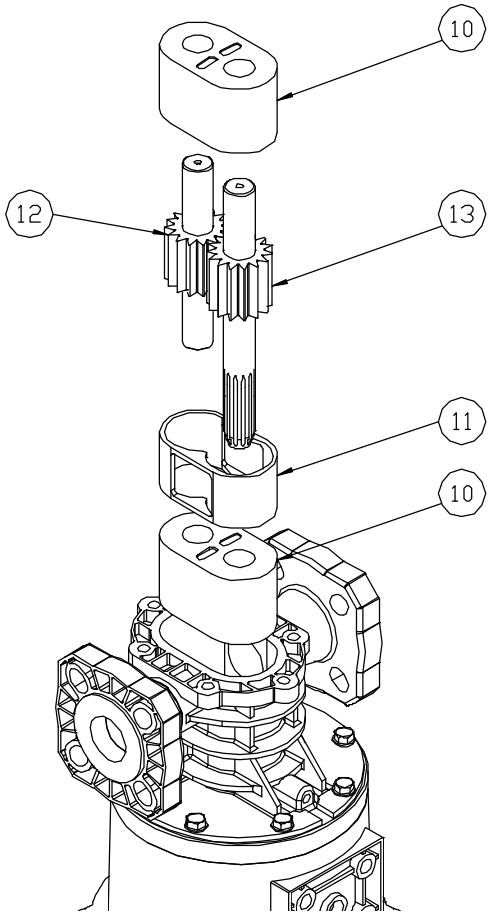


Figure 43

9. Install the two o-rings (items 6, 9) into the front cover (item 5) as shown. Some o-ring lubricant may help keep the o-rings in place during assembly.

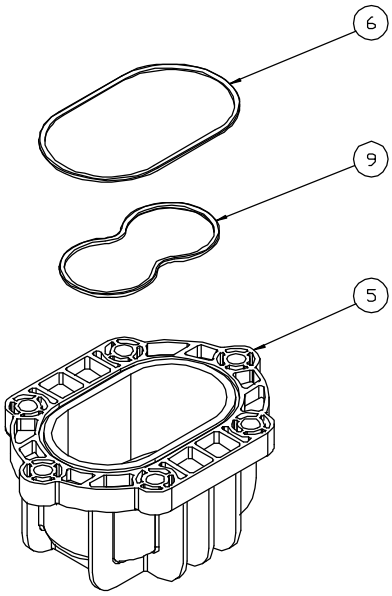


Figure 44

10. Place the front cover (item 5) with o-ring onto the assembled pump. Secure the front cover using the six bolts and washers (items 3, 4) and two nut plates (item 28) as shown. The flat side of the nut plates mate against the back of the center housing flange. Tighten bolts to the torque specified in ***Section 12***. Always tighten fasteners in a progressive "crisscross" pattern.

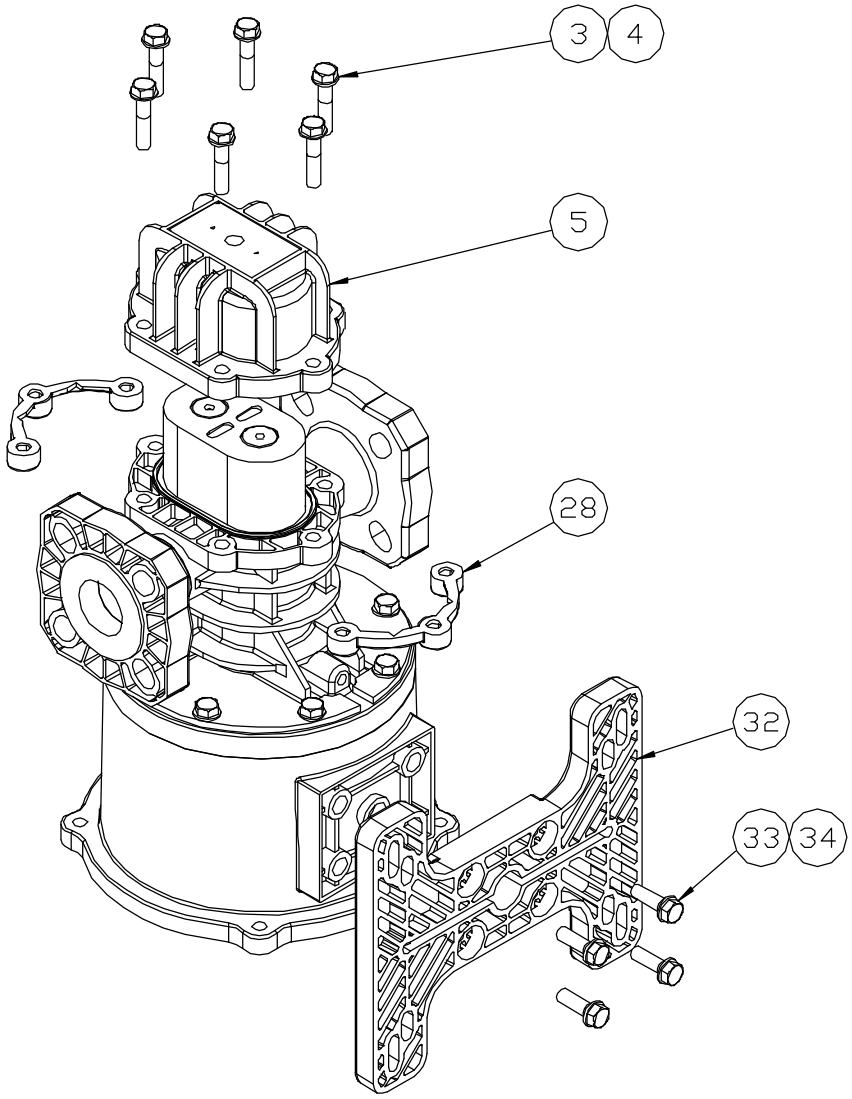


Figure 44

11. Secure the mounting base (item 32) to the motor spool (item 20) using the four bolts and washers (items 33, 34) as shown. Always tighten fasteners in a progressive "crisscross" pattern.

12. If it was removed, install the motor adaptor plate (item 18) onto the motor face using the four bolts and washers (items 29 and 30). Always tighten fasteners in a progressive “crisscross” pattern.

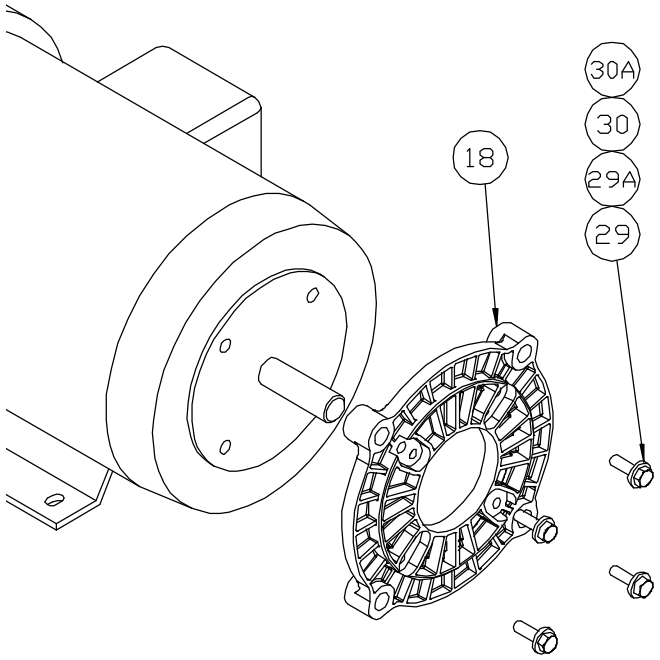


Figure 45

13. Secure the magnet hub (item 25) to the drive magnet (item 24) using the four screws (item 27). Always tighten fasteners in a progressive “crisscross” pattern.

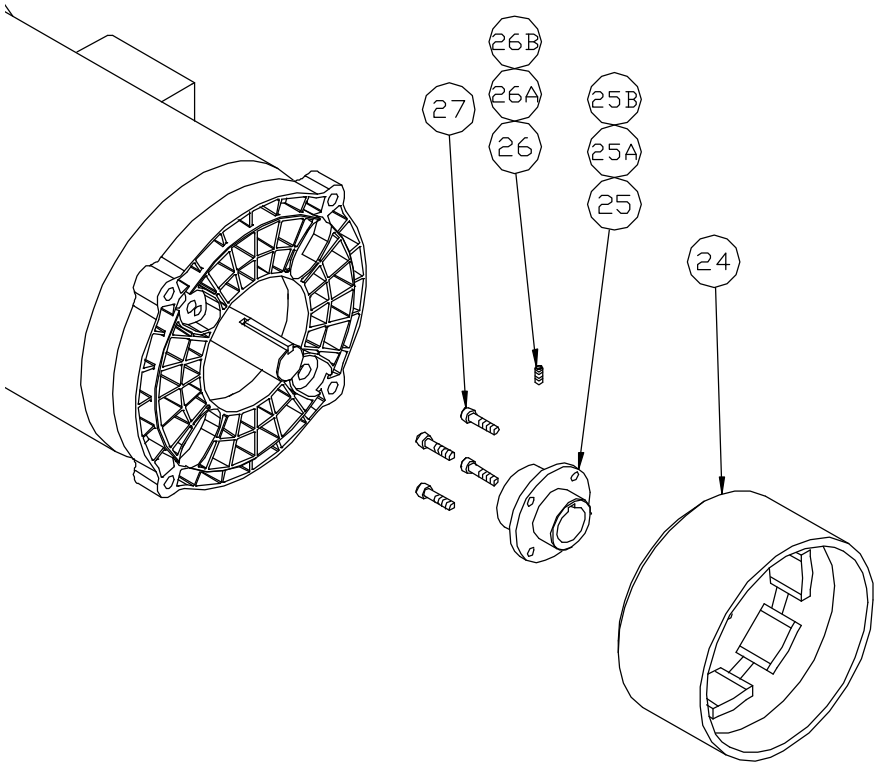


Figure 46

14. Align the keyway, and slide the drive magnet onto the motor shaft until the end of the motor shaft aligns with faces of the drive magnet motor hub as shown below. Secure with the setscrew (item 26). Application of a no-seize compound on the shaft and key will make future maintenance easier.
15. Complete assembly by replacing the assembled pump onto the motor, using care not to allow fingers to get pinched when the magnets attract. Secure the pump to the motor with the four bolts and washers (items 22, 23). Always tighten fasteners in a progressive "crisscross" pattern.

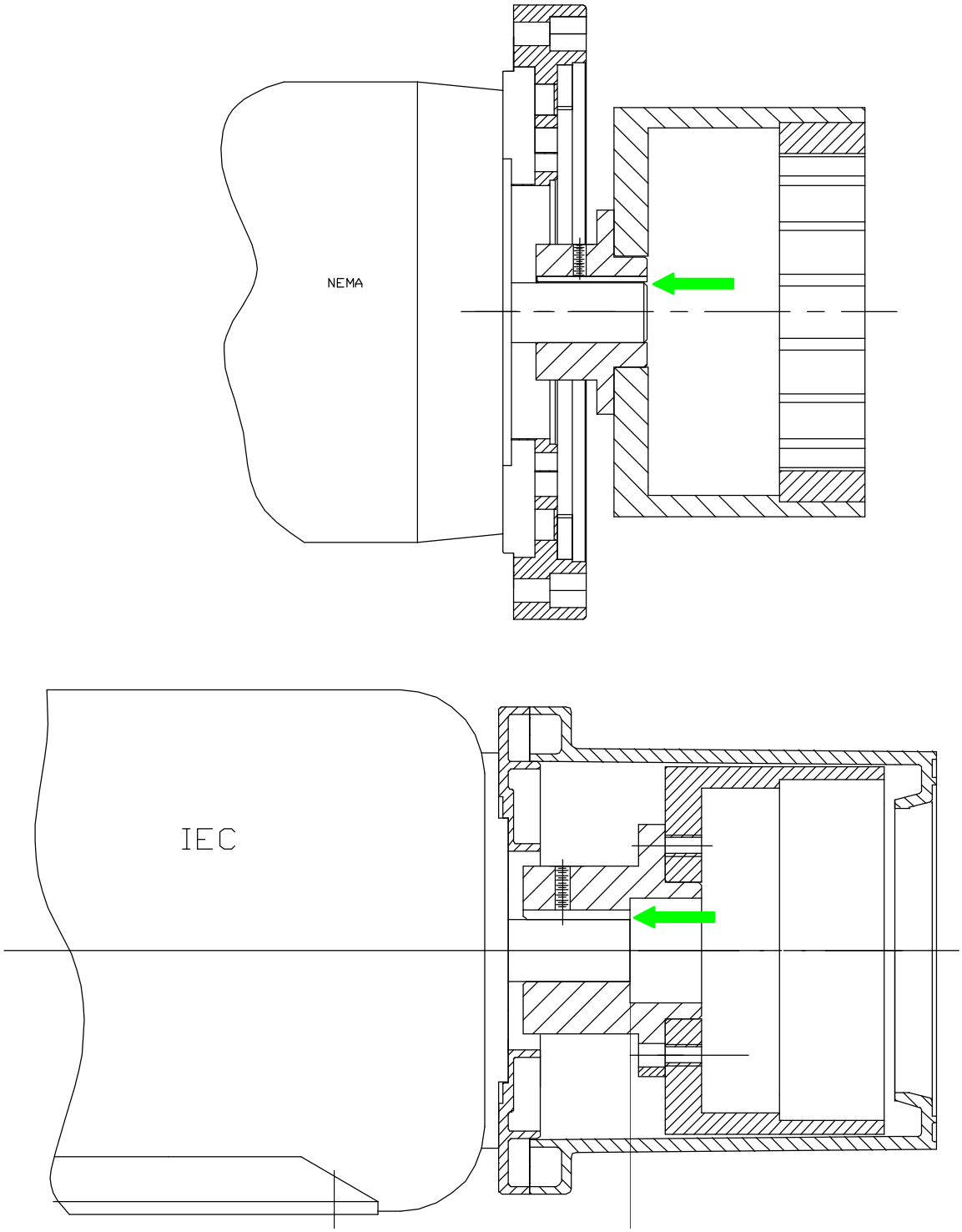


Figure 47

9. Inspection and Wear Limits

Inspect internal pump components as follows:

9.1.1 Bearings

Inspect bearing bores (2) and end surfaces for wear and scoring. If wear or scoring is present on the end surface of the bearing, the bearing can be flipped to expose the undamaged face to the gear side. Bearing should be replaced when both ends show wear and/or scoring, or when the bores have reached the replacement limit (see chart).

9.1.2 Shafts

Both the idler and the drive shaft should be inspected carefully for scoring, wear, and any signs of cracking or chips in the surface of the ceramic material. No cracks or chips are allowed. Shafts should be replaced if they show signs of cracks or chips anywhere on the surface, if they are deeply scored, or if they have reached their replacement limit (see chart).

9.1.3 Gears

Gears can be measured for dimensional change to their length and outside diameter. Gear teeth should also be visually inspected for wear and damage. Gear teeth can be damaged due to solids moving through the pump, which will affect only some teeth, or excessive pressure, which will distort the outside tips of all teeth. Gears that have reached their replacement limits (see chart) or show signs of physical damage or distortion should be replaced. Backlash can be checked by temporarily inserting the two gear/shaft assemblies into known good bearings and observing gear tooth mesh and backlash.

9.1.4 Housing Liner

The housing liner should be visually inspected for scoring, wear, and steps on the ID of the two gear bores. See chart for specific limits.

9.1.5 Special Note, Viscosity

The viscosity of the pumped product will affect the service limits of your Eclipse pump. Fluids with higher viscosities will usually be more tolerant of wear and allow longer maintenance intervals. Fluids with low viscosities will usually require more frequent maintenance, as they are less tolerant of clearances between the pump's internal surfaces. Each application is different, and only regular inspection and good records will determine what the correct maintenance interval is for your application.

9.1.6 Service and Replacement Limits

Part	Pump Model	New Spec Dimension	Serviceable Limit	Replacement Limit
Bearings	Eclipse 2	ID 0.293” Length 0.499”	0.0025 bore wear end wear – flip over	0.005 bore wear both ends worn
	Eclipse 5 and 12	ID 0.439”	0.003 bore wear end wear – flip over	0.006 bore wear both ends worn
	Eclipse 25	ID 0.627”	0.004 bore wear end wear – flip over	0.008 bore wear both ends worn
	Eclipse 75	ID 1.002”	0.005 bore wear end wear – flip over	0.010 bore wear both ends worn
Shafts	Eclipse 2	OD 0.2916”	0.001 smooth wear	0.001 deep or rough scoring
	Eclipse 5 and 12	OD 0.437”		
	Eclipse 25	OD 0.625”		
	Eclipse 75	OD 1.000”		
	NOTE: no cracks or chips in shaft surface are allowed			
Gears	Eclipse 2	Length 0.4055” OD 0.600”	0.0005 wear – length 0.003 wear – OD 0.010 Backlash	0.001 wear – length 0.006 wear – OD 0.020 Backlash
	Eclipse 5	Length 0.624” OD 1.063”	0.001 wear – length 0.004 wear – OD 0.015 Backlash	0.002 wear – length 0.008 wear – OD 0.030 Backlash
	Eclipse 12	Length 1.249” OD 1.063”	Same as E5 above	Same as E5 above
	Eclipse 25	Length 1.499” OD 1.417”	0.002 wear – length 0.005 wear – OD 0.020 Backlash	0.004 wear – length 0.010 wear – OD 0.040 Backlash
	Eclipse 75	Length 1.998” OD 2.125”	0.003 wear – length 0.006 wear – OD 0.025 Backlash	0.006 wear – length 0.012 wear – OD 0.050 Backlash
Housing Liner	Eclipse 2	n/a	0.002 wear or step	0.004 wear or step
	Eclipse 5 and 12	n/a	0.003 wear or step	0.006 wear or step
	Eclipse 25	n/a	0.004 wear or step	0.008 wear or step
	Eclipse 75	n/a	0.005 wear or step	0.010 wear or step

10. Troubleshooting Chart

Symptom	Probable Cause	Remedy
No Liquid Delivered	Pump not primed.	Prime pump. Ensure suction piping and any strainers are clean and clear of any obstructions.
	Motor Incorrectly wired.	Check wiring diagram.
	Air leak in suction.	Locate and repair leak.
	Rotation direction incorrect.	Reverse motor wiring.
	Suction and/or discharge valves closed.	Open valves.
	Suction lift too high.	Do not exceed published limits.
	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.
Low Liquid Delivery	Discharge head higher than calculated.	Reduce discharge restrictions e.g.: Open throttle valve or back-pressure valve.
	Air leak in suction.	Locate and repair leak.
	Rotational speed incorrect.	Check speed and wiring. Adjust as required.
	Suction pipe restrictions	Ensure suction valve is fully open and strainer is clean.
	Pressure relief valve open	Reset PRV to proper setting based on system pressure.
	Pump components worn.	Inspect and repair as required.
Low Discharge Pressure	Rotational speed incorrect.	Check speed and adjust as required.
	Air leak in suction.	Repair leak.
	Air or gas in liquid.	Eliminate air or gas that can be caused by obstructions in suction piping, leak in suction pipe, or cavitation and/or boiling of pumped fluid.
	Pump components 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 properly sized, higher powered motors.
	Binding internal pump parts.	Inspect and correct condition.

11. Specifications

11.1 Eclipse 2 General Specifications	
Port Size and Type	¼ inch FNPT or ISO 7-1
Direction of Rotation	Bi-directional
Theoretical Displacement	0.033 US gal / 100 rev. (1.2 cc / rev.)
Maximum Differential Pressure	150 psig (10 bar, 1034 kPa)
Maximum Allowable Working Pressure	200 psig (13.5 bar, 1375 kPa)
Maximum Speed	1750 rpm
Maximum Capacity at 0 psig	0.4 US gpm (1.5 LPM)
Maximum Viscosity	5,000 cps
Maximum Process Fluid Temperature	150 F (66 C) at maximum differential pressure
Minimum Process Fluid Temperature	-40 F (-40 C)
Fluid pH Range	0-14
Gear Type	Compact Spur Gear Design
Bearing Type	Sleeve Bearing Integral Wear Plate
Magnetic Torque Rating	22 in-lbs. (2.5 N-m)
Motor Frame Sizes - NEMA	56C and 143/145TC
Motor Frame Sizes - IEC	63 and 80 B14 Face
Pump Housing Materials of Construction	Carbon Reinforced ETFE
Gear Materials of Construction	Modified PTFE
Can Materials of Construction	Carbon Reinforced ETFE
Magnet Materials of Construction	Neodymium Iron
O-ring Seal Materials	FKM “A”
Approximate Weight	3.6 lbs. (1.6 kg) less motor

11.2 Eclipse 5 General Specifications	
Port Size and Type	$^3/_8$ inch FNPT or ISO 7-1
Direction of Rotation	Bi-directional
Theoretical Displacement	0.113 US gal / 100 rev. (4.3 cc / rev.)
Maximum Differential Pressure	150 psig (10 bar, 1034 kPa)
Maximum Allowable Working Pressure	150 psig (10 bar, 1034 kPa)
Maximum Speed	1750 rpm
Maximum Capacity at 0 psig	1.3 US gpm (4.9 LPM)
Maximum Viscosity	10,000 cps
Maximum Process Fluid Temperature	150 F (66 C) at maximum differential pressure
Minimum Process Fluid Temperature	-40 F (-40 C)
Fluid pH Range	0-14
Gear Type	Compact Spur Gear Design
Bearing Type	Sleeve Bearing Integral Wear Plate
Magnetic Torque Rating	228 in-lbs. (25.7 N-m)
Motor Frame Sizes - NEMA	56C and 143/145TC
Motor Frame Sizes - IEC	63 and 80 B14 Face
Pump Housing Materials of Construction	Carbon Reinforced ETFE
Gear Materials of Construction	Modified PTFE
Can Materials of Construction	Carbon Reinforced ETFE
Magnet Materials of Construction	Neodymium Iron
O-ring Seal Materials	FKM “A”
Approximate Weight	8.9 lbs. (4.0 kg) less motor

11.3 Eclipse 12 General Specifications	
Port Size and Type	¾" FNPT or ISO 7-1
Direction of Rotation	Bi-directional
Theoretical Displacement	0.226 US gal / 100 rev. (8.6 cc / rev.)
Maximum Differential Pressure Carbon Bearing	100 psig (6.8 bar, 690 kPa)
Maximum Differential Pressure SiC Bearing	150 psig (10 bar, 1034 kPa)
Maximum Allowable Working Pressure Carbon Brg	150 psig (10 bar, 1034 kPa)
Maximum Allowable Working Pressure SiC Brg	150 psig (10 bar, 1034 kPa)
Maximum Speed	1750 rpm
Maximum Capacity at 0 psig	3.2 US gpm (12.1 LPM)
Maximum Viscosity	10,000 cps
Maximum Process Fluid Temperature	150 F (66 C) at maximum differential pressure
Minimum Process Fluid Temperature	-40 F (-40 C)
Fluid pH Range	0-14
Gear Type	Compact Spur Gear Design
Bearing Type	Sleeve Bearing Integral Wear Plate
Magnetic Torque Rating	228 in-lbs. (25.7 N-m)
Motor Frame Sizes - NEMA	56C and 143/145TC
Motor Frame Sizes - IEC	63 and 80 B14 Face
Pump Housing Materials of Construction	Carbon Reinforced ETFE
Gear Materials of Construction	Modified PTFE
Can Materials of Construction	Carbon Reinforced ETFE
Magnet Materials of Construction	Neodymium Iron
O-ring Seal Materials	FKM "A"
Approximate Weight	10.0 lbs. (4.5 kg) less motor

11.4 Eclipse 25 General Specifications	
Port Size and Type	1 inch ANSI 150# / DIN 20/25 Flanged
Direction of Rotation	Bi-directional
Theoretical Displacement	0.479 US gal / 100 rev. (18.1 cc / rev.)
Maximum Differential Pressure	150 psig (10 bar, 1034 kPa)
Maximum Allowable Working Pressure	150 psig (10 bar, 1034 kPa)
Maximum Speed	1750 rpm
Maximum Capacity at 0 psig	6.5 US gpm (24.6 LPM, 1.5 m^3/hr)
Maximum Viscosity	10,000 cps
Maximum Process Fluid Temperature	150 F (66 C) at maximum differential pressure
Minimum Process Fluid Temperature	-40 F (-40 C)
Fluid pH Range	0-14
Gear Type	Compact Spur Gear Design
Bearing Type	Sleeve Bearing Integral Wear Plate
Magnetic Torque Rating	474 in-lbs. (53.5 N-m)
Motor Frame Sizes - NEMA	56C, 143/145TC and 182/184TC
Motor Frame Sizes - IEC	100/112 B14 Face
Pump Housing Materials of Construction	Carbon Reinforced ETFE (alt: C.R. Polypropylene)
Gear Materials of Construction	Modified PTFE
Can Materials of Construction	Carbon Reinforced ETFE
Inner Magnet Materials of Construction	Neodymium Iron
O-ring Seal Materials	FKM "A"
Approximate Weight	26.0 lbs. (11.8 kg) less motor

11.5 Eclipse 75 General Specifications	
Port Size and Type	1.5 inch ANSI 150# / DIN 32/40 Flanged
Direction of Rotation	Bi-directional
Theoretical Displacement	1.423 US gal / 100 rev. (53.9 cc / rev.)
Maximum Differential Pressure	150 psig (10 bar, 1034 kPa)
Maximum Allowable Working Pressure	150 psig (10 bar, 1034 kPa)
Maximum Speed	1750 rpm
Maximum Capacity at 0 psig	20 US gpm (75 LPM, 4.5 m^3/hr)
Maximum Viscosity	10,000 cps
Maximum Process Fluid Temperature	150 F (66 C) at maximum 125 psi differential pressure
Minimum Process Fluid Temperature	-40 F (-40 C)
Fluid pH Range	0-14
Gear Type	Compact Spur Gear Design
Bearing Type	Sleeve Bearing Integral Wear Plate
Magnetic Torque Rating	668 in-lbs. (75.4 N-m)
Motor Frame Sizes - NEMA	143/145TC and 182/184TC
Motor Frame Sizes - IEC	100/112 B14 Face
Pump Housing Materials of Construction	Carbon Reinforced ETFE (alt: C.R. Polypropylene)
Gear Materials of Construction	Modified PTFE
Can Materials of Construction	Carbon Reinforced ETFE
Inner Magnet Materials of Construction	Neodymium Iron
O-ring Seal Materials	FKM “A”
Approximate Weight	43.7 lbs. (19.8 kg) less motor

Maximum Sound Levels	
Pump Size	Sound Level (dB)
Eclipse 2	80
Eclipse 5	81
Eclipse 12	82
Eclipse 25	83
Eclipse 75	85

Maximum Flange Loads		
Pump Size	Flange Loads lb (N)	Flange Loads Ft-lb (N-m)
Eclipse 25	30 (133)	20 (27)
Eclipse 75	50 (222)	25 (34)

Maximum Suction Lift (Dry or Wetted Pump)	
Pump Size	Feet (m)
Eclipse 2	3 (0.9)
Eclipse 5	3 (0.9)
Eclipse 12	3 (0.9)
Eclipse 25	5 (1.5)
Eclipse 75	5 (1.5)

NPSH Required
NPSHr = 2 ft (0.6m) at 1750rpm – All Sizes

Vacuum Systems – Flooded Suction
Maximum vacuum of 28 in-Hg (14 psi- gauge) or 0.1mm Hg (Absolute)

Solids Handling Capability
Size: 70 Microns / 0.003 inches / 0.07 mm
Maximum Concentrations: 10%
200 Mesh strainer recommended

12. Bolt Torque Recommendations

Pump Size	Bolt Position	Bolt Size	Recommended Torque	
			in-lbs	N-m
Eclipse 2	Front Cover / Housing	10 - 32	15	20
	Housing Adaptor -to- Spool	1/4 - 20	48	65
	Spool -to- Motor Adaptor or Motor	3/8 - 16	72	98
	Motor Adaptor -to- Motor			
	56C	3/8 - 16	72	98
	63 B14	M5 - 0.80	24	33
	80 B14	M6 - 1.00	48	65
Eclipse 5 and 12	Front Cover	1/4 - 20	48	65
	Housing -to- Spool	1/4 - 20	48	65
	Spool -to- Motor Adaptor or Motor	3/8 - 16	72	98
	Motor Adaptor -to- Motor			
	56C	3/8 - 16	72	98
	143TC - 182C	3/8 - 16	72	98
	63 B14	M5 - 0.80	24	33
	80 B14	M6 - 1.00	48	65
Eclipse 25	Front Cover	1/4 - 20	72	98
	Housing -to- Spool	3/8 - 16	120	163
	Spool -to- Motor Adaptor	3/8 - 16	120	163
	Base Mount -to- Spool	3/8 - 16	120	163
	Flange Bolts (min. to seal)	Varies	120	163
	Motor Adaptor -to- Motor			
	56C		72	98
	143TC - 182C	3/8 - 16	120	163
	100 - 112 B14	M8 - 1.25	120	163
Eclipse 75	Front Cover	3/8 - 16	120	163
	Housing -to- Spool	3/8 - 16	120	163
	Spool -to- Motor Adaptor	3/8 - 16	120	163
	Base Mount -to- Spool	3/8 - 16	120	163
	Flange Bolts (min. to seal)	Varies	120	163
	Motor Adaptor -to- Motor			
	143TC - 182C	3/8 - 16	120	163
	182TC - 184TC	1/2 - 13	120	163
	100 - 112 B14	M8 - 1.25	120	163

13. Model Identification

Position	Sample	Specifies	Options
1	**E**		**E** - Eclipse
2 and 3	**02**	Size	**02** **05** **12** **25** **75**
4	**E**	Base Material and Connections	**E** - ETFE, FNPT **B** - ETFE, ISO 7-1 **F** - ETFE,Flange **P** - Polypropylene, Flange
5	**L**	Bearings	**L** – Carbon Graphite **B** - Silicon-Carbide
6	**V**	O-rings	**V** – FKM "A" **E** - EPDM
7	**F**	Motor Mounting	**F** - NEMA 56C **O** - NEMA 143TC-182C **R** - NEMA 182-184TC **H** - IEC B14 63 **K** - IEC B14 80 **P** - IEC B14 100/112 **Y** - No motor mount kit
8	**-**		position 8 is a dash
9	**X**	Options	**X** – Complete Pump (No Options) **A** – Bearing Flush Ports **N** – Pump Wet End Only **B** – Options A and N

In the above example, the Eclipse pump E02ELVF-X is a Model 2 pump, ETFE base materials, FNPT process connections, carbon bearings, FKM O-rings, and a NEMA 56 motor mounting.

Options Description:

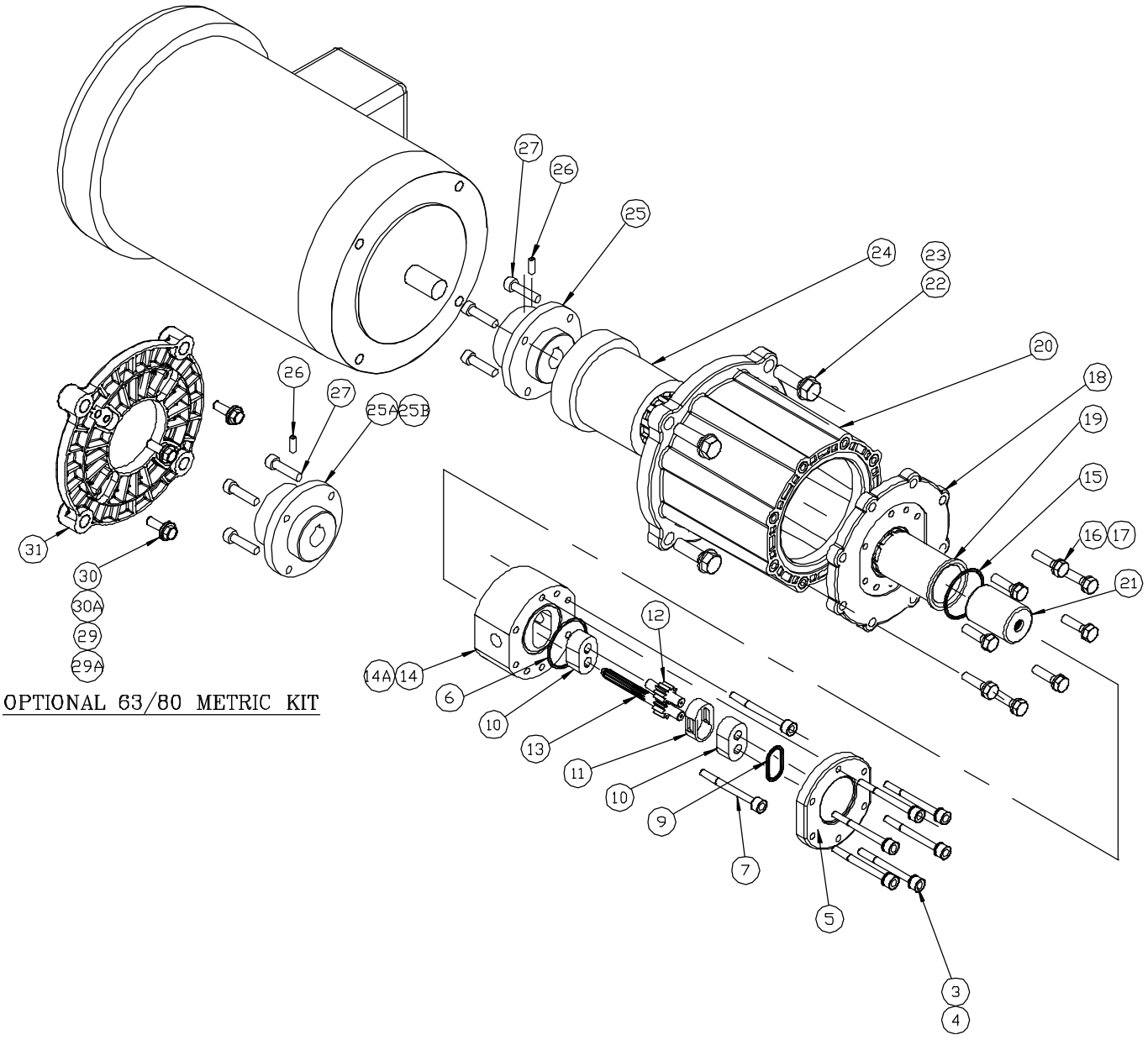
Complete pump model number with no magnet options ("X" or "A" in position 9) includes drive magnet and all necessary motor mounting hardware for a specified motor size.

Option "Y" in position 7 is for a bare pump with drive magnet, but no motor mounting hardware (magnet hub, motor adapter when applicable). This will typically be used as a spare pump or as inventory until a specific motor size is identified.

Option "N" in position 9 is for a bare pump without drive magnet. This will typically only be used as a "wet end" repair kit for an existing unit when the drive magnet is not required with the new pump. ***This option can only be used in combination with a "Y" code in position 7***.

Consult factory for availability of option combinations not covered in the above chart.

14. Parts Diagram and Bill of Materials, Eclipse 2



Eclipse Pump Series Size 02
Position 1,2,3,4 - Base Pump Material

(* denotes recommended spares)

			Position 4 Base Pump Material and Port Connection		
			ETFE (E) or (B)		
E02	**Description**	**Item**	**Part Number:**	**Material**	**Qty**
Common Parts	Screws	3	W770274-188	Stainless steel	6
	Washers	4	W771006-188	Stainless steel	6
	Screws	7	W770274-188	Stainless steel	2
	Front cover	5	NG020001-FTE	ETFE	1
	Name tag	1	NG550001-304	Stainless steel	1
	Containment Can	19	NG210004-FTE	ETFE	1
	Driven Magnet Assembly	21	NG200030-FTE	Neo / ETFE	1
	Drive Magnet	24	NG200034-STL	Neo / Steel	1
	Screws	27	W770021-188	Stainless steel	4
	Adapter, Spool	20	NG110010-001	Polyester	1
	Adapter, Can	18	NG110012-PET	Polyester	1
	Bolt	16	W770403-188	Stainless steel	8
	Washer	17	W771007-188	Stainless steel	8
	Tape for name tag (1 sq. in.)	--	NG990016-000	3M VHB FOAM	1 sq. in.
E	Center housing FNPT (E)	14	NG040019-CTF	Carbon-filled PTFE	1
B	Center housing F ISO 7-1 (B)		NG040020-CTF	Carbon-filled PTFE	

Position 5 - Bearing Materials

	Description	**Item**	**Part Number:**	**Material**	**Qty**
	Housing Liner *	11	NG220002-FTE	ETFE	1
	Drive gear Assembly *	13	NG010014-FTE	ETFE / ALA	1
	Idler Gear Assembly *	12	NG010013-FTE	ETFE / ALA	1
L	Bearing *	10	NG080001-CBN	Carbon -92	2
B	Bearing *		NG080001-SIC	Silicon Carbide	

Position 6 - O-ring material selection

	Description	**Item**	**Part Number:**	**Material**	**Qty**
V	Oring Containment Can *	15	NG440029-VTA	Viton A	1
	Oring Cover *	6	NG440029-VTA	Viton A	1
	Oring Compression *	9	NG440020-VTA	Viton A	1
E	Oring Containment Can *	15	NG440029-NOR	EPDM	1
	Oring Cover *	6	NG440029-NOR	EPDM	1
	Oring Compression *	9	NG440020-NOR	EPDM	1

Position 7 - NEMA C-Face and IEC B14 Metric Face Magnetic Coupling Arrangement

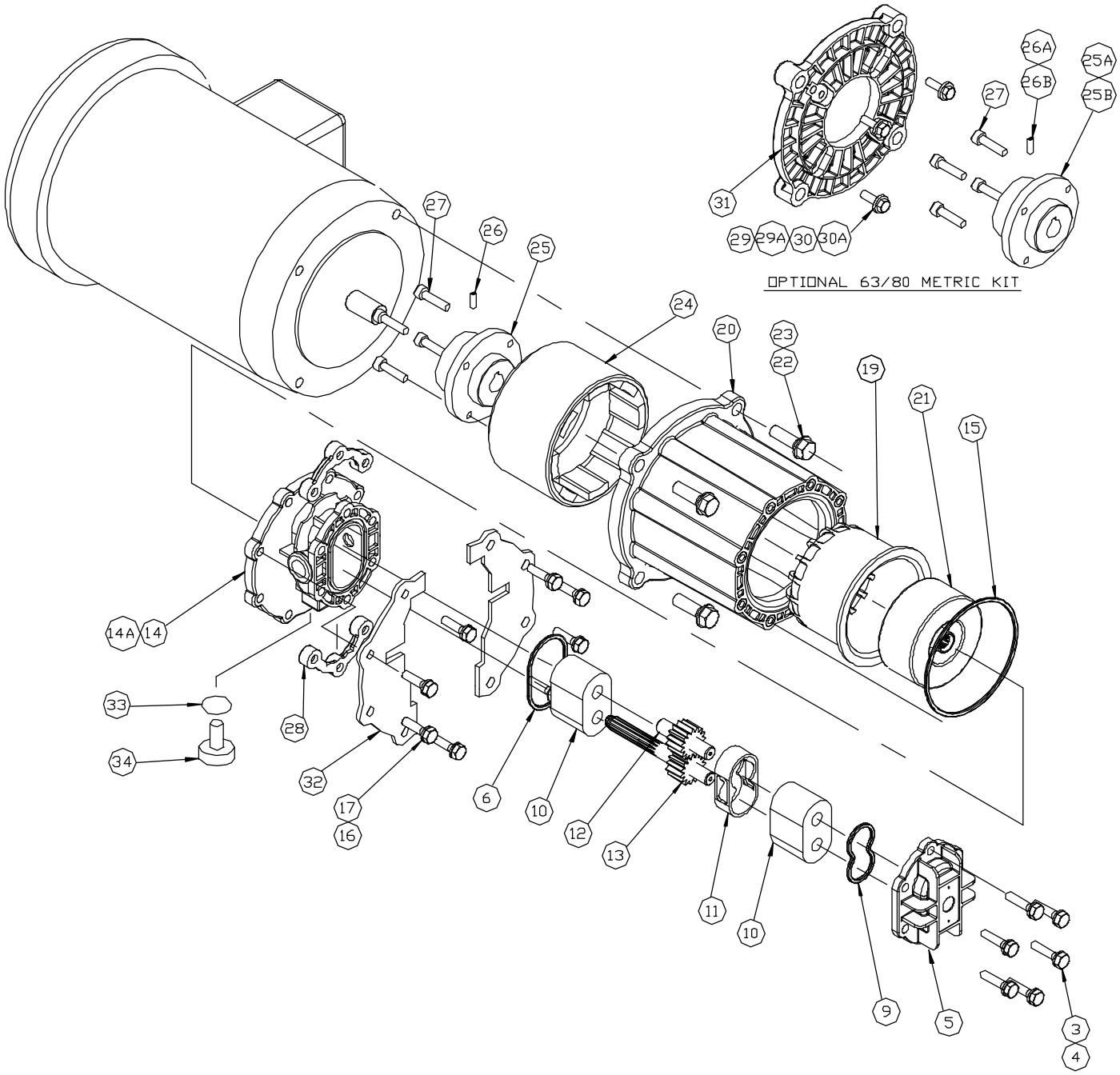
	56C NEMA frame components	Item	Part Number:	Material	Qty
F	Coupling Hub	25	NG940002-STL	Steel	1
	Set Screw	26	W771004-031	Steel	1
	Bolt	22	W770425-188	Stainless steel	4
	Washer	23	W771009-188	Stainless steel	4
	Motor Mount Kit Complete		E02XXXF		

	63 IEC B14 face components	Item	Part Number:	Material	Qty
H	Coupling Hub	25A	NG940004-STL	Steel	1
	Set Screw	26A	NP991004-017	Steel	1
	Adapter, Motor	31	NG110005-PET	Polyester	1
	Bolts	29	NP990418-188	Stainless steel	4
	Washer	30	NP991016-188	Stainless steel	4
	Bolt	22	W770426-188	Stainless steel	4
	Washer	23	W771009-188	Stainless steel	4
	Motor Mount Kit Complete		E02XXXH		

	80 IEC B14 face components	Item	Part Number:	Material	Qty
K	Coupling Hub	25B	NG940005-STL	Steel	1
	Set Screw	26B	NP991004-001	Steel	1
	Adapter, Motor	31	NG110005-PET	Polyester	1
	Bolts	29A	NP990416-188	Stainless steel	4
	Washer	30A	NP991018-188	Stainless steel	4
	Bolt	22	W770426-188	Stainless steel	4
	Washer	23	W771009-188	Stainless steel	4
	Motor Mount Kit Complete		E02XXXK		

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15. Parts Diagram and Bill of Materials, Eclipse 5



Eclipse Pump Series Size 05
Position 1,2,3,4 - Base Pump Material

(* denotes recommended spares)

			Position 4 Base Pump Material and Port Connection		
			ETFE (E) or (B)		
E05	**Description**	**Item**	**Part Number:**	**Material**	**Qty**
Common Parts	Bolts	3	W770403-188	Stainless steel	6
	Washers	4	W771007-188	Stainless steel	6
	Nut plate	28	NG990009-PET	Polyester	2
	Front cover	5	NG020002-FTE	ETFE	1
	Retaining plate	32	NG120006-188	Stainless steel	2
	Bolts	16	W770403-188	Stainless steel	8
	Washers	17	W771007-188	Stainless steel	8
	Name tag	1	NG550002-304	Stainless steel	1
	Drive Screw	2	W771000-188	Stainless steel	2
	Containment Can	19	NG210005-FTE	ETFE	1
	Driven Magnet Assembly	21	NG200031-FTE	Neo / ETFE	1
	Drive Magnet	24	NG200035-STL	Neo / Steel	1
	Screws	27	W770021-188	Stainless steel	4
	Adapter, Spool	20	NG110010-PET	Polyester	1
	Drain Plug	34	NG990014-FTE	ETFE	1
E	Center housing FNPT (E)	14	NG040021-FTE	ETFE	1
B	Center housing F ISO 7-1 (B)		NG040022-FTE	ETFE	

Position 5 - Bearing Materials

	Description	**Item**	**Part Number:**	**Material**	**Qty**
	Housing Liner *	11	NG220003-FTE	ETFE	1
	Drive gear Assembly *	13	NG010016-FTE	ETFE / ALA	1
	Idler Gear Assembly *	12	NG010015-FTE	ETFE / ALA	1
L	Bearing *	10	NG080002-CBN	Carbon -92	2
B	Bearing *	10	NG080002-SIC	Silicon Carbide	2

Position 6 - O-ring material selection

	Description	**Item**	**Part Number:**	**Material**	**Qty**
V	Oring Containment Can *	15	NG440154-VTA	Viton A	1
	Oring Cover *	6	NG440137-VTA	Viton A	1
	Oring Drain Plug *	33	NG440012-VTA	Viton A	1
	Oring Compression *	9	NG440129-VTA	Viton A	1
E	Oring Containment Can *	15	NG440154-NOR	EPDM	1
	Oring Cover *	6	NG440137-NOR	EPDM	1
	Oring Drain Plug *	33	NG440012-NOR	EPDM	1
	Oring Compression *	9	NG440129-NOR	EPDM	1

Position 7 - NEMA C-Face and IEC B14 Metric Face Magnetic Coupling Arrangement

56C NEMA frame components		Item	Part Number:	Material	Qty
F	Coupling Hub	25	NG940002-STL	Steel	1
	Set Screw	26	W771004-031	Steel	1
	Bolts	22	W770425-188	Stainless steel	4
	Washer	23	W771009-188	Stainless steel	4
	Motor Mount Kit Complete	E05XXXF			

143TC - 182C NEMA frame components		Item	Part Number:	Material	Qty
O	Coupling Hub	25	NG940003-STL	Steel	1
	Set Screw	26	W771004-031	Steel	1
	Bolts	22	W770425-188	Stainless steel	4
	Washer	23	W771009-188	Stainless steel	4
	Motor Mount Kit Complete	E05XXXO			

63 IEC B14 face components		Item	Part Number:	Material	Qty
H	Coupling Hub	25A	NG940004-STL	Steel	1
	Set Screw	26A	NP991004-017	Steel	1
	Adapter, Motor	31	NG110005-PET	Polyester	1
	Bolts	29	NP990418-188	Stainless steel	4
	Washer	30	NP991016-188	Stainless steel	4
	Bolts	22	W770426-188	Stainless steel	4
	Washer	23	W771009-188	Stainless steel	4
	Motor Mount Kit Complete	E05XXXH			

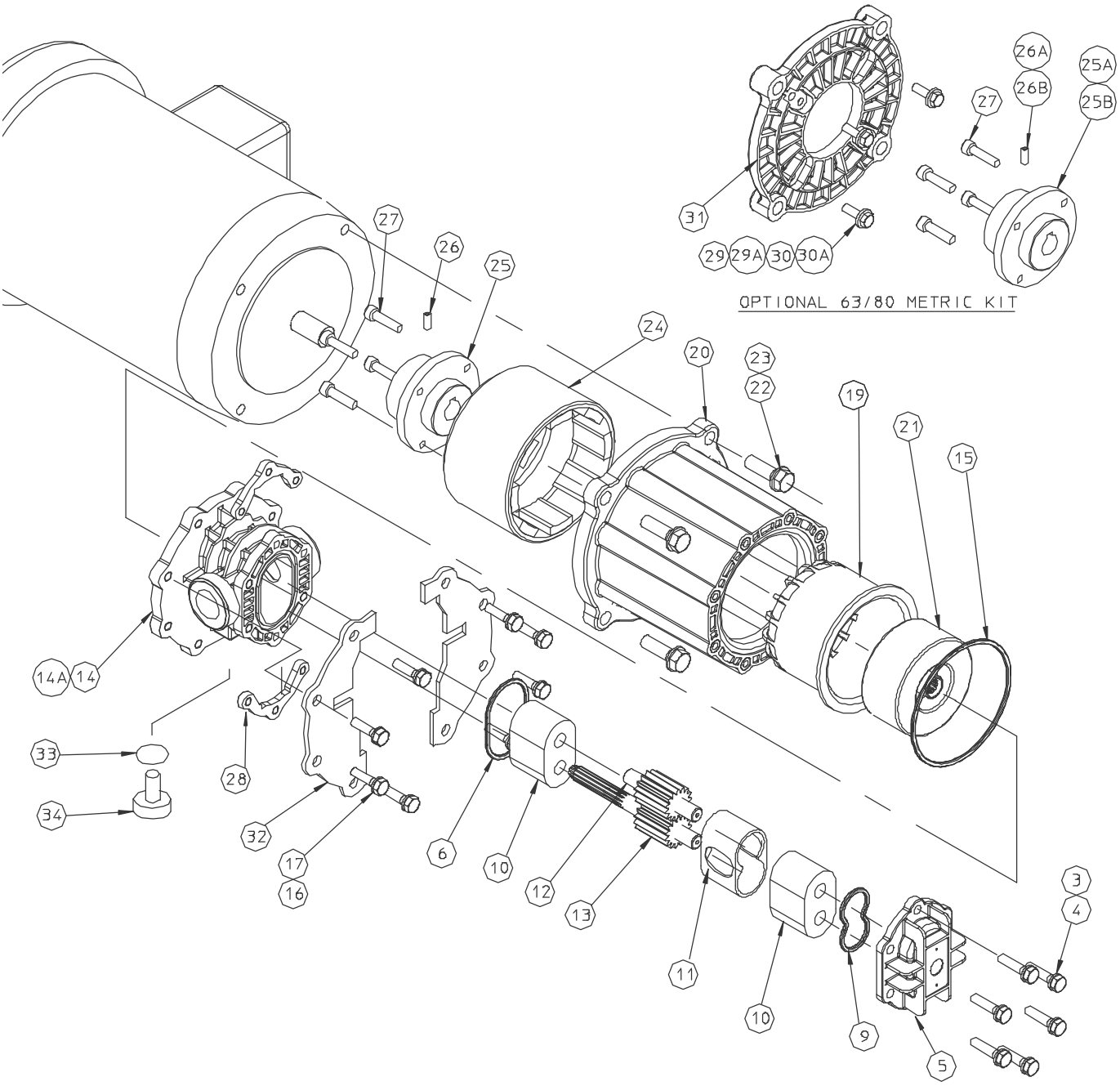
80 IEC B14 face components		Item	Part Number:	Material	Qty
K	Coupling Hub	25B	NG940005-STL	Steel	1
	Set Screw	26B	NP991004-001	Steel	1
	Adapter, Motor	31	NG110005-PET	Polyester	1
	Bolts	29A	NP990416-188	Stainless steel	4
	Washer	30A	NP991018-188	Stainless steel	4
	Bolts	22	W770426-188	Stainless steel	4
	Washer	23	W771009-188	Stainless steel	4
	Motor Mount Kit Complete	E05XXXK			

(only part number affecting options shown here)

	Description	Item	Part Number:	Material	Qty
"A" FLUSH OPTION	Front cover with bearing flush	5	NG020005-FTE	ETFE	1
	Drain plug for cover	34	NG990014-FTE	ETFE	1
	Drain plug o-ring (match o-ring material selected for the pump)	33	NG440012-VTA	Viton A	1
			NG440012-NOR	EPDM	
			(consult factory)	Kalrez	

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16. Parts Diagram and Bill of Materials, Eclipse 12



Eclipse Pump Series Size 12
Position 1,2,3,4 - Base Pump Material

(* denotes recommended spares)

			Position 4 Base Pump Material and Port Connection		
			ETFE (E) or (B)		
E12	**Description**	**Item**	**Part Number:**	**Material**	**Qty**
Common Parts	Bolts	3	W770403-188	Stainless steel	6
	Washers	4	NG990018-188	Stainless steel	6
	Nut plate	28	NG990009-188	Stainless steel	2
	Front cover	5	NG020002-FTE	ETFE	1
	(Front cover also available in Polypropylene, consult factory for part information)				
	Retaining plate	32	NG120006-188	Stainless steel	2
	Bolts	16	W770403-188	Stainless steel	8
	Washers	17	NG990018-188	Stainless steel	8
	Name tag	1	NG550002-304	Stainless steel	1
	Drive Screw	2	W771000-188	Stainless steel	2
	Containment Can	19	NG210005-FTE	ETFE	1
	Driven Magnet Assembly	21	NG200031-FTE	Neo / ETFE	1
	Drive Magnet	24	NG200035-STL	Neo / Steel	1
	Screws	27	W770021-188	Stainless steel	4
	Adapter, Spool	20	NG110010-PET	Polyester	1
	Drain Plug	34	NG990014-FTE	ETFE	1
E	Center housing FNPT (E)	14	NG040028-FTE	ETFE	1
B	Center housing F ISO 7-1 (B)	14A			

Position 5 - Bearing Materials

	Description	**Item**	**Part Number:**	**Material**	**Qty**
	Housing Liner *	11	NG220006-FTE	ETFE	1
	Drive gear Assembly *	13	NG010022-FTE	ETFE / ALA	1
	Idler Gear Assembly *	12	NG010021-FTE	ETFE / ALA	1
L	Bearing *	10	NG080002-CBN	Carbon -92	2
B	Bearing *	10	NG080002-SIC	Silicon Carbide	2

Position 6 - O-ring material selection

	Description	**Item**	**Part Number:**	**Material**	**Qty**
V	Oring Containment Can *	15	NG440154-VTA	Viton A	1
	Oring Cover *	6	NG440137-VTA	Viton A	1
	Oring Drain Plug *	33	NG440012-VTA	Viton A	1
	Oring Compression *	9	NG440129-VTA	Viton A	1
E	Oring Containment Can *	15	NG440154-NOR	EPDM	1
	Oring Cover *	6	NG440137-NOR	EPDM	1
	Oring Drain Plug *	33	NG440012-NOR	EPDM	1
	Oring Compression *	9	NG440129-NOR	EPDM	1

Position 7 - Nema C-Face and IEC B14 Metric Face Magnetic Coupling Arrangement

56C NEMA frame components		Item	Part Number:	Material	Qty
F	Coupling Hub	25	NG940002-STL	Steel	1
	Set Screw	26	W771004-031	Steel	1
	Bolts	22	W770425-188	Stainless steel	4
	Washer	23	NG990019-188	Stainless steel	4
	Motor Mount Kit Complete	E12XXXF			

143TC - 182C NEMA frame components		Item	Part Number:	Material	Qty
O	Coupling Hub	25	NG940003-STL	Steel	1
	Set Screw	26	W771004-031	Steel	1
	Bolts	22	W770425-188	Stainless steel	4
	Washer	23	NG990019-188	Stainless steel	4
	Motor Mount Kit Complete	E12XXXO			

63 IEC B14 Face components		Item	Part Number:	Material	Qty
	Coupling Hub	25A	NG940004-STL	Steel	1
	Set Screw	26A	NP991004-017	Steel	1
H	Adapter, Motor	31	NG110005-PET	Polyester	1
	Bolts	29	NP990418-188	Stainless steel	4
	Washer	30	NP991016-188	Stainless steel	4
	Bolts	22	W770426-188	Stainless steel	4
	Washer	23	NG990019-188	Stainless steel	4
	Motor Mount Kit Complete	E12XXXH			

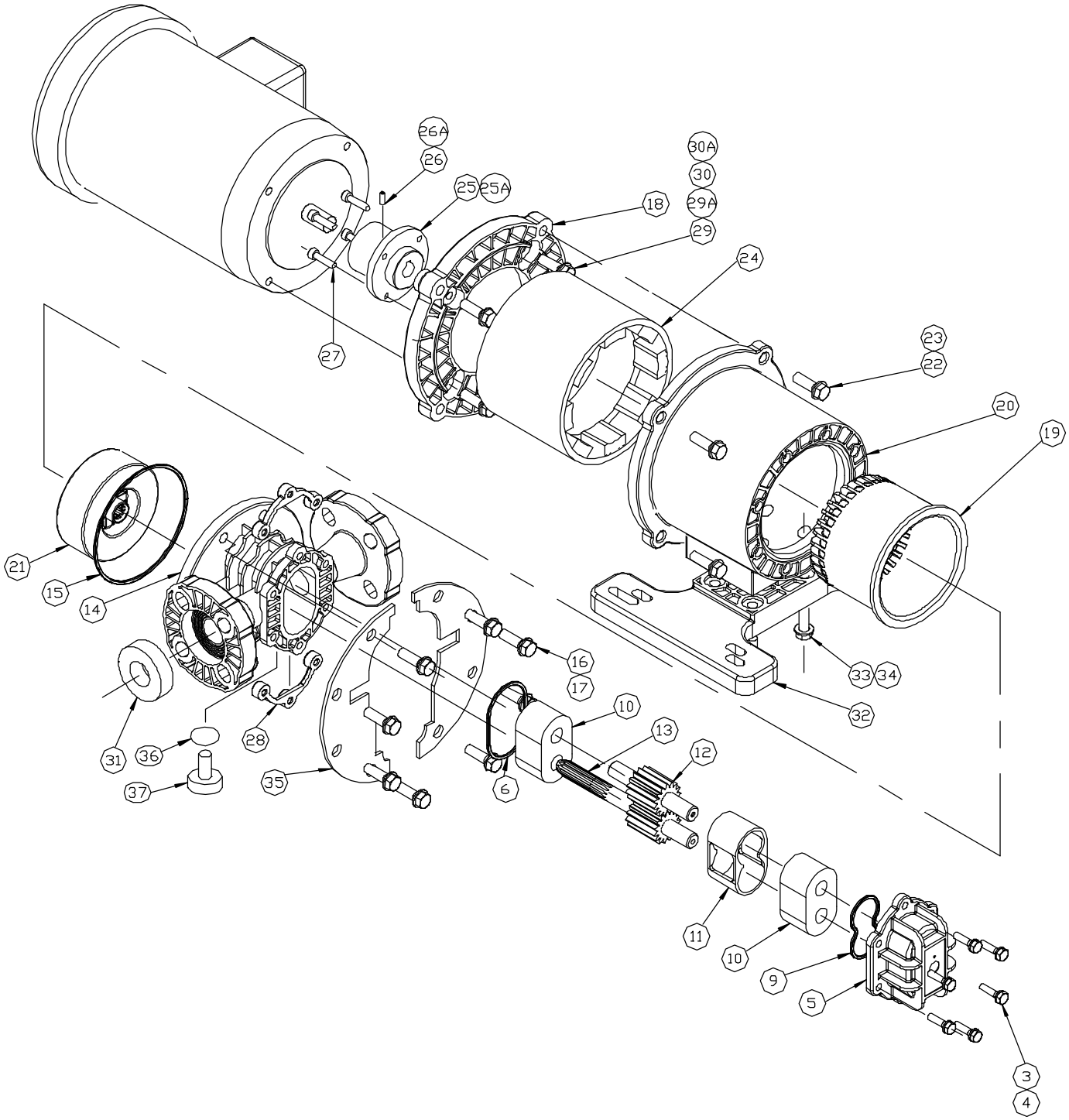
80 IEC B14 Face components		Item	Part Number:	Material	Qty
	Coupling Hub	25B	NG940005-STL	Steel	1
	Set Screw	26B	NP991004-001	Steel	1
K	Adapter, Motor	31	NG110005-PET	Polyester	1
	Bolts	29A	NP990416-188	Stainless steel	4
	Washer	30A	NP991017-188	Stainless steel	4
	Bolts	22	W770426-188	Stainless steel	4
	Washer	23	NG990019-188	Stainless steel	4
	Motor Mount Kit Complete	E12XXXK			

(only part number affecting options shown here)

	Description	Item	Part Number:	Material	Qty
A FLUSH OPTION	Front cover with bearing flush	5	NG020005-FTE	ETFE	1
	Drain plug for cover	34	NG990014-FTE	ETFE	1
	Drain plug o-ring (match o-ring material selected for the pump)	33	NG440012-VTA	Viton A	1
			NG440012-NOR	EPDM	
			(consult factory)	Kalrez	

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17. Parts Diagram and Bill of Materials, Eclipse 25



Eclipse Pump Series Size 25
Position 1,2,3,4 - Base Pump Material

(* denotes recommended spares)

			Position 4 Base Pump Material and Port Connection		
			ETFE (F) or Polypropylene (P)		
E25	**Description**	**Item**	**Part Number:**	**Material**	**Qty**
Common Parts	Bolts	3	W770404-188	Stainless steel	6
	Washers	4	W771007-188	Stainless steel	6
	Nut Plates	28	NG990010-188	Stainless steel	2
	Retaining plate	35	NG120007-188	Stainless steel	2
	Bolts	16	W770426-188	Stainless steel	8
	Washers	17	W771009-188	Stainless steel	8
	Flange Gaskets	31	NG130001-TFE	Teflon	2
	Name tag	1	NG550003-304	Stainless steel	1
	Drive Screw	2	W771000-188	Stainless steel	2
	Containment Can	19	NG210006-FTE	ETFE	1
	Driven Magnet Assembly	21	NG200032-FTE	Neo / ETFE	1
	Drive Magnet	24	NG200036-STL	Neo / Steel	1
	Screws	27	W770021-188	Stainless steel	4
	Adapter, Spool	20	NG110009-ALU	Aluminum	1
	Adapter, Motor	18	NG110006-PET	Polyester	1
	Mounting Base	32	NG970001-PET	Polyester	1
	Bolt	33	W770425-188	Stainless steel	4
	Drain Plug	37	NG990014-FTE	ETFE	1
	Washer	34	W771009-188	Stainless steel	4
F	Center housing Flg	14	NG040023-FTE	ETFE	1
	Front cover	5	NG020003-FTE	ETFE	1
P	Center housing Flg	14	NG040023-PPL	PPL	1
	Front cover	5	NG020003-PPL	PPL	1

Position 5 - Bearing Materials

	Description	**Item**	**Part Number:**	**Material**	**Qty**
	Housing Liner *	11	NG220004-FTE	ETFE	1
	Drive gear Assembly *	13	NG010018-FTE	ETFE / ALA	1
	Idler Gear Assembly *	12	NG010017-FTE	ETFE / ALA	1
L	Bearing *	10	NG080003-CBN	Carbon -92	2
B	Bearing *	10	NG080003-SIC	Silicon Carbide	2

Position 6 - O-ring material selection

	Description	**Item**	**Part Number:**	**Material**	**Qty**
V	Oring Containment Can *	15	NG440158-VTA	Viton A	1
	Oring Cover *	6	NG440147-VTA	Viton A	1
	Oring Drain Plug *	36	NG440012-VTA	Viton A	1
	Oring Compression *	9	NG440138-VTA	Viton A	1
E	Oring Containment Can *	15	NG440158-NOR	EPDM	1
	Oring Cover *	6	NG440147-NOR	EPDM	1
	Oring Drain Plug *	36	NG440012-NOR	EPDM	1
	Oring Compression *	9	NG440138-NOR	EPDM	1

Position 7 - NEMA C-Face and IEC B14 Metric Face Magnetic Coupling Arrangement

56C NEMA frame components		Item	Part Number:	Material	Qty
F	Coupling Hub	25	NG940002-STL	Steel	1
	Set Screw	26	W771004-031	Steel	1
	Bolts	29	W770425-188	Stainless steel	4
	Washer	30	W771009-188	Stainless steel	4
	Bolt	22	W770426-188	Stainless steel	4
	Washer	23	W771009-188	Stainless steel	4
	Motor Mount Kit Complete		E25XXXF		

143TC - 182C NEMA frame components		Item	Part Number:	Material	Qty
O	Coupling Hub	25	NG940003-STL	Steel	1
	Set Screw	26	W771004-031	Steel	1
	Bolts	29	W770425-188	Stainless steel	4
	Washer	30	W771009-188	Stainless steel	4
	Bolt	22	W770426-188	Stainless steel	4
	Washer	23	W771009-188	Stainless steel	4
	Motor Mount Kit Complete		E25XXXO		

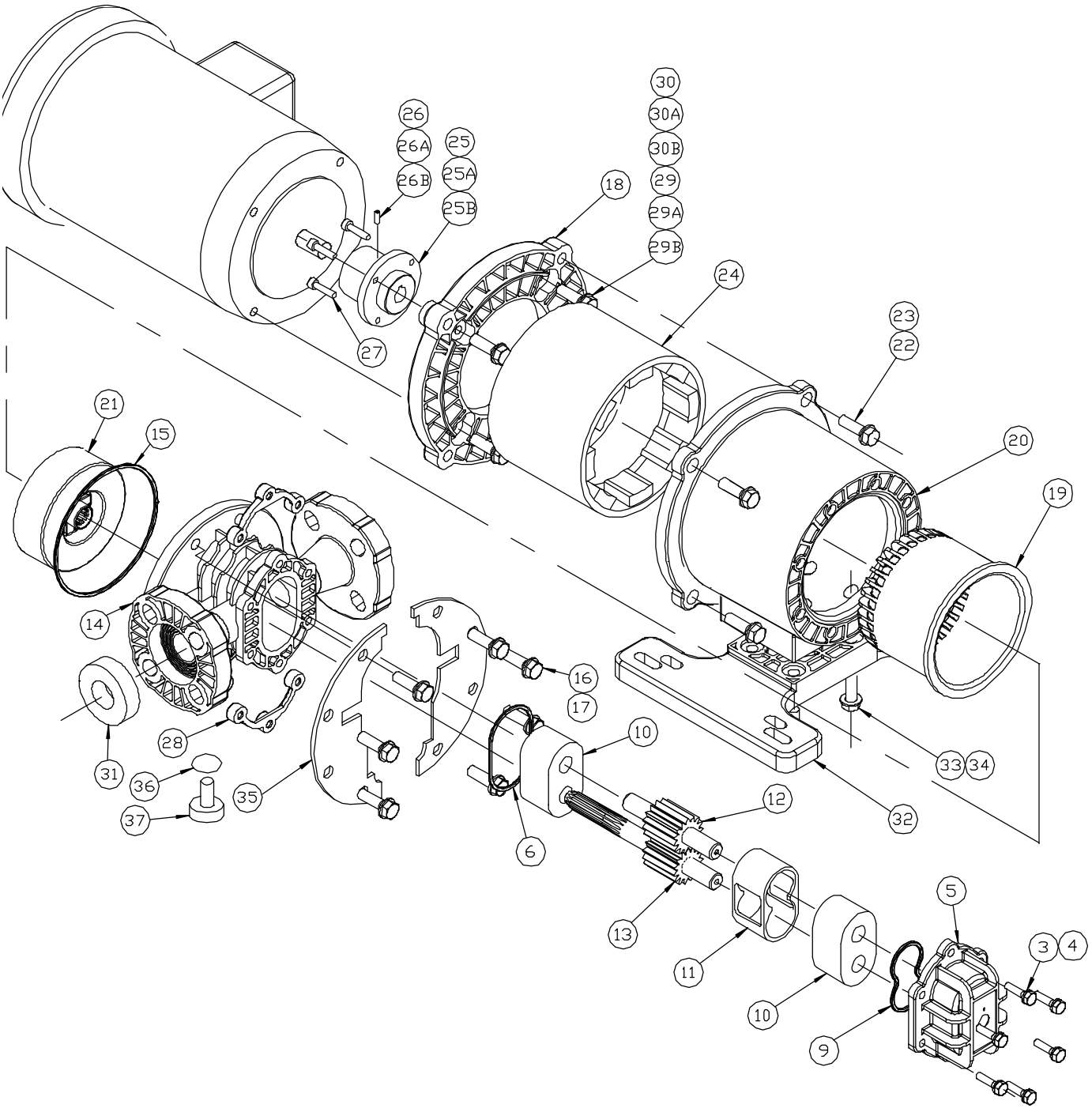
100/112 IEC B14 face components		Item	Part Number:	Material	Qty
P	Coupling Hub	25A	NG940006-STL	Steel	1
	Set Screw	26A	NP991004-018	Steel	1
	Bolts	29A	W770534-188	Stainless steel	4
	Washer	30A	NP991018-188	Stainless steel	4
	Bolt	22	W770426-188	Stainless steel	4
	Washer	23	W771009-188	Stainless steel	4
	Motor Mount Kit Complete		E25XXXP		

(only part number affecting options shown here)

	Description	Item	Part Number:	Material	Qty
"A" FLUSH OPTION	Front cover with bearing flush (match selected pump material)	5	NG020006-FTE	ETFE	1
			NG020006-PPL	PPL	
	Drain plug for cover	37	NG990014-FTE	ETFE	1
	Drain plug o-ring (match o-ring material selected for the pump)	36	NG440012-VTA	Viton A	1
			NG440012-NOR	EPDM	
			(consult factory)	Kalrez	

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18. Parts Diagram and Bill of Materials, Eclipse 75



Eclipse Pump Series Size 75
Position 1,2,3,4 - Base Pump Material
(* denotes recommended spares)

			Position 4 Base Pump Material and Port Connection		
			ETFE (F) or Polypropylene (P)		
E75	**Description**	**Item**	**Part Number:**	**Material**	**Qty**
Common Parts	Bolts	3	W770428-188	Stainless steel	6
	Washers	4	W771009-188	Stainless steel	6
	Nut Plates	28	NG990011-188	Stainless steel	2
	Retaining plate	35	NG120008-188	Stainless steel	2
	Bolts	16	W770428-188	Stainless steel	8
	Washers	17	W771009-188	Stainless steel	8
	Flange Gaskets	31	NG130002-TFE	Teflon	2
	Name tag	1	NG550004-304	Stainless steel	1
	Drive Screw	2	W771000-188	Stainless steel	2
	Containment Can	19	NG210007-FTE	ETFE	1
	Driven Magnet Assembly	21	NG200033-FTE	Neo / ETFE	1
	Drive Magnet	24	NG200037-STL	Neo / Steel	1
	Screws	27	W770021-188	Stainless steel	4
	Adapter, Spool	20	NG110011-ALU	Aluminum	1
	Adapter, Motor	18	NG110008-PET	Polyester	1
	Mounting Base	32	NG970001-PET	Polyester	1
	Bolt	33	W770425-188	Stainless steel	4
	Drain Plug	37	NG990014-FTE	ETFE	1
	Washer	34	W771009-188	Stainless steel	4
F	Center housing Flg	14	NG040024-FTE	ETFE	1
	Front cover	5	NG020004-FTE	ETFE	1
P	Center housing Flg	14	NG040024-PPL	PPL	1
	Front cover	5	NG020004-PPL	PPL	1

Position 5 - Bearing Materials

	Description	**Item**	**Part Number:**	**Material**	**Qty**
	Housing Liner *	11	NG220005-FTE	ETFE	1
	Drive gear Assembly *	13	NG010020-FTE	ETFE / ALA	1
	Idler Gear Assembly *	12	NG010019-FTE	ETFE / ALA	1
L	Bearing *	10	NG080004-CBN	Carbon -92	2
B	Bearing *	10	NG080004-SIC	Silicon Carbide	2

Position 6 - O-ring material selection

	Description	**Item**	**Part Number:**	**Material**	**Qty**
V	Oring Containment Can *	15	NG440163-VTA	Viton A	1
	Oring Cover *	6	NG440155-VTA	Viton A	1
	Oring Oring Drain Plug *	36	NG440012-VTA	Viton A	1
	Oring Compression *	9	NG440152-VTA	Viton A	1
E	Oring Containment Can *	15	NG440163-NOR	EPDM	1
	Oring Cover *	6	NG440155-NOR	EPDM	1
	Oring Oring Drain Plug *	36	NG440012-NOR	EPDM	1
	Oring Compression *	9	NG440152-NOR	EPDM	1

Position 7 - NEMA C-Face and IEC B14 Metric Face Magnetic Coupling Arrangement

143TC - 182C NEMA frame components		Item	Part Number:	Material	Qty
O	Coupling Hub	25A	NG940003-STL	Steel	1
	Set Screw	26A	W771004-031	Steel	1
	Bolts	29A	W770425-188	Stainless steel	4
	Washer	30A	W771009-188	Stainless steel	4
	Bolt	22	W770428-188	Stainless steel	4
	Washer	23	W771009-188	Stainless steel	4
	Motor Mount Kit Complete		E75XXXO		

182TC - 184TC NEMA frame components		Item	Part Number:	Material	Qty
R	Coupling Hub	25	NG940007-STL	Steel	1
	Set Screw	26	W771004-046	Steel	1
	Bolts	29	W770438-188	Stainless steel	4
	Washer	30	W771035-188	Stainless steel	4
	Bolt	22	W770428-188	Stainless steel	4
	Washer	23	W771009-188	Stainless steel	4
	Motor Mount Kit Complete		E75XXXR		

100/112 IEC B14 face components		Item	Part Number:	Material	Qty
P	Coupling Hub	25B	NG940006-STL	Steel	1
	Set Screw	26B	NP991004-018	Steel	1
	Bolts	29B	W770534-188	Stainless steel	4
	Washer	30B	NP991018-188	Stainless steel	4
	Bolt	22	W770428-188	Stainless steel	4
	Washer	23	W771009-188	Stainless steel	4
	Motor Mount Kit Complete		E75XXXP		

(only part number affecting options shown here)

	Description	Item	Part Number:	Material	Qty
"A" FLUSH OPTION	Front cover with bearing flush (match selected pump material)	5	NG020007-FTE	ETFE	1
			NG020007-PPL	PPL	
	Drain plug for cover	37	NG990014-FTE	ETFE	1
	Drain plug o-ring (match o-ring material selected for the pump)	36	NG440012-VTA	Viton A	1
			NG440012-NOR	EPDM	
			(consult factory)	Kalrez	

19. O-ring Reference

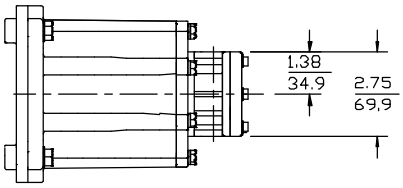
The o-ring seals used in the Eclipse Series pumps are of standard dimensions and can be cross-referenced as follows:

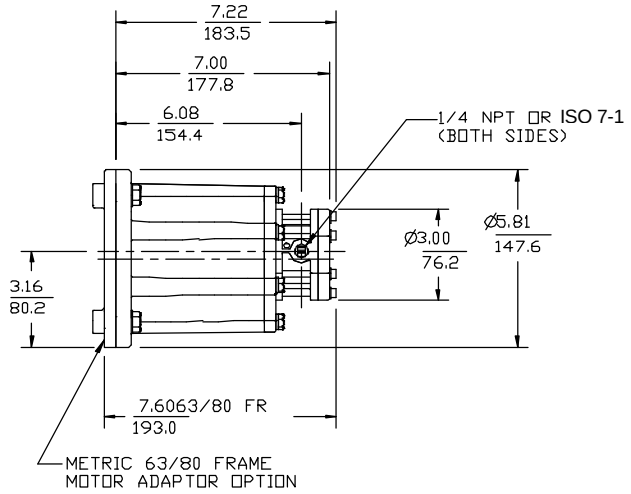
O-Ring Kit No.	Item	Qty	Description	Part Number	Material	Universal Dash No.
E02XXV	6	1	O-ring Cover	NG440029-VTN	Viton A	2-029
	9	1	O-ring Compression	NG440020-VTN	Viton A	2-020
	15	1	O-ring Containment Can	NG440029-VTN	Viton A	2-029
	N/A	N/A	O-ring Drain Plug	N/A	N/A	N/A
E05XXV And E12XXV	6	1	O-ring Cover	NG440137-VTN	Viton A	2-137
	9	1	O-ring Compression	NG440129-VTN	Viton A	2-129
	15	1	O-ring Containment Can	NG440154-VTN	Viton A	2-154
	33	1-2[1]	O-ring Drain Plug	NG440012-VTN	Viton A	2-012
E25XXV	6	1	O-ring Cover	NG440147-VTN	Viton A	2-147
	9	1	O-ring Compression	NG440138-VTN	Viton A	2-138
	15	1	O-ring Containment Can	NG440158-VTN	Viton A	2-158
	36	1-2[1]	O-ring Drain Plug	NG440012-VTN	Viton A	2-012
E75XXV	6	1	O-ring Cover	NG440155-VTN	Viton A	2-155
	9	1	O-ring Compression	NG440152-VTN	Viton A	2-152
	15	1	O-ring Containment Can	NG440163-VTN	Viton A	2-163
	36	1-2[1]	O-ring Drain Plug	NG440012-VTN	Viton A	2-012

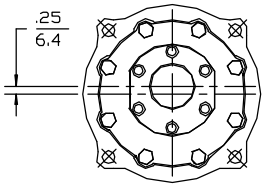
Note, 2^1 in quantity column denotes a quantity of 2 if the 9^{th} position is option “A” (Bearing Flush)

20. Dimensional Drawings

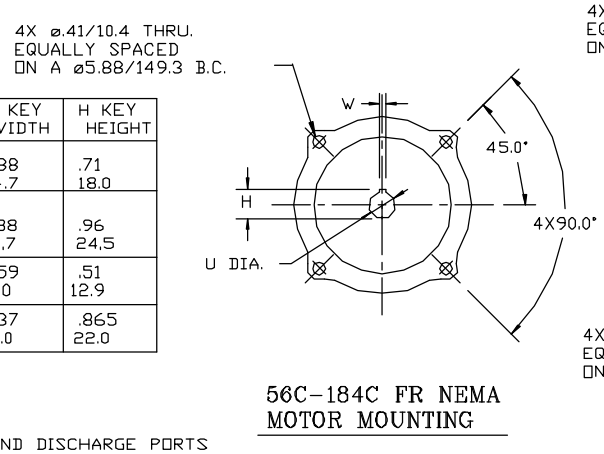
20.1 Eclipse 2



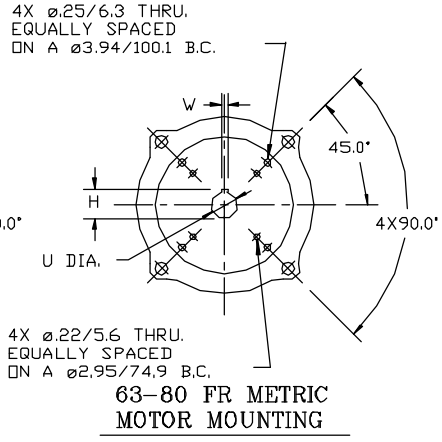




MOTOR FRAME	U DIA. SHAFT	W KEY WIDTH	H KEY HEIGHT
56C	.626 15.9	.188 4.7	.71 18.0
140TC	.876 22,2	.188 4,7	.96 24,5
180C			
63	.434 11.0	.159 4.0	.51 12.9
80	.750 19.1	.237 6.0	.865 22.0



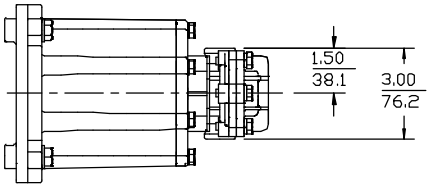
56C–184C FR NEMA
MOTOR MOUNTING

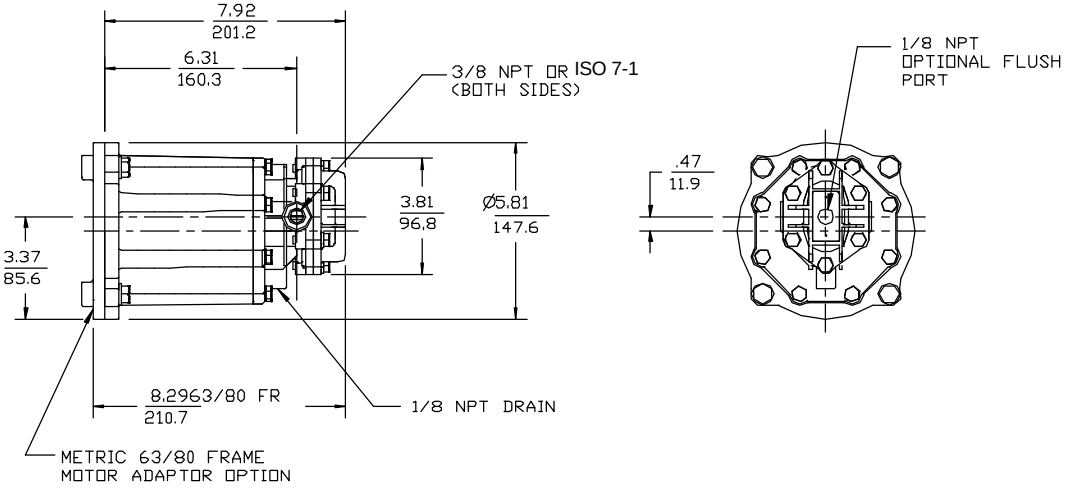


63–80 FR METRIC
MOTOR MOUNTING

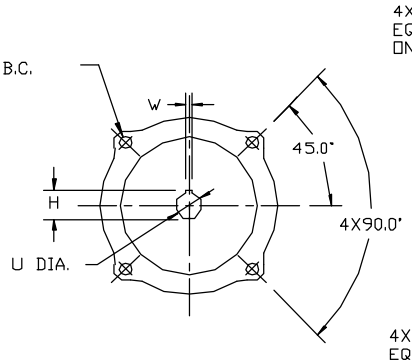
NOTES:
1. SUCTION AND DISCHARGE PORTS DEPENDENT UPON PUMP SHAFT ROTATION.
2. STANDARD MOTOR ADAPTOR FITS NEMA 56C,143TC,182C AND 184C FRAME MOTORS.
3. METRIC MOTOR ADAPTOR OPTION FITS 63 AND 80 FRAME MOTORS.
4. MUST USE FOOT MOUNTED C-FACE MOTOR OF SPECIFIED FRAME SIZES.

20.2 Eclipse 5

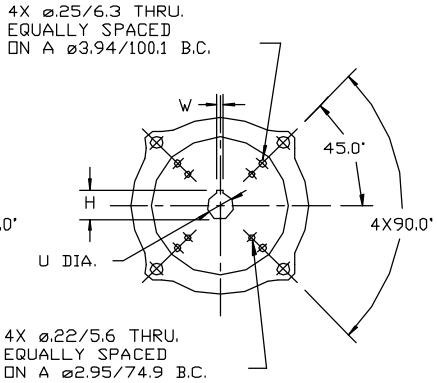




MOTOR FRAME	U DIA. SHAFT	W KEY WIDTH	H KEY HEIGHT
56C	.626 15.9	.188 4.7	.71 18.0
140TC 180C	.876 22.2	.188 4.7	.96 24.5
63	.434 11.0	.159 4.0	.51 12.9
80	.750 19.1	.237 6.0	.865 22.0



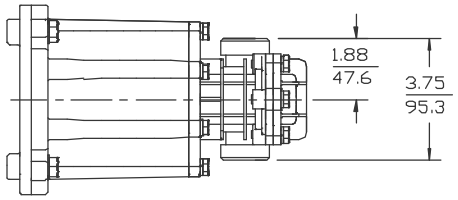
56C–184C FR NEMA
MOTOR MOUNTING

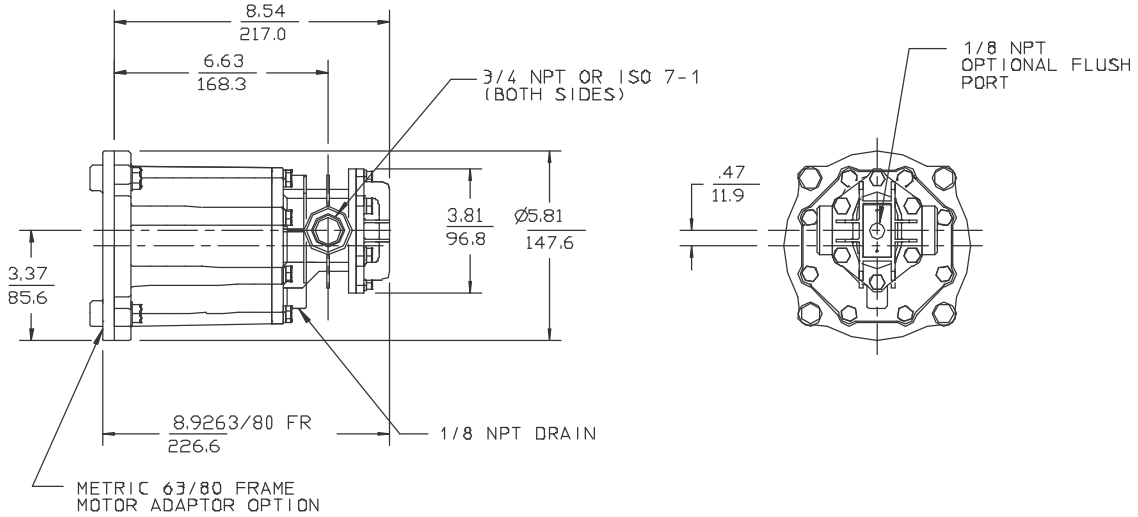


63–80 FR METRIC
MOTOR MOUNTING

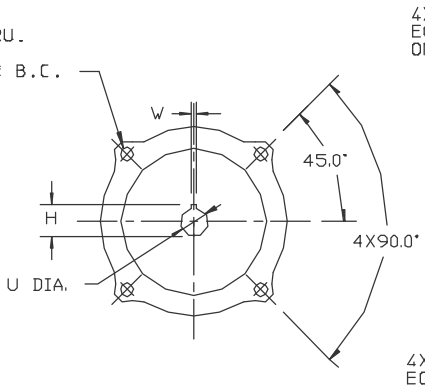
NOTES:
1. SUCTION AND DISCHARGE PORTS DEPENDENT UPON PUMP SHAFT ROTATION.
2. STANDARD MOTOR ADAPTOR FITS NEMA 56C,143TC,182C AND 184C FRAME MOTORS.
3. METRIC MOTOR ADAPTOR OPTION FITS 63 AND 80 FRAME MOTORS.
4. MUST USE FOOT MOUNTED C-FACE MOTOR OF SPECIFIED FRAME SIZES.

20.3 Eclipse 12

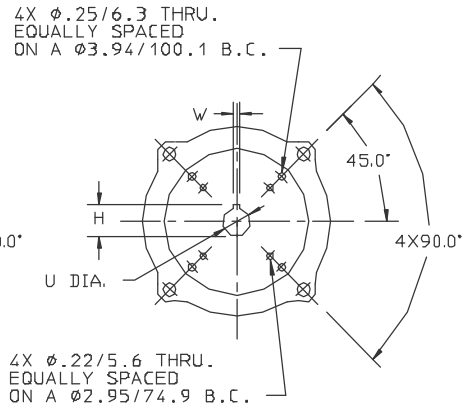




MOTOR FRAME	U DIA. SHAFT	W KEY WIDTH	H KEY HEIGHT
56C	.626 15.9	.188 4.7	.71 18.0
140TC 180C	.876 22.2	.188 4.7	.96 24.5
63	.434 11.0	.159 4.0	.51 12.9
80	.750 19.1	.237 6.0	.865 22.0



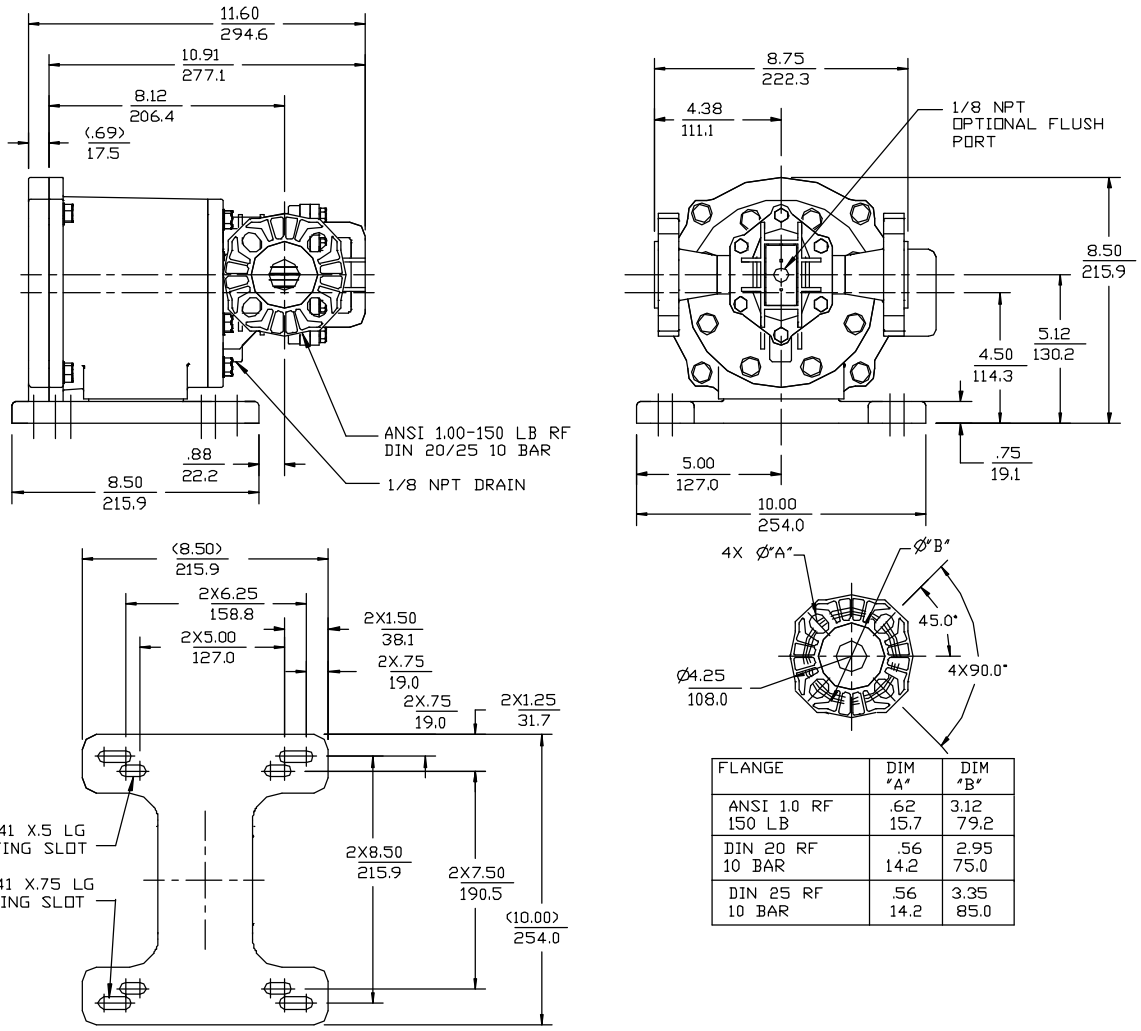
56C–184C FR NEMA MOTOR MOUNTING



63–80 FR METRIC MOTOR MOUNTING

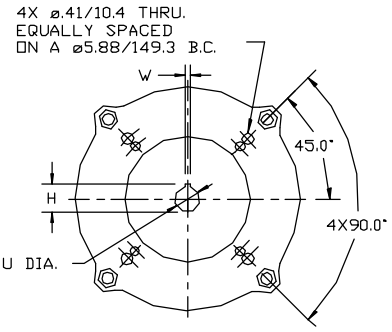
NOTES:
1. SUCTION AND DISCHARGE PORTS DEPENDENT UPON PUMP SHAFT ROTATION.
2. STANDARD MOTOR ADAPTOR FITS NEMA 56C,143TC,182C AND 184C FRAME MOTORS.
3. METRIC MOTOR ADAPTOR OPTION FITS 63 AND 80 FRAME MOTORS.
4. MUST USE FOOT MOUNTED C-FACE MOTOR OF SPECIFIED FRAME SIZES.

20.4 Eclipse 25

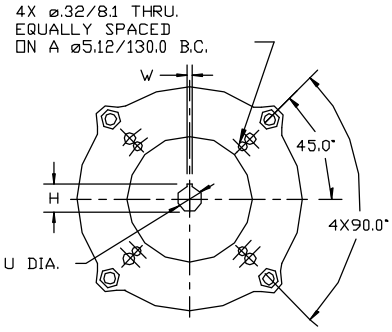


FLANGE	DIM "A"	DIM "B"
ANSI 1.0 RF 150 LB	.62 15.7	3.12 79.2
DIN 20 RF 10 BAR	.56 14.2	2.95 75.0
DIN 25 RF 10 BAR	.56 14.2	3.35 85.0

MOUNTING FOOT DIMENSIONS



56-184C FR NEMA MOTOR MOUNTING



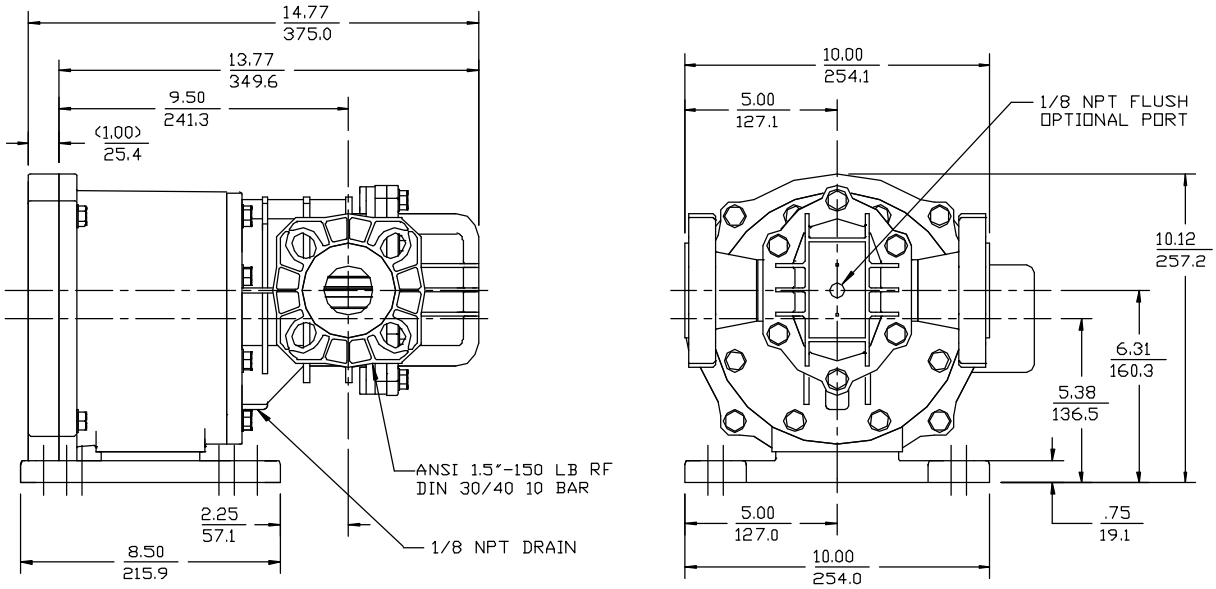
100,112 FR METRIC MOTOR MOUNTING

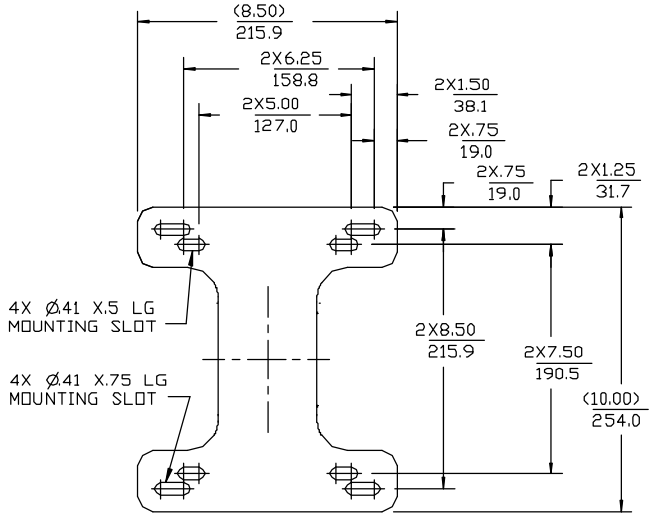
MOTOR FRAME	U DIA. SHAFT	W KEY WIDTH	H KEY HEIGHT
56C	.626 15.9	.188 4.7	.71 18.0
140TC	.876 22.2	.188 4.7	.96 24.5
180C			
100	1.10 28.0	.317 8.0	1.24 31.5
112			

NOTES:
1. SUCTION AND DISCHARGE PORTS DEPENDENT UPON PUMP SHAFT ROTATION.
2. STANDARD MOTOR ADAPTOR PLATE FITS NEMA 56C,143TC,182C,184C AND 100/112 METRIC FRAME MOTORS.
3. MUST USE C-FACE MOTORS OF SPECIFIED FRAME SIZES.

UPDATED PORT DESCRIPTIONS 6/23/05

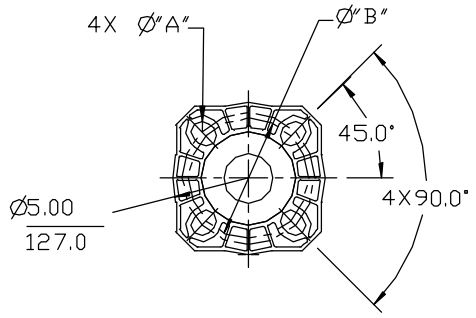
20.5 Eclipse 75



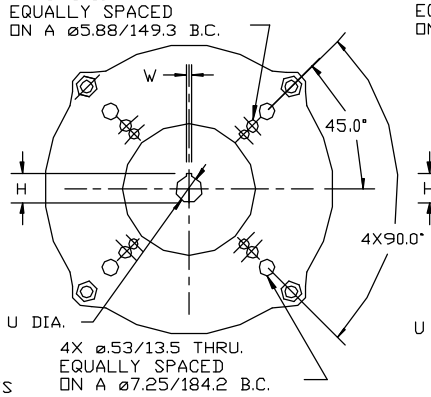


MOUNTING FOOT DIMENSIONS

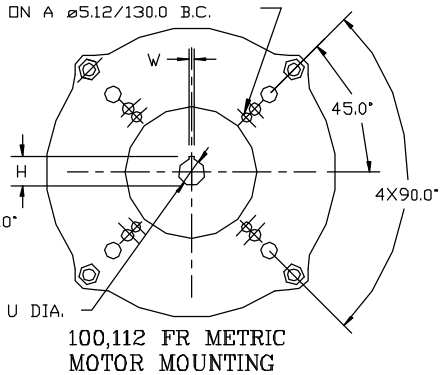
MOTOR FRAME	U DIA. SHAFT	W KEY WIDTH	H KEY HEIGHT
56C	.626 15.9	.188 4.7	.71 18.0
140TC 180C	.876 22.2	.188 4.7	.96 24.5
182TC 184TC	1.13 28.6	.252 6.4	1.24 31.5
100 112	1.10 28.0	.317 8.0	1.24 31.5



FLANGE	DIM "A"	DIM "B"
ANSI 1.5 RF 150 LB	.62 15.7	3.88 98.4
DIN 32 RF 10 BAR	.68 17.3	3.94 100.1
DIN 40 RF 10 BAR	.68 17.2	4.34 110.2



56C-184TC FR NEMA MOTOR MOUNTING

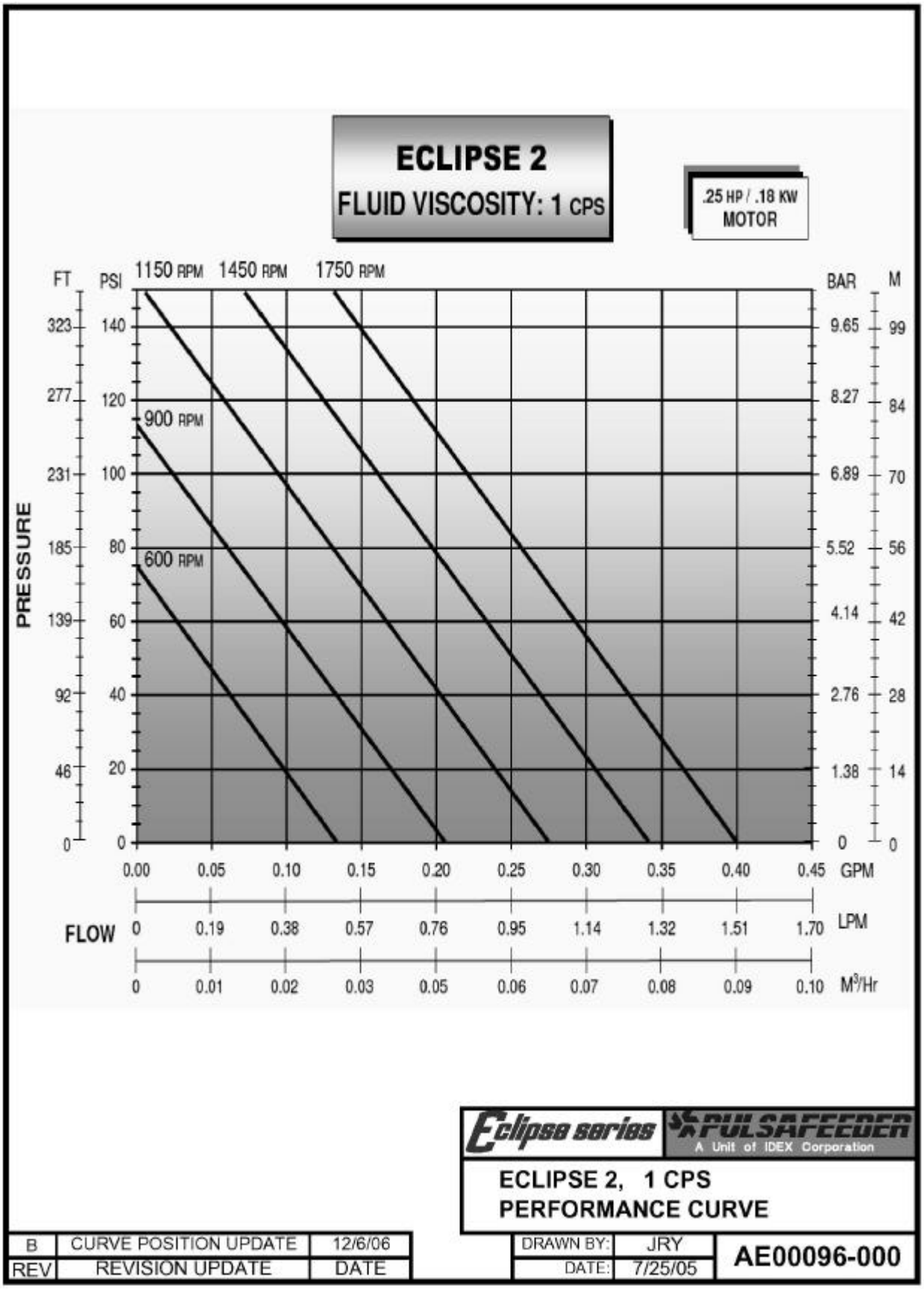


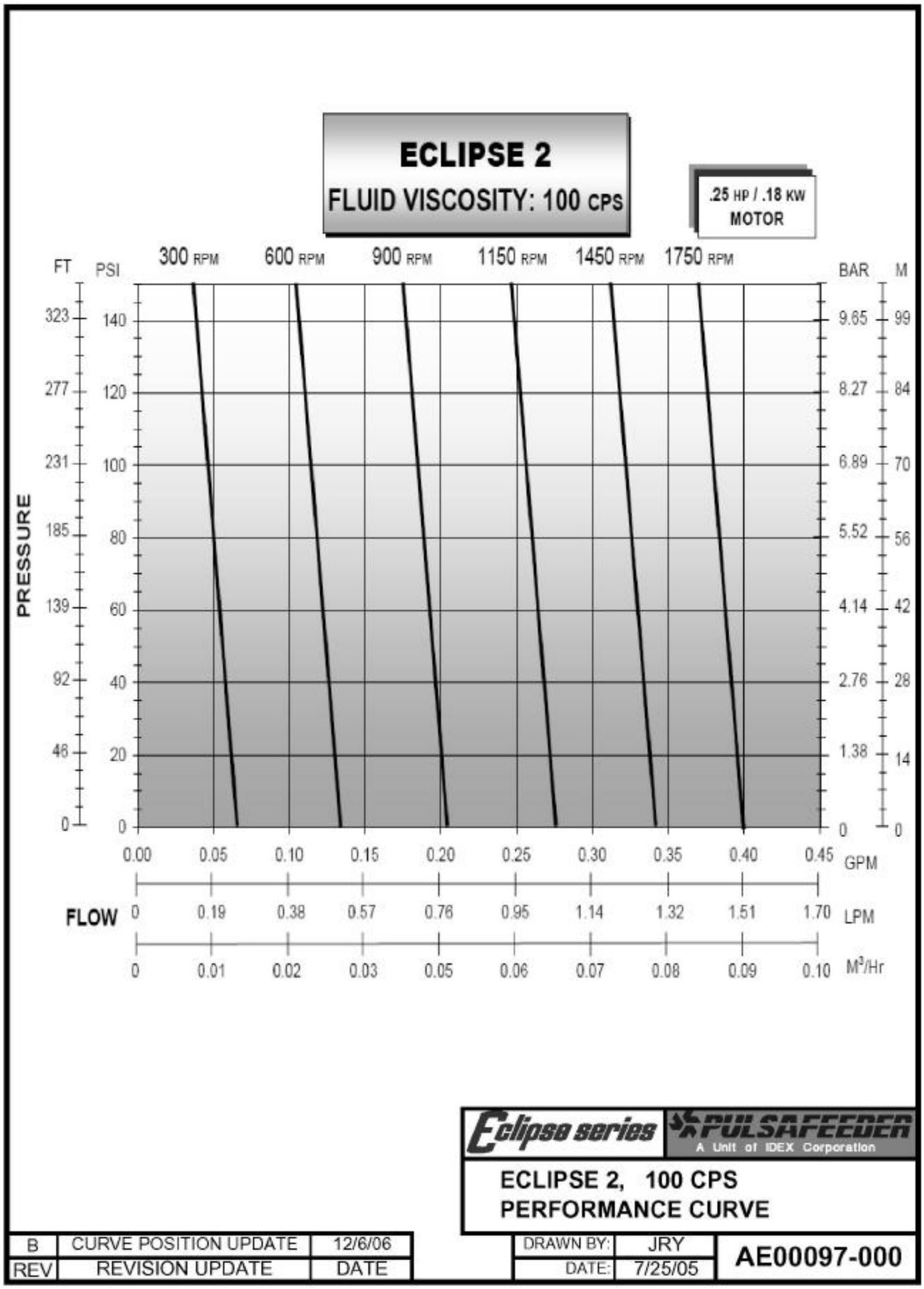
100,112 FR METRIC MOTOR MOUNTING

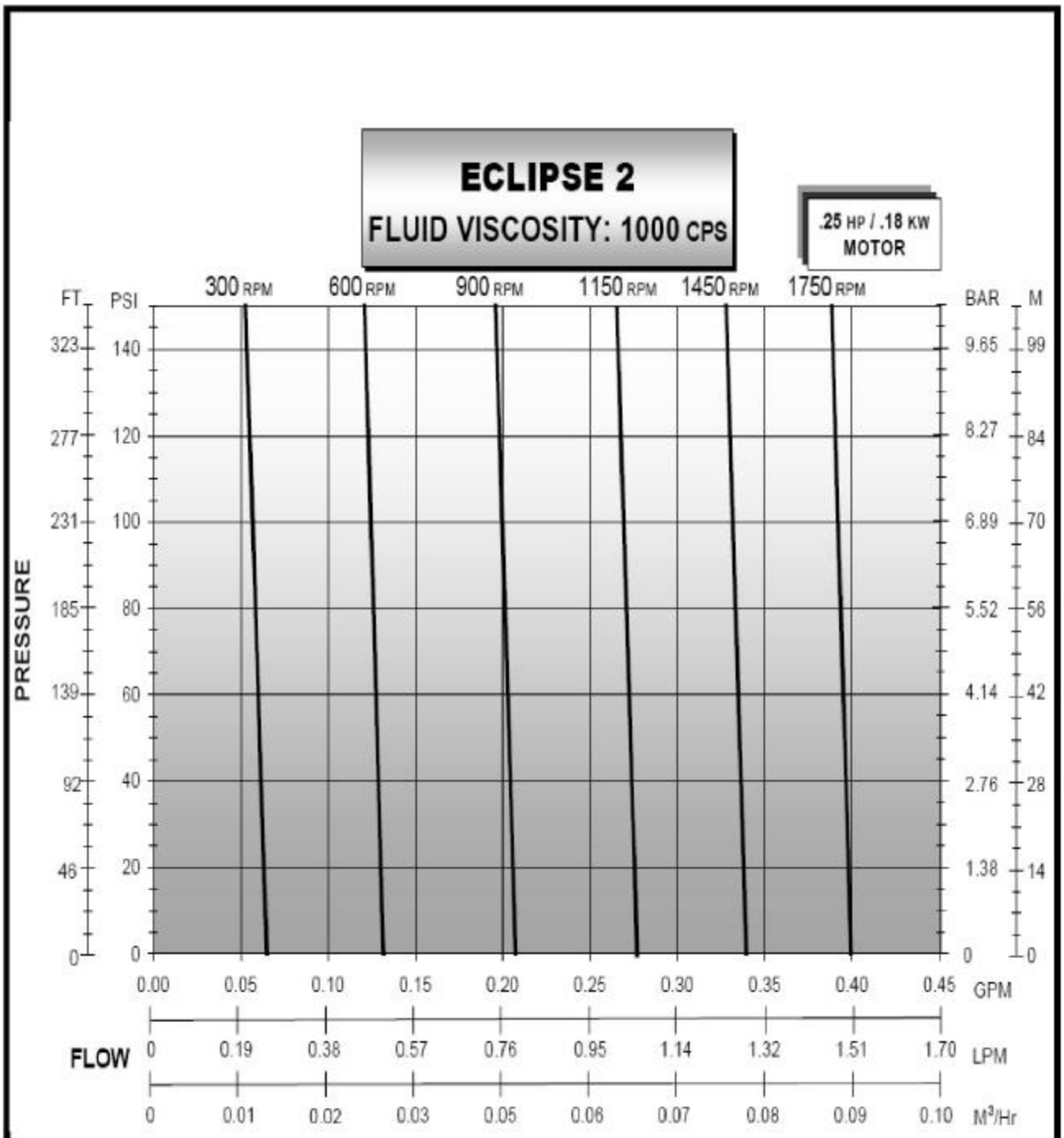
NOTES:
1. SUCTION AND DISCHARGE PORTS DEPENDENT UPON PUMP SHAFT ROTATION.
2. STANDARD MOTOR ADAPTOR PLATE FITS NEMA 56C,143TC,182TC,184TC AND 100/112 METRIC FRAME MOTORS.
3. MUST USE C-FACE MOTORS OF SPECIFIED FRAME SIZES.

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21. Performance Curves




ECLIPSE 2
FLUID VISCOSITY: 100 CPS
.25 HP / .18 KW MOTOR
300 RPM
600 RPM
900 RPM
1150 RPM
1450 RPM
1750 RPM
FT
PSI
BAR
M
PRESSURE
323
277
231
185
139
92
46
0
140
120
100
80
60
40
20
0
9.65
8.27
6.89
5.52
4.14
2.76
1.38
0
99
84
70
56
42
28
14
0
0.00 0.05 0.10 0.15 0.20 0.25 0.30 0.35 0.40 0.45 GPM
FLOW
0 0.19 0.38 0.57 0.76 0.95 1.14 1.32 1.51 1.70 LPM
0 0.01 0.02 0.03 0.05 0.06 0.07 0.08 0.09 0.10 M³/Hr
Eclipse series
PULSAFEEDER
A Unit of IDEX Corporation
ECLIPSE 2, 100 CPS
PERFORMANCE CURVE
B CURVE POSITION UPDATE 12/6/06
REV REVISION UPDATE DATE
DRAWN BY: JRY
DATE: 7/25/05
AE00097-000



Eclipse series

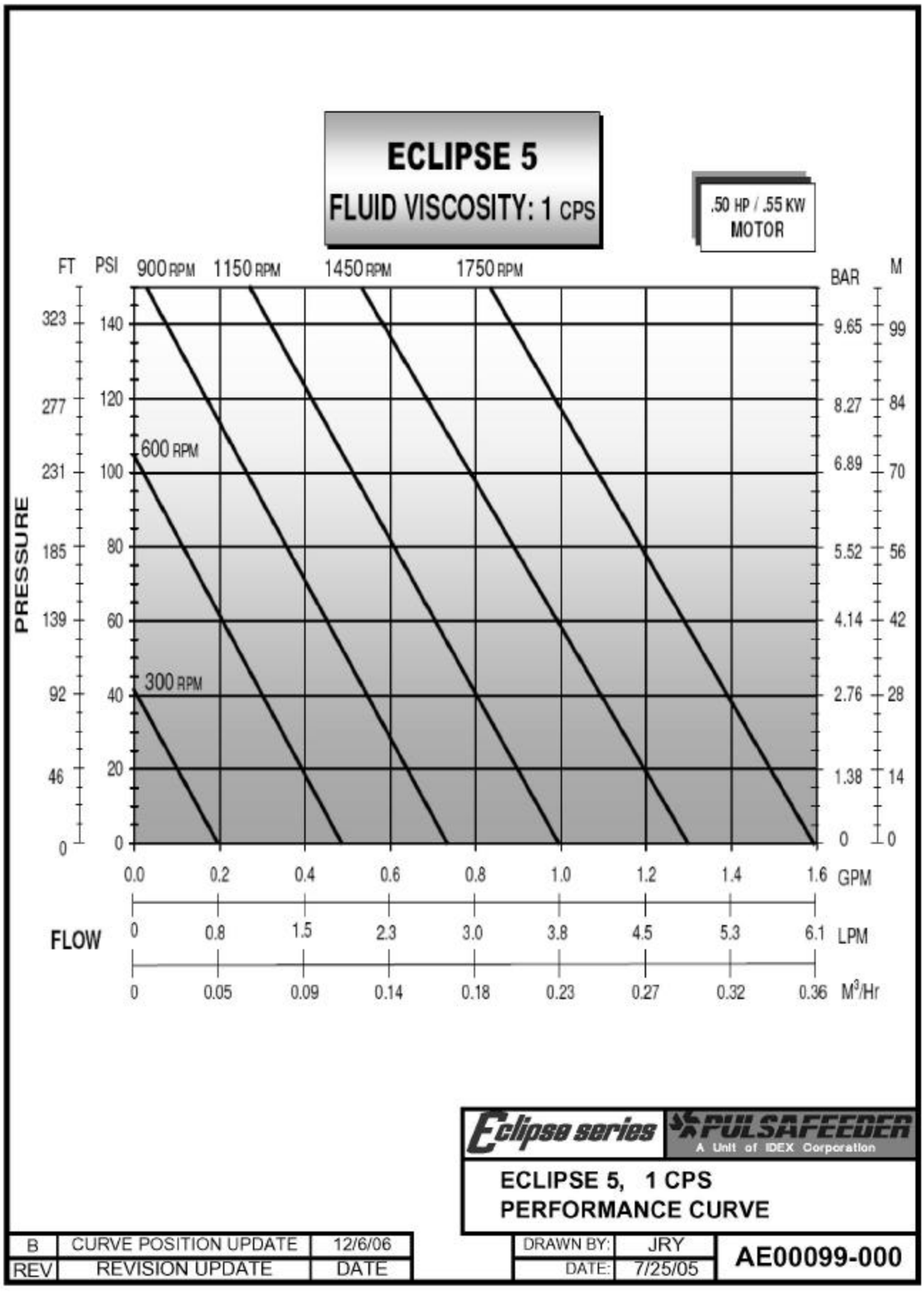
PULSAFEEDER
A Unit of IDEX Corporation

ECLIPSE 2, 1000 CPS
PERFORMANCE CURVE

REV	REVISION UPDATE	DATE
B	CURVE POSITION UPDATE	12/6/06

DRAWN BY:	JRY
DATE:	7/25/05

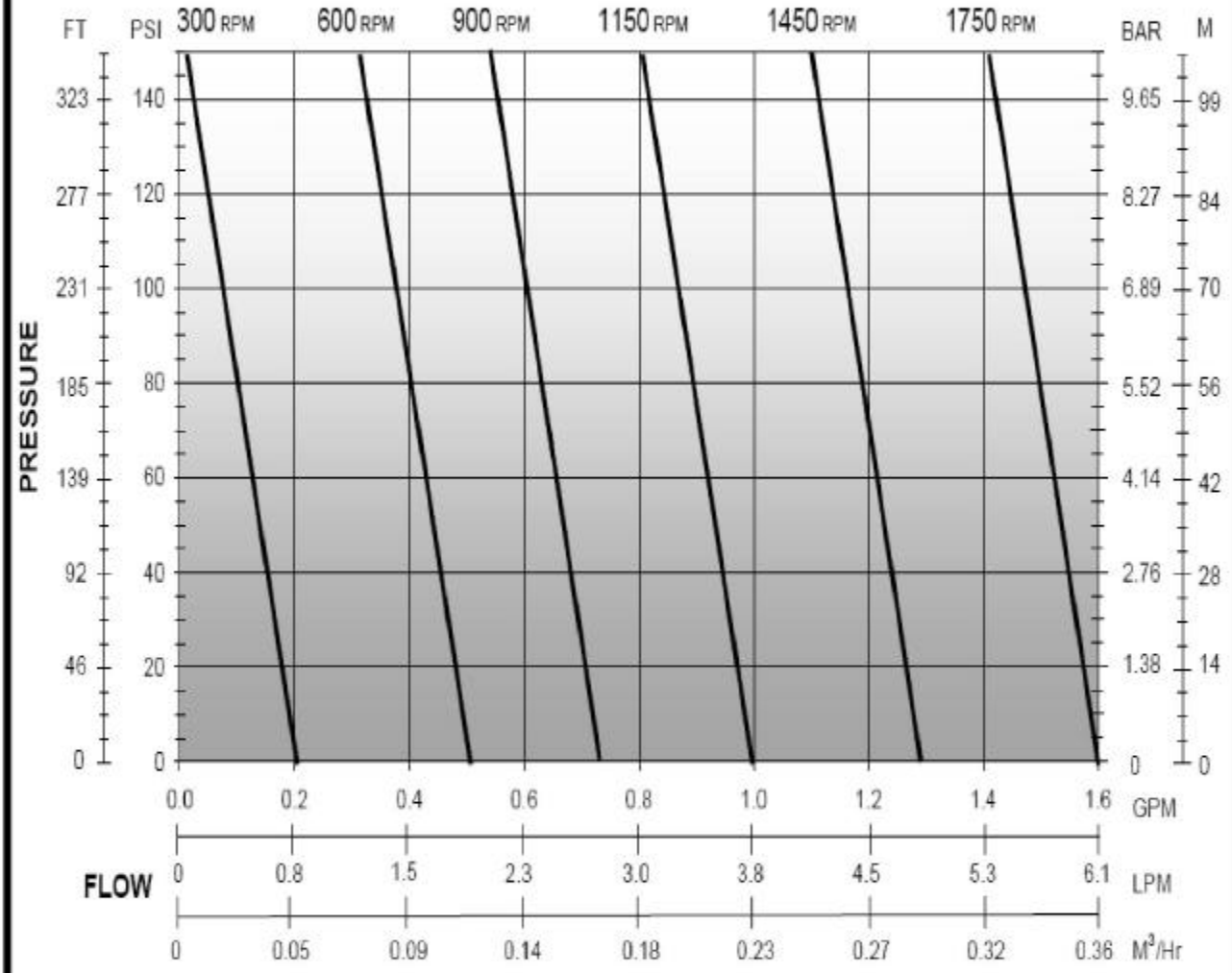
AE00098-000


ECLIPSE 5
FLUID VISCOSITY: 1 CPS
.50 HP / .55 KW MOTOR
FT
PSI
900 RPM
1150 RPM
1450 RPM
1750 RPM
BAR
M
PRESSURE
600 RPM
300 RPM
323
277
231
185
139
92
46
0
140
120
100
80
60
40
20
0
9.65
8.27
6.89
5.52
4.14
2.76
1.38
0
99
84
70
56
42
28
14
0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
GPM
FLOW
0
0.8
1.5
2.3
3.0
3.8
4.5
5.3
6.1
LPM
0
0.05
0.09
0.14
0.18
0.23
0.27
0.32
0.36
M3/Hr
Eclipse series
PULSAFEEDER
A Unit of IDEX Corporation
ECLIPSE 5, 1 CPS
PERFORMANCE CURVE
B
CURVE POSITION UPDATE
12/6/06
REV
REVISION UPDATE
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JRY
DATE:
7/25/05
AE00099-000

ECLIPSE 5

FLUID VISCOSITY: 100 CPS

.50 HP / .55 KW MOTOR



Eclipse series

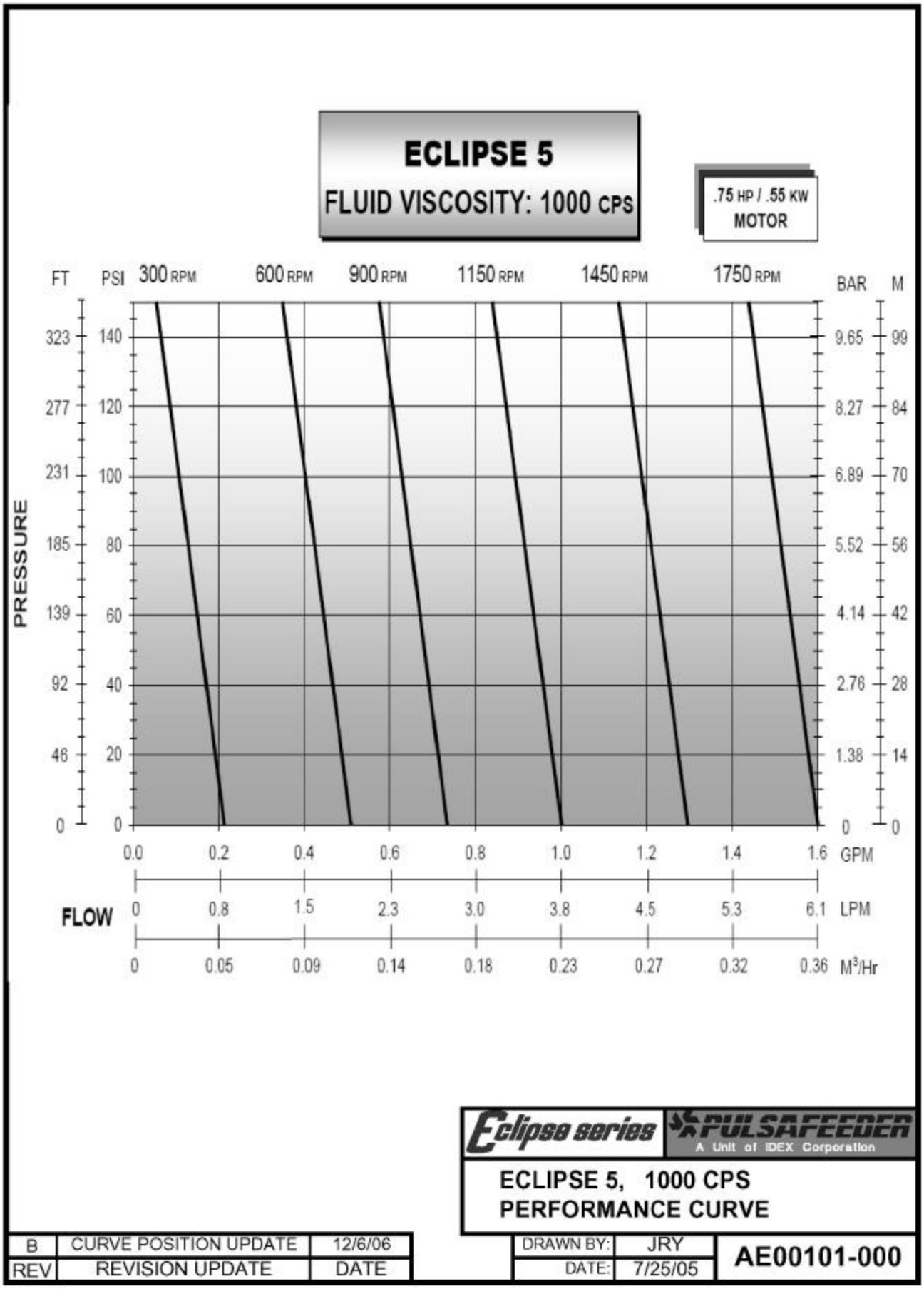
PULSAFEEDER
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ECLIPSE 5, 100 CPS
PERFORMANCE CURVE

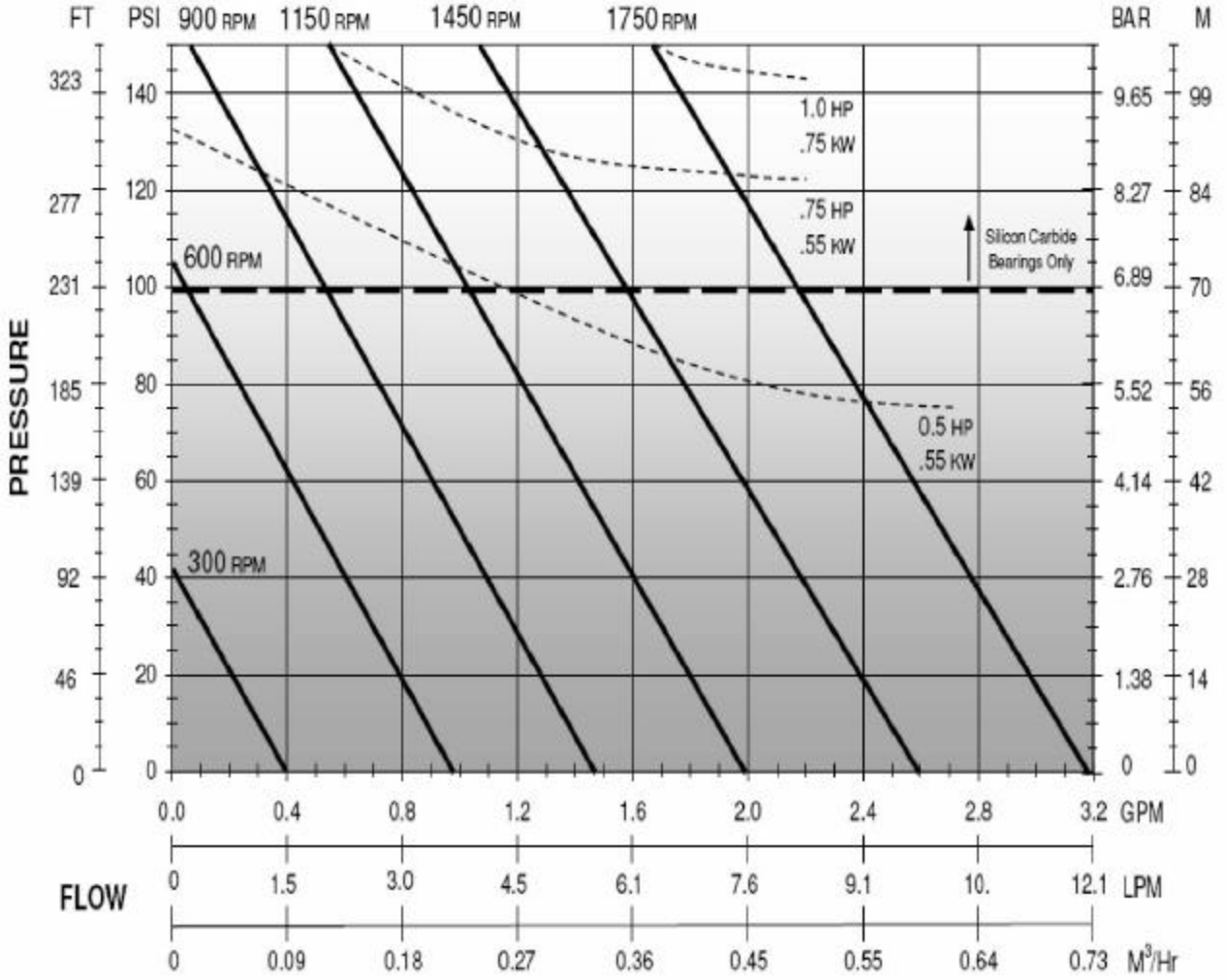
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B	CURVE POSITION UPDATE	12/6/06

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DATE:	7/25/05

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ECLIPSE 5
FLUID VISCOSITY: 1000 CPS
.75 HP / .55 KW
MOTOR
PRESSURE
FT
PSI
300 RPM
600 RPM
900 RPM
1150 RPM
1450 RPM
1750 RPM
BAR
M
323
277
231
185
139
92
46
0
140
120
100
80
60
40
20
0
9.65
8.27
6.89
5.52
4.14
2.76
1.38
0
99
84
70
56
42
28
14
0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
GPM
FLOW
0
0.8
1.5
2.3
3.0
3.8
4.5
5.3
6.1
LPM
0
0.05
0.09
0.14
0.18
0.23
0.27
0.32
0.36
M³/Hr
Eclipse series
PULSAFEEDER
A Unit of IDEX Corporation
ECLIPSE 5, 1000 CPS
PERFORMANCE CURVE
B
CURVE POSITION UPDATE
12/6/06
REV
REVISION UPDATE
DATE
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JRY
DATE:
7/25/05
AE00101-000

ECLIPSE 12
FLUID VISCOSITY: 1 CPS



Eclipse series

PULSAFEEDER
A Unit of IDEX Corporation

ECLIPSE 12, 1 CPS
PERFORMANCE CURVE

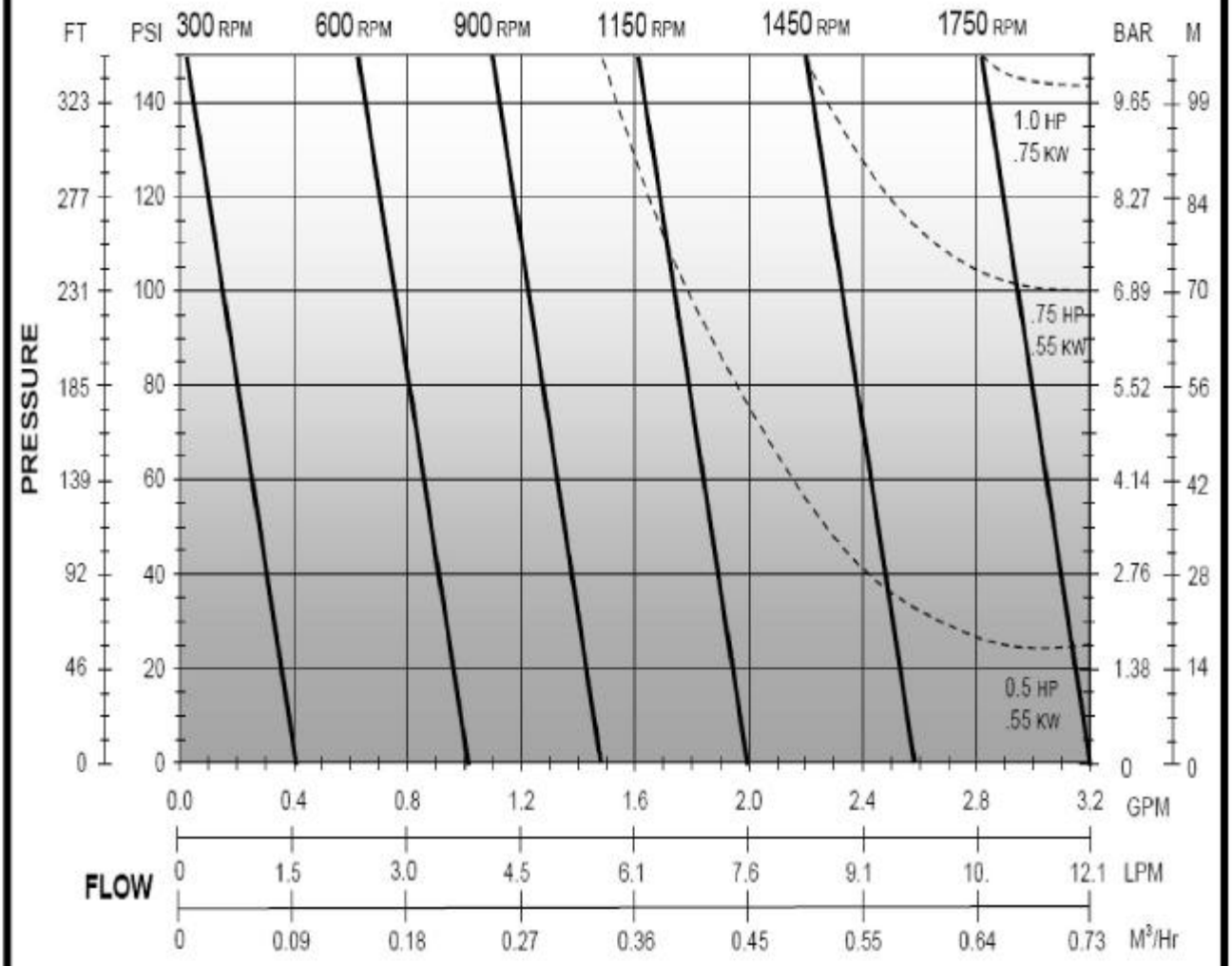
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DATE:	12/6/06

AE00109-000

ECLIPSE 12

FLUID VISCOSITY: 100 CPS



Eclipse series

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ECLIPSE 12, 100 CPS
PERFORMANCE CURVE

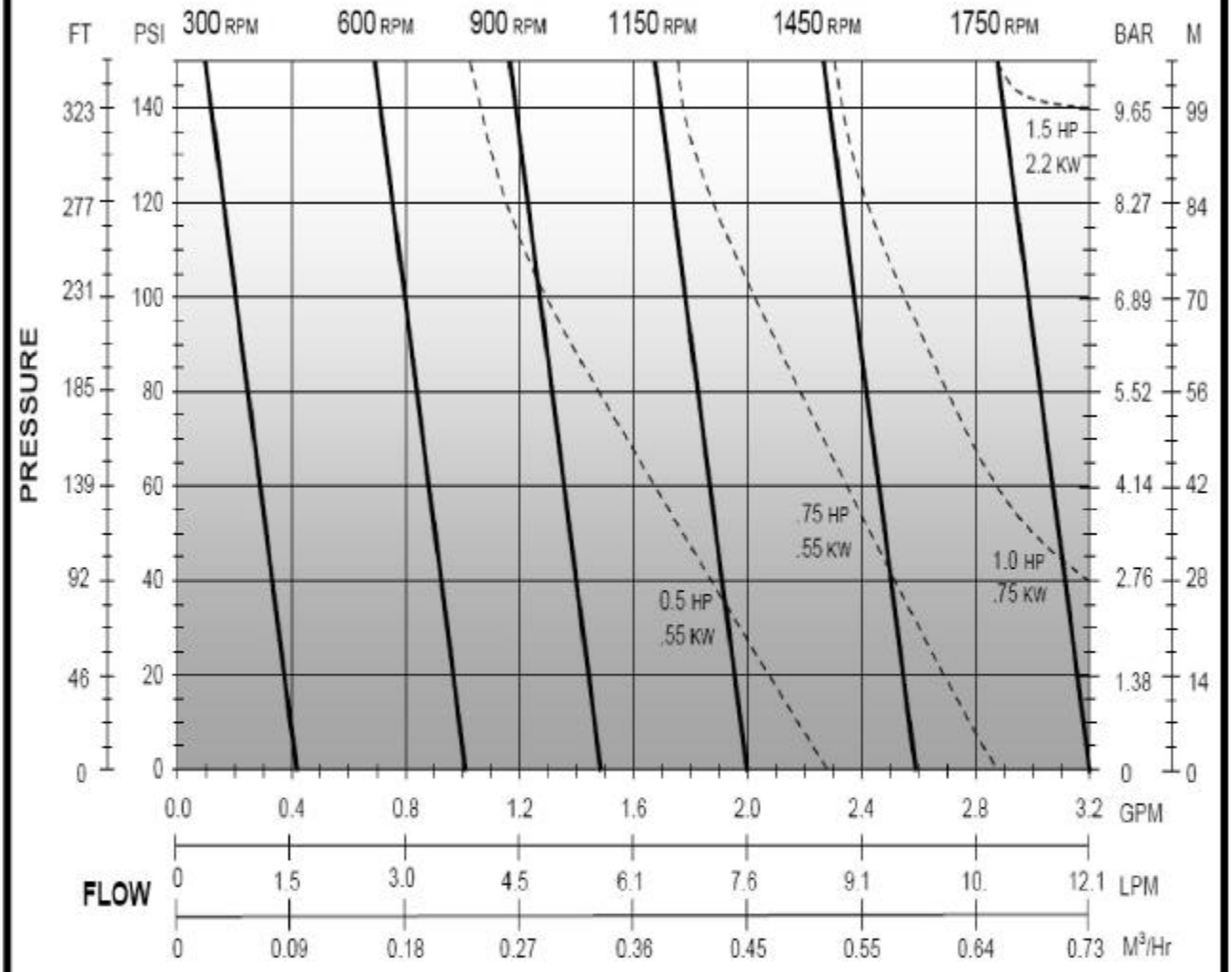
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DATE:	12/6/06

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ECLIPSE 12

FLUID VISCOSITY: 1000 CPS



Eclipse series

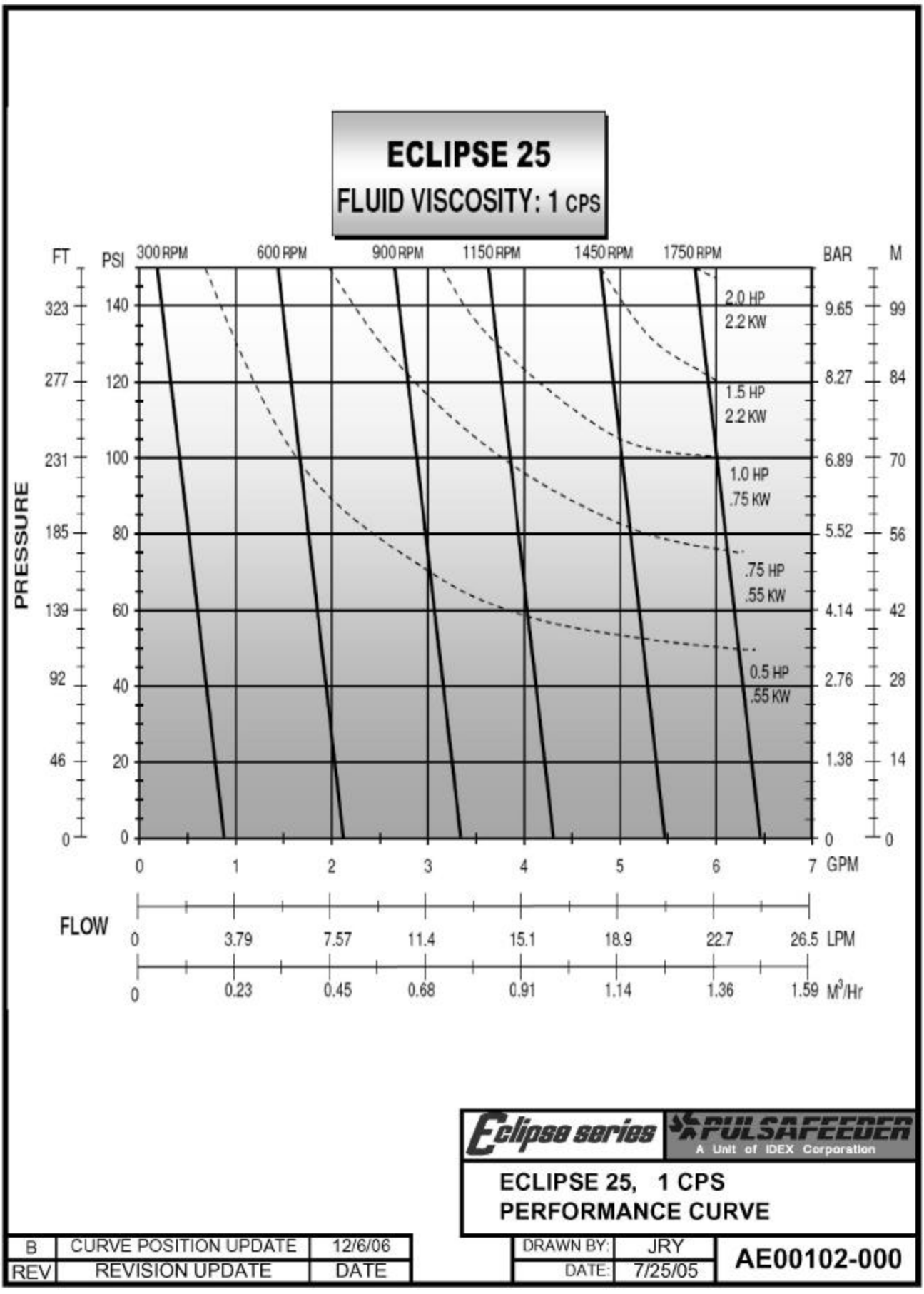
PULSAFEEDER
A Unit of IDEX Corporation

ECLIPSE 12, 1000 CPS
PERFORMANCE CURVE

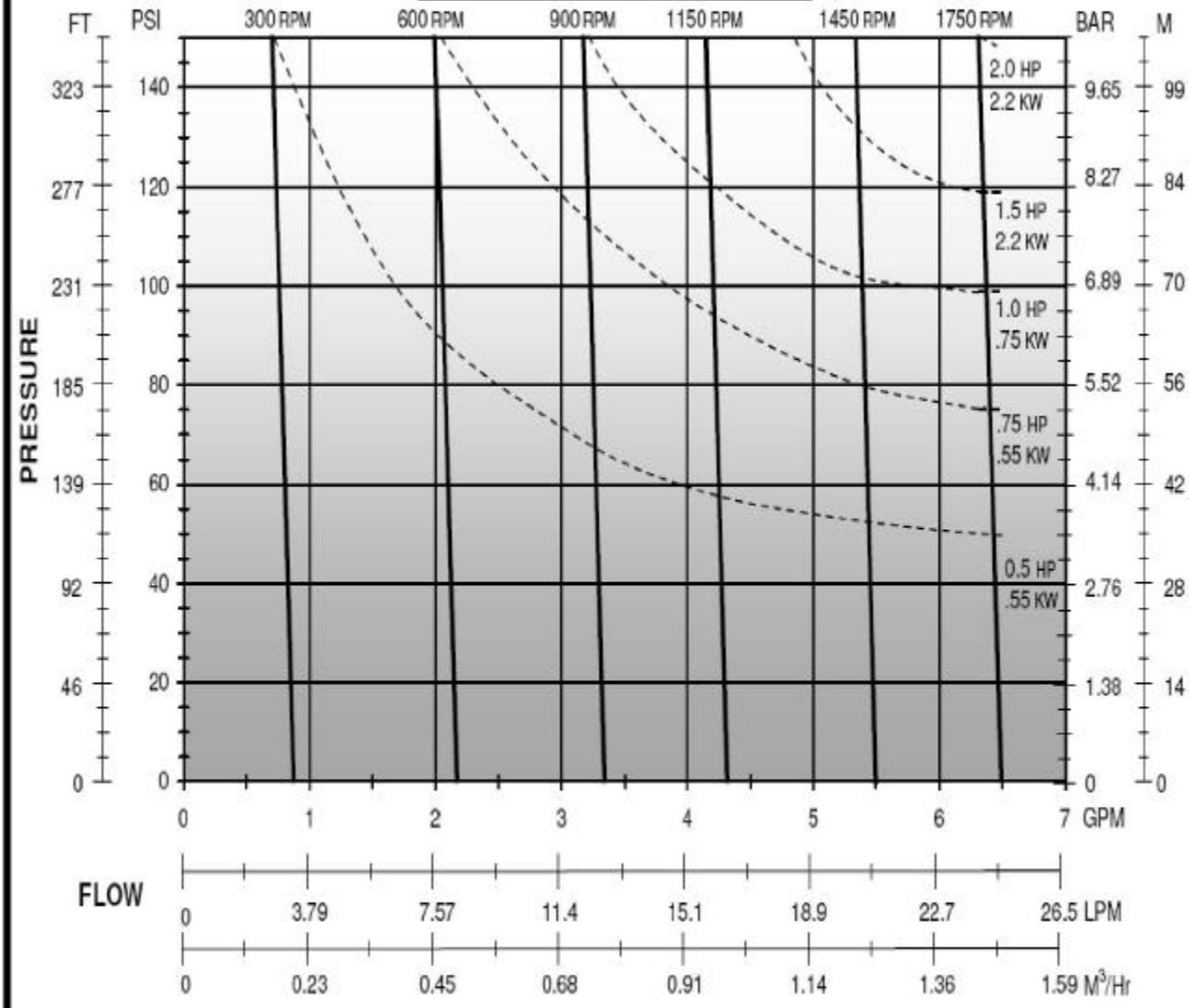
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DATE:	12/6/06

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ECLIPSE 25
FLUID VISCOSITY: 1 CPS
PRESSURE
FT
PSI
BAR
M
300 RPM
600 RPM
900 RPM
1150 RPM
1450 RPM
1750 RPM
2.0 HP
2.2 KW
1.5 HP
2.2 KW
1.0 HP
.75 KW
.75 HP
.55 KW
0.5 HP
.55 KW
323
277
231
185
139
92
46
0
140
120
100
80
60
40
20
0
9.65
8.27
6.89
5.52
4.14
2.76
1.38
0
99
84
70
56
42
28
14
0
0
1
2
3
4
5
6
7
GPM
FLOW
0
3.79
7.57
11.4
15.1
18.9
22.7
26.5
LPM
0
0.23
0.45
0.68
0.91
1.14
1.36
1.59
M³/Hr
Eclipse series
PULSAFEEDER
A Unit of IDEX Corporation
ECLIPSE 25, 1 CPS
PERFORMANCE CURVE
B
CURVE POSITION UPDATE
12/6/06
REV
REVISION UPDATE
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JRY
DATE:
7/25/05
AE00102-000

ECLIPSE 25
FLUID VISCOSITY: 100 CPS



Eclipse series

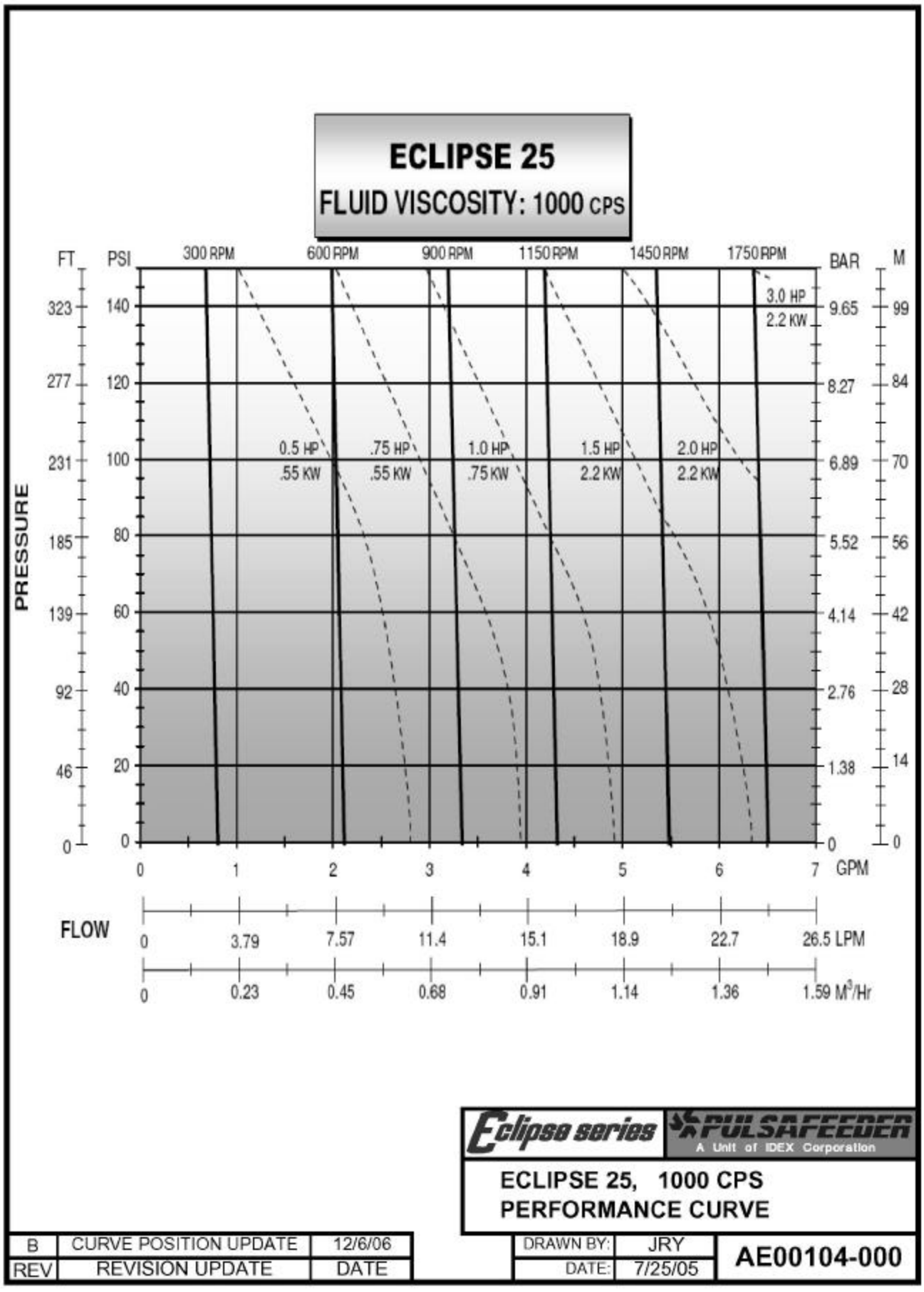
PULSAFEEDER
A Unit of IDEX Corporation

ECLIPSE 25, 100 CPS
PERFORMANCE CURVE

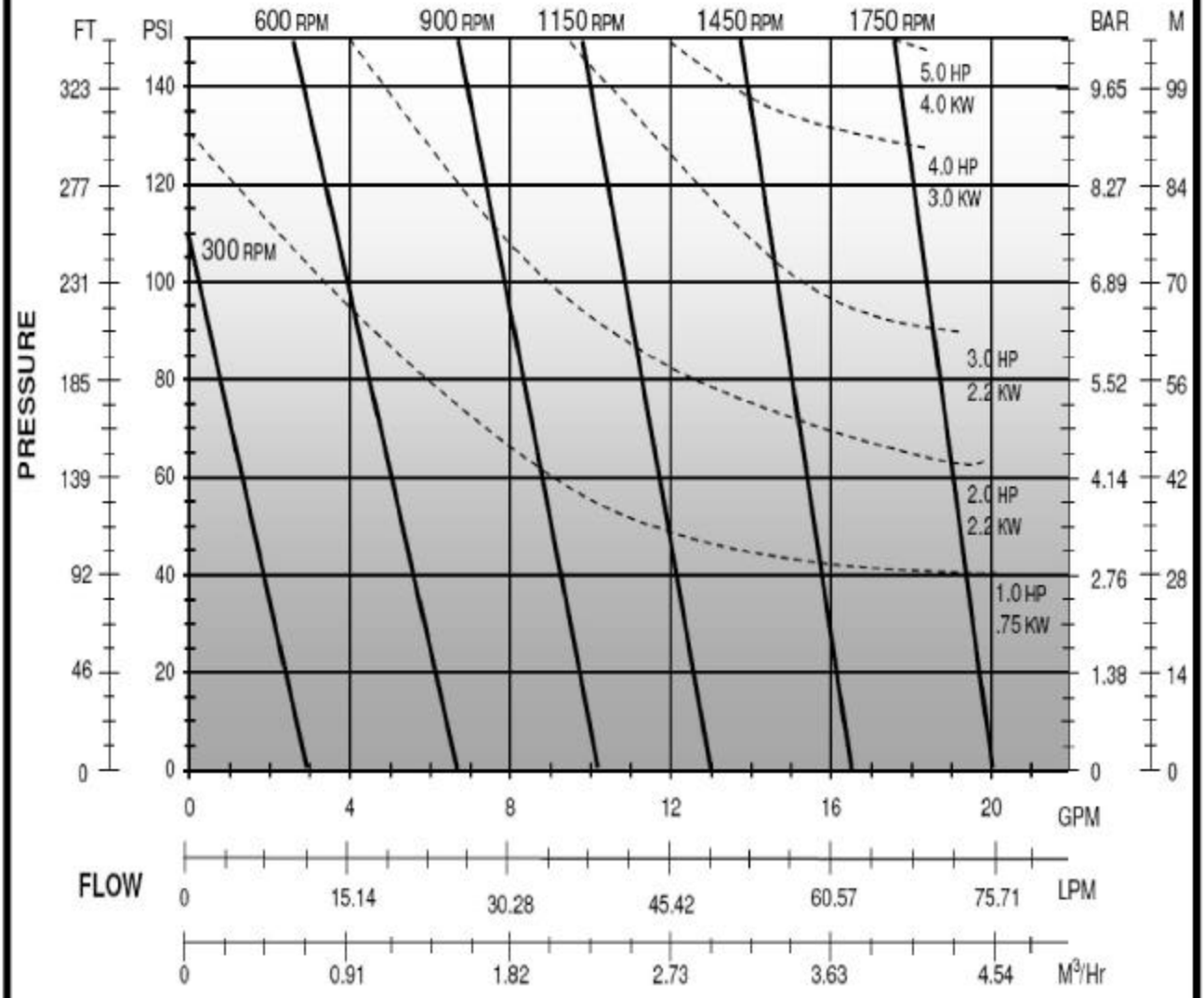
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ECLIPSE 25
FLUID VISCOSITY: 1000 CPS
FT
PSI
300 RPM
600 RPM
900 RPM
1150 RPM
1450 RPM
1750 RPM
BAR
M
PRESSURE
323
277
231
185
139
92
46
0
140
120
100
80
60
40
20
0
9.65
8.27
6.89
5.52
4.14
2.76
1.38
0
99
84
70
56
42
28
14
0
3.0 HP
2.2 KW
0.5 HP
.55 KW
.75 HP
.55 KW
1.0 HP
.75 KW
1.5 HP
2.2 KW
2.0 HP
2.2 KW
0 1 2 3 4 5 6 7 GPM
FLOW
0 3.79 7.57 11.4 15.1 18.9 22.7 26.5 LPM
0 0.23 0.45 0.68 0.91 1.14 1.36 1.59 M³/Hr
Eclipse series
PULSAFEEDER
A Unit of IDEX Corporation
ECLIPSE 25, 1000 CPS
PERFORMANCE CURVE
B
CURVE POSITION UPDATE
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ECLIPSE 75
FLUID VISCOSITY: 1 CPS



Eclipse series

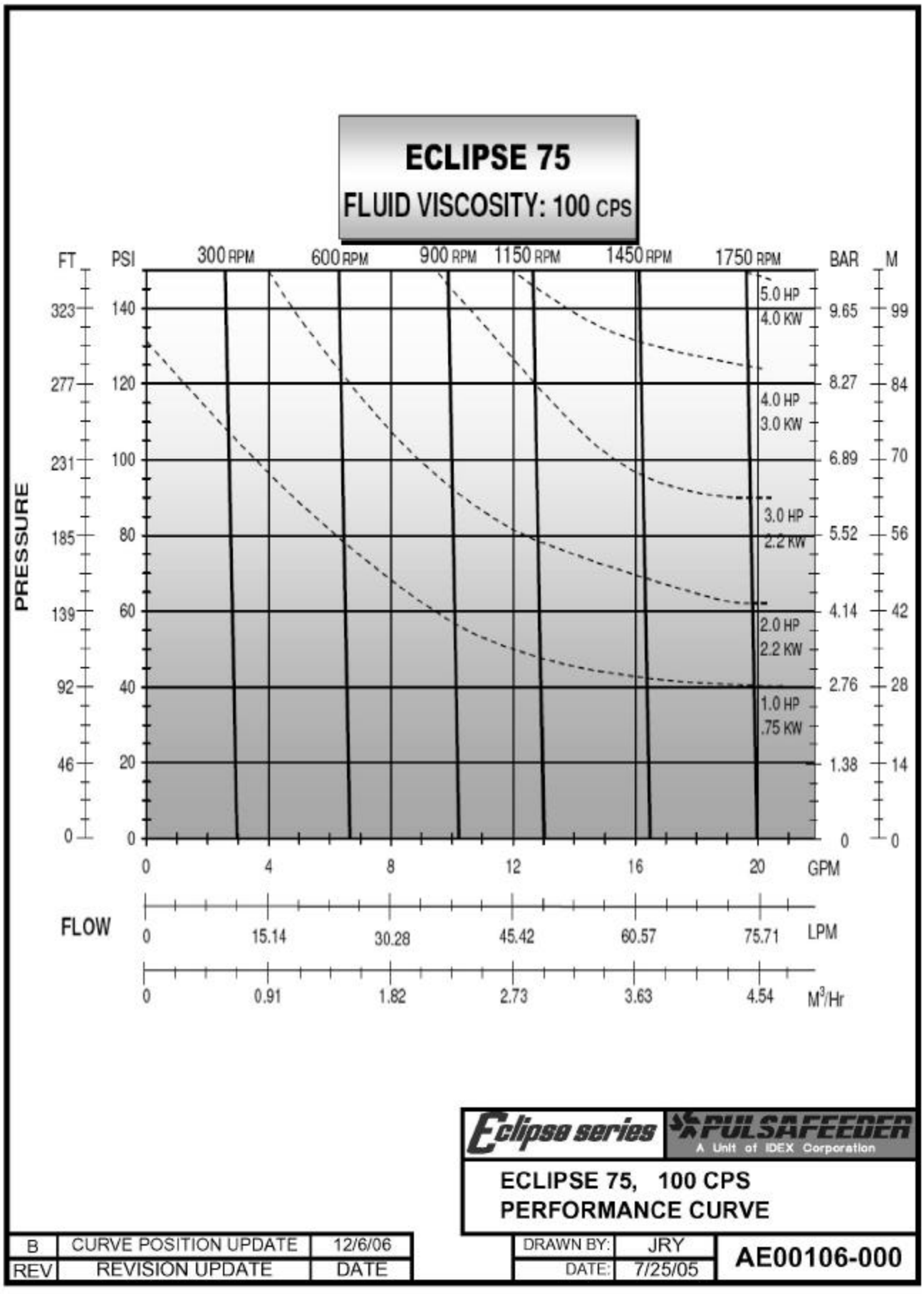
PULSAFEEDER
A Unit of IDEX Corporation

ECLIPSE 75, 1 CPS
PERFORMANCE CURVE

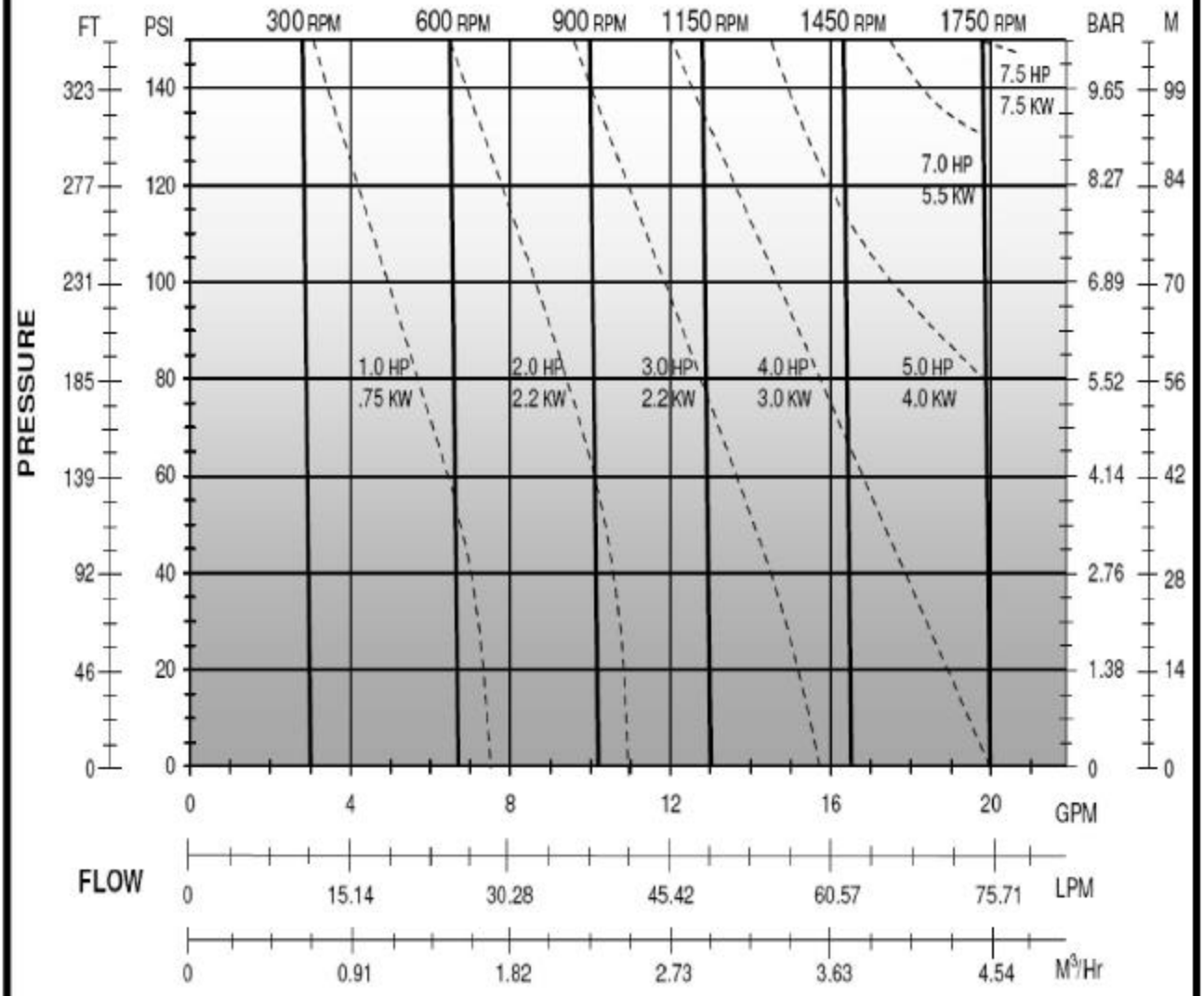
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B	CURVE POSITION UPDATE	12/6/06

DRAWN BY:	JRY
DATE:	7/25/05

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ECLIPSE 75
FLUID VISCOSITY: 100 CPS
PRESSURE
FT
PSI
BAR
M
300 RPM
600 RPM
900 RPM
1150 RPM
1450 RPM
1750 RPM
5.0 HP
4.0 KW
4.0 HP
3.0 KW
3.0 HP
2.2 KW
2.0 HP
2.2 KW
1.0 HP
.75 KW
323
277
231
185
139
92
46
0
140
120
100
80
60
40
20
0
9.65
8.27
6.89
5.52
4.14
2.76
1.38
0
99
84
70
56
42
28
14
0
0
4
8
12
16
20
GPM
FLOW
0
15.14
30.28
45.42
60.57
75.71
LPM
0
0.91
1.82
2.73
3.63
4.54
M3/Hr
Eclipse series
PULSAFEEDER
A Unit of IDEX Corporation
ECLIPSE 75, 100 CPS
PERFORMANCE CURVE
B
CURVE POSITION UPDATE
12/6/06
REV
REVISION UPDATE
DATE
DRAWN BY:
JRY
DATE:
7/25/05
AE00106-000

ECLIPSE 75
FLUID VISCOSITY: 1000 CPS



Eclipse series

PULSAFEEDER
A Unit of IDEX Corporation

ECLIPSE 75, 1000 CPS
PERFORMANCE CURVE

REV	REVISION UPDATE	DATE
B	CURVE POSITION UPDATE	12/6/06

DRAWN BY:	JRY
DATE:	7/25/05

AE00107-000

22. ATEX Directive

ECO / ISOCHEM / ECLIPSE IOM ADDENDUM
ATEX Directive 94/9/EC
Potentially Explosive Atmospheres

NP550110-IOM REV B
8/10/2005

Scope

This addendum is to the Installation, Operation and Maintenance Manual of the ECO, Isochem and Eclipse Gear Pump family of pumps. It includes all the necessary additional information to be considered when installing these pump models in a potentially explosive environments (Group II, Category 2, G & D).

Models Included in the Assessment

G , GA and GC series ECO Mechanical sealed gear pumps
GM and GMC Isochem Magnetically driven gear pumps
E Series Eclipse Magnetically driven gear pumps

Description of Equipment

The general product description for this equipment is positive displacement external gear pumps. They are supplied as mechanically sealed and magnetically driven versions.

Intended Usage of the Equipment

ECO / Isochem / Eclipse gear pumps are intended to be used to transfer various fluids. With proper sensors or feedback devices they can also be used to meter fluids.

Pulsafeeder has decided to construct the pumps to meet the requirements for Group II, category 2 equipment. To meet Category 2 equipment requirements, all possible ignition sources that can occur in normal operation of the pumps and additionally, those that can become effective as a result of malfunctions expected to occur in service must be considered. As the pumps are not intended to meet the requirements of category I, potential ignition sources arising from rare malfunctions can be neglected.

Reference Standards

97/38/EC Machinery safety directive
EN 13463-1 (2001) Non-electrical equipment for potentially explosive atmospheres - Part 1: Basic method and requirements

EN 1127-1 Explosive atmospheres - Explosion prevention and protection - Part I: Basic concepts and methodology
EN 60529 Degrees of protection provided by enclosures (IP Code)

Equipment

Equipment in Group II, Category 2, is intended for use in areas in which explosive atmospheres caused by gases, vapors, mists or air/dust mixtures are likely to occur.

G & D Atmospheres

In G type Explosive atmosphere (Gas, vapor, mist) equipment is suitable for use in Zone 1 areas.
In D type Explosive atmosphere (Dust) equipment is suitable for use in Zone 21 areas.

Temperature Class

Temperature class TX based on ambient and pumped fluid temperature.
Different temperature classes can be achieved based on fluid and ambient temperatures (See chart)

Temperature Class and Maximum Liquid Temperatures

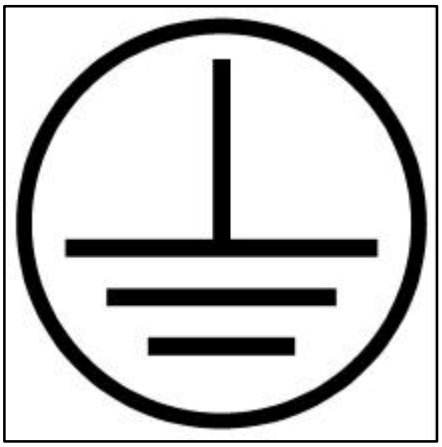
Temperature Class	Maximum Surface Temperature C Permitted (Dust)	Max. Liquid or Ambient Temperature C		Comments
		Sealed Pumps	Magnetic Drive	
T1	450	260	230	Fluid temperatures are limited by pump construction
T2	300	225	225	
T3	200	145	145	
T4	135	90	90	
T5	100	65	65	
T6	85	50	50	Normal class rating

* Maximum Temperature Class for Eclipse Series Pumps is T6.

Technical Support & Service

For technical support or service contact:
Pulsafeeder Inc.
2883 Brighton Henrietta Townline Road
Rochester, New York
14623
USA
(585) 292-8000

Protective Earth Ground Symbol



Sample Tag



Additional Equipment

Additional equipment such as a Power Monitor, Temperature probe and a Flow meter should be fitted at all times when using a pump in a potentially explosive atmosphere. The pump / unit must also be "Earth Grounded" at all times. **A pump should never be "Run Dry" especially in Potentially Explosive Atmospheres.**

General Usage Precautions

1) The pump must be "Earth Grounded" at all times to prevent Electrostatic charge build up. (When an ATEX approved pump is requested, a "Ground" contact point is provided or identified by the protective earth ground symbol.) The electrical installation must conform to all location relevant codes.
2) The pump must not be used beyond its ratings and if the original operating conditions change, it is the users responsibility to check with Pulsafeeder to confirm if the pump is still acceptable for the new operating conditions.
3) Pulsafeeder will only consider the pump safe for the purpose and duty conditions originally specified by the purchaser. Pulsafeeder will not accept responsibility for pump failure or personal injury arising from mis-application of the product.
4) In the event of any one of the following conditions occurring the pump should be shut down and the cause investigated and rectified.

    Unaccountable rise in discharge pressure
    Release of liquid from the pressure relief mechanism
    Excessive noise emissions
    Unaccountable rise in operating temperature
    Excessive power consumption
    Loss of flow

5) Unauthorized modification or use of components other than original Pulsafeeder spares revokes any liability for consequences, which may result.
6) A pressure relief method must be used at the discharge of the pump to provide over pressure protection. For ATEX Potentially Explosive Atmospheres, a "return to tank type piping system" is recommended to prevent high temperatures due to recycled fluid.

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7) Pumps cannot be driven by belts or chains.

8) Lubricate Power Frames if used with the appropriate lubricant specified in the standard instructions.

9) Check any gear reducers, motor, couplings, etc for instructions and lubricate as recommended.

10) Packing should not be used in potentially explosive environments. Packing adjustment is critical to prevent high surface temperatures. Packing must leak to cool itself.

11) Care must be exercised on the initial start of a new pump to prevent dry running. The pump can not tolerate dry run for more than a few seconds. Even after initial break in, pumps must not run dry as high temperatures can happen very quickly.

12) Inspecting the pump for internal wear regularly. Look for signs of heavy grooving, galling, twisting or breakage. These are the signs that rapid wear has taken place. This is a good indication that the pump may not be a good match for the service conditions. Rapid wear could result in unexpected failure that could be the source of ignition of the explosive environment.

13) The purchaser/user must ensure that all maintenance work including disassembly and reassembly is carried out by authorized and qualified personnel, who are sufficiently trained in the operation of the pump.

14) Due to the tight internal tolerances of a gear pump the most reliable way of repairing a pump is by the use of a KOPKit, which contains all the normal wear parts to restore the pump to like new condition.

15) Make sure that heavy deposits of dust are not allowed to accumulate. Clean pump periodically.

16) Don't run the pump faster or at a higher pressure than rated.

17) Don't flush the pump with steam or air without protecting against shaft rotation due to the gears in the pump being forced to turn like a turbine.

18) The use of a power, pressure and temperature monitoring of the pump and system is highly recommended.

19) Refer to the provided temperature table for information relating to ambient and fluid temperatures.

20) Properly vent or flush the pump of fluids or gasses before disassembling for service.

21) Obtain, read and keep maintenance instructions furnished with the pump.

Normal Operation

More detailed information is supplied in the Installation, Operation, and Maintenance manual.

Potential Ignition Source	Measures to take to prevent the source from becoming effective
Frictional ignition	All moving parts in the pumps are submersed in the pumped fluid, which acts as a lubricant and coolant. Do not run the pump dry. Packing is not recommended for Explosive environments due to the possibility of high temperature in the area of the stuffing box due to mis-adjustment. If packing is used, thermal monitoring is required to meet ATEX requirements
Pump bearings	Verify pump turns freely The use of a strainer is recommended The use of bearing flushing is recommended The bearing housings need to be examined for signs of overheating, abnormal noise, or discoloration on a daily basis. Alternatively continuous temperature monitoring can be fitted and set to trip the drive power at 10 C above normal baseline temperature Monitor pump frequently when pumping non-lubricating fluids
Power frame bearings	Check lubricant level weekly and monitor for leaks daily
Dust deposits on pump	Regular cleaning is needed to prevent deposits from accumulating in a thickness great enough to become an ignition hazard
Static electricity discharge	The pump must be grounded (bonded) at the "Protective Earth Ground" location marked on the pump Vent cavities to prevent Oxygen / Air build up
High temperatures	Recommend Temperature monitors Recommend Flow indicator Recommend Power monitor Recommend Pressure switch
Use of electric motor	If an electric motor is used as a driver for the pump, it must be ATEX approved for the environment

Expected Malfunction

Potential Ignition Source	Measures to take to prevent the source from becoming effective
Dry run	All moving parts in the pumps are submersed in the pumped fluid, which acts as a lubricant and coolant. Do not run the pump dry. Recommend Power monitor Recommend Flow indicator Recommend Pressure switch Recommend Temperature monitors
Pump bearings	Max. radial wear on bearings is .13 mm (.005 in) Monitor pump daily when pumping non-lubricating fluids for high temperatures at bearing bosses Every 1000 hours inspect the pump for wear and rebuild with a KOPKit if necessary Typical life of the pump bearings is 2000 hours. Regular maintenance and good record keeping will provide a more accurate service interval
Power frame bearings	Check condition of lip seals for the power frame every month to insure lubricant containment
High temperature	Recommend Temperature monitors Recommend Flow indicator Recommend Pressure switch Recommend Power monitor

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12-2006
Bulletin IOM-NMG-0804
Rev D