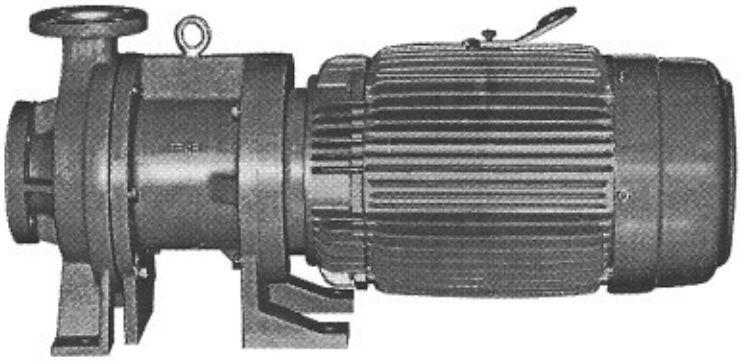
MAGNATEX®
Pumps, Inc.

Operation and Maintenance Manual

TEXEL MTA Series
ANSI Close-Coupled Pumps



PFA-Lined
Magnetic Drive
Sealless Pumps

Magnatex Pumps, Inc.
3575 West 12th Street
Houston, TX 77008
Phone (713) 972-8666 Fax (713) 972-8665
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!WARNING! - MAG DRIVE PUMP

DO NOT WORK ON THIS PUMP IF YOU ARE WEARING A MEDICAL DEVICE (DEFIBRILLATOR, PACEMAKER, ETC.) PERSONNEL WHO EXPERIENCE INTERFERENCE WITH THEIR MEDICAL DEVICE SHOULD MOVE AWAY FROM THE PUMP AND REFRAIN FROM HANDLING MAGNETIC PUMP COMPONENTS. SEEK IMMEDIATE MEDICAL ATTENTION IF YOU HAVE EXPERIENCED INTERFERENCE WITH YOUR MEDICAL DEVICE.

The rare earth permanent magnets in this pump have been manufactured such that the magnetic field is directional toward each half of the magnetic coupling. For this reason, the magnetic field that exists outside of the assembled magnetic coupling is minimal. When the two halves are apart, the magnetic field is exposed, which is why we recommend that personnel wearing medical devices DO NOT HANDLE the magnetic coupling components. When the pump is assembled, the magnetic fields from the magnetic coupling components are not exposed and it is safe for wearers of medical devices to be in the general proximity of the assembled pump, whether the pump is in operation or not.

TABLE OF CONTENTS

OPERATING & MAINTENANCE INSTRUCTIONS
TEXEL® MTA SERIES CLOSE-COUPLED PUMPS

1. RECEIVING INSPECTION

A. Before uncrating, check for physical damage to the pump assembly. Notify the common carrier **IMMEDIATELY** if any damage is found.

B. Check the nameplate on the pump against receiving and purchase order documents to be sure the correct pump size and materials of construction have been supplied. If a motor has been supplied, check for correct horsepower, speed and voltage.

C. Check to see if flange protectors are intact. If not, check for foreign objects that may have found their way into the pump casing through the flange openings.

D. Remove the motor fan cover and make sure the pump freely rotates by hand using the motor shaft. Only slight resistance should be felt. If the pump has a heavy resistance, or if any noise is heard, call your **TEXEL** representative or **MAGNATEX® PUMPS, INC.** at (713) 972-8666.

2. SAFETY PRECAUTIONS

For safe operation and to prevent personal injury and/or damage to equipment or property, read and follow all warnings described below.

A. Handling the Pump

The pump may be lifted by the eyebolt, however additional support, such as slings or chains or other lifting devices must be used once a motor is attached.

B. Inspection

When conducting operational tests after installation or maintenance, make certain that all drain bolts, casing bolts etc., are tight.

C. Application

This pump has been designed and constructed for specific operating conditions and specifications. If pump is to be used for other services, consult with your representative or **MAGNATEX® Pumps, Inc.** at (713)972-8666.

WARNING!
When working on magnetically driven pumps…

- Strong magnetic fields may damage watches, credit cards, computer disks, calculators and computer tapes.

- People with pacemakers should be cautioned that the strong magnetic field might upset the timing or cause the pacemaker to malfunction.

- When working on the pumps, be aware that tools or metal parts brought within close proximity to the magnets may suddenly be attracted trapping fingers in the process.

3. STORAGE PROCEDURES

Storage up to three months:

A. Do not remove flange protectors until time of installation.
B. Store in dry, adequately ventilated room.
C. Tape the motor terminal box opening to prevent foreign matter from entering.

Storage for longer than three months:

A. Follow above steps for storage up to 3 months.
B. Remove the fan cover from the motor and rotate motor and pump several times every 3 months.
C. Motor insulation can degrade over time due to moisture absorption. Therefore, measure and record insulation resistance on delivery of pump/motor assembly and check periodically. Dry motor if required. (Refer to motor instruction manual.)

Storage for longer than one year

A. Follow above steps, for storage longer than 3 months.
B. Perform internal pump inspection and replace gasket.

4. INSTALLATION AND PIPING

A. FOUNDATION

The foundation should be firm and heavy to reduce vibrations. The foundation bolts should be mounted in concrete to provide a firm and positive support.

B. LOCATION & PIPING

1. Locate the pump as close as practical to the source of the liquid supply.

2. The suction line should be as short and straight as possible and contain a minimum number of elbows. Any elbow should be the large radius type. Elbows and fittings should be no closer than 10 pipe diameters to the pump suction to allow undisturbed flow to the pump impeller.

3. Generally, suction piping should be one or two sizes larger than the pipe suction. This will keep friction losses to a minimum. This becomes more important as the distance between the pump and the liquid supply increases, or if fittings are located closer than 10 pipe diameters to the pump's suction.

4. The suction piping should have no high spots where air pockets can collect. All joints in the suction line should be tight to prevent air from entering into the system and creating the possibility of vapor locking. This is especially important when suction pressure is lower than atmospheric pressure. A pressure gauge should be installed in the suction line as close as possible to the suction flange.

5. An air vent should be installed at the initial high point in the pump discharge line. A check valve and shut-off valve should be installed as close as possible to the pump discharge nozzle. The check valve is installed to protect the pump from excessive back pressure, including reverse flow/rotation, and back flow during shut down or driver failure. The discharge valve is to regulate the flow and isolate the pump for servicing. A pressure gage should also be installed as close as possible to the discharge nozzle between the pump and the discharge valve.

6. Large particles can block the bushing lubrication ports in the pump causing serious damage. In addition, metallic particles can magnetically attach to the inner magnet also resulting in damage. If possible, a temporary start-up strainer with a 40x40 mesh screen should be installed in the pump's suction line. **BE VERY CAREFUL** not to allow the temporary strainer to be plugged to the point of starving the pump of liquid. This may result in cavitation and the possibility of running the pump dry, which can destroy the pump's bushings. It is recommended to install a pressure gauge between the strainer and pump to monitor possible plugging of the strainer. The discharge pressure should also be closely monitored. Any drop in the discharge pressure without discharge valve throttling could suggest strainer plugging (assuming constant demand to the system).

7. ***TEXEL®*** pumps, although very rugged, are not designed to handle excessive stress(see p.18). The resulting forces and moments can result in possible damage to the pump. Piping must be anchored and supported as close as possible to, but independent from the pump. Pump and pipe flanges must be positioned together before attempting to tighten flange bolts.

8. The pump **MUST NOT RUN DRY.** Adequate liquid should always be available to the pump suction. A flow sensor and/or amp/watt monitor should be installed to shut the pump down in the event of dry run. MAGNATEX provides optional protection devices to prevent dry run.

5. OPERATING PROCEDURES

ROTATION CHECK

To confirm the direction of rotation against the rotation arrow on the pump casing use the following procedures:

A. Open the suction and discharge valve and allow the pump to be filled with liquid.

WARNING! NEVER RUN THE PUMP DRY

B. Remove the motor fan cover for visual inspection and rotation.

C. Bump the motor by quickly pushing the motor start & stop buttons. Rotation should be clockwise as seen from motor end. If the direction of rotation is incorrect, reverse two of the three-phase power leads to the motor.

D. After confirming proper rotation, replace the motor fan cover.

PRIMING AND START-UP

A. Open the suction and discharge valves and allow the pump to fill with liquid.
(If the direction of rotation has not been checked, this must be done as detailed in the Rotation Check section above.)

WARNING! NEVER RUN THE PUMP DRY

B. Close the discharge valve to ¼ open.

C. Start the motor and immediately check the discharge pressure gauge. The pressure should rise quickly and hold steady. If the pressure rises and then falls back, there is air or vapor in the system. **STOP THE PUMP IMMEDIATELY.** Wait 15 to 20 seconds before restarting the pump.

D. If after repeating step C several times, the pressure gauge does not hold steady or does not yield the expected pressure (from performance curve), contact your TEXEL representative, or **MAGNATEX® PUMPS, Inc**. for assistance. Do not continue to operate the pump under these conditions.

E. Once the pump is fully primed and the discharge pressure is satisfactory, slowly open the discharge valve until the desired operating point is reached.

F. Operators should make frequent visual inspections to insure the pump is running smoothly without noise or vibration. The discharge pressure should hold steady without fluctuation. Any excessive heating of the pump or motor bearings is cause for alarm. The unit should be shut down immediately, an investigation made to find the cause, and corrective action taken.

G. Follow the motor manufacturer's recommendations and keep the motor bearings lubricated properly.

WARNING!

Never throttle the pump by closing the valve on the suction side of the pump. Throttling the suction side can cause serious damage to the pump. Throttle only from the discharge valve.

WARNING!

Never operate the pump against a closed discharge valve. Low flow operation can cause rapid heating of the pumped liquid with possible vaporization and the pump bushing running dry, resulting in serious damage to the pump.

SHUT DOWN

A. Normally pump should be stopped only after discharge valve is closed. If suction valve is close first, cavitations and pump seizure may occur.

B. If suction is flooded, close suction valve after pump is stopped.

C. If pump is shut down for long periods of time, drain liquid from the pump. Freezing liquid may cause pump damage.

6. MAINTENANCE SCHEDULE

A. Daily check

- Check pump for any abnormal noise or vibration.
- Check suction and discharge pressure as well as liquid level of the suction tank,
- Check motor amp draw versus motor rated amps.

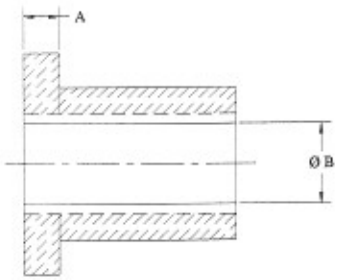
B. Periodic Check

For smooth and safe operation of the pump, check each part of the pump during normal preventive maintenance in accordance with instructions given below. Special care should be taken when handling the shaft, thrust rings and bushings.

PART NAME	CHECK POINTS
CASING	• Accumulation of dirt. • Presence of cracks. • Wearing or rubbing.
IMPELLER	• Dirt or foreign matter in the impeller. • Contact of inlet area. • Wear condition of mouth ring.
INNER MAGNET	• Rubbing of the outer surface. • Presence of cracks. • Accumulation of dirt. • Wear condition of bushing. • Clogging of cooling passage in Bushing.
REAR CASING	• Rubbing of rear casing. • Accumulation of dirt. • Wear condition of rear thrust ring. • Presence of cracks.
SHAFT	• Presence of cracks. • Wear condition of bushing.
OUTER MAGNET	• Rubbing of the inner surface. • Position of motor shaft.
MOTOR BEARING	• Presence of abnormal noise.

C. Maximum allowable bushing dimensional losses.

	A (inch/mm)	B (∅) (inch/mm)	C (inch/mm)
New	0.236/6.0	1.024/26	0.315/8.0
At replacement	0.197/5.0	1.063/27	0.276/7.0



Bushing

Mouth Ring

7. DISASSEMBLY OF PUMP

SAFETY PRECAUTIONS:

A. Always wear protective clothing and equipment such as rubber/insulated gloves and safety glasses when disassembling the pump.

WARNING!
There is a danger from chemical contact with skin during and after disassembling the pump.

B. After disassembling the pump, take the proper precautions when handling the shaft and bushing. They can be easily damaged by sharp contact.

C. The inner magnet and outer magnet can exert strong magnetic forces. Do not allow metal chips or metal materials to come close to the Magnets.

WARNING!
Magnet strength results in strong magnetic forces that could cause physical damage to hands and fingers. Caution must be taken to keep fingers and hands from between magnets.

PREPARATION FOR DISASSEMBLY

A. Check for safety of the working environment.

B. Lock out the main power supply to avoid unintentional operation. Before disassembling the pump, be sure the work area is appropriately defined with proper warning notices and lockouts are in place.

WARNING!

The pump is a mechanical rotating device… if the pump is switched on with the rotating parts exposed while disassembled, sever injury to personnel may result.

C. Fully close the suction and discharge valves before removing the pump from the piping.

D. Wear protective rubber gloves and safety glasses before loosening flange bolts. Drain the liquid from the pump and piping.

E. If the pump is provided with a casing drain, the following procedure and precaution should be taken for draining the pump.

1. Open the drain cap or remove the drain bolts holding the drain plug to the casing.

2. Slowly loosen the four (4) flange bolts and nuts of the pump discharge flange, until the trapped liquid begins to drain. Be properly positioned to prevent personnel contact while the liquid is draining.

WARNING!

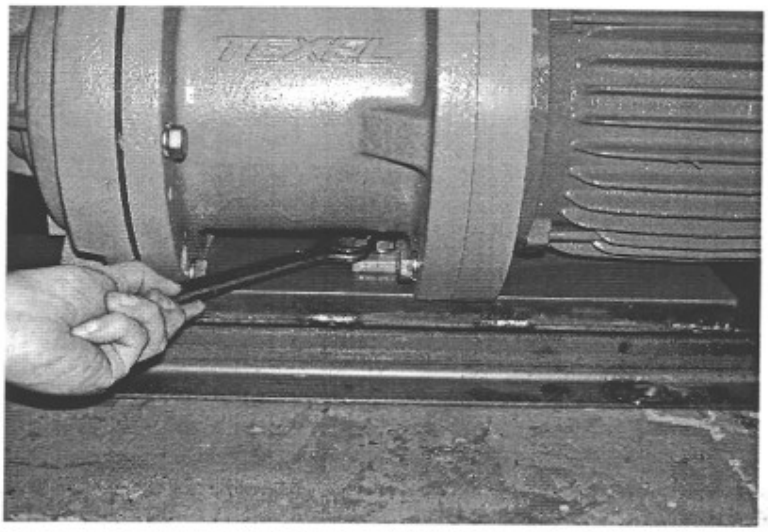
Do not loosen all four bolts that secure the pump flange or the discharge side at the same time. Liquid may leak or splash out causing severe bodily harm. It is dangerous to work in front of the drain port while draining the fluid. Be properly positioned before and during the process of draining the pump.

3. When the pump and discharge piping are completely drained, remove the four (4) bolts and nuts from the discharge flange.

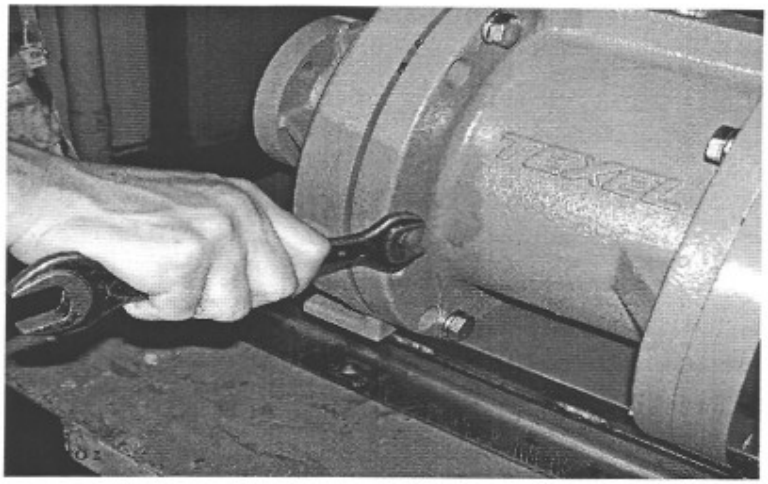
DISASSEMBLY

The *TEXEL*® MTA series is a back pull out type pump. Disassemble in accordance with instructions (A) through (G).

A. Detach the bracket foot bolt(s)



B. Detach the six (6) casing bolts (104-3).



C. **Remove the casing bolts (104-3); leave the two (2) disassembly/assembly bolts (104-58) in the tapped holes on either side of the bracket (028). Use these bolts to separate the bracket (028) from the casing (001) (photo 3).**

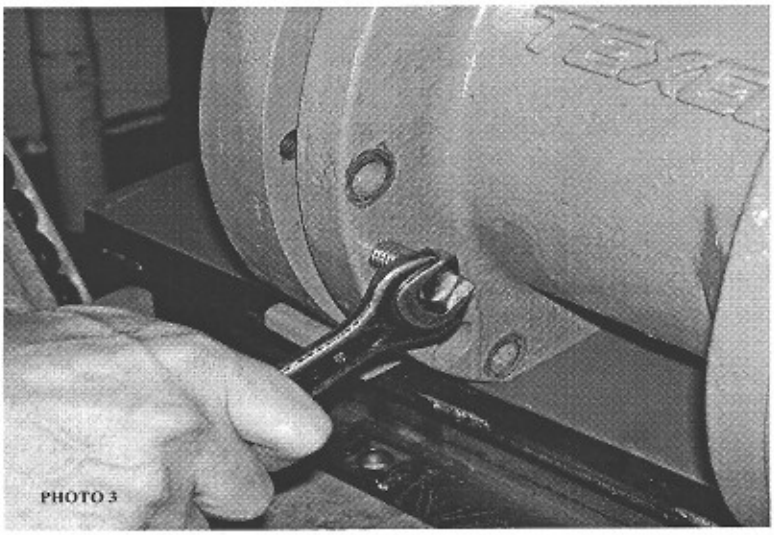


PHOTO 3

D. **Detach the four (4) rear casing bolts (104-54) and remove the rear casing (060) by moving it backward (photo 4). <u>NOTE: Don't use a wrench when assembling.</u>**

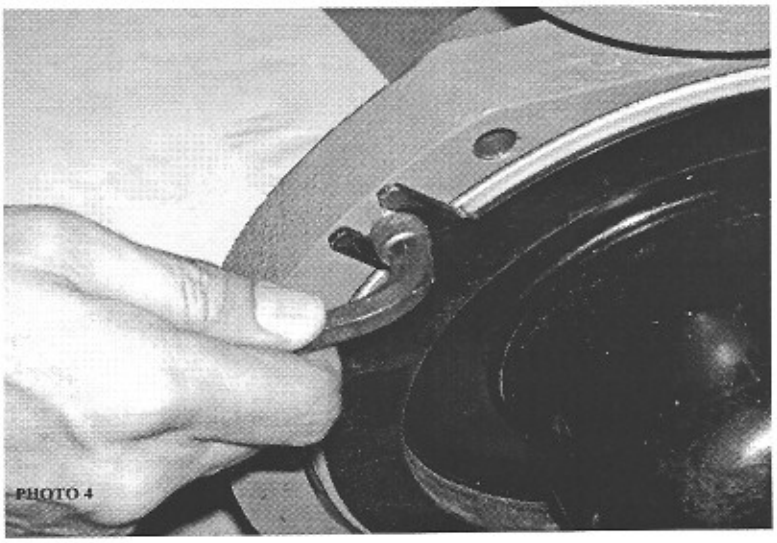


PHOTO 4

E. **Remove the inner magnet/ impeller (058+013) by sliding it off the shaft (018) (photo 5).**

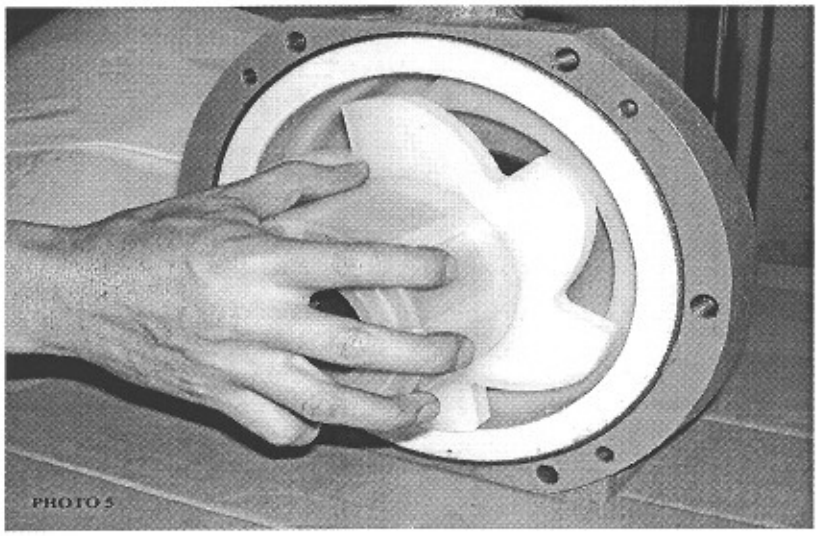


PHOTO 5

F. **Detach the four (4) motor liner bolts (104-33) and remove the motor with the outer magnet (057) (photo 6).**

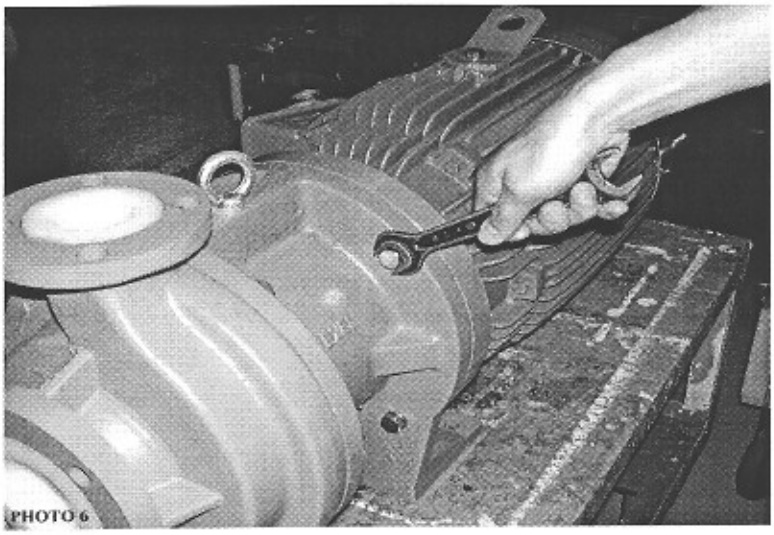


PHOTO 6

G. **Loosen the two (2) outer magnet screws (104-46) and remove the outer magnet (057) (photo 7).**

8. ASSEMBLY OF PUMP

To assemble the pump, follow the disassembly procedure in reverse order.

F. **Slip the outer magnet (057) on the motor shaft (018) until the inner surface of the magnet hub is flush with the motor shaft, as shown in (Fig. 3)**

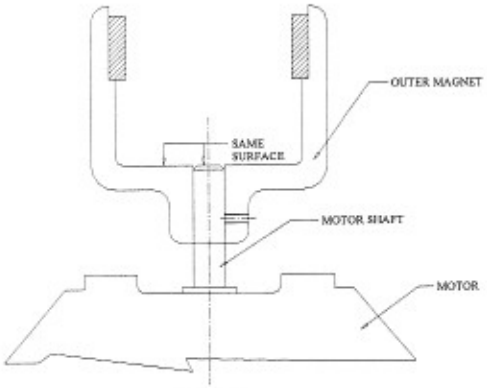


FIG. 3

G. **Bolt the bracket (028) to the motor (901) using the motor liner (902).**

H. **Slide the Inner Magnet/Impeller (058+013) on to the Shaft (018).**

I. **Install the casing gasket (101-1) on the casing (001) and attach the rear casing (060) to the casing using the four (4) rear casing bolts (104-54). (Tighten the rear casing bolts lightly by hand). DO NOT USE A WRENCH.**

WARNING!

Since the Inner Magnet and Outer Magnet strongly attract each other, be careful to avoid trapping your fingers between the casing and bracket.

J. **Assemble the casing (001) to the bracket (028). Tighten the casing bolts in a cris-cross pattern to ensure even tightness.**

K. **Install the bracket foot bolt(s) (104-17) and tighten.**

L. **At the completion of assembly, check to assure the motor fan turns smoothly by rotating it with a screwdriver.**

9. REMOVAL AND INSTALLATION OF SHAFT

A. When removing the shaft, insert a small drift punch or plus driver through the hole in the shaft support and tap the driver head gently with a resin mallet.

B. To install the shaft, align the notches in the shaft and the shaft support. Lightly tap the rear of the shaft with a resin mallet until the shaft seats in the shaft support.

10. REMOVAL AND REPLACEMENT OF BUSHING

A. When removing the bushing from the inner magnet, place a small wooden dowel on the impeller side of the bushing and lightly tap out using a resin hammer.

B. To install the bushing, align the bushing notches and the inner magnet side notches. Tap into position using a resin mallet.

11. REMOVAL AND INSTALLATION OF FRONT/REAR THRUST RING(S) AND MOUTH RING.

The front/rear thrust rings (054/056) and mouth ring (052) is held in place by holding tabs in two or three places.

A. When replacing the thrust rings and mouth ring, melt and deform these tabs using a hot air gun welder.

B. To install the thrust rings and mouth ring, align the notches, re-melt the holding tabs using a hot air gun welder. Use a small wooden dowel (0.16) to flatten any excess tab material.

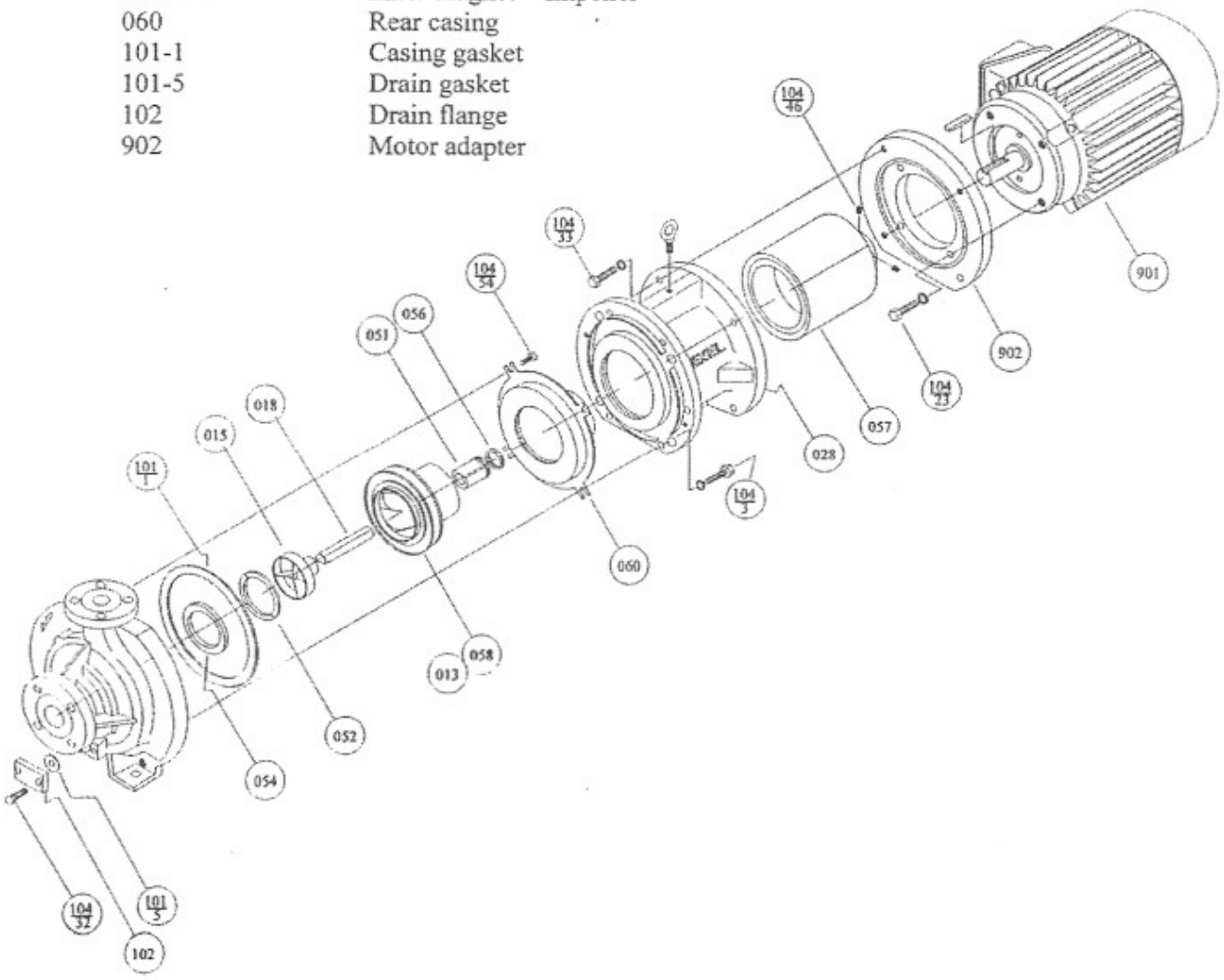
12. INSTALLATION OF THE SHAFT SUPPORT

The shaft support is pressed in and welded to the Casing. When replacing the Shaft support, remove the welded portion and detach the support from the Casing. When installing the Shaft support, use PFA welding rod and hot air gun welder.

13. EXPLODED VIEW DRAWING

MODEL: MTA-AA6/AA8

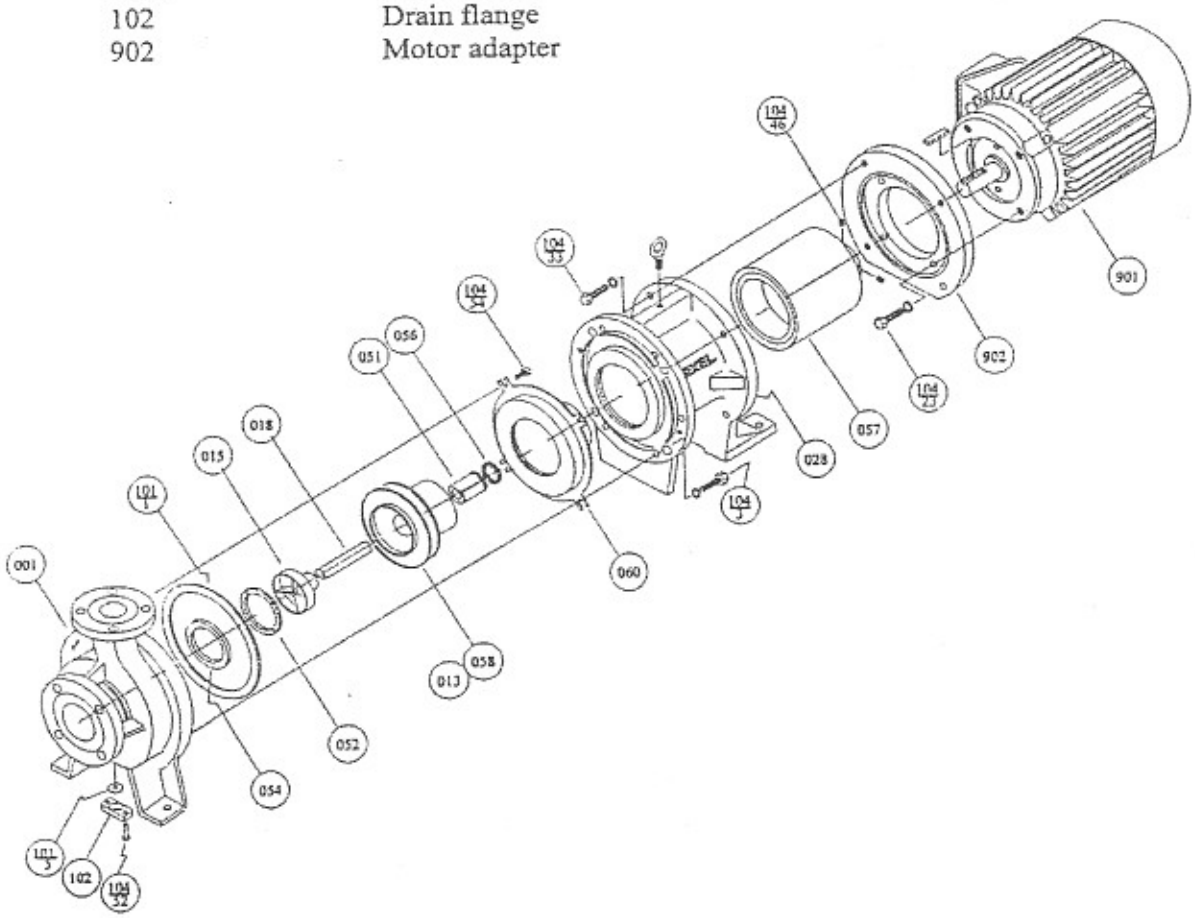
Item no.	Description
001	Casing
015	Shaft support
018	Shaft
028	Bracket
051	Bushing
052	Mouth ring
054	Front thrust ring
056	Rear thrust ring
057	Outer magnet
058+013	Inner magnet + Impeller
060	Rear casing
101-1	Casing gasket
101-5	Drain gasket
102	Drain flange
902	Motor adapter



13b. EXPLODED VIEW DRAWING

MODEL MTA-A10

Item no.	Description
001	Casing
015	Shaft support
018	Shaft
028	Bracket
051	Bushing
052	Mouth ring
054	Front thrust ring
056	Rear thrust ring
057	Outer magnet
058+013	Inner magnet + Impeller
060	Rear casing
101-1	Casing gasket
101-5	Drain gasket
102	Drain flange
902	Motor adapter



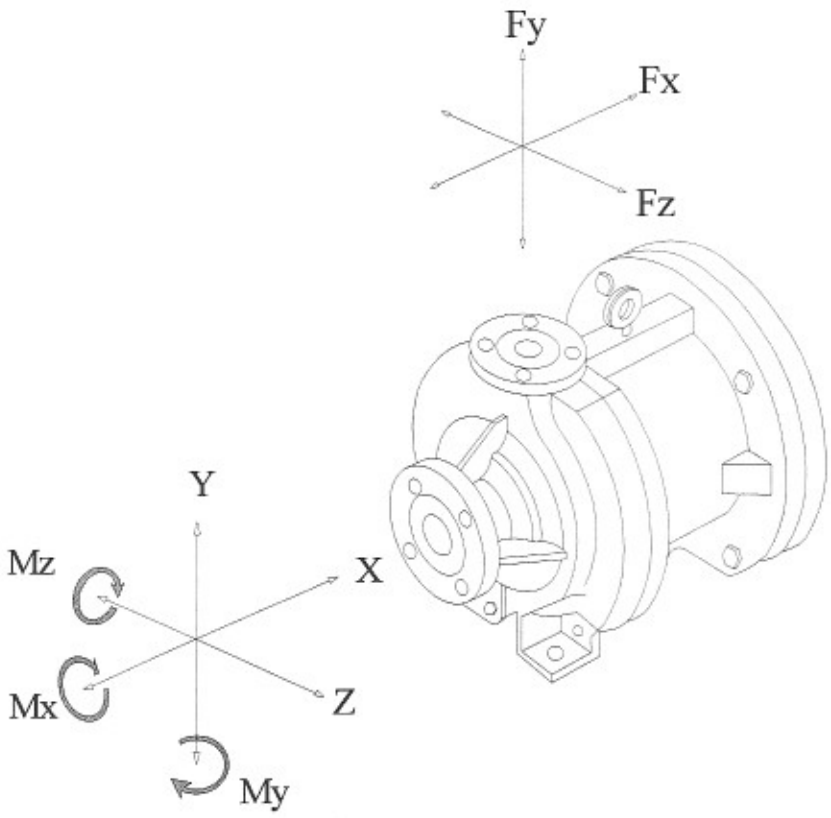
14. PARTS LIST

Item No.	Part Name	Material	Qty
001	Casing	PFA + ductile iron	1
015	Shaft support	PFA	1
018	Shaft	SiC ceramics	1
028	Bracket	Cast iron	1
051	Bushing	C-PTFE / SiC ceramic	1
052	Mouth ring	C-PTFE / SiC ceramic	1
054	Front thrust ring	SiC ceramic	1
056	Rear thrust ring	SiC ceramic	1
057	Outer magnet	Rare earth	1
058+013	Inner magnet + Impeller	PFA / rare Earth	1
060	Rear casing	PFA + eng. plastic	1
101-1	Casing gasket	PTFE	1
101-5	Drain gasket	PTFE	1
102	Drain flange	Cast iron	1
104-3	Casing bolt	304SS	6
104-17	Bracket bolt	304SS	1 set
104-23	Motor bolt	304SS	4
104-33	Motor adapter bolt	304SS	4
104-46	Outer magnet set screw	304SS	2
104-52	Drain bolt	304SS	2
104-54	Rear casing bolt	304SS	4
104-58	Assembly / disassembly bolt	304SS	2
901	Motor		1
902	Motor adapter	Ductile Iron	1

15. RECOMMENDED SPARES

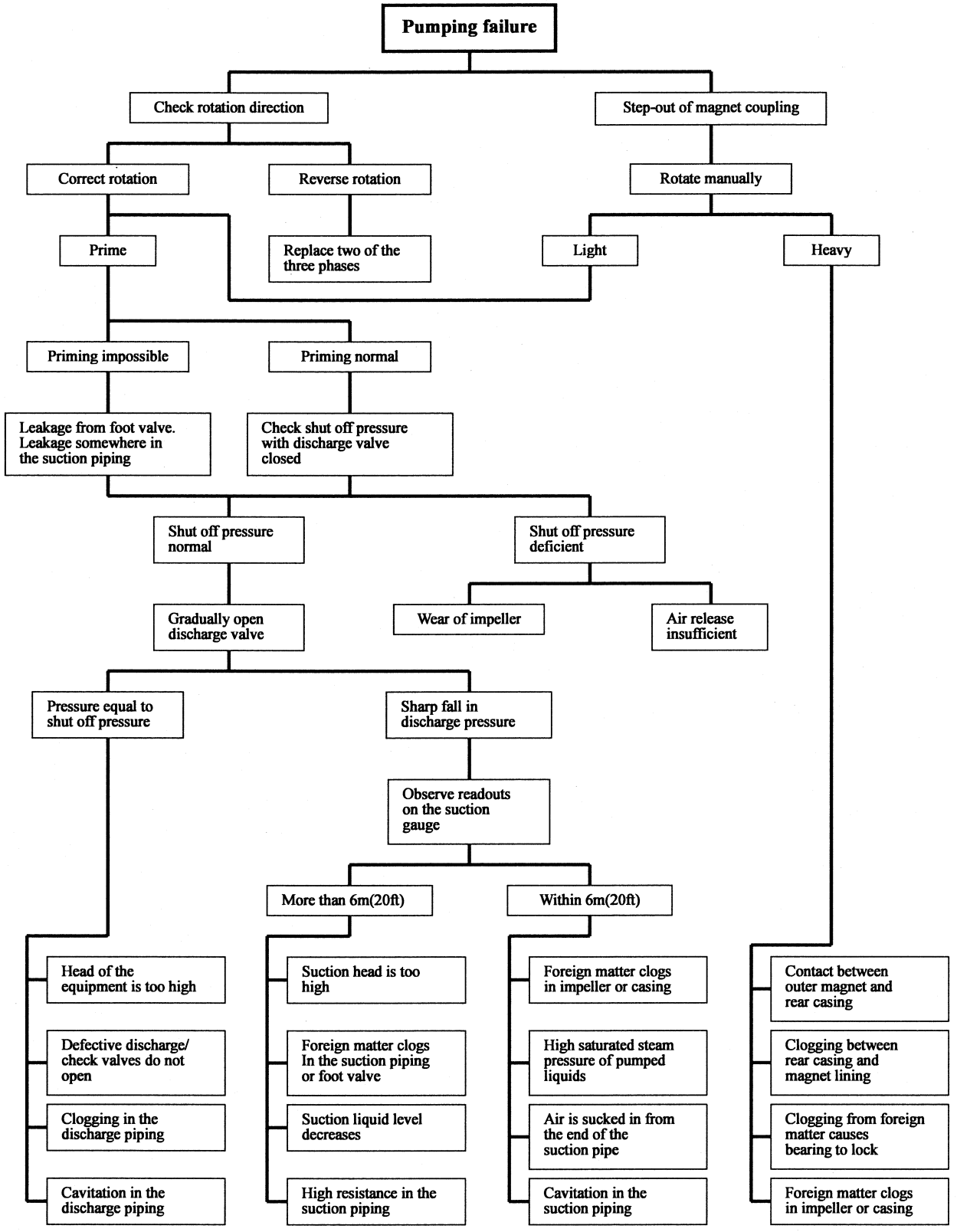
Item No.	Part Name	Material	Qty
051	Bushing	C-PTFE / SiC ceramic	1
052	Mouth ring	C-PTFE / SiC ceramic	1
054	Front thrust ring	SiC ceramic	1
056	Rear thrust ring	SiC ceramic	1
101-1	Casing gasket	PTFE	1
101-5	Drain gasket	PTFE	1

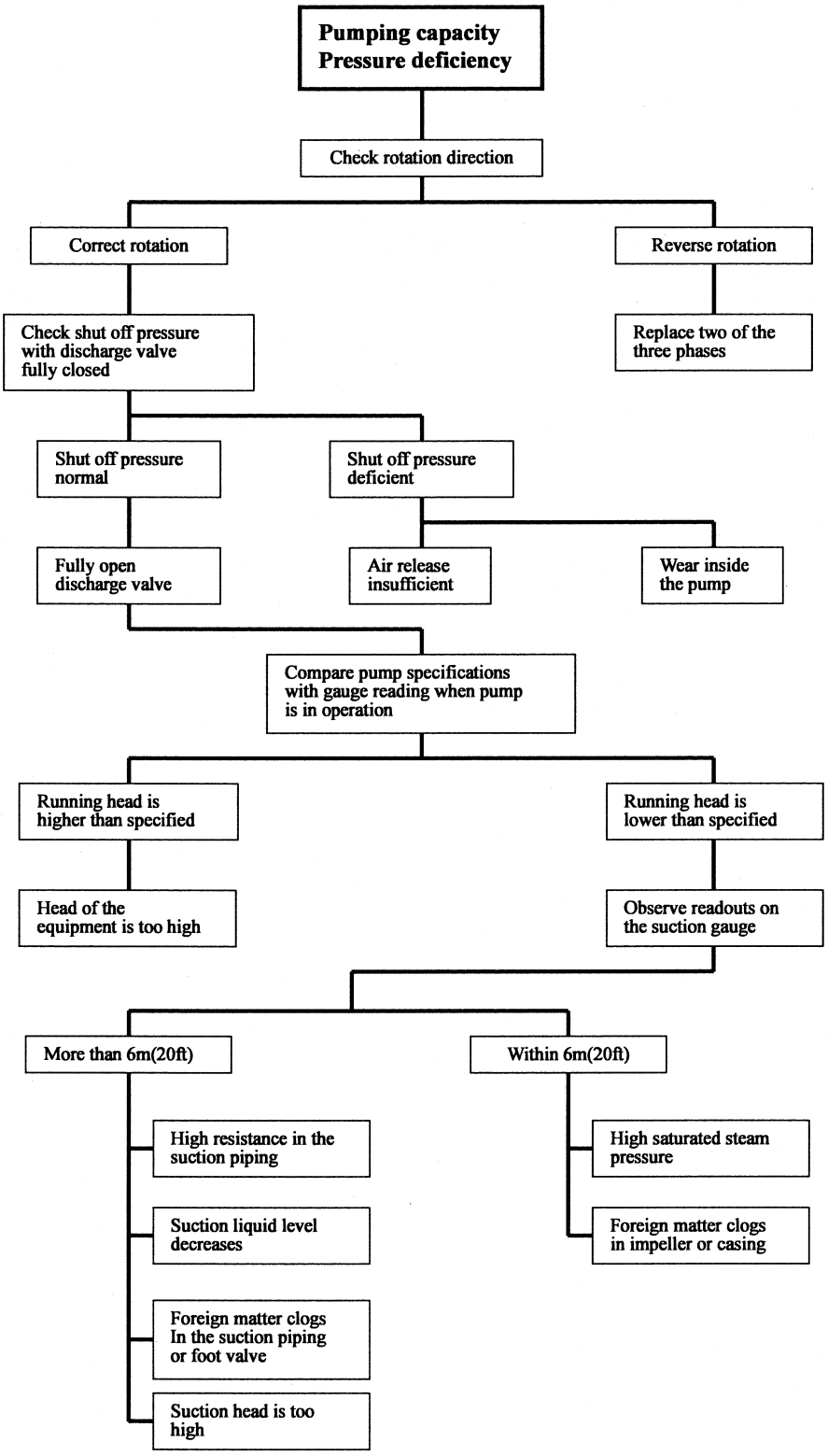
16. NOZZLE LOADING CRITERIA

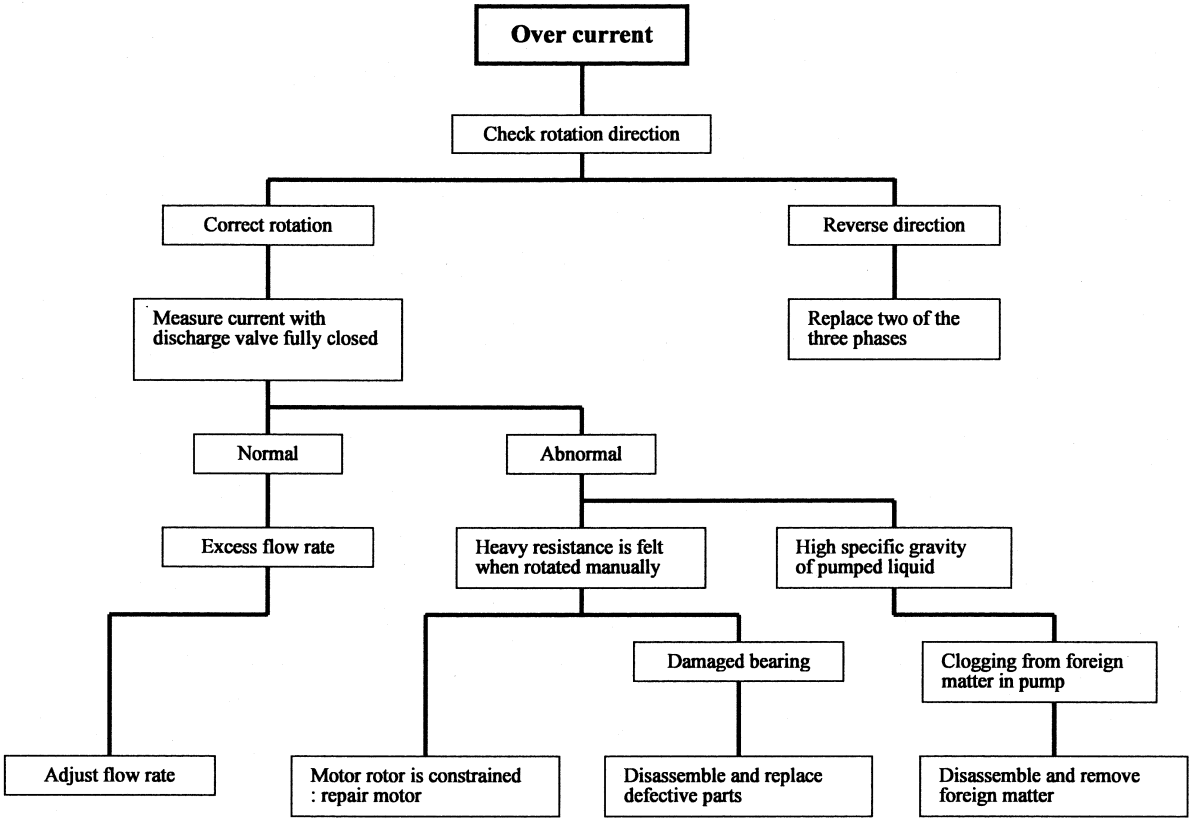


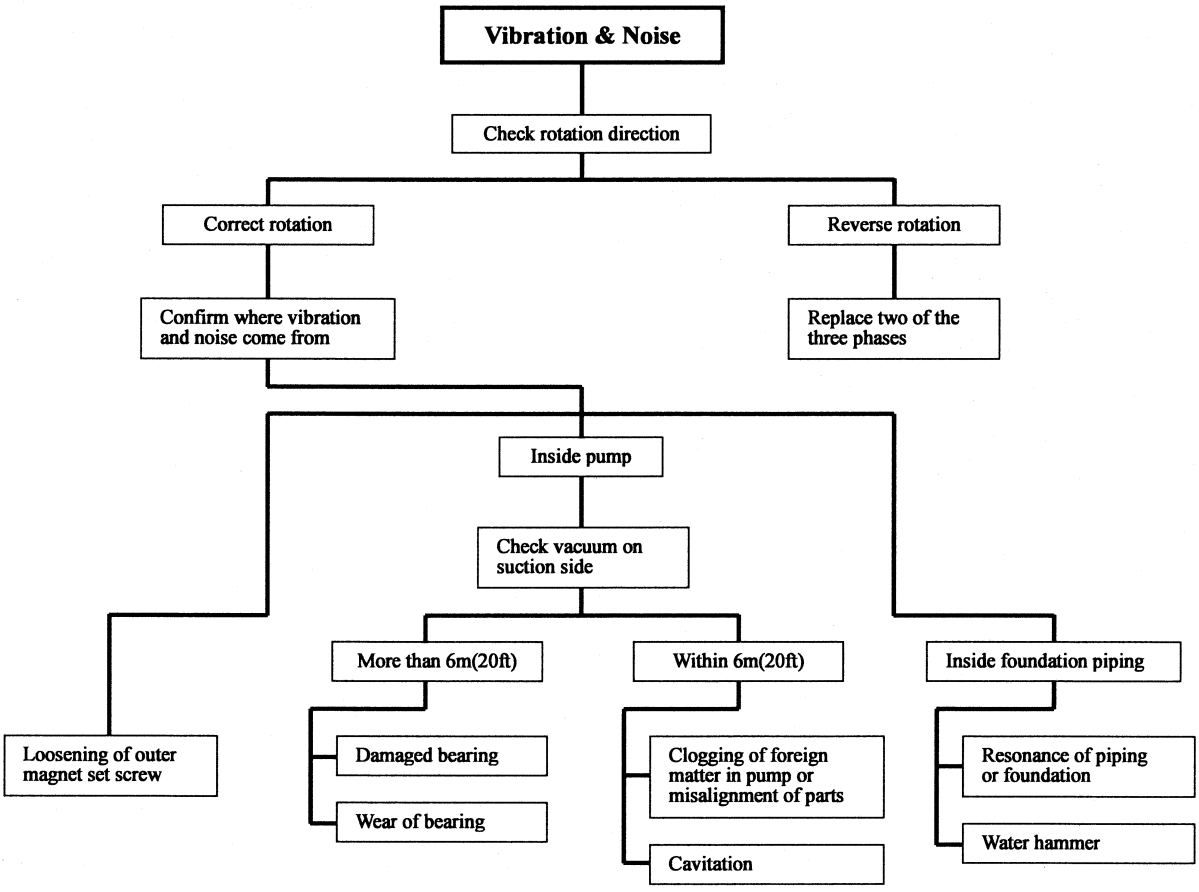
MODEL	SUCTION						DISCHARGE					
	FORCES (LBS)			MOMENTS (FT-LBS)			FORCES (LBS)			MOMENTS (FT-LBS)		
	FX	FY	FZ	MX	MY	MZ	FX	FY	FZ	MX	MY	MZ
AA6/AA8	173.8	88.0	145.2	433.0	288.8	216.5	138.6	70.4	116.6	346.4	230.9	173.2
A10	356.4	178.2	297.0	887.6	591.7	447.4	286.0	143.0	237.6	707.2	476.3	360.8

Troubleshooting Chart




Pumping capacity
Pressure deficiency
Check rotation direction
Correct rotation
Reverse rotation
Check shut off pressure with discharge valve fully closed
Replace two of the three phases
Shut off pressure normal
Shut off pressure deficient
Fully open discharge valve
Air release insufficient
Wear inside the pump
Compare pump specifications with gauge reading when pump is in operation
Running head is higher than specified
Running head is lower than specified
Head of the equipment is too high
Observe readouts on the suction gauge
More than 6m(20ft)
Within 6m(20ft)
High resistance in the suction piping
Suction liquid level decreases
Foreign matter clogs In the suction piping or foot valve
Suction head is too high
High saturated steam pressure
Foreign matter clogs in impeller or casing


Over current
Check rotation direction
Correct rotation
Reverse direction
Measure current with discharge valve fully closed
Replace two of the three phases
Normal
Abnormal
Excess flow rate
Heavy resistance is felt when rotated manually
High specific gravity of pumped liquid
Damaged bearing
Clogging from foreign matter in pump
Adjust flow rate
Motor rotor is constrained : repair motor
Disassemble and replace defective parts
Disassemble and remove foreign matter


Vibration & Noise
Check rotation direction
Correct rotation
Reverse rotation
Confirm where vibration and noise come from
Replace two of the three phases
Inside pump
Check vacuum on suction side
More than 6m(20ft)
Within 6m(20ft)
Inside foundation piping
Loosening of outer magnet set screw
Damaged bearing
Wear of bearing
Clogging of foreign matter in pump or misalignment of parts
Cavitation
Resonance of piping or foundation
Water hammer