SERVICE INSTRUCTIONS

V-BELT DRIVEN SIDE ENTERING MIXERS
MODEL HVM
MANUAL NO. 05-09829
SEAL NO. 05-48076

CUSTOMER:

P.O. NO.:

ITEM NO.:

MIXER MODEL NO.:

MIXER SERIAL NO.:

SEAL: 05-48076

DATE:

MIXMOR
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FOREWORD

The information contained in this manual covers MixMor Model HVM V-belt driven side entering mixers.

This model is furnished with different types of shaft seals. The front page of this manual and the certified drawing lists the mechanical seal number, which corresponds with the type of seal furnished on your mixer.

GENERAL INFORMATION

When apparent or suspected damage has been found on equipment, during transport from factory to user, both the carrier and MixMor must be notified immediately.

When receiving equipment, a check should be made to determine whether all inventoried parts are still in the shipment. Any discrepancy should immediately be reported to both the carrier and MixMor, if claim is to be made.

MixMor mixers do not require the service of a factory engineer upon installation. This service is not included in the price of the unit; therefore, if it is to be furnished, it must be agreed upon, in writing, between MixMor and the purchaser.

MixMor warranty becomes void if the unit sold is not operated within the rating and mixing service conditions for which it was specifically sold. The purchaser shall take all necessary precautions to eliminate all external destructive conditions, including unusual variable loads affecting the critical speeds of the system, severe shock loading, mechanical or thermal overloads and other conditions of which MixMor was not fully advised. The mixer must be installed and maintained in accordance with this service manual.

MixMor must be informed within thirty days, for warranty to cover the mixer in the event of any malfunction during the warranty period.

All personnel directly responsible for operation of equipment must be instructed on proper installation, maintenance and safety procedures.

Design improvements are implemented on a continuous basis. Therefore, we reserve the right to make changes without notice. If any questions arise regarding the data or information in this manual, please contact MixMor in Los Angeles, California.

HANDLING INSTRUCTIONS

SAFETY

When handling or working on a MixMor mixer, safety precautions must always be remembered and followed. The proper tools, clothing and methods of handling should be used to prevent any accidents.

This manual lists a number of safety precautions. Follow them. Insist that your employees do the same. Safety precautions and equipment have been developed from past accidents. Follow and use them for your protection.

HANDLING

Do not support or lift the mixer in a manner, which could create excessive stress on parts or shaft extensions. Never allow shafting to support any weight of the drive assembly. A slightly bent shaft will cause extreme mixer vibration. Support the mixer with a lifting sling to prevent damaging of any external mixer parts.

INSTALLATION INSTRUCTIONS

STORAGE

If installation of the mixer and/or operation is to be delayed for more than one month after factory shipment, special rust preventative precautions should be taken. The precautions may be taken by the user or by the factory if full information concerning storage conditions is provided at the time of ordering.

LOCATION

The mounting location of the mixer has a definite effect on the flow pattern within the tank. The recommended location has been made with regard to your particular application and should be carefully followed to obtain optimum results.

MOUNTING

Remove the impeller and mount the mixer on the tank flange as outlined in the HANDLING INSTRUCTIONS. Tighten the flange bolts and replace the impeller. Properly adjust the tie rods and turnbuckles or pipe pedestal mount until the mixer is level.

V-BELT DRIVE

The mixer is shipped with the V-belts installed. However, they must be properly adjusted before the mixer is put into service.

Because of the higher horsepower ratings of narrow belts, they must be operated at higher tensions than classical belts. However, due to flexibility of the smaller cross section, they may not feel as tight as would be expected for the tension they carry.

1. Disconnect power to the motor. Be certain that the mixer cannot be remotely or automatically started.

2. Remove the pulley guard and adjust the belts so that the slack in each belt is on the same side of the drive. Adjust take-up until the belts are seated in the sheaves.

3. Start the mixer. When it is operating at full load and full speed, adjust the take-up screw until only a slight bow appears on the slack side. Shut off the mixer.

4. Apply the force, perpendicular to the center of the span, (refer to Figure 1) required to deflect the belt the distance shown on Chart 1. The force can be applied by means of a simple spring scale or a commercially available V-belt tension tester. The tension tester will provide scales for reading both the required force and the distance of belt deflection.

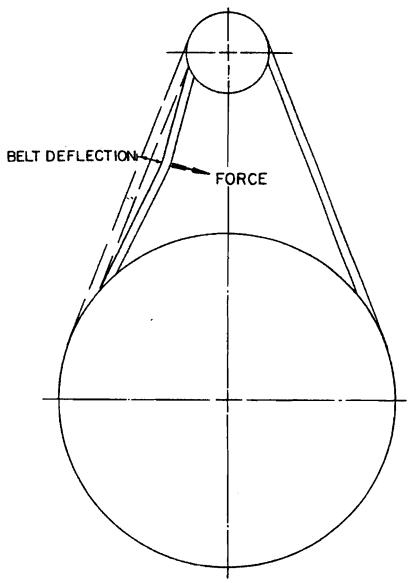


FIGURE 1

MixMor Model	Shaft Speed					
	420 RPM			280 RPM		
	Defl.	Force/Lbs.		Defl.	Force/Lbs.	
		Min.	Max.		Min.	Max.
HV-1	1/4"	3.7	5.6	1/4"	3.7	5.6
HV-1.5	1/4"	3.7	5.6	1/4"	3.7	5.6
HV-2	1/4"	3.7	5.6	1/4"	3.7	5.6
HV-3	1/4"	3.7	5.6	1/4"	3.7	5.6
HV-5	1/4"	3.7	5.6	1/4"	3.7	5.6
HV-7.5	1/4"	3.7	5.6	1/4"	3.7	5.6
HV-10	1/4"	3.7	5.6	1/4"	3.7	5.6
HV-15	1/4"	5.1	7.5	9/32"	5.1	7.5
HV-20	1/4"	5.1	7.5	9/32"	5.1	7.5
HV-25	9/32"	5.1	7.5	9/32"	5.1	7.5
HV-30	9/32"	5.1	7.5	5/16"	5.5	8.4
HV-40	9/32"	5.1	7.5	5/16"	5.5	8.4
HV-50	5/16"	5.5	8.4	5/16"	5.5	8.4
HV-60	5/16"	5.5	8.4			

CHART 1

5. The force required in step 4 should be within the limitations given in Chart 1. If it is not, adjust the tension accordingly. The new belts can initially be tightened to 120% of maximum force. Subsequent running will reduce the tension to within specified tolerances.

6. Recheck tension of new belts several times in the first 50 hours of operation and adjust if necessary. Thereafter, check the belt tension periodically.

SHAFT SEAL

The mixer shaft seal must be checked before the mixer is started and/or the tank filled. Some mechanical seals are not set when shipped from the factory. If a mixer with a single mechanical seal, which requires product in the tank as the seal lubricant, is run for an extended period of time with the seal set and the tank empty, the seal may be severely damaged. Prior to mixer start-up, refer to the SHAFT SEAL section for detailed instructions on the specific supplied seal.

LUBRICATION

SHAFT BEARINGS

The mixer shaft runs on two heavy-duty ball bearings. These bearings are supplied with grease fittings and should be relubricated periodically, depending upon operating conditions, on a regular schedule. The bearings should contain as much grease as practical, since a full bearing with consequent slight leakage is the best protection against entrance of foreign material. When establishing a relubrication schedule, note that a small amount of grease at frequent intervals is preferable to a large amount at infrequent intervals. A good starting point to establish a relubrication schedule is to relubricate the bearings weekly. If the mixer is operated in a clean, dry environment, the bearings will have to be relubricated less frequently.

Abnormal bearing temperatures may indicate faulty lubrication. Normal temperatures may range from "cool to warm to the touch" up to a point "too hot to touch for more than a few seconds", depending upon the bearing size and surrounding conditions. High temperature with no grease showing at the seals, particularly if the bearing seems noisy usually indicates too little grease. Unusually high temperature accompanied by excessive leakage of grease indicates too much grease. Normal temperature and a slight showing of grease at the seals indicate proper lubrication.

Many ordinary cup greases are not suitable for lubrication. The bearings have been lubricated at the factory with No. 2 consistency lithium base grease, which is suitable for normal operating conditions. Relubricate with lithium base grease or grease, which is compatible with original lubricant and suitable for ball bearing service. In unusual or doubtful cases, consult with a reputable grease manufacturer.

MECHANICAL SEAL INSTRUCTIONS
SEAL No. 05-48076

GENERAL INFORMATION

Mechanical seals will provide a near perfect seal and a long life when handled and operated properly. Care should always be taken during installation or replacement of mechanical seals in accordance with the following instructions. Always be sure that components are clean and free of foreign material.

LUBRICATION

This seal requires product in the tank as the seal lubricant. If the mixer is run for an extended period of time with the tank empty, the seal may be severely damaged. The mixer may be run for thirty (30) seconds, with the tank empty, to check the mixer rotation or electrical system.

SEAL SETTING

Mechanical seals are installed when shipped from the factory. Check the hex head cap screw (17) torque, next tighten dog point socket head set screws (19) and then tighten cup point socket head set screws (19) to the correct torque. Remove centering pads retention plate (18). The centering pads will move out of way when the shaft starts to rotate. Refer to the pictorial instructions on pages 6 and 6b for additional information.

FLUSH PORT

The mechanical seal is furnished with a flush, quench and drain ports. If lines are not connected to the ports, they must be plugged. Refer to page 6b for port locations.

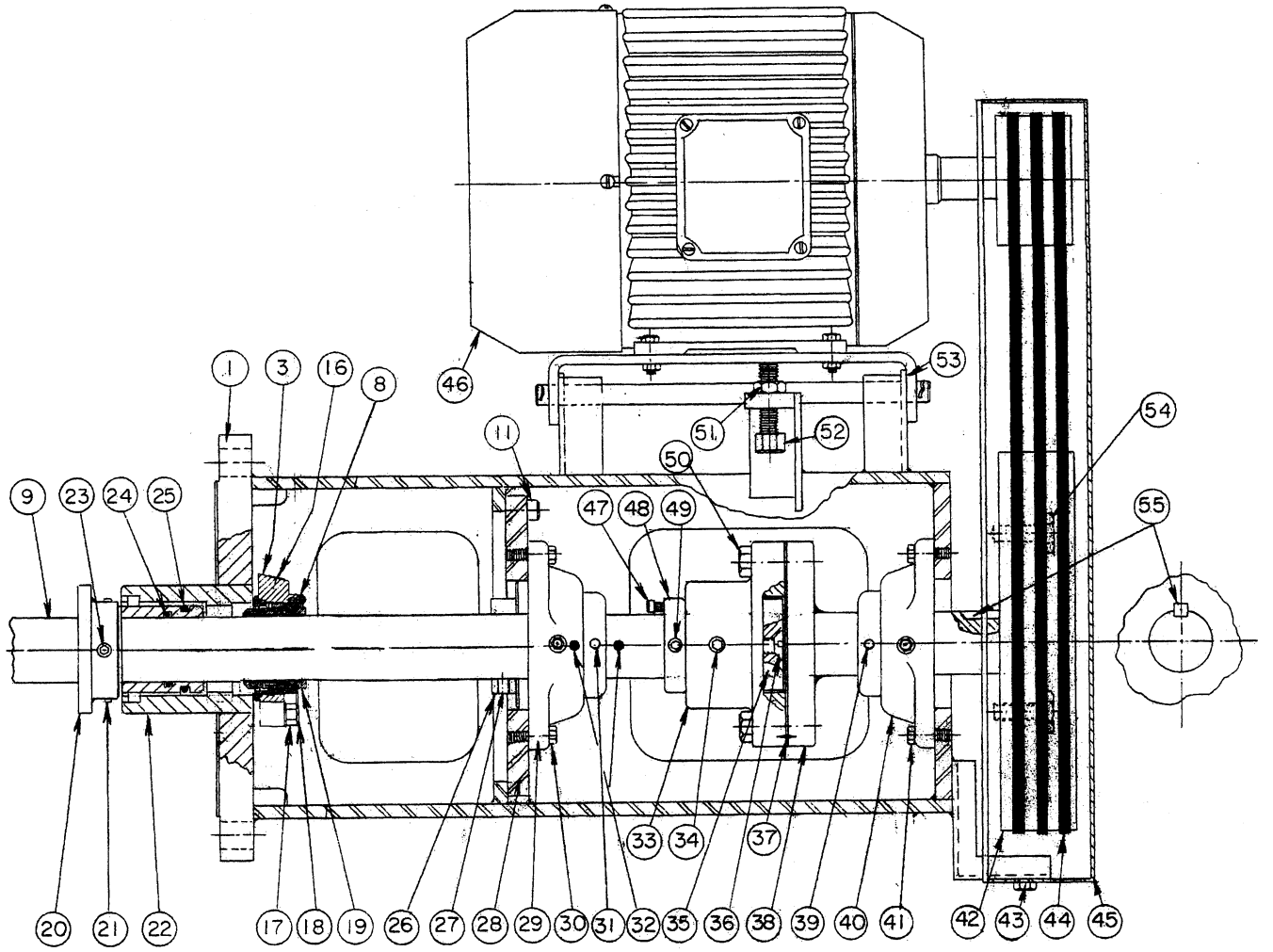
SEAL-OFF AND REPLACEMENT

Mechanical seal is designed so that it may be replaced with a full tank. Thoroughly review these instructions before starting to replace the seal.

1. Disconnect the power to the motor. Be certain the mixer cannot be remotely or automatically started.
2. Remove hex head cap screws (43) and belt guard (45).
3. Loosen hex nut (51) and adjustment screw (52) until the belt set (44) can be removed.
4. Rotate pulley (42) until key (55) is in the twelve o'clock position. Alignment marks (32) on mixer shaft (9), bearing (29) and mixer housing should be inline.
5. Loosen socket head set screws (31, 39, & 19) in bearings (29 & 40) and seal housing (3). Note: If furnished with optional thrust collar (26), loosen socket set screws (27).
6. Using a marking pen, mark the shaft relative to its' location in bearing (29). After the new seal is installed, the shaft must be returned to the same location.
7. Using pulley (42), pull the mixer shaft back approximately 1/2" until it stops and rotate it clockwise 45°. If needed, the pulley (42) has jack-screws (54) for assisting in pulling the shaft back. This will seal off the tank contents with seal-off sleeve (20) and seal-off housing (22), and support the shaft while the seal is replaced.
8. Remove hex head cap screw (17).
9. Remove hex head cap screws (50) and pull outboard shaft/coupling (38) back 4". Note the alignment marks (37) on the coupling for reassemble consideration.
10. Loosen socket head set screw (34); remove socket flat head cap screw (36) and keeper plate (35). Do not let the shaft rotate when removing flat head cap screw (36). Coupling and shaft use a taper fit. Tighten socket head cap screws (47) in jack-screw collar (48) to break the taper fit and remove coupling (33).
11. Remove socket head cap screws (11) and bearing (29) with bearing plate (28).
12. Remove hex head cap screws (17) and slide seal housing (3) off the shaft.
13. Reverse the above procedure for assembly, while noting the following instructions.

    A. The shaft coupling (33) and outboard shaft/coupling (38) must be reassembled with alignment marks (37) inline. Gradually and evenly tighten hex head cap screw (50) to insure proper alignment.
    B. Before returning shaft to its original location, be certain that alignment marks (32) are inline.
    C. When installing bearing (29) and bearing plate (28), it may be necessary to use a pinch bar with a wooden block on the shaft. Using the pinch bar, push the shaft (9) down, while sliding the bearing plate into the housing, be certain the rabbit fit is aligned.
    D. Install hex head cap screws (17) after bearing (29) has been re-installed. Refer to the above SEAL SETTING instructions.

REPLACEABLE SINGLE OUTSIDE MECHANICAL SEAL
SEAL NO. 05-48076

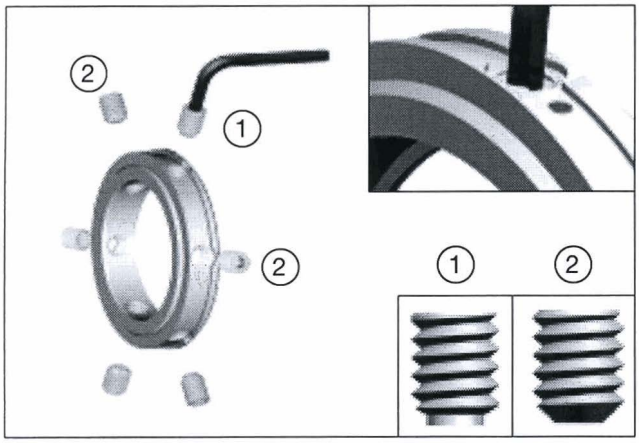


PART NO.	DESCRIPTION	PART NO.	DESCRIPTION	PART NO.	DESCRIPTION
1	FLANGE	26	THRUST COLLAR (OPTIONAL)	41	HEX HEAD CAP SCREW (4)
3	SEAL HOUSING •	27	SOCKET HEAD SET SCREW (2)	42	PULLEY
8	CENTERING PADS	28	BEARING PLATE	43	HEX HEAD CAP SCREW (3)
9	SHAFT	29	BEARING •	44	BELT SET •
11	SOCKET HEAD CAP SCREWS (4)	30	HEX HEAD CAP SCREW (4)	45	BELT GUARD
16	FLUSH/QUENCH/ DRAIN PORTS	31	SOCKET HEAD SET SCREW (2)	46	MOTOR
17	HEX HEAD CAP SCREW (4)	32	ALIGNMENT MARKS	47	SOCKET HEAD CAP SCREW (2)
18	CENTER PADS RETENTION PLATE	33	SHAFT COUPLING	48	JACK-SCREW COLLAR
19	SOCKET HEAD SET SCREWS (6)	34	SOCKET HEAD SET SCREW	49	SOCKET HEAD SET SCREW (2)
20	SEAL-OFF SLEEVE	35	KEEPER PLATE	50	HEX HEAD CAP SCREW (6)
21	ALIGNMENT PIN (2)	36	SOCKET FLAT HEAD CAP SCREW	51	HEX NUT
22	SEAL-OFF HOUSING	37	ALIGNMENT MARKS	52	ADJUSTMENT SCREW
23	SOCKET HEAD SET SCREW (2)	38	OUTBOARD SHAFT/COUPLING	53	MOTOR BASEPLATE
24	'O' RING •	39	SOCKET HEAD SET SCREW (2)	54	HEX HEAD JACK SCREWS (2)
25	'O' RING •	40	BEARING •	55	KEY

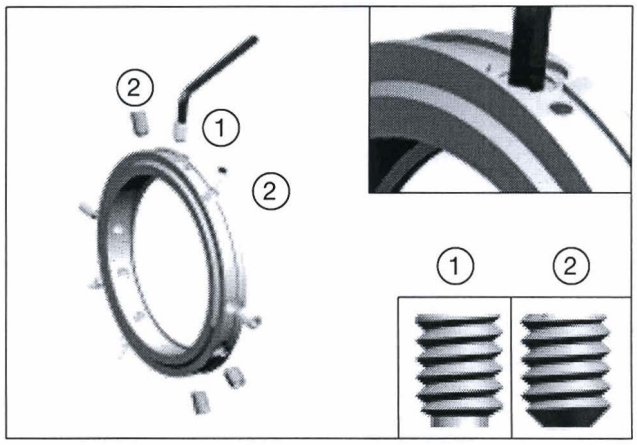
• RECOMMENDED SPARE PARTS

S10/S20 LOCK RING ASSEMBLY / TORQUE TABLE

S10/S20 XS/Small Lock Ring Assembly



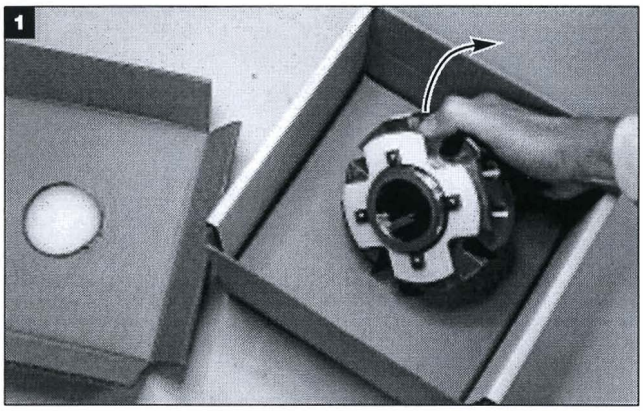
S10/S20 Large Lock Ring Assembly

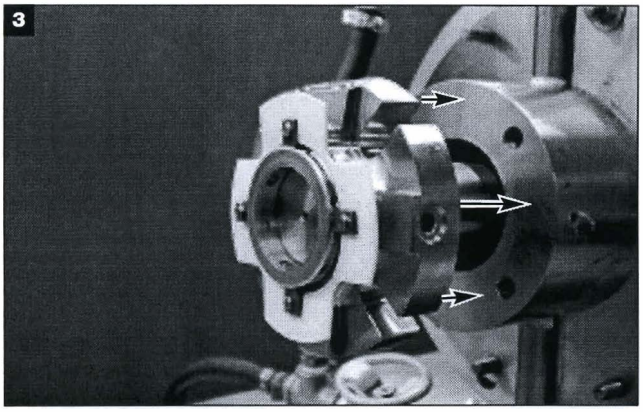


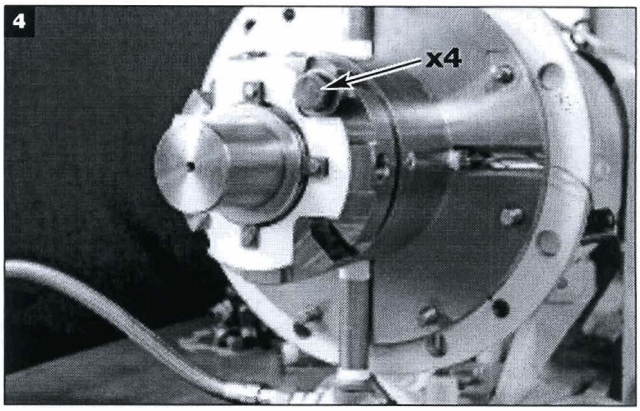
S10/S20 Set Screw/Bolting Torques Table

SEAL SIZE	DOG POINT SET SCREWS	CUP POINT SET SCREWS	STUFFING BOX BOLTS
up to 2.50" (60 mm)	50-60 in-lbf (5,7-6,8 Nm)	50-60 in-lbf (5,7-6,8 Nm)	20-30 ft-lbf (27-40 Nm)
up to 4.75" (120 mm)	65-75 in-lbf (7,3-8,3 Nm)	65-75 in-lbf (7,3-8,3 Nm)	25-35 ft-lbf (34-48 Nm)

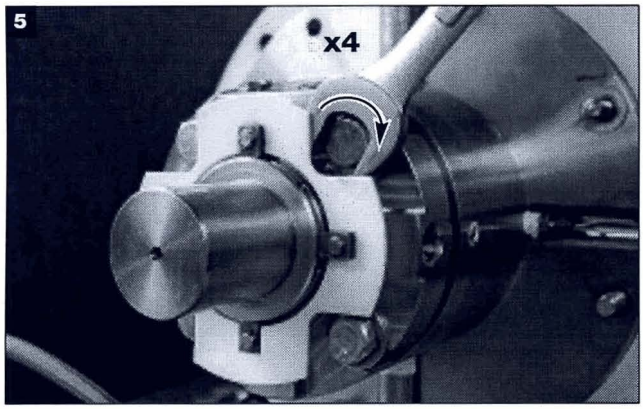
INSTALLATION

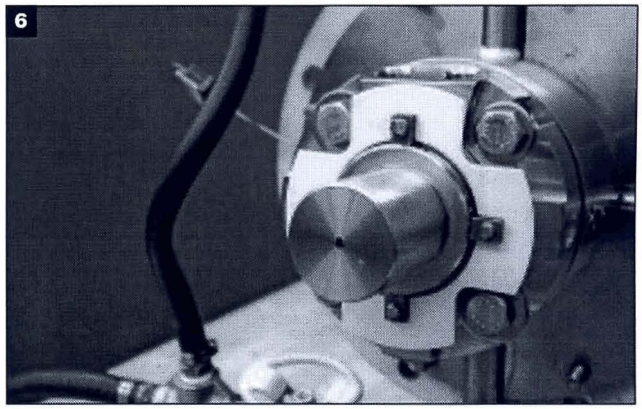


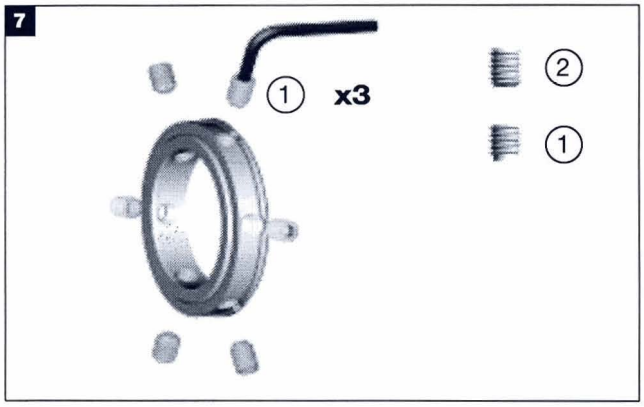


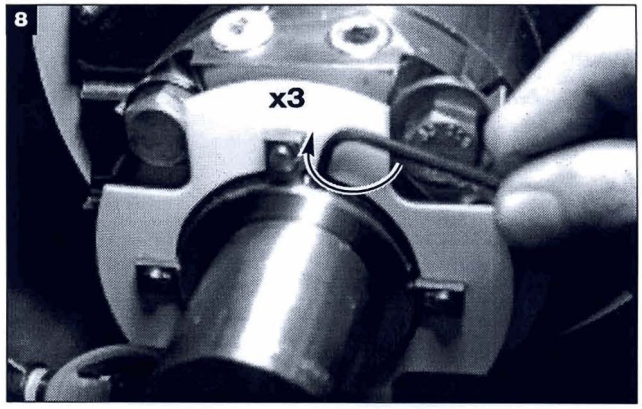


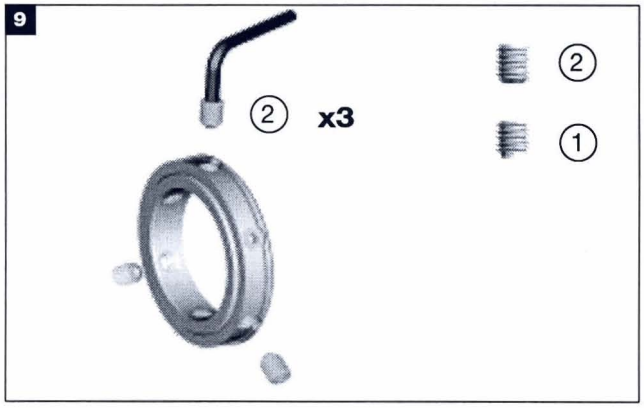
INSTALLATION

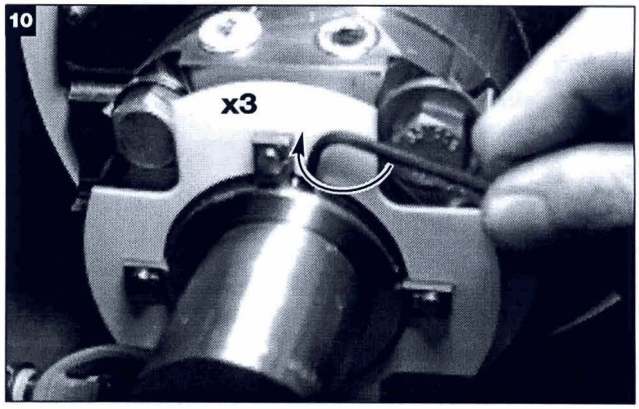


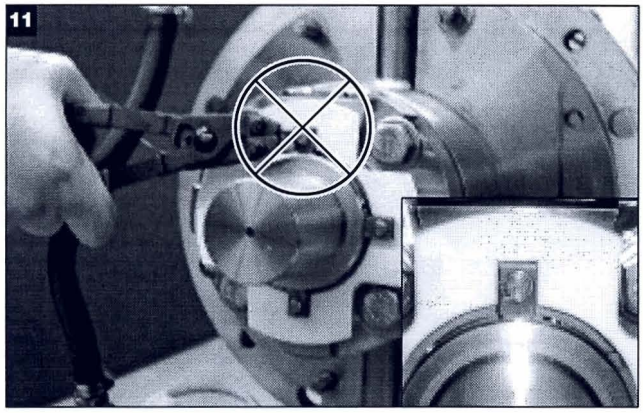


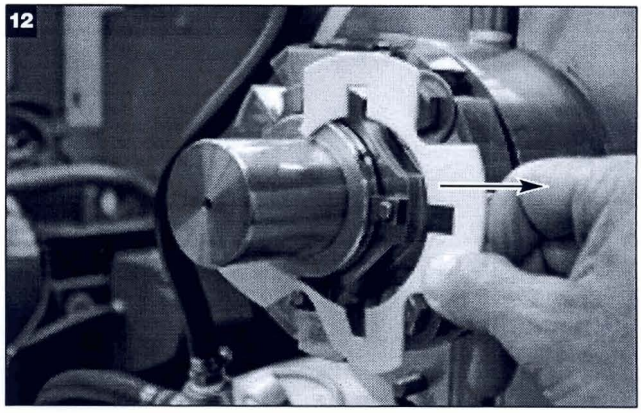












ENVIRONMENTAL CONTROLS

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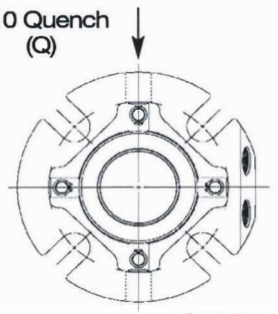

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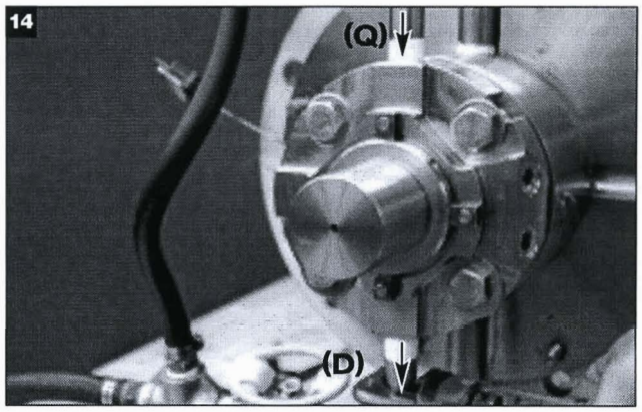

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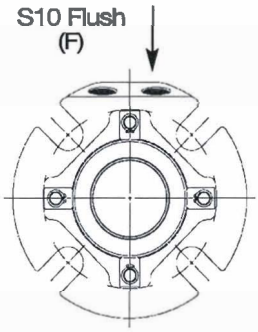

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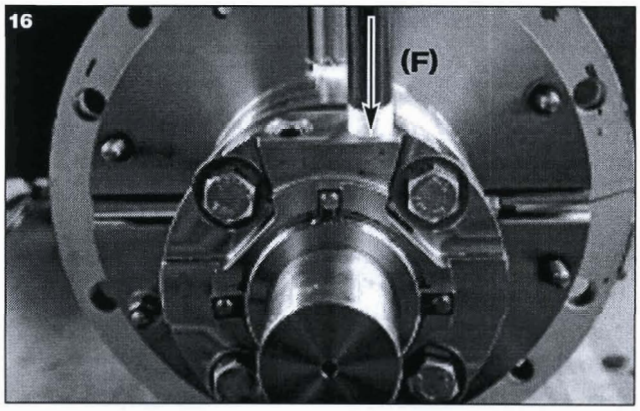

START-UP

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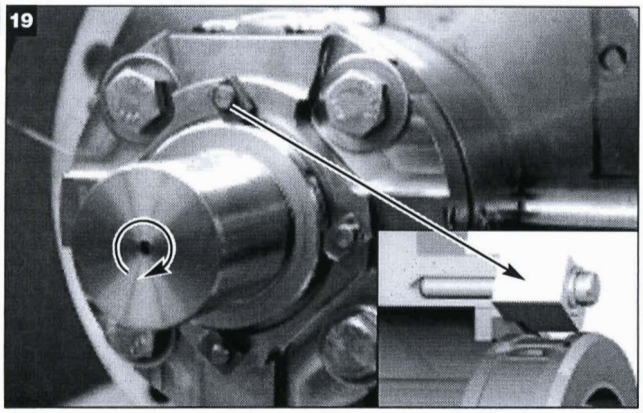
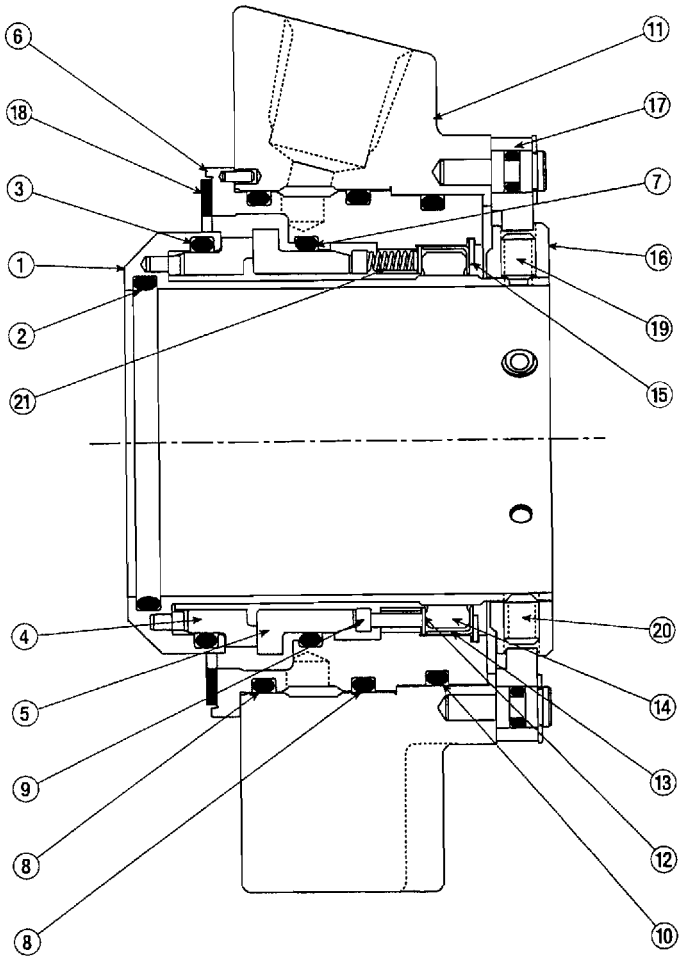


Non-removable centering pads stay attached to the gland. The pads move out of the way when the shaft starts to rotate.

MECHANICAL SEAL No. 05-48076
SEAL DETAIL DRAWING



Part No.	Description	Part No.	Description
1	Sleeve	12	Washer
2	Shaft 'O' Ring	13	Bushing Holder
3	Rotary 'O' Ring (1)	14	Throttle Bushing
4	Rotary Face	15	Snap Ring
5	Stationary Seat	16	Lock Ring
6	Housing Assembly	17	Centering Pads
7	Stationary 'O' Ring (1)	18	Gasket
8	Cassette 'O' Rings (2)	19	Dog Point Set Screws
9	Follower Plate	20	Cup Point Set Screws
10	Quench 'O' Ring	21	Springs
11	Gland Assembly		

START-UP INSTRUCTIONS

When starting up any new piece of equipment, it is wise to proceed cautiously. Even though the best installation practices are followed, the possibilities of errors or omissions always exist. MixMor recommends that before the initial start-up, the following checklist should be followed:

1. Has all accessory equipment such as: level indicators, pressure gauges, switches, etc., been mounted? It is often necessary to box these items separately to prevent damage or loss in shipment.

2. Are mounting bolts tight? Check all external bolts, screws, accessories, etc., to make sure they have not become loose in shipping and handling.

3. Have bearings been greased?

4. Have couplings been tightened properly? Have necessary guards and safety devices been installed at all hazardous locations?

5. Has the V-belt drive been properly adjusted as shown in the INSTALLATION INSTRUCTIONS section?

6. Have required electrical connections been made? Units should be wired in accordance with motor manufacturers' wiring diagram on the motor.

7. Have required piping connections been made?

8. Have mixer shaft seal instructions been followed?

Mixers are test run at the factory. However, during start-up, the following procedures are recommended:

1. Start unit slowly under as light a load as possible. Check rotation of the shaft against rotation arrow on the mixer housing. If necessary, reverse electrical leads on motors to have shaft rotation conform to direction shown on mixer.

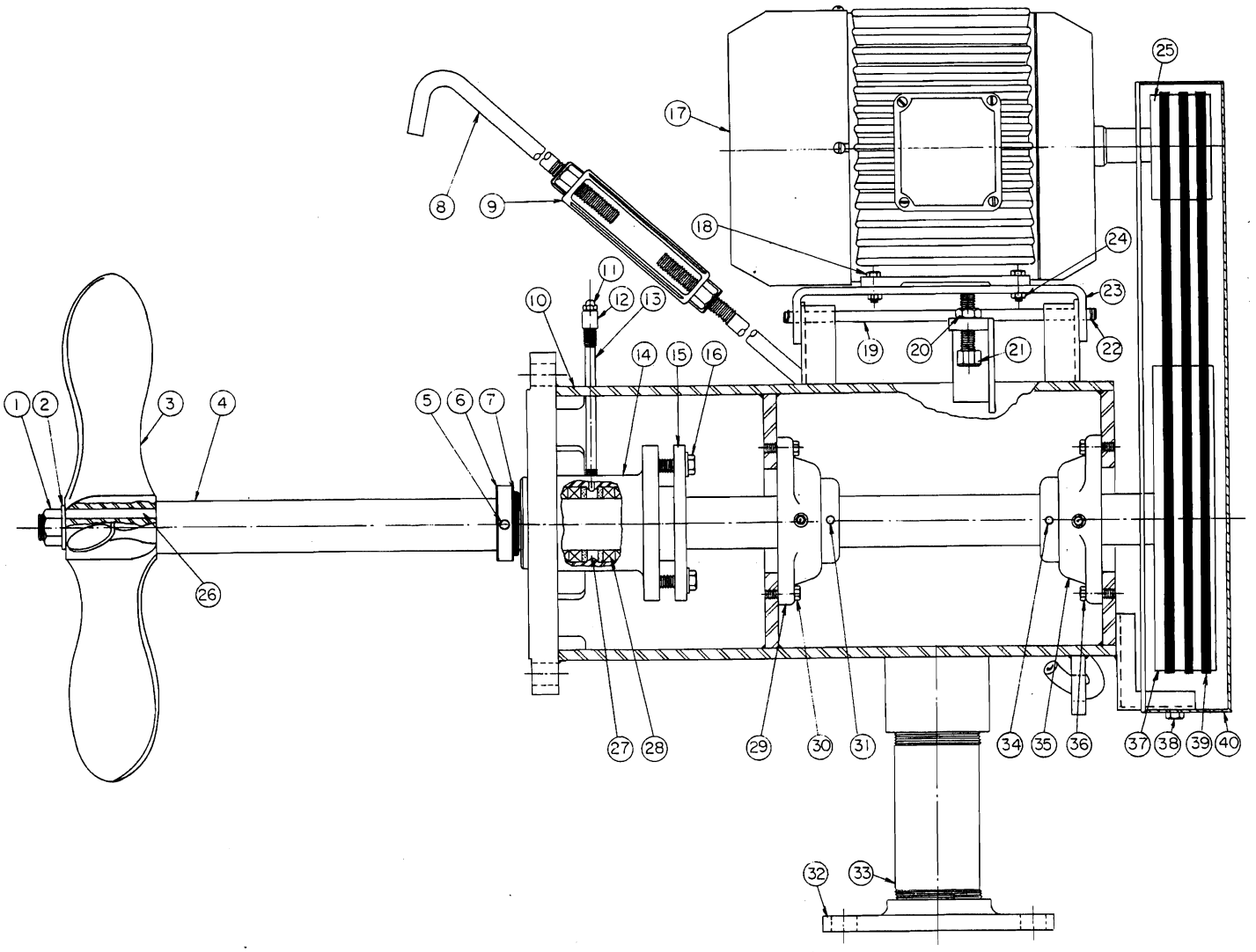
2. Prime mover electrical starting equipment should be arranged to start unit as slowly as possible to avoid severe impact loads.

3. As the mixer is brought up to normal operating speed, it should be checked continuously for unusual sounds, excessive vibrations, excessive heat or leakage. If any of these develop, the unit should be shut down immediately and the cause determined and corrected

4. After the first 48 hours of operation, all external housing and mounting fasteners should be checked for tightness. Loose fasteners can cause alignment problems and excessive wear.

5. Re-check tension of the V-belts several times in the first 50 hours of operation and adjust as outlined in the INSTALLATION INSTRUCTIONS, if necessary. Thereafter, check the belt tension periodically.

MIXER PARTS
Dwg. No. 05-05583



NOTE: MIXER SHOWN WITH #05-00549 STANDARD STUFFING BOX. REFER TO PAGES 4 & 5 FOR MECHANICAL SEAL PARTS.

PART NO.	DESCRIPTION	PART NO.	DESCRIPTION	PART NO.	DESCRIPTION	PART NO.	DESCRIPTION
1	HEX NUT	11	GREASE FITTING	21	ADJUSTMENT SCREW	31	SOCKET HEAD SET SCREW
2	FLAT WASHER	12	COUPLING	22	COTTER PIN	32	BASE FLANGE
3	IMPELLER	13	GREASE FITTING	23	MOTOR BASE	33	PIPE LEG SUPPORT
4	SHAFT	14	STUFFING BOX	24	HEX NUT	34	SOCKET HEAD SET SCREW
5	SOCKET HEAD SET ACREW	15	FOLLOWER	25	MOTOR PULLEY	35	BEARING+
6	SEAL OFF COLLAR	16	HEX HEAD CAP SCREW	26	KEY	36	HEX HEAD CAP SCREW
7	'O' RING+	17	MOTOR	27	LANTERN RING+	37	DRIVEN PULLEY
8	TIE ROD	18	HEX HEAD CAP SCREW	28	PACKING+	38	HEX HEAD CAP SCREW
9	TURNBUCKLE	19	MOTOR BASE PLATE	29	BEARING+	39	BELT+
10	HOUSING	20	LOCK NUT	30	HEX HEAD CAP SCREW	40	BELT GUARD

+ RECOMMENDED SPARE PARTS

MAINTENANCE RECORD

DATE	WORK PERFORMED

NOTES