

SERVICE INSTRUCTIONS

FOR GX/DX (FIXED) SERIES MIXER

Customer Name:
Tag:

Serial No.:

Size/Type:

Reduction Ratio:

Motor HP:

Input RPM:

Output RPM:

AGMA S.F.:



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PLEASE READ BEFORE UNPACKING MIXER

Your mixer has been tested and shaft straightness verified prior to shipment. Careful handling of shaft prior to and during installation will ensure continued service at specified operating conditions.

The following criteria must be adhered to in order to prevent damage to equipment or serious injury to operating personnel:

1. **Always** operate agitator in liquid.
2. **Always** follow the mounting recommendation for baffles if center mounted, or for properly angled and offset mounting in unbaffled vessels.
3. **Always** turn the agitator off when filling or drawing liquid levels down through the lower propeller.
4. **Always** maintain a minimum liquid level of 2 propeller diameters above the lower propeller.
5. **Always** rotate the shaft to verify straightness prior to operation in liquid.
6. **Always** check the mixer drawing for any special operating requirements if using a variable speed mixer.
7. **Always** set the lower propeller at the end of the shaft and the upper propeller (if any) not closer than 2 propeller diameters above the lower propeller unless noted otherwise on the mixer drawing.
8. **Always** fluidize settled solids before starting mixer.

ANY EXCEPTION TO THE ABOVE SHOULD BE AGREED TO IN WRITING BY HAYWARD GORDON LTD. AND NOTED ON THE MIXER DRAWING.



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HAYWARD GORDON PORTABLE FIXED MOUNT MIXERS

MODELS: GX, DX, GS, DS, GM, DM, SGS, & SGM

SERVICE MANUAL

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Hayward Gordon's portable mixers are furnished in gear and direct drive designs. Both types are available in fixed mount and clamp mount. This manual concerns the fixed mount designs only.

If additional information is required, contact your nearest Hayward Gordon representative.

All inquiries must be accompanied by the following information:

- 1) Mixer Size and Type (Model)
- 2) Hayward Gordon Serial Number

NOTE: Orders for renewal parts must include the description and part number shown on the parts list, in addition to the above info.

GENERAL INSTRUCTION

1. The Seller's Warranty applies insofar as the unit is operated within the rating and service conditions for which it was specifically sold.
2. The purchaser must prevent the existence of any destructive external conditions, which might typically include vibratory loads due to critical speeds, severe shock loading, mechanical or thermal overloads, or other conditions that may adversely affect operation. The unit must be installed and maintained in accordance with the instructions provided in this manual.
3. In the event of malfunction within the warranty period, Hayward Gordon must be notified within 30 days if it is intended that the warranty is to cover the incident.
4. Adequate installation, maintenance and safety instructions must be given by the user to personnel directly responsible for the operation of the mixer drive.
5. Guards, alarms, heaters, and safety devices, which may be furnished by Hayward Gordon must be installed by the user.
6. The user is also responsible for the furnishing and installing of any additional guards or safety equipment needed to protect operating personnel as required.
7. Any apparent or suspected damage sustained by equipment manufactured or furnished by Hayward Gordon during transport from the factory to the user should be immediately reported to Hayward Gordon and the Carrier.
8. Upon delivery of the equipment furnished, careful inventory must be made against shipping papers to determine whether any shortages exist in the delivered material. Any such shortages must immediately be reported to Hayward Gordon Ltd. and the Carrier if a timely claim is to be made.
9. The installation of most power transmission equipment does not normally require the services of a factory engineer. These services are not included in the selling price of the equipment unless specifically agreed upon in writing by the seller and purchaser. In applications requiring a more complex arrangement for components, consideration should be given to the user for a factory engineer



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for construction, supervision or check-out of the installation. These services are available from Hayward Gordon Ltd.

10. All electric motors are either totally enclosed or explosion proof, single or three phase, NEMA Style C footless. This style of motor is standard with all motor manufacturers.
11. Inspect unit for corrosion. Notify Hayward Gordon immediately if corrosion is present.
12. This manual lists a number of safety precautions. Follow them, and insist that those working for you do the same. An accident is usually caused by neglect or oversight. All unauthorized personnel must be required to remain a safe distance away from rotating shaft, coupling, propellers, impellers, etc..

13. Before start-up all Hayward Gordon Mixer drives should be checked for lubrication.

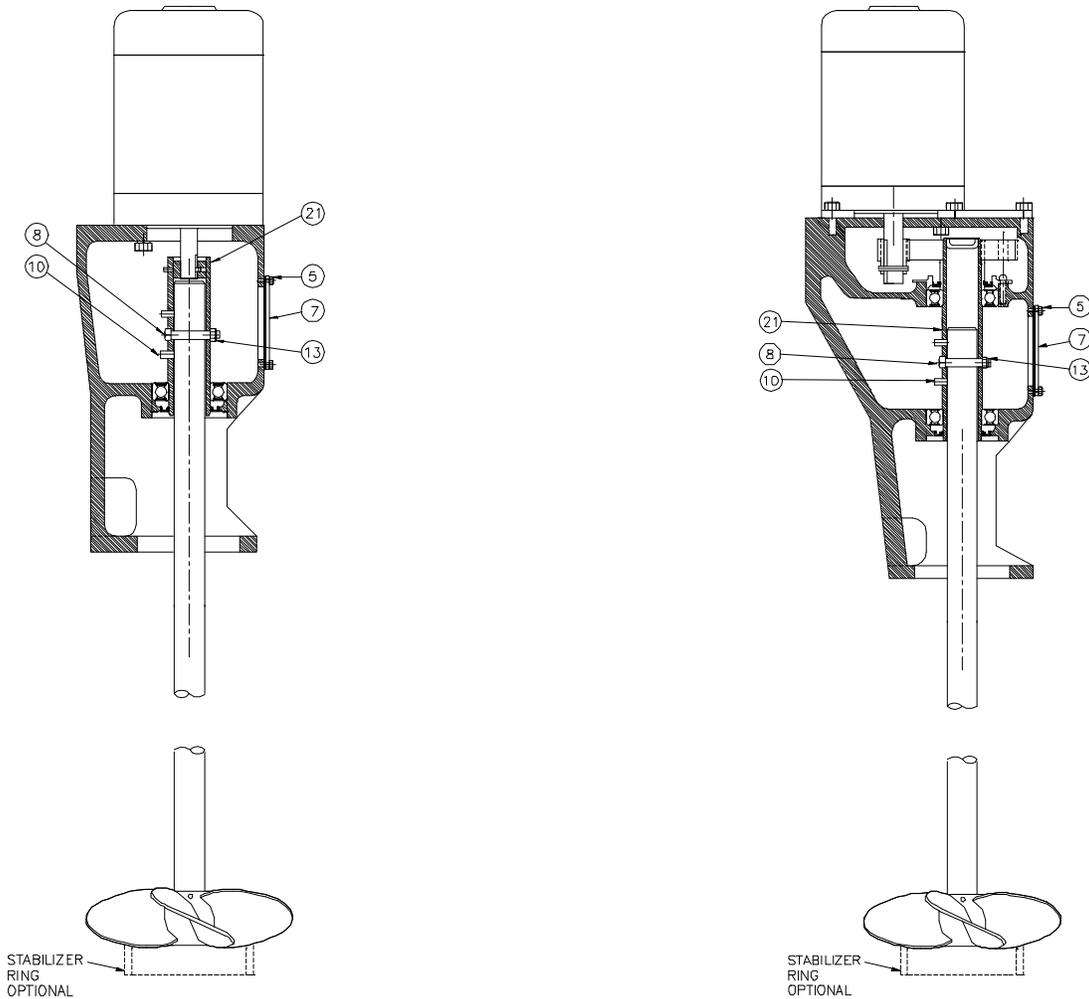
14. SAFETY INFORMATION

WARNING

In the installation, operation and maintenance of mixer drives, SAFETY comes first. Use proper clothes, tools, and methods of handling to prevent serious accidents. The safety precautions listed in this manual MUST BE FOLLOWED by all personnel working on equipment; otherwise, serious injury may result.



INSTALLATION INSTRUCTIONS



AGITATOR SHAFT INSTALLATION

To install agitator shaft, remove bolts (5) and inspection cover (7). If drive pin (8) and flex loc nut (13) are in position, unbolt and remove. Loosen setscrews (10). Coat drilled end of agitator shaft with commercial rust preventive (i.e. CRC-556 or WD-40) if needed and check that the shaft is free from burrs and large nicks. Reinstall drive pin and flexloc nut and tighten to 6 ft.lbs. Tighten setscrews onto flats to 6 ft.lbs. Replace inspection cover.



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PROPELLER INSTALLATION

Slide single or dual propellers onto shaft noting which is upper side of each propeller from the figures below. Tighten setscrews to 6 ft.lbs. For severe duty, the shaft should be dimpled for the setscrew. The lower propeller is normally positioned at the end of the shaft and the upper propeller, (if provided), at least two propeller diameters below the liquid level. To determine pitch face, place a straight edge across the blade width. If the straight edge contacts almost entire width, this is the pitch face. If the straight edge touches near the center only, this is the back face.

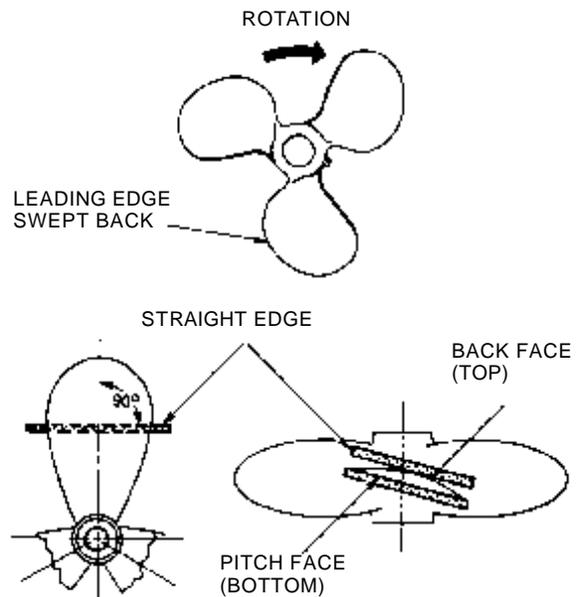
Your mixer has been tested and shaft straightness verified prior to shipment. Careful handling of shaft prior to and during installation will ensure continued service at specified operating conditions.

Always follow mounting recommendation for baffles if center mounted, or for properly angled and off-set mounting in un-baffled vessels.

Always set lower propeller at end of shaft and upper propeller (if any) not closer than 2 propeller diameters above the lower propeller unless noted otherwise on the mixer drawing.

PROPELLER LOCATION

The bottom propeller on the agitator shaft should be positioned no less than 1.5 times and not more than 3 times the propeller diameter from the bottom of the tank. Where applicable, the top propeller should be positioned a minimum of 24 inches below surface of the liquid.



MOUNTING

Fixed mount mixers used in baffled tanks should be positioned such that the agitator shaft is centered and vertical in tank. If tank has no baffles, agitator shaft should be angled and offset.

The mixer may be supported by a wall or column when tank design does not allow support for the mixer. Refer to diagram on page 22.



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OPERATION

GENERAL

When starting up the portable mixer for the first time, proceed cautiously. Even when the best installations and practices are followed, errors or omissions are always possible.

PRELIMINARY CHECKS:

It is recommended that the following checks be made before the portable mixer is started:

- a. Check all mounting bolts and/or clamps for proper installation.
- b. Check covers for proper installation.
- c. Check all electrical connections.
- d. Check for grease leaks.

INITIAL START-UP

The portable mixer has been spin tested at the factory, however, during the initial start-up, the following precautions must be observed:

- a. Check for grease leaks.
- b. Check for any unusual noise or overheating. If this occurs, mixer must be stopped immediately and the problem corrected.

MAINTENANCE

During operation, the mixer should be observed for evidence of overheating (temp. >1800F), grease leaks and/or unusual noise. If any of these problems develop shut down the mixer and determine the correct cause.

Note that it is normal for the lower bearing in the direct drive model mixers (e.g. DX), to operate at a temperature 25 oC (40 oF) or more above the ambient temperature.

LUBRICATION

The gear drive model mixers (e.g. GX models) have the gear cavity fully packed with grease (Esso Unirex EP-1) at the factory and unless grease has been removed, or otherwise depleted the mixer does not require the addition of grease during its lifetime. If grease addition is done, the gear cavity must be filled to 85-90% of its full capacity, eliminating all air pockets and completely submerging the gears. In addition, gear drive models are supplied with permanently lubricated bearings and therefore do not require additional lubrication.

Hayward Gordon direct drive mixers (e.g. DX models) have permanently lubricated bearings and therefore require no additional lubricant.

If units have been supplied with either packing or mechanical shaft sealing devices (e.g. models DM, DS, GM or GS) refer to the appropriate section in this manual for proper lubrication of these items.

DISASSEMBLY INSTRUCTION

Referring to the parts list, begin as follows:

- a. Disconnect power supply. Remove agitator shaft, (see installation section). Remove mixer from tank or support.
- b. Remove bolts (16) and separate top cover (17), motor assembly from mixer housing.
- c. Pinion is locked on motor shaft with "Loctite 601" adhesive. Pinion must be pressed off shaft. Heating pinion will weaken adhesive bond. Apply heat only



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until adhesive bond is weakened enough to ease pinion removal. Pinion temperature must not exceed 500 F. Note position and orientation of pinion to aid re-assembly.

- d. Remove grease from housing. Align holes in gear (2) with socket head cap screws (3). Insert wrench through holes and remove screws.
- e. Pull hollow shaft (21) assembly out of housing. When lower bearing (11) contacts upper bearing mount in housing, guide bearing through mount.
- f. Gear is locked on hollow shaft with "Loctite 601". See (c) for removal instructions.
- g. Press bearing off shaft. Bearing can be heated to a maximum of 200° F to ease removal and re-assembly.

ASSEMBLY INSTRUCTION

Assembly reverses disassembly. Adhere to the following guidelines:

- a. Clean and inspect all parts.;
- b. Apply grease to inside lip of lower oil seal (12).
- c. Replace gasket (27) between top cover (17), through cap (4), and housing (1).
- d. Follow manufacture's instructions when reinstalling pinion and gear with "loctite 601" or equivalent. Vapor phase cleaning or washing of gear members in a chlorinated solvent, before application of adhesive, is recommended.
- e. Refill gear cavity of housing with Esso Unirex EP-1 or equivalent to 85-90% of its full capacity, eliminating all air pockets.

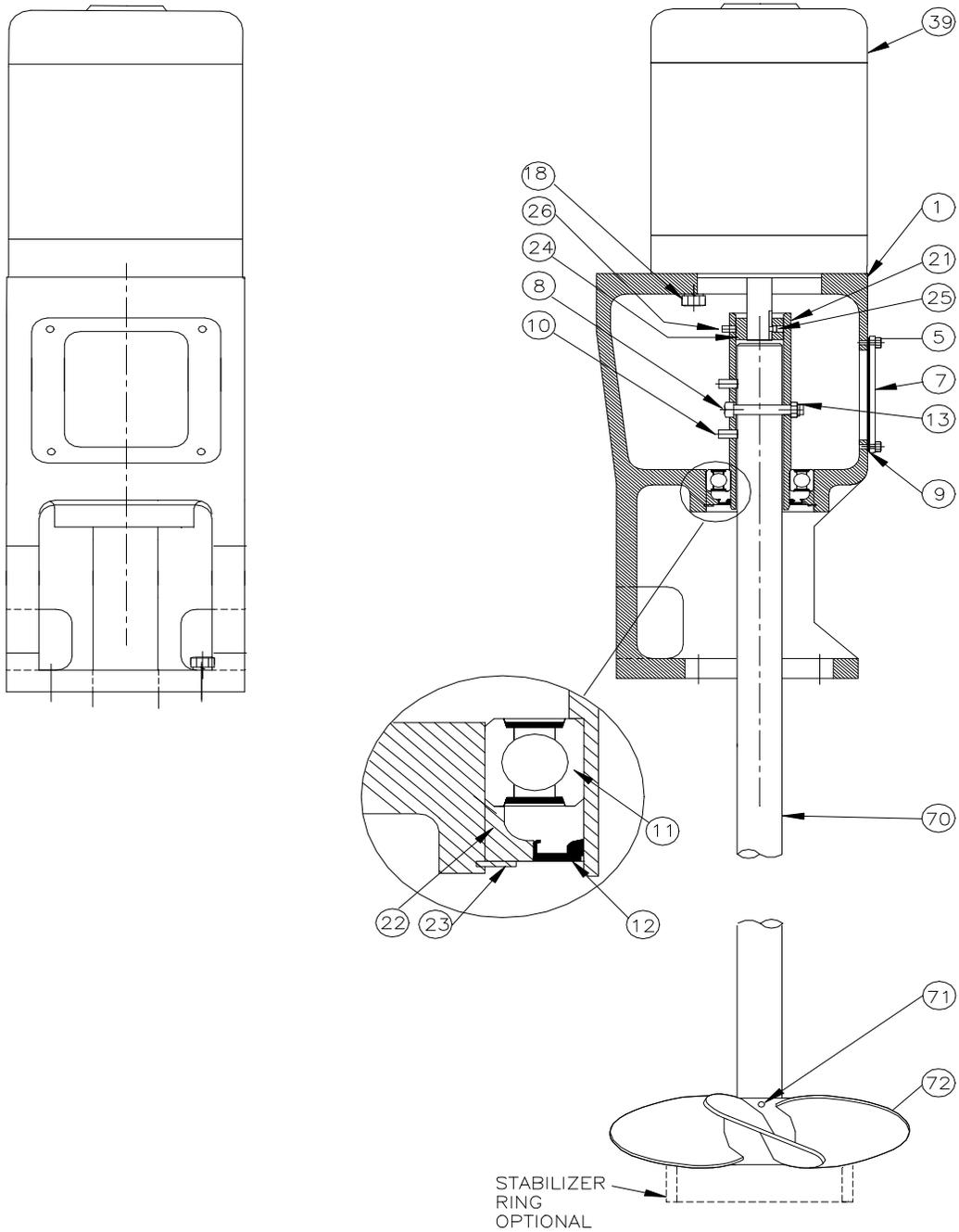


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PARTS LIST, DIRECT DRIVE MODEL DX





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PARTS LIST, DIRECT DRIVE MODEL DX

ITEM NO.	PART NUMBER	DESCRIPTION	QTY. UNIT
1	2075550001	HOUSING	1
5	70303007	SELF TAPPING SCREW	4
7	4070850001	INSPECTION COVER	1
8	72783009	HEX HEAD BOLT	4
9	52549500	GASKET	1
10	73275011	SET SCREW (1.25" SHAFT)	2
10	73275012	SET SCREW (0.75" SHAFT)	2
*11	50149500	BEARING, BALL	1
*12	50349500	OIL SEAL	1
13	73875017	FLEXLOC NUT	1
18	72783037	HEX HEAD SCREW C/W	4
	74682033	LOCKWASHER	4
21	4030350101	SLEEVE (1.25" SHAFT)	1
21	4030350001	SLEEVE (0.75" SHAFT)	1
22	2185550101	ALUMINUM SPACER	1
23	50403500	RETAINING RING	1
24	4030350401	SLEEVE ADAPTOR FOR MOTOR SHAFT	1
25	73284010	FULL DOG SET SCREW	1
26	73275011	SET SCREW SOC,HEAD,CAP (1.25" SHAFT)	1
26	73275012	SET SCREW SOC,HEAD,CAP (0.75" SHAFT)	1
39		MOTOR	1
70		SHAFT	1
71		SET SCREW	1
72		PROPELLER	1

*RECOMMENDED SPARE PARTS
REFER TO PAGE 9 FOR DRAWING.

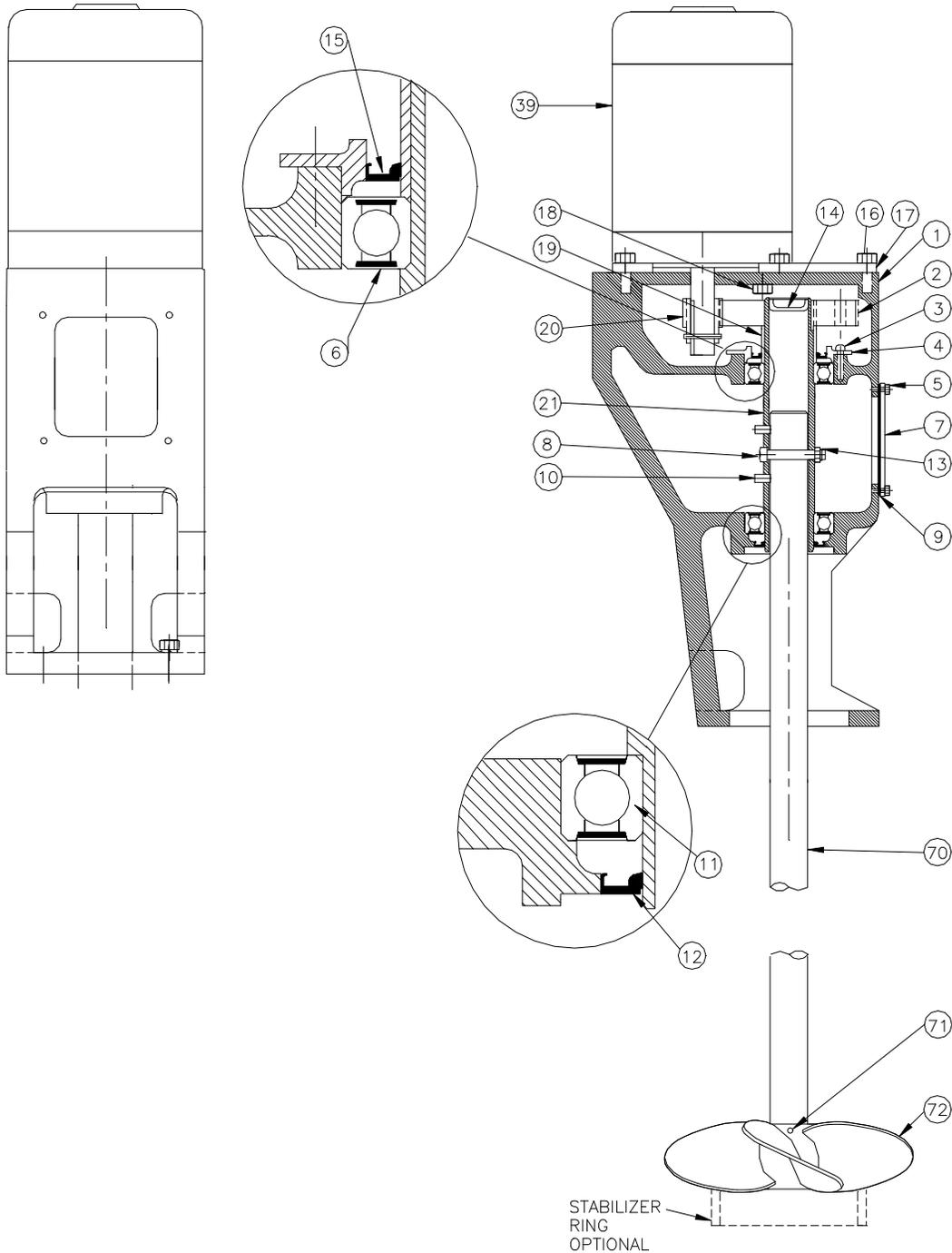


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PARTS LIST, GEAR DRIVE MODEL GX (0.75" & 1.25" SHAFT)



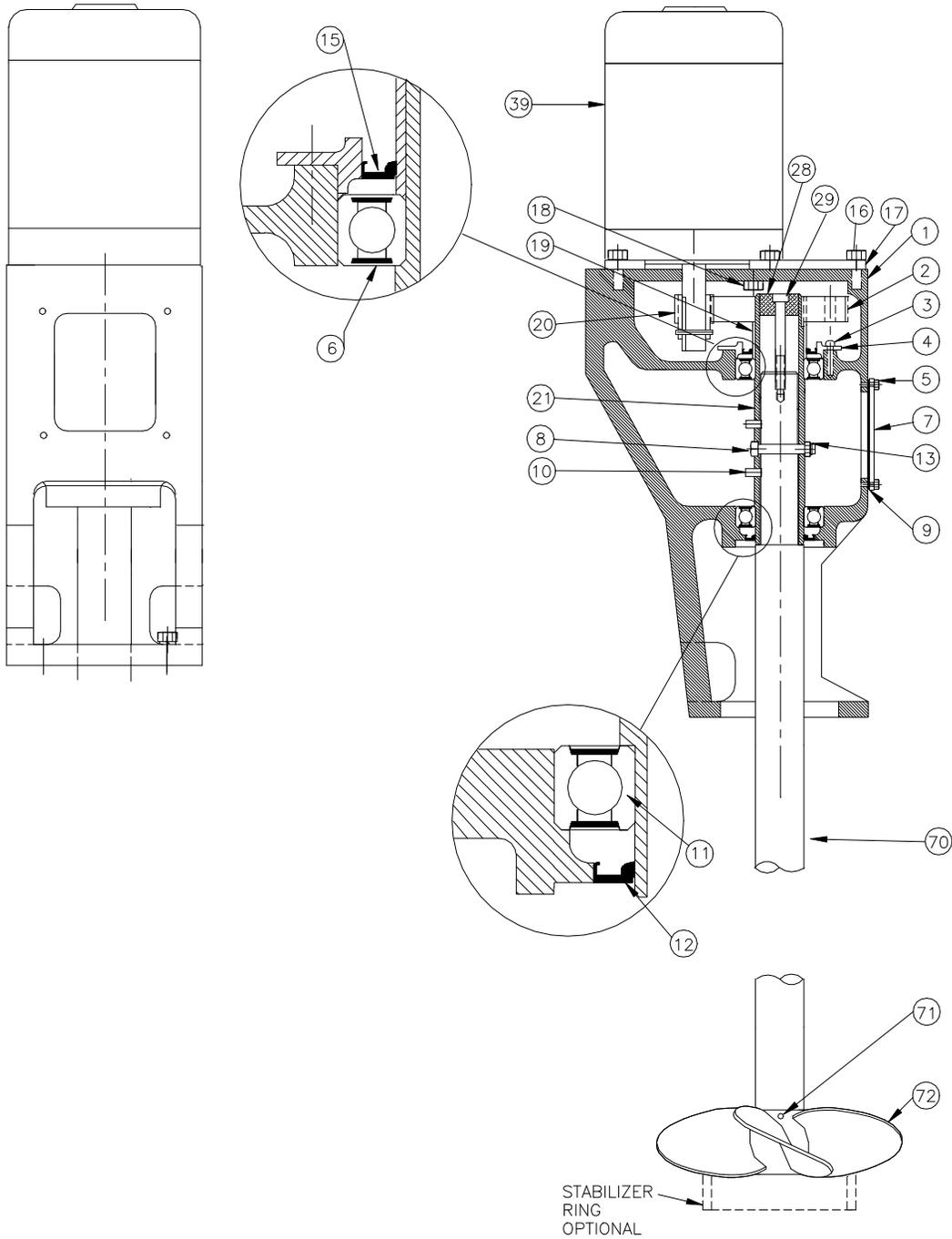


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PARTS LIST, GEAR DRIVE MODEL GX (1.50" SHAFT)





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PARTS LIST, GEAR DRIVE

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	2075550301	HOUSING	1
*2	53049500	GEAR	1
3	73084002	SCREW,SOC.HEAD,CAP	3
4	2105550001	THRU CAP	1
5	70303007	SELF TAPPING SCREW	4
*6	50149500	BEARING, BALL	1
7	4070850001	INSPECTION COVER	1
8	72783009	HEX HEAD BOLT	1
9	52549500	GASKET	1
10	73275011	SET SCREW (1.25" DIA.SHAFT)	2
10	73275012	SET SCREW (0.75"DIA.SHAFT)	2
*11	50149500	BEARING, BALL	1
*12	50349500	OIL SEAL	1
13	73875017	FLEXLOC NUT	1
14	77049500	EXPANSION PLUG	1
*15	50349501	OIL SEAL	1
16	72783003	HEX HEAD SCREW	6
17	4275550001	TOP COVER	1
18	72783034	HEX HEAD SCREW	4
19	4030350501	SLEEVE SEAL	1
*20	53049501	PINION	1
21	4030350301	SLEEVE (1.25" DIA.SHAFT)	1
21	4030350201	SLEEVE (0.75"DIA.SHAFT)	1
28	4130350001	THRUST PLATE (1.5" DIA SHAFT)	1
29	73084033	SCREW SOC. HD. CAP (1.5" SHAFT)	1
39		MOTOR	1
70		SHAFT	1
71		SET SCREW	1
72		PROPELLER	1
	4081060301	GEAR KEY	1
	52549501	GASKET (TOP COVER)	1
	52549502	GASKET (BEARING CAP)	1
	52549503	GASKET (MOTOR)	1
	75210500	DOWEL PINS (MOTOR PLATE)	1
	75303503	DRIVE PINS (H.S. PINION)	1



DOUBLE MECHANICAL SEALS

To avoid damaging a double mechanical seal, the seal chamber should always be pressurized before the mixing vessel. Double mechanical seals require that a suitable sealant fluid be introduced to the seal chamber at a pressure approximately 10% above the vessel pressure. The pressure within the seal chamber cannot exceed 20 psi. above the vessel pressure nor can it exceed the maximum pressure rating of the seal itself. Never operate the mixer until the sealant has been introduced to the seal.

For optimum seal life, the best choice for a sealant is light mineral oil. However, when oil cannot be used because of the possibility of process contamination one of the process fluids or another fluid (with the proper viscosity and lubricity) may be used. The sealant fluid must not rust or attack the seal components or seal housing. The sealant temperature must be maintained below the vaporization or boiling point and above the freezing point of the sealant. The sealant temperature must be controlled to assure optimum lubricity. The sealant temperature must also be adjusted, by means of the sealant pressurizing system, to meet the operating conditions assuring sufficient heat removal thereby retaining seal internal components at a safe operating temperature.

If leakage occurs at the mechanical seal, inspect the seal area to be sure that deposits of foreign or process material have not accumulated. Solids build-up in close tolerance areas and can score the shaft, or damage sealing faces, thus causing leakage. Remove and clean mechanical seal

thoroughly and area of shaft where material has build up.

Note: Use clean lubricant and keep system clean in order to achieve maximum seal life. If a dead-end lubrication system is used, the seal chamber and lubrication system should be flushed every 2500 hours or every 6 months, whichever occurs first.

MECHANICAL SEAL REMOVAL INSTRUCTION

1. Depressurize mixing tank and disconnect all lubricating lines, electrical connections, and control devices.
2. Remove plug (Item 12 on pg. 17) From mechanical seal housing and loosen set screws
3. Support the agitator shaft either from within the mixing tank or with a clamp fastened around the shaft directly above the mechanical seal housing. If a clamp is used, another means of supporting the shaft must also be available, as the clamp must be removed to enable removal of the mechanical seal.
4. Remove mixer drive inspection cover (Item 7 on pg.05 or 11, depending on type of drive) and loosen set screws (Item 10) above and below the drive pin (Item 8). Remove drive pin.
5. Remove mixer drive mounting bolts from mechanical seal flange and lift the mixer drive from the flange to expose the mechanical seal assembly and the agitator shaft.
6. If a clamp was used to support the agitator shaft while the mixer drive was removed, another method of sup-



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porting the shaft must now be provided to enable removing and servicing the mechanical seal.

7. While maintaining support to the agitator shaft, unbolt the mechanical seal housing from the mounting flange and slide the mechanical seal off the agitator shaft and service as necessary

Reinstallation Procedure

The reinstallation of the mechanical seal is essentially the reverse of the removal procedure. Be sure that internal mechanical seal elements are positioned evenly between the stationary faces and that all necessary mechanical connections have been made before the seal set screws are tightened.



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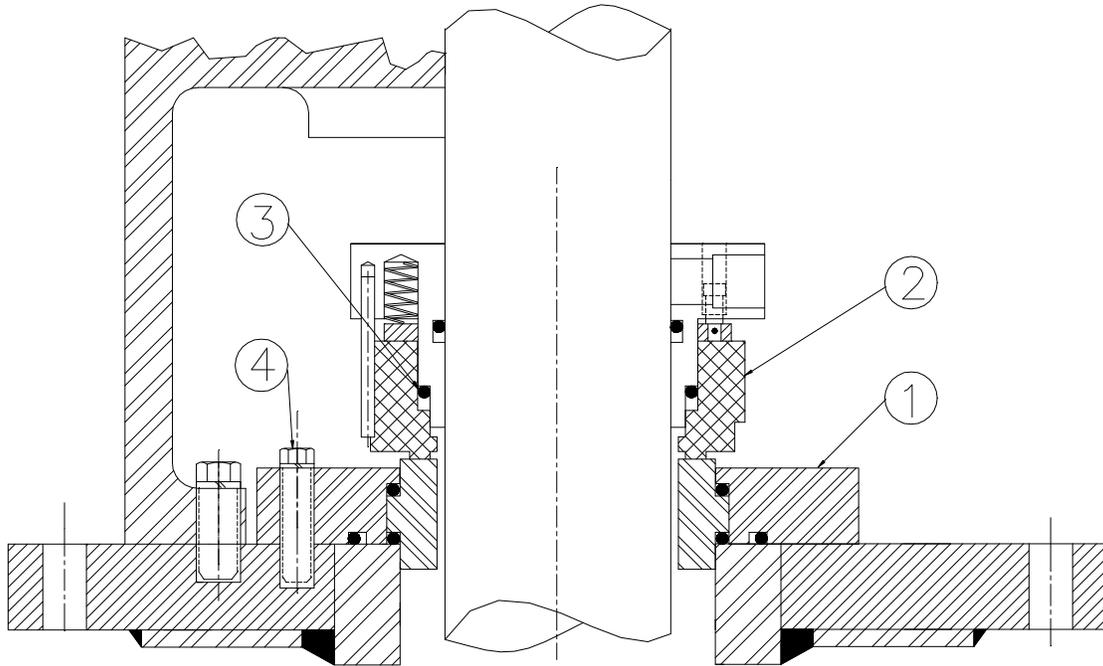
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**SINGLE MECHANICAL SEAL
DURAMETALLIC VRA**



PART NO.	DESCRIPTION	QTY / UNIT
*1	GLAND	1
*2	ROTATING FACE	1
*3	'O' RINGS	2
*4	HEX HEAD BOLT (4)	2

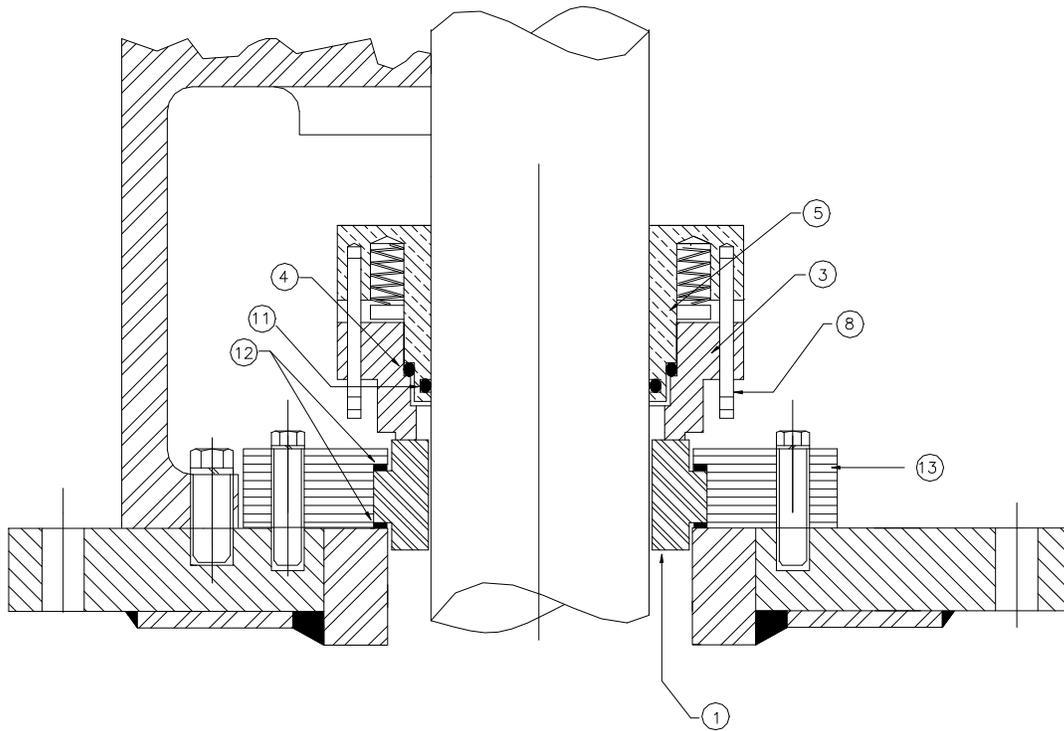


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**SINGLE MECHANICAL SEAL
John Crane Type 32**



Part Number	Description	Qty/unit
1	Seal Seat	1
3	Rotating Member	1
4	O-ring	1
5	Retainer	1
8	T-Bar	4
11	O-ring	1
12	Gasket	2
13	Gland Plate	1

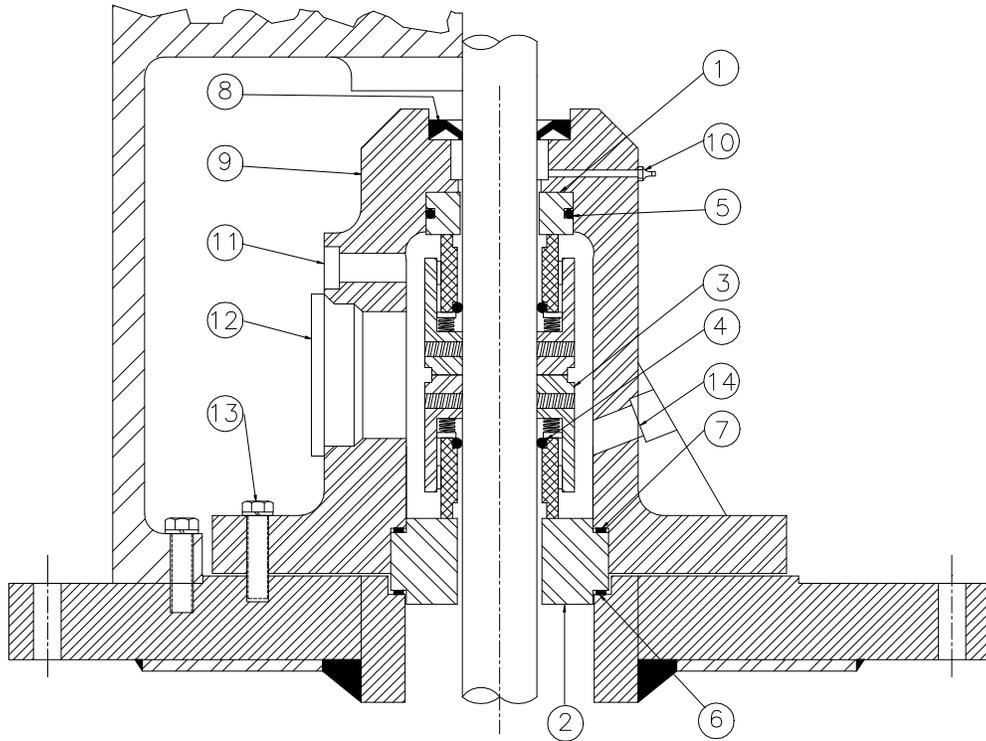


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DOUBLE MECHANICAL SEAL



PART NO.	DESCRIPTION	QTY / UNIT
*1	UPPER STATIONARY FACE	1
*2	LOWER STATIONARY FACE	1
*3	ROTATING ASSEMBLY	2
*4	"O" RING (ROTATING FACE)	2
*5	"O" RING (STATIONARY FACE)	1
*6	GASKET (STATIONARY FACE 1/16" THK.)	1
*7	GASKET (STATIONARY FACE 1/16" THK.)	1
*8	LIP SEAL	1
9	SEAL HOUSING	1
10	GREASE FITTING	1
11	FLUSH OUTLET 1/4 " N.P.T.	1
12	STRIGHT THREADED PLUG	1
13	HEX HEAD BOLT C/W LOCKWASHER	4
14	FLUSH INLET 1/4 " N.P.T.	1



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STUFFING BOX INSTRUCTIONS

The purpose of the stuffing box packing is NOT TO STOP leakage, but to limit it to a practical amount. If the gland is tightened to prevent leakage, packing life will be shortened and shaft damage may occur.

Lubrication

For best stuffing box performance, lubricant should be introduced CONTINUOUSLY at pressures between 5 to 15 PSI above tank pressure.

If intermittent lubrication is provided by means of a grease gun, care must be taken to prevent over lubrication. An amount of grease that fills the lubricant cavity and is distributed evenly throughout the packing area is sufficient for proper lubrication. The stuffing box is shipped WITHOUT lubricant, because of the danger of using a lubricant that may contaminate the product.

Before using, please check that packing and lubricant are of physically and chemically suitable for the service conditions.

START UP INSTRUCTIONS STUFFING BOX

1. Tighten the gland nuts to "finger tightness"
2. Start the mixer and run it until the stuffing box has reached a constant operating temperature. When tightening the gland nuts, be careful to avoid cocking the gland. Even tightening of the gland will seat the packing while it is warm and plastic.
3. Again, loosen the gland nuts to finger tightness and restart mixer. Leakage may be excessive, but do not take up on the gland nuts for the first 20 to 30 minutes,
4. If, after this initial run-in period, the leakage is still excessive, adjust by tightening the gland nuts evenly - one flat or a sixth of a turn at a time. This should be done every 30 minutes until leakage is reduced to a normal level.
5. Adjustments must always be done gradually, over several hours, and held



RE-PACKING PROCEDURE

1. Remove the split gland, all packing, and lantern ring. Carefully avoid scoring the shaft with the packing hook or removal tool.
2. Inspect the shaft and lantern ring. Lantern ring, lubrication channel, and holes must be free of dirt. Minor shaft wear should be worked smooth. Where excessive wear exists, the shaft should be built up and re-machined to give a smooth finish, or replaced. Clean stuffing box thoroughly, checking to ensure the lubrication holes are free and clear.
3. The location of the lantern ring should be pre-determined for proper alignment between lubrication holes and grease lines or fittings.
4. Insert first ring of packing into the stuffing box. Install a split spacer (preferably of wood) into the box against the packing ring. Install gland and tighten evenly against the spacer, so that packing ring is firmly seated and spread to effect a good seal against the inside walls of the box as well as the shaft. When tightening the gland, pull it up evenly so each ring will be packed squarely into the box, assuring a good seal. Repeat this procedure for each ring. The individual packing joints must be staggered at 90 degrees.
5. After the box has been completely packed, replace the split gland, tightening the gland nuts to finger tightness.

STANDARD PACKING SPECIFICATIONS

PACKING TYPE	SERVICE	Temp.	pH
STYLE C1050 Soft braided packing. Contains Teflon dispersion on the yarns with heat resistant lubricant. Clear and colorous	Conc.Acid	500 °F Max	0-14
STYLE K1730 Braided from a special kevlar aramid fiber with special lubricant. A high tensile strength packing.	Sewage, mild chemicals, mild caustic and abrasive type service	500 °F Max	3-10



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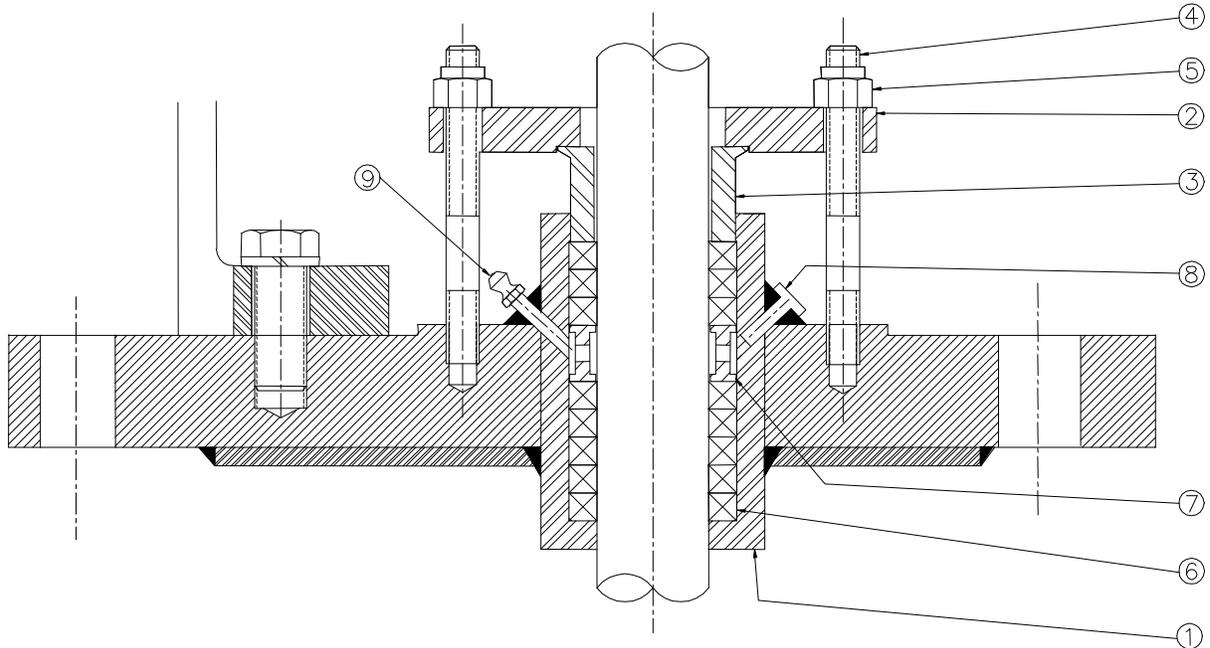
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STUFFING BOX, HIGH PRESSURE (0-150 PSI)



PART NO.	DESCRIPTION
1	STUFFING BOX FLANGE ASSEMBLY * +
2	GLAND PLATE *
3	PACKING GLAND *
4	STUD
5	NUT
6	PACKING RINGS *
7	LANTERN RING *
8	RELIEVE PLUG
9	GREASE FITTING

-For Material type refer to unit assembly drawing.
-Mounting flange is ANSI raised face on alloy units only.
Steel units are ANSI flat face.

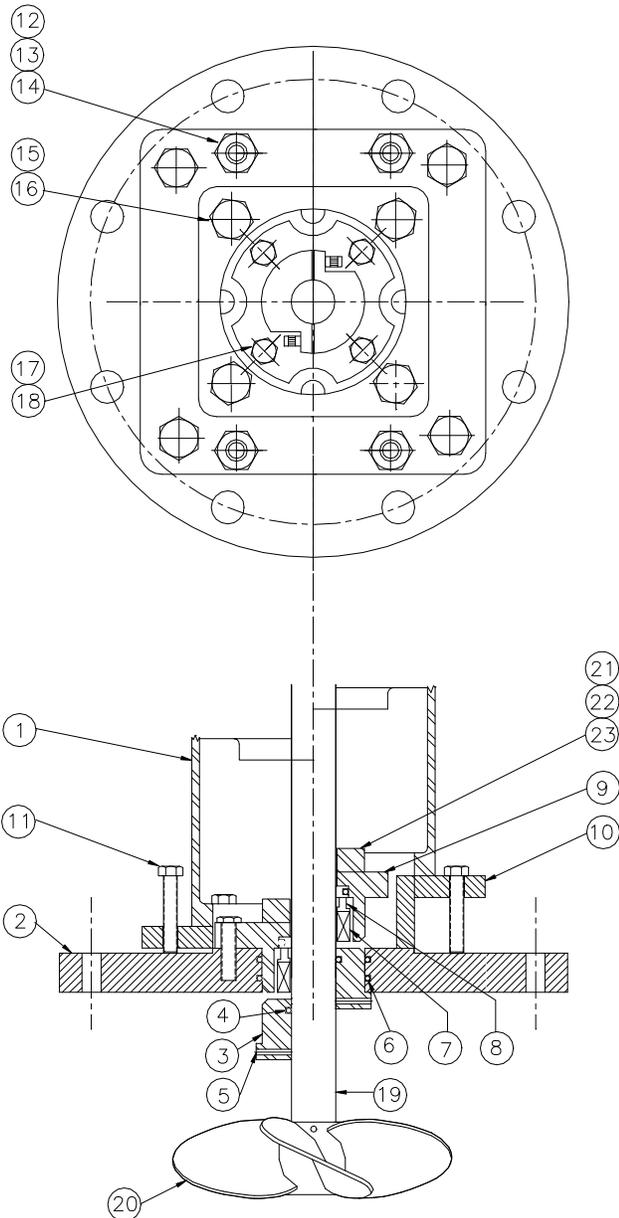


INSTRUCTIONS FOR OPERATING TANK SHUT-OFF DEVICE

TO ENGAGE THE SHUT OFF DEVICE
(REPACK FEATURE):

1. Remove 4 screws (17).
2. Tighten 4 jacking screws (11) evenly until repack collar (3) is engaged approximately 1 3/16" gap between jacking plate (10) and mounting flange (2).
3. Disconnect shaft from gearbox (refer to Mixer Shaft Installation in Maintenance Instructions).
4. Remove 4 screws (15).
5. Remove gearbox from shaft.
6. Remove thrust collar (21), seal gland (9), mechanical seal head (7).
7. Reinstall thrust collar (21) on shaft, seating it on flange. Lock it to shaft at this position.

REVERSE THE ABOVE INSTRUCTIONS
TO RESTORE THE UNIT TO AN OPER-



ITEM	DESCRIPTION	QTY
1	DRIVE ASSEMBLY	1
2	MOUNTING FLANGE	1
3	REPACK COLLAR	1
4	O' RING	1
5	SET SCREW	1
6	O' RING	2
7	ROTATING FACE	1
8	STATIONARY FACE	1
9	GLAND	1
10	JACKING PLATE	1
11	JACKING SCREW	4
12	STUDS	4
13	HEX NUT	4
14	LOCK WASHER	4
15	HEX HEAD SCREW	4
16	LOCK WASHER	4
17	HEX HEAD SCREW	4
18	LOCK WASHER	4
19	SHAFT	1
20	PROPELLER	1
21	THRUST COLLAR	1
22	SCREW, SOC. HEAD, CAP	2
23	LOCKWASHER	2



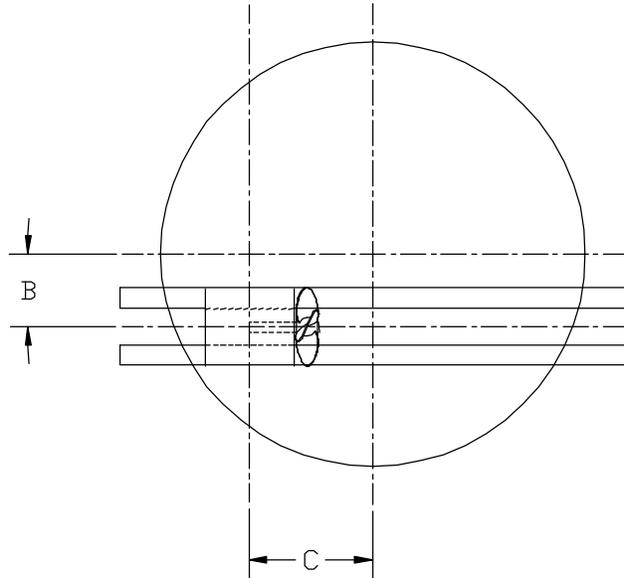
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PORTABLE FIXED MOUNT

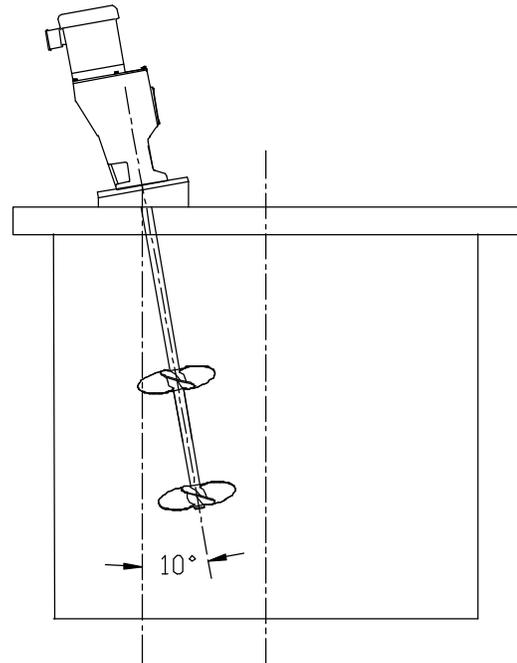
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FIXED MOUNT CONFIGURATION FOR UN-BAFFLED TANKS

	0.25 HP TO 0.75 HP		1.0 HP TO 3.0 HP	
	C	B	C	B
24	6	3-1/2	4-7/8	2-7/8
27	7-1/4	4-1/4	6-1/4	3-5/8
30	8-3/8	4-7/8	7-3/8	4-1/4
33	9-1/2	5-1/2	8-1/2	4-7/8
36	10-1/2	6-1/8	9-3/4	5-5/8
39	10-7/8	6-7/8	10-7/8	6-1/4
42	13	7-1/2	11-7/8	6-7/8
45	14	8-1/8	13-1/4	7-5/8
48	15-1/8	8-3/4	14-1/8	8-1/8
51	16-3/8	9-1/2	15-3/8	8-7/8
54	17-1/2	10-1/8	16-1/2	9-1/2
57	18-1/2	10-3/4	17-1/2	10-1/8
60	19-5/8	11-3/8	18-7/8	10-7/8
63	21	12-1/8	20	11-1/2
66	22	12-3/4	21	12-1/8
69	23-1/8	13-3/8	22-1/8	12-3/4
72	24-1/2	14-1/8	23-3/8	13-1/2
75	25-1/2	14-3/4	24-1/2	14-1/8
78	26-1/2	15-3/8	25-1/2	14-3/4
81	27-3/4	16	26-5/8	15-3/8
84	28-3/4	16-5/8	27-7/8	16-1/8
87	30	17-3/8	29	16-3/4
90	31-1/8	18	30-1/8	17-3/8
93	32	18-1/2	31-1/4	18-1/8
96	33-1/2	19-3/8	32-1/2	18-3/4
99	34-5/8	20	33-1/2	19-3/8
102	35-1/4	20-3/8	34-5/8	20
105	36-3/4	21-1/4	35-3/4	20-3/4
108	37-7/8	21-7/8	36-7/8	21-3/8
111	38-3/4	22-3/8	38-1/8	22
114	40-1/4	23-1/4	39-1/4	22-5/8
117	41-3/8	23-7/8	40-3/8	23-3/8
120	42-1/2	24-1/2	42-1/8	24
126	44-3/4	25-7/8	43-7/8	25-3/8
132	47	27-1/8	46-1/8	26-5/8
138	49-3/8	28-1/2	48-3/8	28
144	51-1/2	29-3/4	50-7/8	29-1/4
150	53-7/8	31-1/8	53	30-5/8
156	56	32-3/8	55-1/4	32
162	58-1/4	33-5/8	57-1/2	33-1/4
168	60-7/8	35-1/8	59-7/8	34-5/8



PLAN VIEW CLOSED TANK



ELEVATION VIEW CLOSED TANK

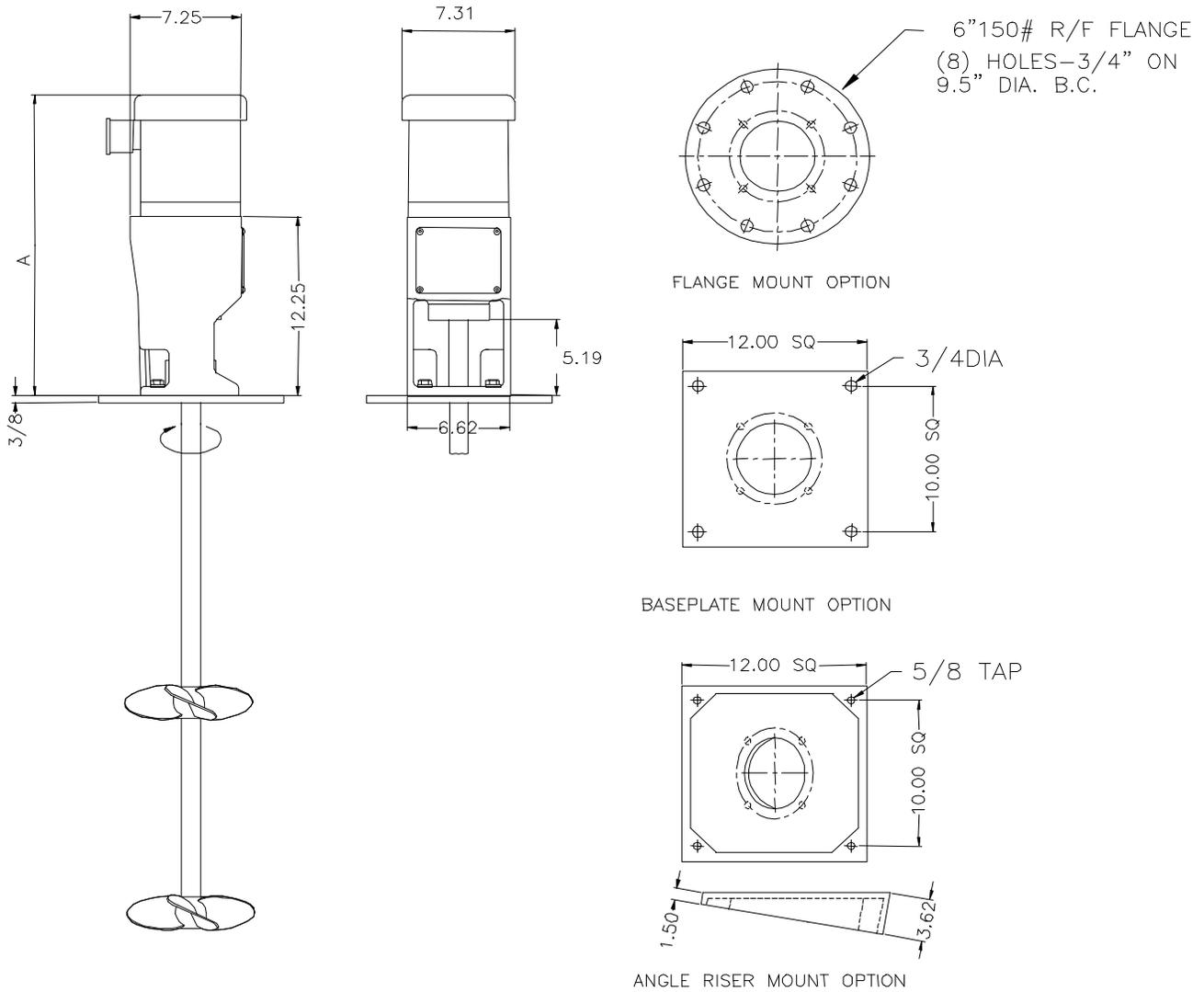


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DIRECT DRIVE GENERAL DIMENSIONS & WEIGHTS



Model	HP	A	Approx. Wt.
DX-14	0.25	21.1	92
DX-13	0.33	21.1	95
DX-12	0.5	21.1	100
DX-34	0.75	23.4	125
DX-11	1.0	23.4	130
DX-15	1.5	23.4	136
DX-2	2.0	26.0	142
DX-3	3.0	27.6	155

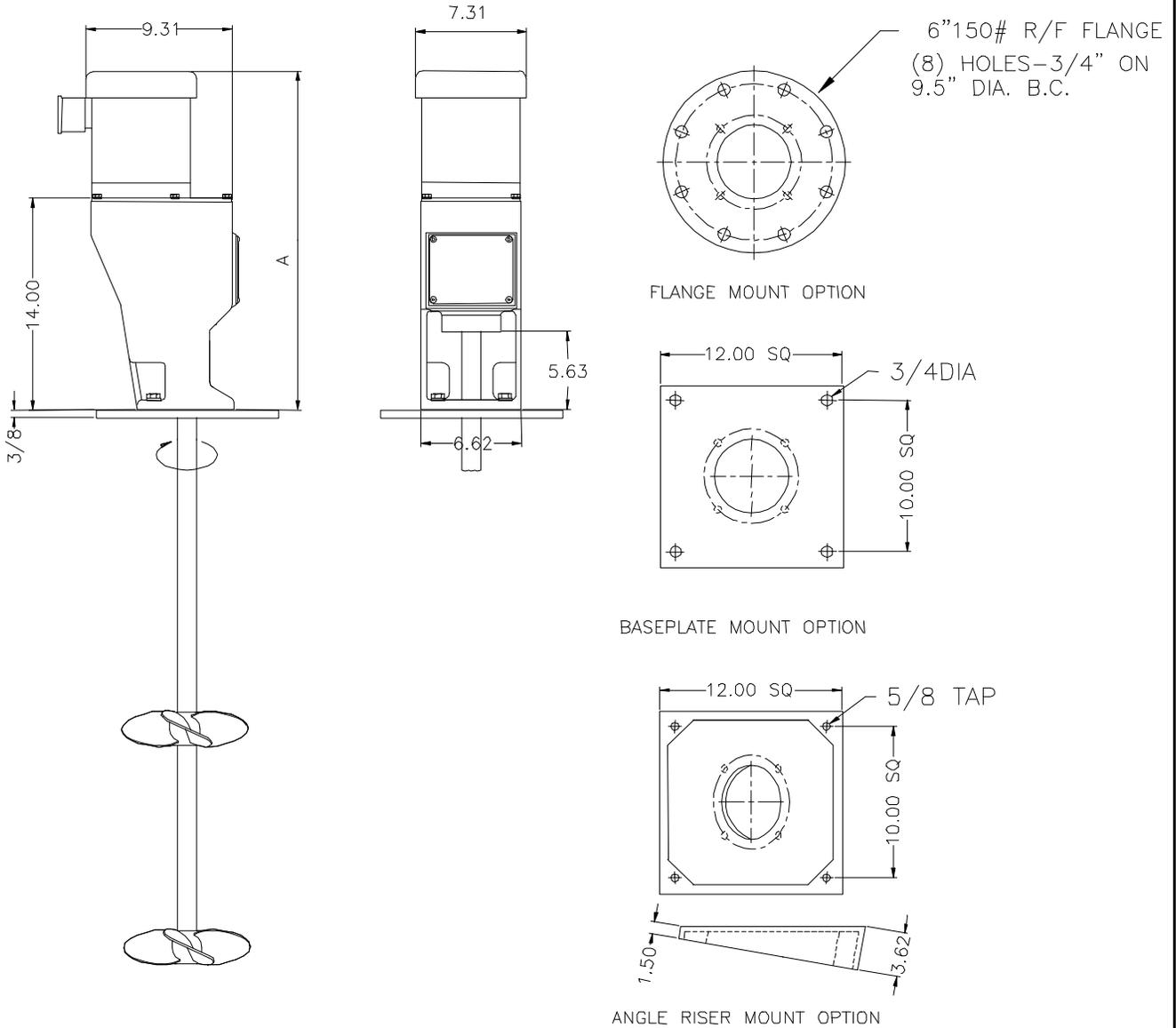


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GEAR DRIVE GENERAL DIMENSIONS & WEIGHTS



Model	HP	A	Approx. Wt.
GX-14	0.25	22.9	125
GX-13	0.33	22.9	128
GX-12	0.5	22.9	130
GX-34	0.75	25.1	132
GX-11	1.0	25.1	132
GX-15	1.5	25.1	142
GX-2	2.0	27.8	154
GX-3	3.0	29.3	170