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## CLAMP-ON PORTABLE MIXERS RG, RAG, RH & RA SERIES OPERATING AND MAINTENANCE INSTRUCTIONS

### Handling

The mixer should be lifted with care. Usually the drive unit, shaft (6) and impellers (7) are separated when packed. If the mixer is moved with the impeller shaft assembled, the shaft should be adequately supported when not in the vertical position. Do not, at any time, attempt to lift the mixer by means of the shaft.

Assemble shaft (6) to the motor by means of the arbor (26). Check all set screws (5) for tightness.

### Mixer Impeller Assembly

If your mixer is shipped from the factory with impeller(s) not assembled, carefully follow the instructions in this paragraph.

Care should be taken when mounting the impeller (7) on the shaft (6), that the driving face of the impeller is down. In other words, the impeller generally pumps towards the bottom of the vessel.

The single impeller is mounted on the mixer shaft just above the spiral pin (8). The spiral pin has been placed at the end of the mixer shaft to insure against the impeller dropping off the shaft into the product.

The lower impeller in a multiple configuration is mounted on the mixer's shaft in the same way as a single impeller. The spacing of the impeller is significant with respect to stability, fluid regime and the horsepower drawn by the impellers. The best impeller spacing peculiar to the particular application will be given by EMI. Generally, the minimum spacing is two impeller diameters with an optimum spacing of four impeller diameters.

**NOTE:** On gear driven models equipped with a hydrofoil impeller rather than a marine type propeller, be sure the impeller is secured to the shaft right side up. The hub of the impeller is marked "TOP" and should be facing you when viewed from the drive end of the mixer.

### Mounting

See Figure A below, for proper positioning.

Install the portable mixer on the tank edge or other suitable support by tightening the clamp (39) thumb-screw.

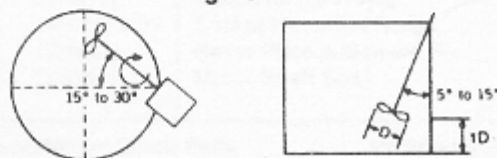
Position the portable mixer as shown in Figure A for best top to bottom flow, this is accomplished through the ratchet handle (34) in the ball and socket. Rotate the handle clockwise to tighten; counter-clockwise to loosen. To release spring loaded ratchet, pull up on the handle. This will enable you to move the handle freely without tightening or loosening.

### Power Supply

Make proper electrical connections as per local code dictates. Test machine for smoothness of operation. The motor should rotate so as to force liquid downward (unless otherwise specified). Always check this, especially if three-phase wiring is required. If a three-phase motor is used, reversing two of the three connections will reverse the rotation of the motor. Single phase motors are wired for proper rotation at the factory.

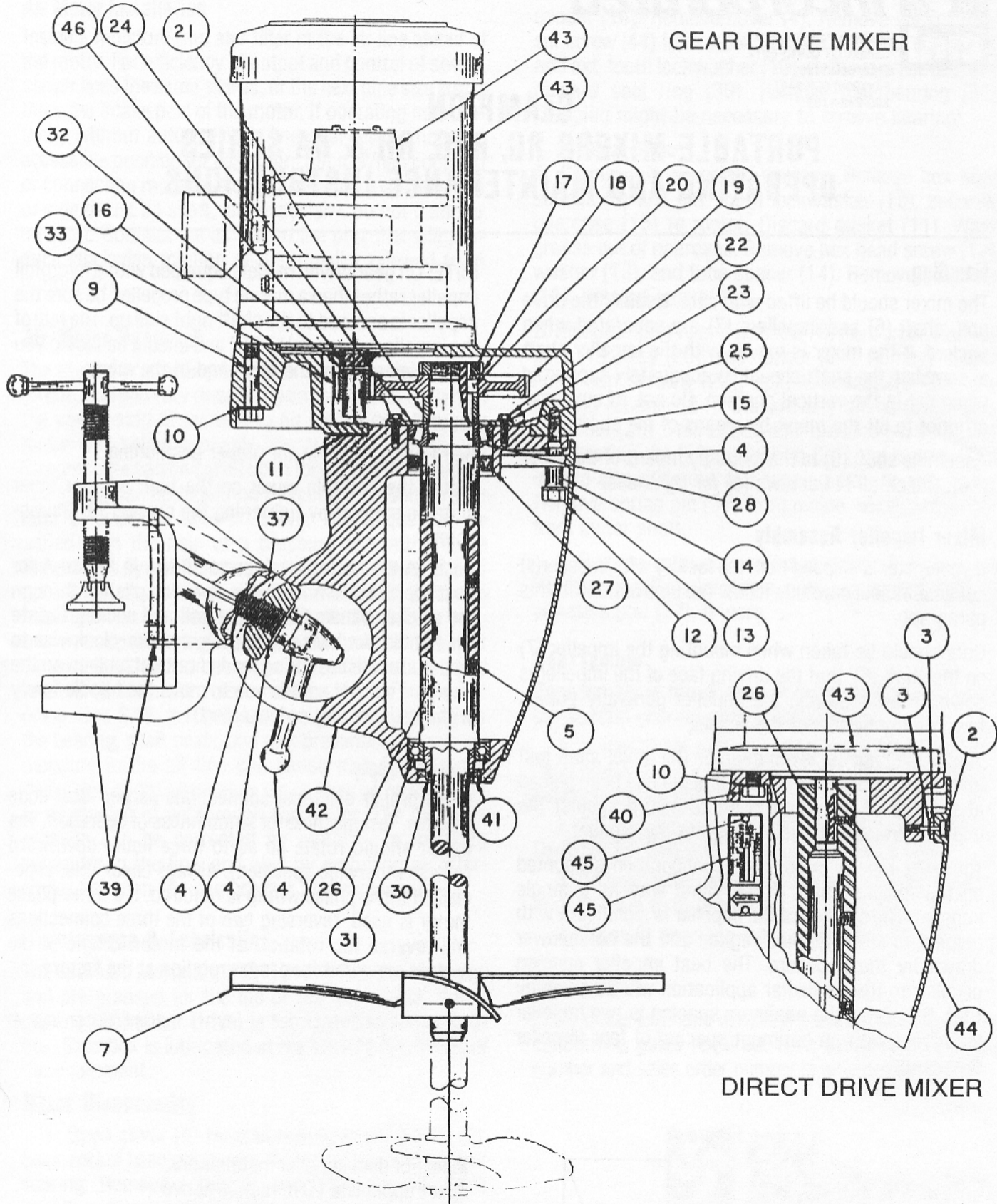
(continued on page 4)

Figure A



**Note:** For dual impeller installations, space upper one 1D minimum above lower, or 1D minimum below surface of liquid.

# GEAR DRIVE MIXER



# DIRECT DRIVE MIXER

# PORTABLE MIXERS RG, RAG, RH, RS & RA SERIES PARTS LIST

Ref. Number	Part Number	Description	# Per Assembly	
			Direct	Gear
2	330010	Panel Screw	1	1
3	330011	Retaining Ring	1	1
	330012	Retaining Washer	1	1
4	311083	Cover	1	1
5	320160P47	Set Screw	4	4
6	**317083	Shaft ¾"	1	1
	**317084	Shaft 1"	1	1
	**317085	Shaft 1¼"	1	1
7	***313850	Impellers	1-2	1-2
8	320108P13	Spiral Pin ¾"	1	1
	320108P8	Spiral Pin 1"	1	1
	320108P5	Spiral Pin 1¼"	1	1
9	320032P42	Hex Head Screw	0	3
10	330001P08	Ext. Tooth Washer	3	6
11	*314459	Gasket	0	2
12	320032P41	Hex Head Screw	1	1
13	320156P11	Washer	1	1
14	313821	Tube Spacer	1	1
15	311084	Gearcase	0	1
16	*314459	Gasket	0	1
17	*315385	Locknut	0	1
18	*329387P01	Lockwasher	0	1
19	*310151	Gear	0	1
20	*310268	Key, Gear	0	1
21	311088	Spacer	0	1
22	320217P62	Socket Head Cap Screw	0	4
23	320050P26	Lockwasher	0	4
24	310265	Bearing Retainer	0	1
25	*330005-1	Shims (.005")	0	A/R
	*330005-2	Shims (.007")	0	A/R
	*330005-3	Shims (.020")	0	A/R
26	322969P2	Arbor ¾"	0	1
	322969P1	Arbor 1"	0	1
	322968P1	Arbor 1¼"	0	1
26A	322970P2	Arbor ¾"	1	0
	322970P1	Arbor 1"	1	0
	322971P1	Arbor 1¼"	1	0
27	*320216P16	Seal Upper	0	1
28	*330014/15	Bearing Set (Upper)	0	1
29	323680	Grease (1 Lb.) (Not Shown)	0	1
30	*330006-3	Seal Ring ¾"	1	1
	*330006-2	Seal Ring 1"	1	1
	*330006-1	Seal Ring 1¼"	1	1
31	*322852P1	Bearing	1	1
32	*330498-77	Spring Pin	0	1
33	*313828	Pinion	0	1
34	323402P1	Ratchet Handle Assembly w/Locking Shoe & Washer	1	1
37	330420	Vibration Pad	1	1
39	†323783A1	C-Clamp Assembly	1	1
	†315158	Cup Plate Mount	1	1
40	320032P37	Hex Head Screw	3	3
41	*320216P12	Seal, Lower	1	1
42	311082	Bearing Support (RG/RAG)	0	1
42	311090	Bearing Support (RH/RA)	1	0
43	313865	Motor, Electric	1	1
	313866	Motor, Air (RA/RAG)	1	1
44	320160P29	Socket Head Set Screw	2	0
45	330526	Name Plate w/Screws	1	1
46	*330412-1	Motor Shaft Seal	1	1

\* Recommended Spare Parts

\*\*\* Specify Bore, Diameter & Material When Ordering

\*\* Specify Length When Ordering

† Specify Which Mounting Type When Ordering

NOTE: When Ordering Replacement, Specify H.P. Current Characteristics, Enclosure, EMI Sales Order Number and Model Number.

## Air Motor Installation

Install a moisture trap and filter in the air line ahead of the motor. For efficiency of output and control of speed, use air lines the same size as, or the next pipe size larger than, the intake port of the motor. If operating intermittently without automatic air line oiler, place motor in accessible position for easy lubrication. When coupling or connecting motor to a driven member, avoid any end or side thrust on shaft, and especially, do not hammer on shaft. Connect the air line to the port that will produce clockwise rotation of the impeller (viewed from motor end).

## Air Motor Operation

The stalled or starting torque is less than the running torque, and will vary depending on the position at which the vanes stop in relation to air intake port. Operate motor well below available line pressure, so that full line pressure can be called upon for overloads on motor. The speed can be regulated by using a pressure regulator or a simple shut-off valve. The torque can be varied with the help of a pressure regulating valve (diaphragm type). For moderate speeds (under 2,000 r.p.m.), or intermittent operation, 1 squirt of oil in bearing oilers per day will suffice. If the duty is continuous, or speed is high, use an automatic air line oiler set to feed 1 to 3 drops per minute. The bearing will receive oil from the rotor chamber during automatic oiling. Use SAE #10 oil. Lubrication is necessary for the bearing, shaft seals, and rust prevention. Excessive moisture in the air line can cause rust formation in motor and might also cause ice to form on muffler, due to expansion of air through the motor. The moisture problem can be corrected by installing a moisture separator in the line, and also by installing an after-cooler between the compressor and air receiver.

## Maintenance & Lubrication

The outboard ball bearing (31) in either model is sealed and pre-greased for the life of the equipment. Upper bearing (28) (Gear Drive) is lubricated from the gear box. Gear box is lubricated at the factory for the life of the equipment.

## Mixer Disassembly

1. Open cover (4) by unscrewing panel screw (2). Back socket head set screws (5) well off shaft to prevent scoring. Remove shaft (6) and impellers (7). Slide impellers from shaft. Do not remove spiral pins (8).

## 2A. Direct Drive:

Remove hex head screw (12), washer (13) and tube spacer (14). Remove cover (4). Remove socket head set screw (44) from arbor. Remove hex head screw (40) and ext. tooth lockwasher (10). Remove arbor (26) and discard seal ring (30). Remove ball bearing (31). (Tapping might be necessary to remove bearing).

## 2B. Gear Drive:

A. Clamp unit in upright position. Remove hex head screws (9) and ext. tooth lockwasher (10), securing gearcase (15) to motor. Discard gasket (11). Wash grease out of gearcase. Remove hex head screw (12), washer (13), and tube spacer (14). Remove gearcase (15). Discard gasket (16).

B. Remove nut (17) and washer (18) from arbor. Remove gear (19), key (20), and spacer (21). Remove socket head cap screws (22), split lockwashers (23) and bearing retainer (24). Discard any shims (25). Press out arbor (26). This action also presses out seal (27), and bearing set (28). Seal ring (30) and bearing (31) should also slide out, but tapping may be necessary. Remove spring pin (32) from pinion. Slide pinion (33) from motor shaft.

3. Remove ratchet handle assembly w/washer and locking shoe (34). Remove c-clamp assembly. Replace vibration pad (37), if worn.

## Reassembly

Reassembly is the reverse of disassembly, except for the special characteristics noted below.

1. If applicable, distance between double impellers must remain the same as described in the **Mixer Impeller Assembly** paragraph.
2. On gear drive models, pack gearcase with SHELL DARINA EP GREASE 2, approximately 1 pint.
3. On gear drive models, shim under bearing retainer in gear drive to obtain .002-.006 end play.
4. Press fit bearings into place using the arbor.

## Spare Parts

Refer to the exploded view and parts list for information concerning parts required. Give the mixer assembly number and sales order number in any correspondence.



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