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**PORTABLE MIXERS  
CLAMP-ON CD, CA, CG, CGA SERIES  
OPERATING & MAINTENANCE INSTRUCTIONS**

**General Information**

CLEVELAND-EASTERN Portable mixers are designed to operate satisfactorily under all conditions normally encountered in liquid processing. It is precision machinery of the highest quality. With proper care your Portable will give years of trouble-free service. If you should have any questions regarding its operation, which are not answered in this manual, call Cleveland Eastern toll free 1-800-243-1188.

**Inspection, Storage, Shipping and Handling**

Your mixer has been carefully packaged utilizing foam-in-place to prevent any damage during transit.

Although unlikely, after uncrating your mixer, check for shipping damage. Report any damage immediately to the carrier and to Cleveland/Eastern at 1-800-243-1188. The mixer and propeller(s) are packed together. The mixing shaft is packed in a separate container.

**Storage**

**Do not** remove wrappings or protective coating if the mixer is to be stored before it is placed in operation. Store the mixer upright, in a clean, dry location. When gear drive models have been stored for more than a year, the condition of the gear lubricant should be checked before the mixer is installed (see lubrication instructions).

**Handling**

The mixer should be lifted with care. If the mixer is moved with the propeller 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.

**Shaft & Propeller Assembly**

- Place the mixing shaft into the spindle. Make sure the shaft bottoms in the spindle.
- A flat is provided in the shaft for the set screw in the spindle. Align and tighten the set screw.
- Align and mount the propeller at the opposite end of the shaft. Make sure that the set screw on the propeller is properly tightened.

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- A spiral pin (18) taped to the end of the shaft should be removed and inserted into the hole on the bottom of the mixer shaft to insure against the propeller dropping off the shaft into the product.
- For dual propellers the spacing of the upper propeller is significant with respect to stability, fluid regime and the horsepower drawn by the propellers. The best spacing peculiar to the particular application, will be given by the factory. Generally, the minimum spacing is two propeller diameters with an optimum spacing of four propeller diameters. See Figure "A,"

**Note:** Flats are not provided when a second propeller is used. This is to give the second propeller full adjustment over the complete length of the shaft.

**CAUTION** - Be extremely careful when handling the shaft. A slight bend will cause mixer vibration. Check alignment of all parts. Check to make sure all set screws are tight.

Figure A



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

### Mounting

See Figure A above for proper positioning.

Install the portable mixer with the clamp squarely on the tank edge or other suitable support by tightening the clamp (10) thumb-wheel.

Position the portable mixer as shown in Figure A for best top to bottom flow, this is accomplished through the nut (3) in the ball and socket.

- These mixers are designed to mount to various diameter vessels so care should be taken to make sure that the propeller rotates freely inside the vessel without interference of the inner vessel wall.
- Rotate the shaft by hand to be sure that there is no interference.
- Index marks are provided on the socket swivel so the user can record settings and reposition accurately.

### MOTOR CONNECTIONS

All portable mixers are equipped with drive motors that are especially designed for mixing service. Line cords are provided on fractional HP, single phase models.

The most commonly used motors are AC motors that are the TENV, TEFC or EXP ball-bearing type squirrel cage models.

Air motors and DC variable speed units are also provided on certain models. With the electric power off, make necessary electrical connections as required.

**Caution** - The motor must be wired in accordance with NEMA and all applicable federal, state and local electrical codes.

Test the 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.

### **Installation of Air Driven Mixers**

If your mixer is equipped with an air motor, install a moisture trap and filter in the airline 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. 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 airline to the port that will produce clockwise rotation of the propeller (viewed from motor end).

**Note:** The motor warranty is void if operated without an airline oiler or moisture filter.

### **Operating the Mixer**

Your mixer is designed to operate continuously under all standard conditions at normal levels. It is not good practice, however, to operate the mixer continuously when extreme vortexing or surging occur.

After the mixer has been securely fastened in position and a check of propeller rotation clearance has been achieved, the mixer is ready for operation.

Turn on the mixer. Allow time enough for the mixing pattern to be established, then make any required adjustment of position.

At the end of two week's service, check housing cap screws, clamp screw, and the set screws for tightness.

**Note:** Your Cleveland-Eastern Mixer(s) is carefully engineered, constructed and inspected. They are intended for operating in the service for which they are recommended. Emptying and filling the tank or drum while mixer is in operation can

cause unwanted problems. Light wall tanks or drums sometimes set up a harmonic vibration, which is not usually harmful to the mixer.

## **Air Motor Operation**

For mixers equipped with air motors, please note: 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 needle shut-off valve. The torque can be varied with the help of a pressure regulating valve (diaphragm type). For moderate speeds (under 2,000 RPM), 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 airline 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 airline 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 and Lubrication**

The outboard ball bearing (11) in either model is sealed and pre-greased for the life of the equipment. The upper bearing in gear drive models is lubricated from the gear box. The gear box is lubricated at the factory for the life of the equipment.

## **Mixer Overhaul Service for DIRECT DRIVE MODELS CD, CA**

### Disassembly:

- Disconnect ALL power and remove unit from tank.
- Remove set screws #12, then remove the shaft and propeller from the coupling.
- Loosen set screws #8
- Remove cap screws #14 then lift the motor from the housing.
- Clean the motor spindle housing or gear case with solvent or an alkali cleaner.
- Clean all internal parts with solvent or an alkali cleaner.
- When the bearing is removed, clean it with "Mineral Seal" or Neutral Oil."
- Inspect the bearing for wear. If the bearing is used again, dip it in oil or coat it with soft grease to prevent rusting.

**Note:** Replace all damaged or worn parts

### Reassembly

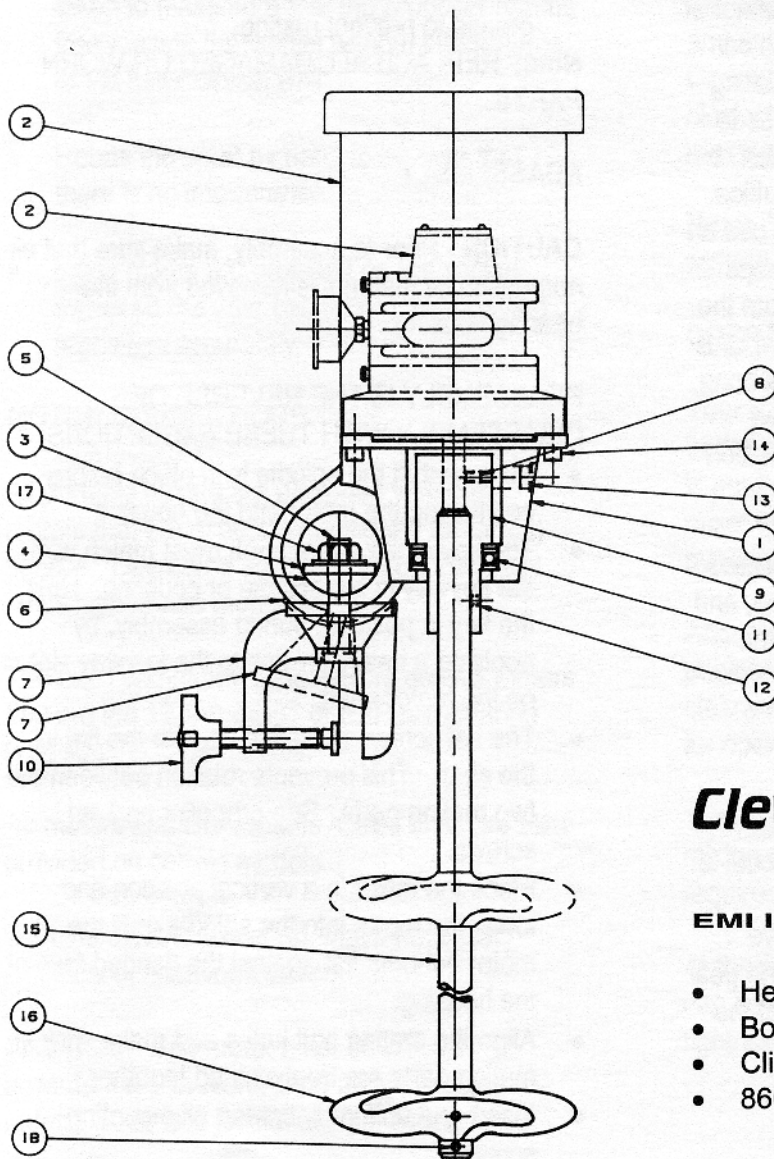
**Caution-** Prior to assembly, make sure that all non-essential material is removed from the bearing housing.

Reassembly is the reverse of disassembly with these exceptions:

- Be sure that the spindle is in place before positioning the motor into the housing.
- The key in the motor shaft must match with the keyway in the spindle or coupling.
- Hold the key in position, during assembly, by applying a heavy grease to the keyway slot on the motor shaft.
- The set screws must line up with the flat in the shaft. This prevents rotation between the two mating parts. See propeller and set screws.
- Place the mixer in a vertical position and lower the motor into the spindle until the motor bottoms flat against the flanged face of the housing.
- Align the mating bolt holes and make sure all mating parts are freely joined together.
- Insert and uniformly tighten all mounting screws.

# PARTS LIST

Ref. #	Part Number	Description	Qty.
1	340073	Housing	1
2	313865	Electric Motor	1
2	313866	Air Motor	1
3	320049P5	Hex Head Nut	1
4	A-CPR-5	Saddle	1
5	320032P61	Hex Head Cap Screw	1
6	A-CPR-31	Isolator Pad	1
7	315158	Cup Plate Mount	1
7	C-3928	Clamp	1
8, 12	320160P29	Set Screw Socket Head	2
9	340074-1	Arbor 3/4"	1
9	340074-2	Arbor 1"	1
10	340001	Handle & Screw Assembly	1
11	322852P1	Bearing	1
13	329388PO1	Plug Button	1
14	320217P122	Cap Screw	4
15	340075	Shaft 3/4"	1
15	340076	Shaft 1"	1
16	313850	Propeller	1
17	A-2145	Pressure Plate	1
18	320108P13	Spiral Pin 3/4"	1
18	320108P8	Spiral Pin 1"	1



  
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