LIGHTNIN

MIXER MANUAL

INSTRUCTIONS

INSTALLATION

OPERATION

MAINTENANCE

Ship To Customer:	COLE-PARMER INSTRUMENT COMPANY
Bill To Customer:	COLE-PARMER INSTRUMENT CO
PO Number:	WM237
Model:	Lightnin Mixer Model EV1P25
Order Number:	0001049548
Line Number:	000010

Tagging:
50310-36

INSTRUCTION MANUAL

LIGHTNIN SALES ORDER 0001049548

LIGHTNIN LINE ITEM 000010

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SAFETY CHECK LIST

IMPORTANT WARNINGS

All *LIGHTNIN* Mixers and Aerators are provided with properly designed lifting devices and safety covers to avoid potential injury and/or equipment damage. The following SAFETY CHECK LIST should be THOROUGHLY REVIEWED AND ADHERED TO before installing, operating or performing maintenance on the mixer. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS INJURY. Ensure the use of qualified, quality trained and safety conscious personnel.

1. Use only the lifting device, if provided, on your unit to install the mixer. Use shouldered eyebolts and tighten securely to handle component parts. We strongly recommend that the hoist rings be of safety swivel type with 360° rotational capability. Lift per instructions in the instruction manual.

2. DO NOT connect the motor to the power source until all components are assembled, the mixer is installed, and all hardware is tightened to the proper torque which is specified in the operation and maintenance manuals supplied by *LIGHTNIN*.

3. DO NOT operate shaft sealing devices at temperatures or pressures higher than those specified in the manual or on the nameplates.

4. DO NOT service the mixer until you have followed your ”Control of Hazardous Energy Sources” (lockout, tagout procedure) as required by OSHA 29 CFR Part 1910.

5. DO NOT touch rotating mixer parts or any part of mixer that has the potential of having a hot surface including motor, gear drive housing, seal, shafting and flange.

6. DO NOT operate mixer for service other than its intended use, that being fluid mixing with the mixer attached to a rigid structure and connected to a power source appropriate to operate the drive motor.

7. DO NOT make any field changes or modifications (horsepower, seal material components, output speed, shaft lengths, impellers, etc.) without reviewing the changes with your *LIGHTNIN* Sales Representative or the *LIGHTNIN* Customer Service Department.

8. DO NOT install an aftermarket Variable Frequency Drive without first consulting your *LIGHTNIN* Sales Representative or the *LIGHTNIN* Customer Service Department to determine the compatibility of the existing motor with the Variable Frequency Drive.

9. DO NOT operate mixer until you have checked the following items:
   - A. Make sure the mixer is properly grounded.
   - B. Ensure all protective guards and covers are installed. Guarding of the mixer shaft below mixer mounting surface is the responsibility of the customer.
   - C. Ensure all detachable components are securely coupled to the mixer.
   - D. Thoroughly REVIEW and ADHERE TO the mixer operating instructions supplied by *LIGHTNIN*.
   - E. Ensure the mixer output shaft rotates freely by hand.
   - F. Ensure all personnel and equipment are clear of rotating parts.
   - G. Ensure all external connections (electrical, hydraulic, pneumatic, etc.) have been completed in accordance with all applicable codes and regulations.

10. DO NOT enter the mixing vessel UNLESS:
    - A. The mixer power supply is locked out (follow Item number 4).
    - B. The mixer shaft is firmly attached to the mixer drive or the shaft is supported securely from below.
    - C. You have followed applicable confined space regulations.

CE COMPLIANCE

If mixer nameplate has a CE marking on it, then the equipment furnished conforms to the following directives:

98/37/EC Machinery Directive

89/336/EEC Electro–Magnetic Compatibility

73/23/EEC Low Voltage

Any CE marking and/or associated documentation applies to the mixer only. This has been supplied on the basis that the mixer is a unique system. When the mixer is installed, it becomes an integral part of a larger system which is not within the scope of supply and CE marking is the responsibility of others.

CAUTION: CE Compliance does not imply that the mixer satisfies PED (Pressure Equipment 97/23/EC) or ATEX (Potential

Explosive Atmospheres 94/9/EC) unless marking is clearly shown on mixer.

‘

NOISE LEVELS

SOUND PRESSURE LEVELS

Portable Series: ECL, EV – maximum 80 Dba @ 1 meter

Heavy Series: S10, 70/80, 500/600 – maximum 85 Dba @ 1 meter

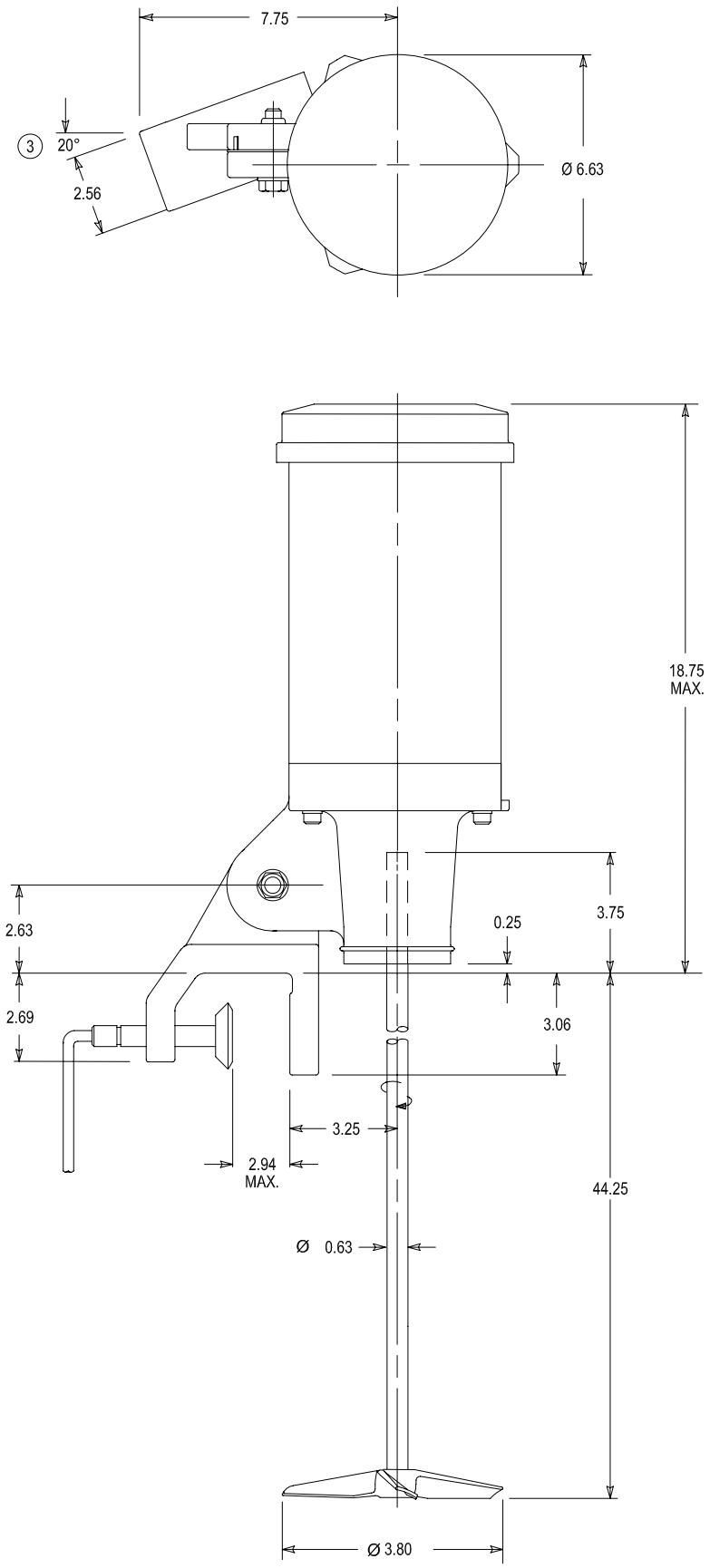
THIS PRODUCT MAY BE COVERED BY ONE OR MORE OF THE FOLLOWING U. S. PATENTS:

5006283	5046245	5118199	5152934	5152606	5203630
5344235	5364184	5368390	5378062	5427450	5454986
5470152	5478149	5480228	5501523	5511881	5560709
5568975	5568985	5655780	5720286	5746536	5758965
5779359	5842377	5925293	5951162	5972661	5988604
6089748	6109449	6142458	6158722	6250797	6299776
6334705	6386753	6457853	6634784	6715913	6742923
6746147	6789314	6796707	6796770	6808306	6843612
6860474	6877750	6935771	6986507	6997444	7001063
	7056095	7168641	7168848	7168849	

DATE: 06/18/2008

NOTES:

1. DIMENSIONS ARE IN INCHES AND ARE MAXIMUM.
2. WEIGHT (LESS SHAFT AND IMPELLERS): 44 LBS.
3. UNIT OFFSET 20° HORIZONTALLY, AND ADJUSTABLE 10° (OR MORE) VERTICALLY. UNIT ALSO AVAILABLE WITH 0° OFFSET.
4. MATERIAL OF MIXER PARTS IN CONTACT WITH TANK CONTENTS IS 316
5. MOTOR DATA:
   H.P.: 0.250 R.P.M.: 1725 DUTY: STANDARD DUTY
   VOLTS: 230/460 PHASE: 3 Hz: 60
   ENCLOSURE: TEFC IMPELLER R.P.M.: 1725



LIGHTNIN®
MIXERS AND AERATORS

ISO 9001 CERTIFIED

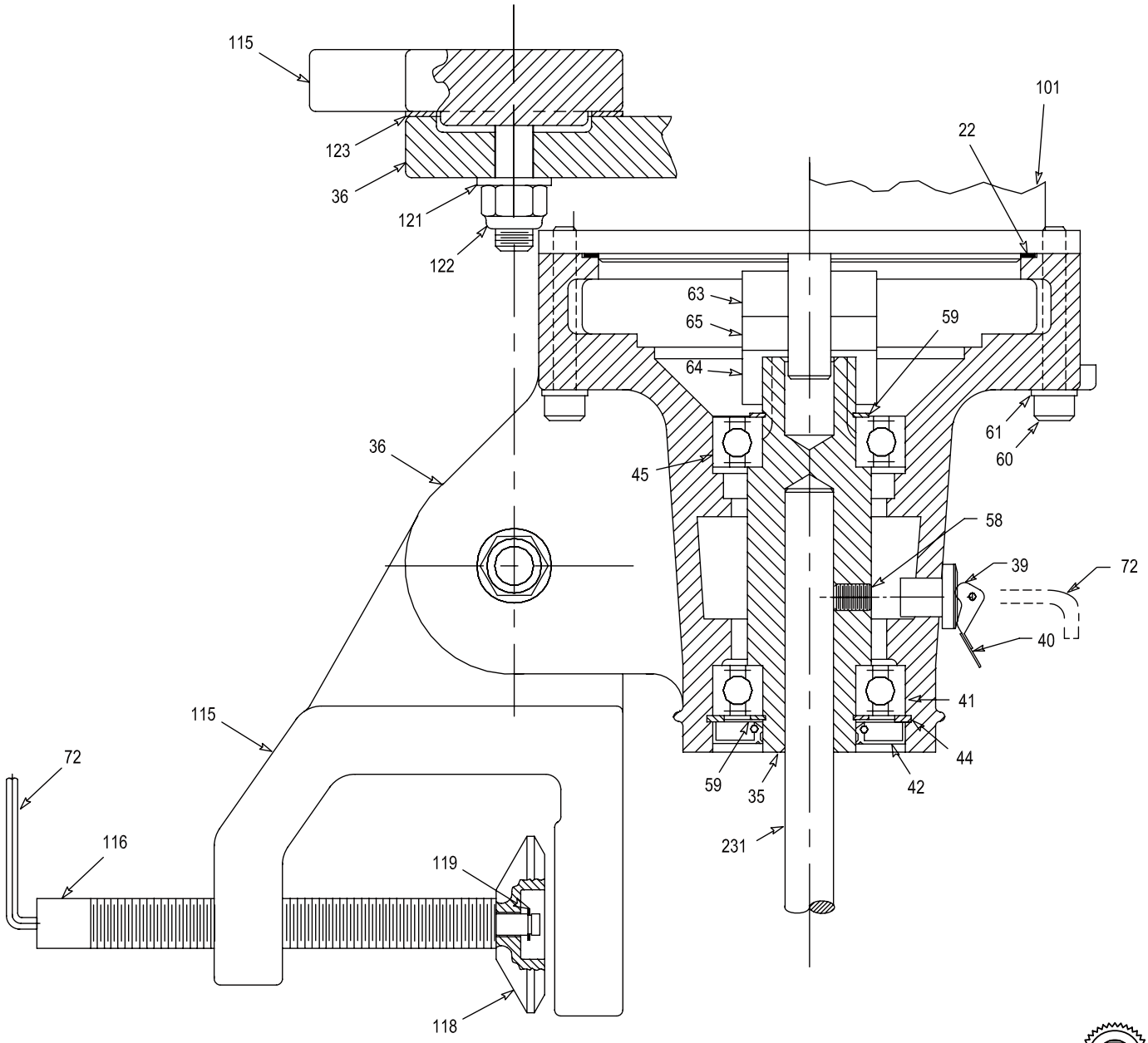
GENERAL ARRANGEMENT

FOR: **COLE-PARMER INSTRUMENT CO**

S.O. NO.: 1049548 ITEM NO.: 10
CUST. P.O. NO.: WM237 QUANTITY: 1
TAG NO.: 50310-36
MIXER MODEL: EV1P25 RATIO: 1:1
SERIAL NO.: 1000001772163

CERTIFIED BY: _____ DATE: _____

DRAWING NO. 1049548000010-A



WHEN ORDERING PARTS, SPECIFY:
MODEL AND SERIAL NUMBER, PART NAME,
ITEM NUMBER AND DRAWING NUMBER

ISO 9001 CERTIFIED

ITEM	PART NAME	ITEM	PART NAME
61	FLAT WASHER (4)	231	MIXER SHAFT
60	SOCKET HEAD CAP SCREW (4)	123	ROTATIONAL INSERT
59	RETAINING RING	122	HEX LOCKNUT
58	HEX SOCKET SET SCREW - NYLOK	121	FLAT WASHER
45	BALL BEARING	119	RETAINING RING
44	RETAINING RING	118	CUP WASHER
42	OIL SEAL	116	CLAMP SCREW
41	BALL BEARING	115	TANK CLAMP
40	LANYARD	101	MOTOR
39	EXPANSION PLUG	72	HEX WRENCH
36	HOUSING	65	COUPLING INSERT
35	DRIVE QUILL	64	MIXER COUPLING HALF
22	GASKET	63	MOTOR COUPLING HALF

LIGHTNIN®
MIXERS AND AERATORS

ASSEMBLY DRAWING

EV "P" SERIES MIXER DIRECT DRIVE BEARING HOUSING ASSEMBLY

DRAWING NO. L-17094C

GENERAL INSTRUCTIONS
"EV" SERIES DIRECT DRIVE MIXERS

SECTION 1 - INITIAL INSPECTION, SHIPPING ARRANGEMENTS

1.1 Check the shipping crates and your ***LIGHTNIN*** equipment for possible shipping damage. Report any damage immediately to the carrier and our factory.

1.2 The mixer and impellers are packed together. The mixer shaft, if over 48 inches long, is packed in a separate container.

1.3 Do not remove any protective coatings or wrappings until the mixer is ready to be put into service. If the mixer is to be stored, store only in an indoor, clean, dry location with controlled temperatures of 15° C to 40° C (59° F to 104° F).

SECTION 2 - MIXER INSTALLATION

2.1 Refer to Installation drawing for:

a . Proper mixer mounting and location.

b . Proper minimum impeller off-bottom and relative spacing for dual impeller applications.

2.2 Lock-out power before positioning mixer, and review safety instructions before starting mixer.

2.3 The clamp and beamplate are cast offset at recommended 20° horizontal plane and adjustable 0-10° in the vertical plane. Clamp and beamplate are also available with zero degree offset in the horizontal plane and adjustable 0-10° in the vertical plane. Refer to Table 1 for recommended angular positions.

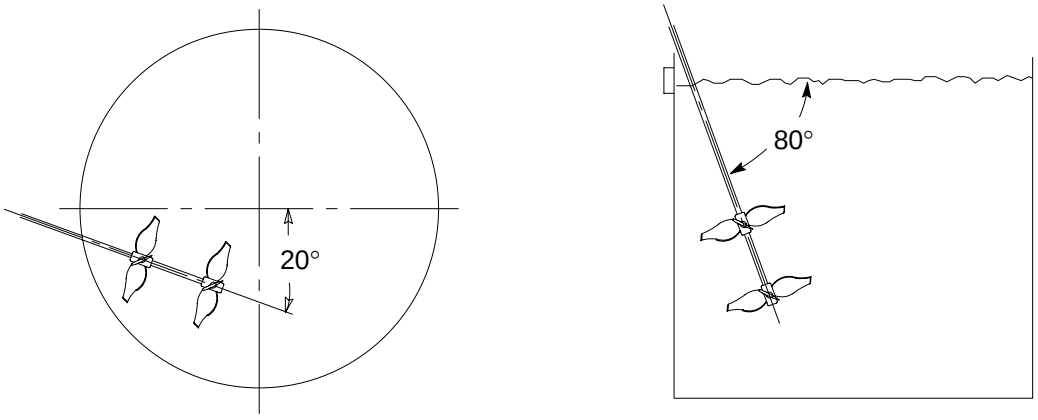


Table 1 - Mixer positioning

2.4 BOLT TIGHTENING TORQUE RECOMMENDATIONS

a . Inadequately or improperly tightened hardware can loosen due to vibration or the reactions imposed by fluid forces. This can result in reduced equipment service life or damage and failure.

b . Recommended torques for tightening the bolts and screws on your ***LIGHTNIN*** mixer are listed with assembly instructions. Use of a torque wrench is recommended to ensure compliance with torque recommendations.

c . The amount of torque required to maintain a tight connection can vary considerable for bolts of the same size under different operating conditions. Variations such as basic joint design, compression factors, type and strength of base and hardware material, surface finish of mating parts and lubrication are only some of the factors that influence the tightness of bolted connections for given torque values.

d . All bolts should be coated with oil, grease, or an anti-seize compound whenever possible. The threads and bearing face of bolt heads and/or nuts should be lubricated.

e . **ALL BOLTS SHOULD BE RETIGHTENED AFTER THE UNIT HAS BEEN RUN UNDER LOAD FOR TWO (2) WEEKS, AND AT EACH SCHEDULED SHUT-DOWN THEREAFTER.**

f . Unless otherwise specified, it is recommended that metric commercial standard class 8.8 bolts and screws, and class 8 nuts be used for all bolted connections. For inch hardware use GR5.

SECTION 3 - SHAFT AND IMPELLER INSTALLATION

3.1 Install the impeller(s) on the mixer shaft (231) by tightening the set screws in the impeller hub. Refer to the installation drawing for recommended dual impeller spacing if two impellers are supplied. Refer to Impeller Assembly drawing for general impeller orientation.

3.2 Clean the mixer shaft (231) end and drive quill (51) thoroughly.

3.3 Orient the drive quill so that the set screw (58) aligns with the hole in the bearing housing (36). Align quill shaft by inserting lower shaft (231) into quill and rotate quill manually.

3.4 Grasp mixer shaft approximately 20 inches below the shaft top and insert the mixer shaft completely into the drive quill, until it contacts the top of the quill bore. Align flat on shaft with set screw (58). Tighten the set screw (58).

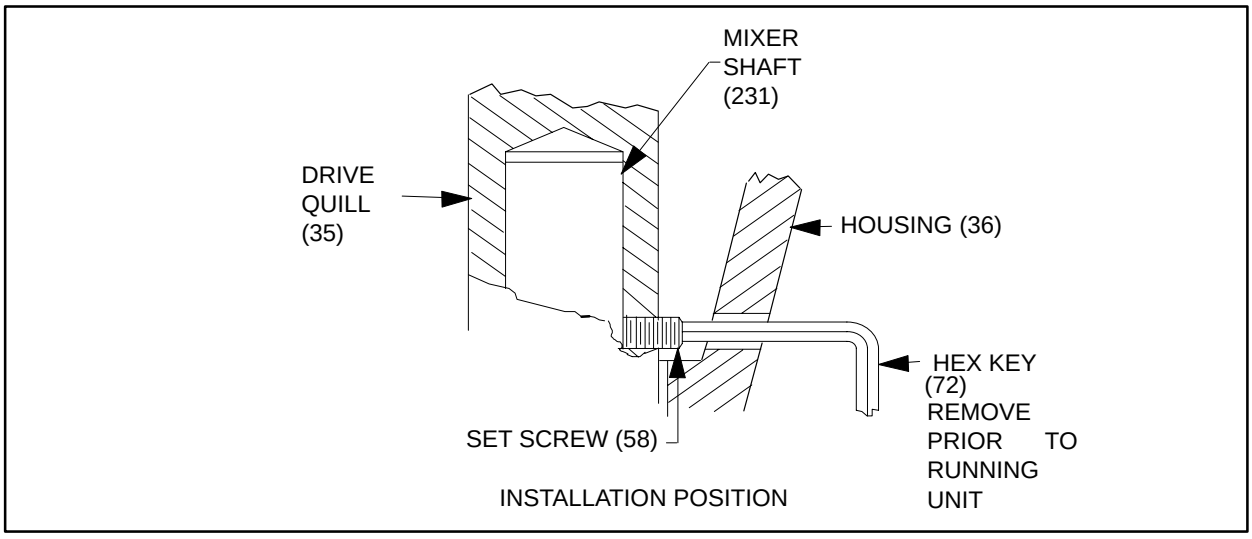


Figure 1 - Shaft Installation

3.5 DRIVE QUILL ORIENTATION

a . NORMAL LIGHT CONDITIONS - Rotate the drive quill until the set screw (58) aligns with the access hole in the housing (36). Rotate drive quill by inserting lower shaft into drive quill and rotating by hand.

b . LOW LIGHT CONDITIONS - If the mixer shaft is being installed in low light conditions, the drive quill can be oriented by feel. Insert lower shaft into drive quill and rotate the drive quill (35) by hand until the set screw (58) can be felt with the hex wrench through the access opening.

3.6 With the drive quill oriented, insert the 7/32” hex key (72) provided into the housing opening and tighten the set screw (58) to (15-30 ft-lbs). **DO NOT IMPACT THE WRENCH OR USE AN EXTENSION.**

3.7 Check for free movement of all components by rotating the mixer shaft.

SECTION 4 - SHAFT REMOVAL

CAUTION: THE UPPER PORTION OF THE MIXER SHAFT (231) MAY BE HOT TO THE TOUCH. ONCE REMOVED FROM THE DRIVE QUILL (35), DO NOT GRASP THE UPPER 20” OF THE MIXER SHAFT.

4.1 It is recommended that the mixer be removed from the tank before shaft or shaft and impeller are removed.

a . Make sure all electrical power is disconnected.

b . Grasp impeller by hand (or shaft with a strap wrench) and rotate mixer shaft (231) until the drive quill set screw (58) aligns with the access hole in the housing (36). See Caution above.

c . With hex key (72) loosen set screw (58) and back out two (2) turns. See Figure 2.

d . Remove mixer shaft from quill. See Caution above.

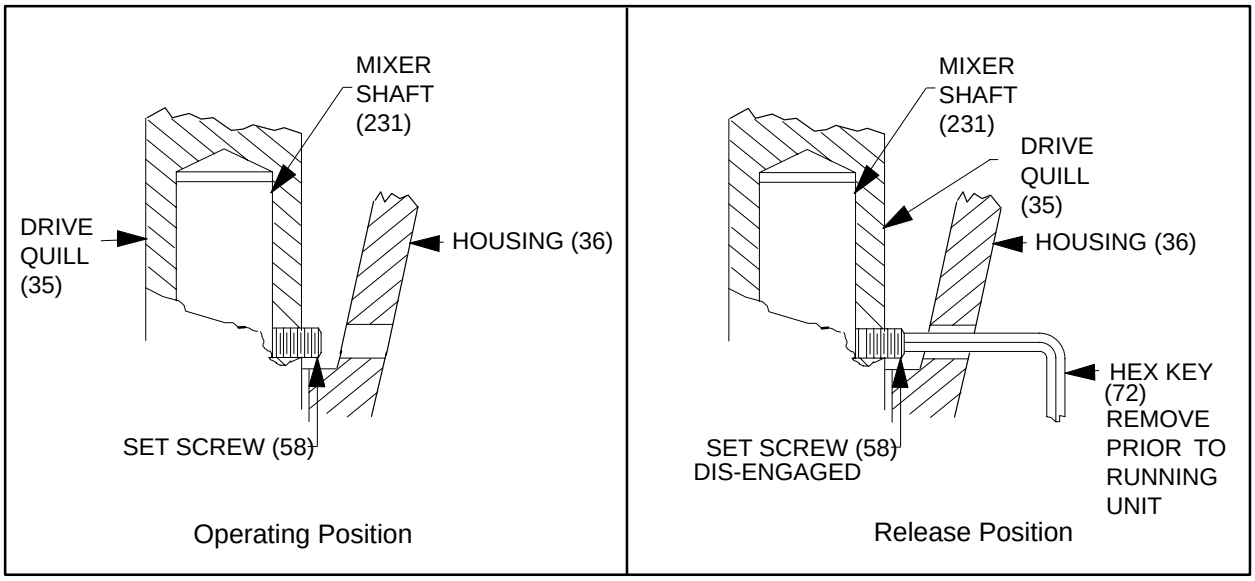


Figure 2 - Shaft Removal

SECTION 5 - MIXER OPERATION

5.1 This ***LIGHTNIN*** mixer is designed for continuous operation and normally needs no additional maintenance.

CAUTION: IT IS NOT RECOMMENDED TO OPERATE THE MIXER WITH EXTREME VORTEXING OR SURGING OF THE LIQUID BEING MIXED.

5.2 At the end of two weeks service, check all hardware for tightness.

WARNING: AT THE END OF THE MIXING CYCLE, IT IS GOOD PRACTICE TO TURN OFF THE MIXER BEFORE THE TANK HAS BEEN DRAINED TO A LEVEL WHICH WILL RESULT IN EXCESSIVE SPLASHING. THIS MAY RESULT IN SHAFT DAMAGE.

SECTION 6 - LUBRICATION

6.1 All mixer bearings are the sealed type and are pre-packed with lubricant. Relubrication of these bearings is not necessary.

SECTION 7 - DISASSEMBLY INSTRUCTIONS

WARNING: DISCONNECT MOTOR LEADS OR OTHERWISE LOCK-OUT POWER SUPPLY BEFORE SERVICING THE MIXER. EYE PROTECTION MUST BE WORN.

7.1 This mixer is precision manufactured and assembled to provide long trouble free service when properly maintained. If it becomes necessary to disassemble the unit, careful precise reassembly is necessary.

7.2 Refer to the assembly drawings for location of parts.

7.3 Equipment that will be required to service the mixer, in addition to standard mechanics tools is, a rubber mallet, retaining ring pliers, metric and ”inch” allen wrenches, arbor press and torque wrench.

7.4 When disassembling the mixer, clean external surfaces adjacent to prevent dirt from entering the housings.

7.5 It is recommended that oil seals and gaskets be replaced when the mixer is disassembled.

7.6 SEAL REPLACEMENT

Inspect oil seals and gaskets for nicks, gouges and deformities. When replacing seals:

a . Coat the lips of seals with bearing grease.

b . Install oil seal with lip facing up as shown in Figure 3.

c . Coat the section of shaft sealing surface with oil.

7.7 BEARING REPLACEMENT

a . Old bearings can be removed with a puller or an arbor press.

b . New bearings can be pressed on the shafts. Be careful to apply load only to the inner race.

c . Make sure the bearings are tightly seated against the shaft or housing shoulders with no clearance.

7.8 SHAFT REMOVAL

Loosen set screw (58) and remove mixer shaft (231) as outlined in Section 4.

7.9 MOTOR REMOVAL

a . Remove the mixer from the tank and remove the mixer shaft (231) as outlined in Section 4.

b . Tip the mixer upside down on a workbench.

c . Remove the four socket head cap screws (60) holding the bearing housing (36) to the motor (101).

d . Lift the bearing housing off the motor. It may be necessary to tap the bearing housing GENTLY with a rubber mallet to get the bearing housing to separate from the motor.

e . Remove motor coupling half (63) and insert (65) from motor shaft.

7.10 BEARING MODULE DISASSEMBLY

a . Remove the oil seal (42) from the drive quill (35). This oil seal will be damaged and a new oil seal must be installed when reassembled.

b . Remove retaining ring (44).

c . Remove upper retaining ring (59).

d . Place the bearing housing upright in a press, and press out the drive quill (35) and lower bearing (41).

e . Remove lower retaining ring (59) and bearing (41) from the drive quill (35).

f . Remove upper bearing (41) from housing (36).

g . Inspect bearing (41) for excessive wear. Replace if necessary.

SECTION 8 - ASSEMBLY INSTRUCTIONS

8.1 QUILL ASSEMBLY

Insert the set screw (58) into the drive quill (35) until it is flush with the bore of the quill.

8.2 BEARING MODULE ASSEMBLY

a . Press the lower bearing (41) onto the drive quill (35) bearing journal. The bearing must seat against the drive quill shaft shoulder with no visible gap.

b . Install the lower external retaining ring (59).

c . Press the drive quill assembly into the bearing housing (36) from the bottom until the bearing seats on the housing shoulder.

d . Install lower retaining ring (44).

e . Press oil seal (42) in place with the seal cavity facing as shown in Figure 3. Make sure the oil seal has the internal spring removed. This is a non-lubricated seal, and will run hot and have a shortened life if the spring is not removed.

f . Turn the bearing housing over, support the assembly on the quill shaft (35) and install the upper bearing (45) by pressing it into the bearing housing and onto the quill shaft.

g . Install the upper retaining ring (59).

h . Support the bearing housing assembly in an upright position and press the drive quill downward until the bearing (41) shoulders on the retaining ring (59). This will relieve any locked in axial load on the bearing created during assembly.

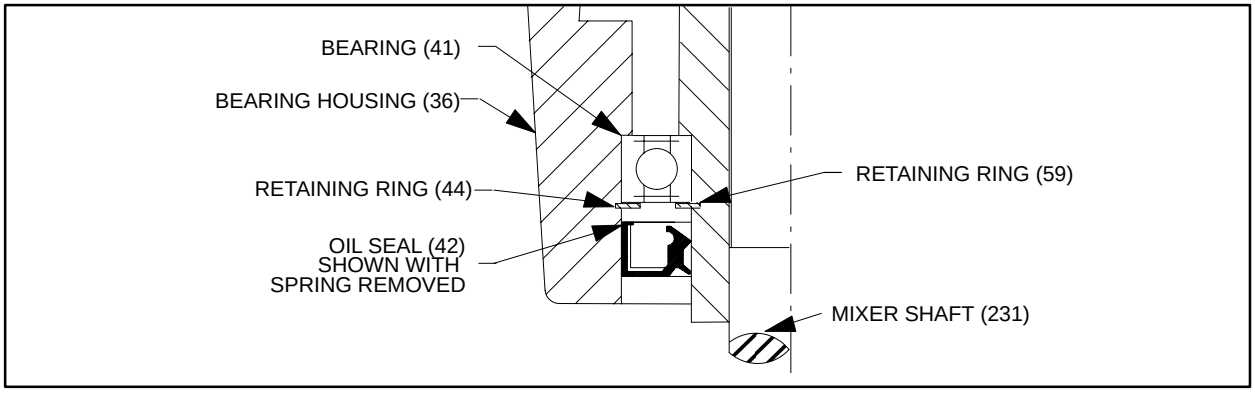


Figure 3- Oil Seal Installation

8.3 FINAL ASSEMBLY (Refer to assembly drawing L-17094).

a . Install gasket (22) around the bearing housing (36).

b . Assemble mixer coupling hub (64) to the quill shaft (35), until it seats against the upper retaining ring (59). Tighten the mixer hub set screw to 5 ft-lbs. Install the insert (65) on the mixer hub.

c . With the motor upside down on a workbench, assemble the motor coupling hub (63) to the motor shaft as shown in Figure 4. Align motor coupling hub keyway 180° opposite motor output shaft keyway. Motor coupling hub set screw is tightened against motor output shaft (key is not used in the assembly). Tighten the motor hub set screw to 5 ft-lbs.

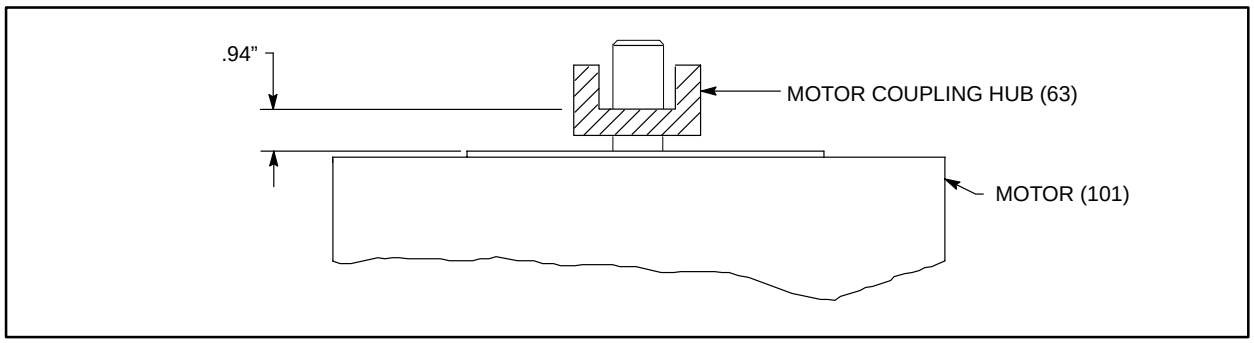


Figure 4 - Motor Coupling Hub Installation

d . Align coupling hubs and assemble the bearing housing to the motor, using care so as not to damage the flexible element (65) or the gasket (22).

e . Bolt the bearing housing (36) to the motor (101), using socket head cap screws (60) and washers (61). Alternately tighten the hardware to 9 ft-lbs to ensure that all components are drawn evenly together.

f . Install mixer shaft (231) as outlined in Section 3.

SECTION 9 - AIR MOTOR REQUIREMENTS

Be sure your compressor has capacity for both pressure and the proper cubic feet per minute air displacement. Wet air, and low pressure will cause sticking of the motor, requiring hand starting. It is important to use an air filter and moisture trap near the motor for removal of foreign matter. Maximum recommended operating pressure is 100 P.S.I.

AIR PRESSURE / AIR CONSUMPTION GUIDE
FOR AIR MOTOR DRIVEN MIXER
(AIR MOTOR OPERATING AT 1800 RPM)

			PRESSURE CONSUMPTION REQUIRED	
H.P.	GAST MOTOR #	SHAFT RPM	* (PSIG)	** (CFM FREE AIR)
1/3	#2	1800	60	15
1/3	#2	360	60	15
1	#4	1800	85	30
1	#4	360	85	30

* Live pressure should be approximately 1-1/2 times the operating pressure of the air motor. The full line pressure will then be available for overloads and startup.

** CFM free air refers to air at atmospheric conditions measured at the inlet of the compressor.

Table 2

SECTION 10 - AIR MOTOR LUBRICATION

10.1 Use only a high detergent lubricant of the recommended viscosity. Recommended oils are shown in Table 3.

10.2 For continuous duty or high speed operation, it is recommended that an automatic lubricating device in the air line be provided to feed 1 to 3 drops per minute to the motor. If required request optional air-line lubricator (part # 151030psp).

10.3 For manual oiling, remove the oil cap at the top of the motor, and add one squirt of oil at the end of each 8 hours of operation.

RECOMMENDED LUBRICANT	AMBIENT TEMPERATURE	GRADE OF OIL
GAST AD 220 (SAE #10) OR A HIGH DETERGENT AUTOMOTIVE ENGINE OIL DESIGNED FOR ANY ONE OR MORE OF THE FOLLOWING API SERVICE RATINGS SB, SC, SD, SE, CB, CC, CD.	BELOW 32° F	DILUTE SAE #10 OIL WITH 25% KEROSENE
	32° F TO 100° F	SAE #10 OIL
A HIGH DETERGENT AUTOMOTIVE ENGINE OIL DESIGNATED FOR ANY ONE OR MORE OF THE FOLLOWING API SERVICE RATINGS - SB, SC, CD, CE, CB, CC, CD.	101° F TO 200° F	SAE #20 OIL

Table 3 - Motor Lubrication

ELECTRIC MOTOR INSTRUCTIONS

SECTION 1 - INITIAL INSPECTION

1.1 Care is taken at the factory to assure that the motor arrives at its destination in first class condition. If there is evidence of rough handling or damage in shipment, file a claim at once with the carrier and notify our factory.

Examine the outside of the motor carefully for damage, with particular attention to the conduit box, fans and covers. Check nameplate for correct speed, kilowatt, voltage, hertz and phase for conformance with power supply. See Section 1.3 for warning on explosion-proof motors.

1.2 GENERAL DATA:

a .Single phase totally enclosed motors are wired at our factory for correct rotation.

b .All three phase and explosion-proof motors must be field wired for proper rotation. If rotation does not agree with nameplate, reverse any two line leads.

c .Dual voltage motors must be wired for the desired voltage. Refer to the connection diagrams provided on the motor nameplate, inside the conduit box cover or in this manual.

d .Refer to Section 2 for motor maintenance and storage instructions.

1.3 WARNING

• EXPLOSION-PROOF MOTORS - These motors are constructed to comply with the U.L. Label Service Procedure manual. When repairing and reassembling a motor that has an Underwriter's Label, it is imperative that the unit be reinspected and;

a .All original fits and tolerances must be maintained

b .All plugs and hardware to be securely fastened

c .Any part replacements, including hardware, be accurate duplicates of the originals

REPAIR WORK ON EXPLOSION-PROOF MOTORS CAN ONLY BE DONE BY THE ORIGINAL MANUFACTURER. VIOLATIONS OF ANY OF THE ABOVE ITEMS WILL INVALIDATE THE SIGNIFICANCE OF THE U.L. LABEL.

- **EXPLOSION-PROOF MOTORS ARE EQUIPPED WITH AN INTERNAL CIRCUIT INTERRUPTING DEVICE WHICH TRIPS WHEN OVER HEATING OCCURS. THIS THERMAL PROTECTION CIRCUIT WILL RESET AUTOMATICALLY WHEN UNIT COOLS.**
- If the thermal protector continues to trip, some abnormal condition exists. This condition must be corrected before motor will operate normally.
- **ALWAYS DISCONNECT POWER LINE BEFORE SERVICING ANY PART OF THE MIXER**. Unexpected motor start-up may occur after the thermal protection circuit trips.

1.4 After unpacking and inspection to see that all parts are in good condition, turn the shaft by hand to be sure there are no obstructions to free rotation. Equipment which has been in storage should be tested prior to being put into service.

a .It is best to check the insulation resistance of the stator winding with a megohmeter. If resistance is lower than one megaohm, consult ***LIGHTNIN***®.

b .Motors are shipped from the factory with sealed, shielded bearings properly packed with grease and ready to operate. Bearings are not regreaseable.

1.5 WIRING - Examine the nameplate data to see that it agrees with the power circuit to which the motor is to be connected. The motor is guaranteed to operate successfully with frequency not more than 5% and voltage not more than 10% above or below the nameplate data, or combined variation of voltage and frequency of not more than 10% above or below nameplate data. Efficiency, power factor and current may vary from nameplate data.

1.6 Connect the motor leads to a power source that matches the line voltage and wiring diagram specified on the motor nameplate.

1.7 Check impeller shaft rotation by jogging the motor until it is determined that rotation is correct.

1.8 **CAUTION**

Repeated trial starts can overheat the motor (particularly for across-the-line starting). If repeated trial starts are made, allow sufficient time between trials to permit heat to dissipate from the windings or rotor to prevent overheating. Starting currents are several times running currents, and heating varies as the square of the current. Do not exceed 12 starts per hour.

1.9 **WARNING**

The frames and other metal exteriors of motors should be grounded to limit their potential to ground in the event of accidental connection or contact between live electrical parts and the metal exteriors. All motors should be grounded through the conduit box. Explosion-proof motors have an integral ground lead for grounding.

1.10 **WARNING**

Before starting motor, remove all unused shaft keys and loose rotating parts to prevent them from flying off.

1.11 Start motor and operate at minimum load prior to filling the tank or basin. Look for any unusual condition.

The motor should run smoothly with little noise. If the motor should fail to start and produces a decided hum, it may be that the load is too great for the motor or that it has been connected improperly. Shut down immediately and investigate for trouble.

SECTION 2 - MOTOR MAINTENANCE AND STORAGE

Electric motors or other prime movers are not prepared by ***LIGHTNIN***® for indoor storage beyond 12 months in a dry ambient atmosphere with controlled temperatures, or 6 months in a dry ambient atmosphere with no temperature control. OUTDOOR STORAGE OF ELECTRIC MOTORS IS NOT RECOMMENDED BY ANY MOTOR MANUFACTURER. For information on storage periods beyond those shown, consult ***LIGHTNIN***®.

2.1 To insure continued reliable operation of electric motors, the following basic rule applies: **KEEP THE MOTOR CLEAN AND DRY.** Motors should be inspected, and output shaft rotated, at a minimum of 6 month intervals with increased frequency as needed depending upon the type of motor and the service.

2.2 Terminal connections and assembly hardware may loosen from vibration during service and should be tightened.

2.3 Insulation resistance should be checked at operative temperature and humidity conditions to determine possible deterioration of insulation due to excessive moisture or extremes in operating environment. If wide variations are detected, motors should be reconditioned.

2.4 LUBRICATION - The ball bearing has deep grooved, double shielded sealed bearings with sufficient lubricant packed into the bearings by the manufacturer for “life lubrication”. The initial lubricant is supplemented by a supply packed into larger reservoirs in the end shield at time of assembly. No grease fittings are provided, as the initial lubrication is adequate for up to 10 years of operation under normal conditions.

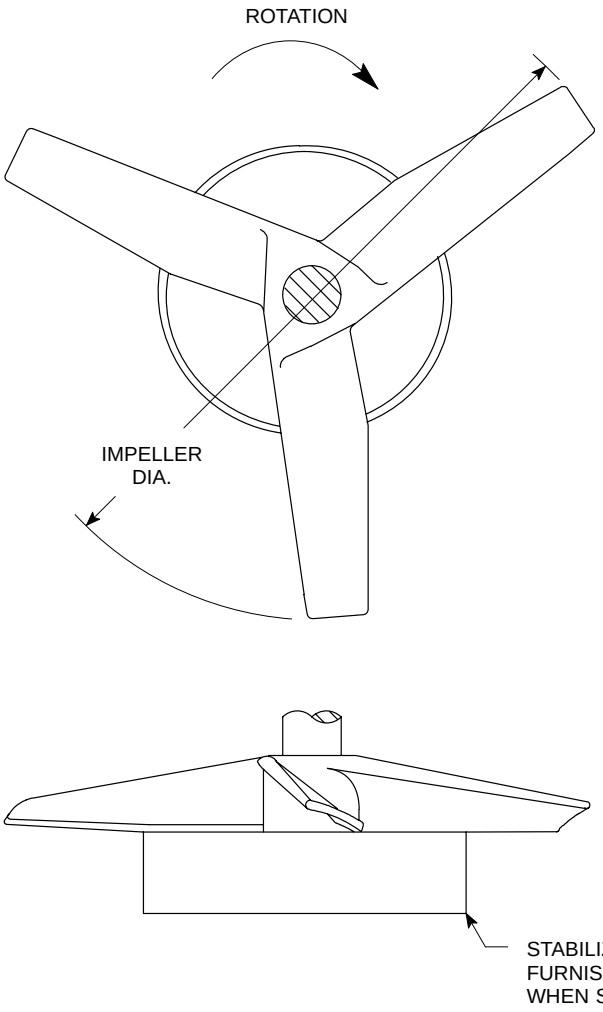
2.5 **STORAGE REQUIREMENTS FOR MOTORS –** These extended storage requirements must be followed to allow the submission of a valid warranty claim.

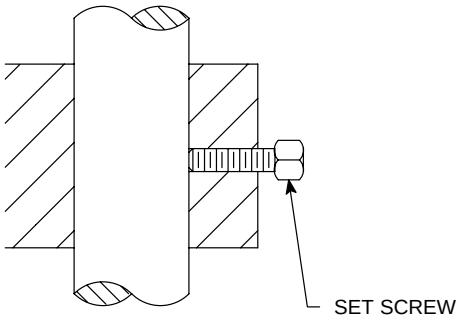
a .The motors, if not mounted, are to be stored in the original containers in a clean, dry, protected warehouse.

b .The storage area is to be free from any vibration and from extremes in temperature.

c .Windings to be megged at the time equipment is put in storage. At the time of removal from storage, the resistance reading must not have dropped more than 50% from the initial reading. Any drop below this point, consult ***LIGHTNIN***®.

d .All external parts and motors subjected to corrosion should be protected by a corrosive resistant coating.





WHEN ORDERING PARTS, SPECIFY:
DRAWING NUMBER, PART NAME, ITEM
NUMBER AND SERIAL NUMBER

LIGHTNIN ®
MIXERS AND AERATORS

ISO 9001
CERTIFIED

ASSEMBLY DRAWING

A310
AXIAL FLOW IMPELLER

DRAWING NO. L–16701B

FOR AN UP TO DATE REPRESENTATIVE LIST

PLEASE GO TO: www.lightnin-mixers.com

-OR-

CALL: 1-888-649-2378

1-888-MIX-BEST

Notes

LIGHTNIN

REPAIR & SERVICE GUIDE

LIGHTNIN Process Equipment Services (LPES): The fastest route to uptime.

Expertise: LPES technicians are the backbone of our dedicated service organization. They're uniquely qualified to keep your LIGHTNIN mixers running right.

Lightnin Certified Technicians: All LPES technicians are certified via training courses to ensure that the work they do meets the highest standards for consistency and reliability.

Genuine LIGHTNIN Parts: All LPES repairs follow original design specs and use only factory-authorized replacement parts.

Full LIGHTNIN Factory Warranty: We're so confident we'll do the job right that all LPES repair and service work is covered by a full factory warranty. What we repair, we guarantee – 100%.

Repair Services: *LIGHTNIN provides quick, reliable repair services – using only certified technicians and factory-authorized replacement parts – on gearboxes, mechanical seals (seal cartridge and seal assembly), steady bearings, machine assemblies, impellers, shafts and all portable units. This service can be provided either at your site or at a LIGHTNIN Service Center location. All work is backed by LIGHTNIN's full warranty on all parts and service.*

Exchange Services: *By eliminating repair time, LIGHTNIN Exchange Services offer the fastest way to get up and running when a breakdown occurs. LPES keeps selected speed reducers, portable units and mixer subassemblies in stock – and available for immediate exchange – at regional service centers. Simply call and we will configure the appropriate assembly and ship it to you within 24 hours. Then send the damaged assembly back to us within 30 days – to ensure you receive a discounted price.*

Equipment Upgrade Services: *Preventive maintenance is your best defense against costly unplanned downtime and repairs associated with old or obsolete equipment. The full range of LPES upgrade services give you a convenient and cost-efficient way to address problems before they happen by converting older equipment to the latest, most reliable LIGHTNIN designs.*

Additional LPES Services: *In addition to minimizing downtime and repair costs when equipment failure occurs, LPES offers a comprehensive range of services for maximizing productivity through every stage of the equipment life cycle.*

- **Installation and Start-up**
- **Maintenance and Repair**
- **Asset Management**

LIGHTNIN Process Equipment Services Warranty

When repairs to your LIGHTNIN mixer are needed, we guarantee the results for one full year. This exclusive warranty covers all parts and labor. Talk to your LIGHTNIN sales representative for more information.

Call:

The LIGHTNIN Experts

When your need is urgent and after normal business hours call our 24-hour response team hotline at 1-888-MIX-BEST (U.S. and Canada). Your request will be promptly processed and directed to your nearest LPES team member. For more information visit our website at: www.lightninmixers.com.

Factory Service Center Locations

Chicago, Illinois
Houston, Texas
Mulberry, Florida
Reading, Pennsylvania
Rochester, New York
San Francisco, California
Wytheville, Virginia

Authorized Service Center Locations

Baton Rouge, Louisiana
Concord, Ontario, Canada
East Hanover, New Jersey
Macon, Pooler, Roswell, Georgia