SERVICE INSTRUCTIONS

MODEL G & GA
GEAR DRIVEN PORTABLE MIXERS
MANUAL NO. 05-07884
REVISED 01/14

CUSTOMER:

P.O. NO.:

ITEM NO:

MIXER MODEL NO.:

MIXER SERIAL NO.:

MIXER HP:

MIXER DRIVE DRAWING NO.:

DATE:

MIXMOR
3131 CASITAS AVENUE
LOS ANGELES, CA 90039
TELE: 323-660-1941
FAX: 323-660-5677
E-MAIL: info@mixmor.com

TABLE OF CONTENTS

FOREWORD

The information contained in this service instruction manual covers MixMor Model G portable clamp-on gear driven mixers.

The model is determined by the type of motor on the mixer. The following are descriptions of the models.

"G" - Electric motor driven, A.C. or D.C.

"GA" - Air motor driven, separate Operating and Maintenance Instructions for the air motor are included in this manual.

Throughout this manual it will refer to drawing numbers which identify drives sizes, coupling designs, and other mechanical details.The front page of this manual lists all the drawings that apply to your specific mixer.

We have included information in this manual that covers installation, start-up service, and trouble shooting to assure years of reliable mixer service. Should questions or problems occur that are not covered in this manual, consult your local representative or phone MixMor at either our Los Angeles, California plant (213-664-1941) or our King of Prussia, Pennsylvania plant (215-337-2700).

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.

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 or King of Prussia, Pennsylvania.

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 parts.

INSTALLATION INSTRUCTION

REFER TO DWG. NO. 05-07923 or 05-02108

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.

MOUNTING

Position the mixer clamp on the mounting surface with the base and inside face making full contact. Securely tighten the star wheel screw (14). Do not use an extension.

GEAR REDUCER

The mixer is shipped from the factory with a completely assembled gear drive. Gearing is carefully assembled at the factory to provide gear contact. Do not change the setting in any way.

When shipped, the gear reducer has been filled with the proper lubricating grease and does not have to be serviced before start-up. We recommended that you read the LUBRICATION INSTRUCTIONS before start-up to familiarize yourself with the mixer.

MIXER SHAFT

Handle the shaft carefully and always place it in a horizontal position, supporting it at several points. Check the shaft for nicks or burrs.

Align the shaft keyway with the key and slide the shaft as far as it will go into the quill shaft and tighten socket head cap screw (28). Refer to pages 10 and 11 for alternate shaft coupling instructions.

IMPELLER

When mixers are furnished with two impellers the upper impeller should be positioned midway between the lower impeller and the normal liquid level. I f one of the impellers has a stabilizing on it, it must be used as the lower impeller and attached to the end on the shaft with the stabilizing ring down. Position the impellers on the shaft and tighten the hex head set screws. Depending on the severity of the application, it may be advisable to spot drill the shaft for the impeller set screws.

LOCATION

The mounting position of the mixer has a definite effect on the flow pattern within the tank.

The correct position for your mixer will depend on your application and the tank geometry. After start-up, adjustment may be required to achieve optimum mixing results.

The location chart gives guidelines for positioning your mixer. When the mixer shaft is angled to the right of horizontal tank centerline, a top-to-bottom flow pattern will be achieved, which is well-suited for most mixing applications. Positioning the shaft on center with the tank centerline will create a vortex which may be helpful in wetting or introducing light solids. Positioning the shaft to the left of the tank centerline will produce a swirling flow pattern which may be useful when blending high-viscosity products. Do not be hesitant to try various positions before deciding on the optimum location.

Warning! Do not attempt to change the position while the mixer is running. Always disconnect power to the mixer before making a change.

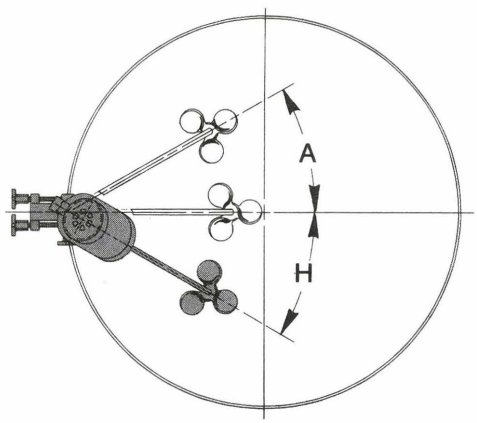
To change the position of the mixer, loosen the wedge lock screw (13) and move the drive into the desired position and tighten the wedge lock screw. The sliding wedge (09) has a limited amount of travel and can top out against the hex bolt (06) before the drive can be securely locked to the clamp. If this happens, remove the wedge lock screw (13) and tighten hex nut (07) until the drive can just be moved in the clamp socket. Replace the wedge lock screw and tighten it.

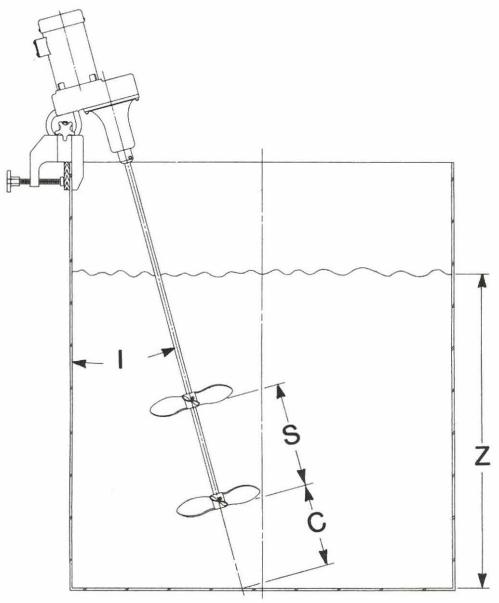
LOCATION CHART

FLOW PATTERN	APPLICATION	POSITION		
		"A"	"H"	"I"
TOP TO BOTTOM	CONVENTIONAL POSITION. MOST BLENDING AND SOLID SUSPENSION APPLICATION, VARIOUS VISCOSITIES	___	10-30°	5-20°
VORTEXING	VORTEX TO WET OR DISPERSE LIGHT SOLIDS	ON-CENTER		5-20°
SWIRLING	BLENDING OF SOME HIGH VISCOSITY PRODUCTS	10-30°	___	5-20°

The vertical angle of the shaft (angle "I") should not reach a point where the lower impeller contacts the tank centerline.

Dwg. No. 05-08422





$$S = \frac{Z-C}{2}$$

LUBRICATION

GEAR REDUCER

All top entering mixers are shipped from the factory with the gear reducer filled with the proper lubricating grease. The grease should be changed every five years, when used under normal operating conditions, and /or whenever repair work is performed. If the mixer is operating is extremely dirty, or high of low temperature environments, the grease should be changed more often. If you or your lubricant supplier is uncertain as to the frequency of changes, please consult MixMor for the recommendations for your specific environment.

CHANGING GREASE

Refer to front page of the manual for the mixer drive drawing number.

Refer to drawing number 05-02108 or 05-07923. Remove the mixer shaft (29) from the drive. Remove hex nut (7) and separate the clamp assembly from the gear housing (5). Remove socket head cap screws (22) and separate quill housing (23) from the gear housing. Remove cap screws (16) and separate the motor from the gear housing. Remove all grease and clean all parts with a non-flammable, non-toxic solvent. Attach the motor to the gear reducer repack the gear housing with grease. Refer to the following charts for the approved lubricant recommendation and gear housing grease capacity.

APPROVED LUBRICANTS

LUBRICANT MANUFACTURER	BRAND NAME
Shell	Gadus S2-U1000-1
Texaco	Thermatex EP-1
Chevron	SIL-X NGL1
Esso	Unirex EP1
Castrol	Spheerol EPL 1

APPROXIMATE CAPACITY

DRAWING NUMBER	CAPACITY
05-07923	1 lb., 4 oz.
05-02108	2 lbs., 12 oz.

GEAR REDUCER BEARINGS

All gear reducer bearings are permanently lubricated, double sealed and do not require additional lubrication.

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: breathers, level indicators, switches, etc., been mounted? It is often necessary to box these items separately to prevent damage or loss in shipment.

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

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

During start-up, the following procedures are recommended to assure years of trouble-free operation:

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

2. As the mixer is brought up to normal operating speed, it should be checked for unusual sounds, excessive vibrations, excessive heat or grease leakage. If any of these develop, the unit should be shut down immediately and the cause determined and corrected. The operating temperature of the unit at the hottest point normally should not exceed 200° F.

3. If possible, the mixer should be operated under a light load (approximately half-load) for one or two days to allow final breaking-in of gears. After this period, the unit can be operated under normal load.

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

PREVENTATIVE MAINTENANCE

Keep shafts and vent plug clean to prevent foreign particles from entering seals or gear case. Never paint the vent plug. Check coupling set screws and all fasteners for tightness. Loose fasteners will cause alignment problems and excessive wear. Check end play in shaft. Noticeable movement might indicate service or parts replacement.

When lip seals are new, a small amount of lubricant leakage is sometimes noted until the seals seat on the shaft. This condition is normal. However, if leakage persists, this indicates a damaged seal and it must be replaced.

TROUBLE SHOOTING

It is advisable to periodically inspect your gear drive for signs of wear. Spare or replacement parts can often be ordered and obtained before disassembly is necessary, thus minimizing downtime. The following symptoms can be visually inspected without disassembly and may, in some cases, require repair work.

CHECKLIST		
OBSERVATION	POSSIBLE SOURCE	ACTION
VIBRATION	1) Loose hardware	Be certain all external housing and mounting fasteners are tight.
	2) Bearing failure	Replace bearings
	3) Foreign particles in bearings and gears	Foreign particles will cause excessive wear. Take steps to prevent entrance of particles. Thoroughly flush drive with solvent and refill with new grease.
OVERHEATING	1) Breather	Breather must be free of any obstruction. Clean breather as required.
	2) Overloaded	Check mixer speed and impeller diameter against certified drawing. Has the specific gravity and/or viscosity of the product increased? Inspect for material build-up on impeller. Check shaft rotation against rotation arrow.
	3) Bearing failure	Replace bearings.
	4) Reducer grease	Check grease level and condition and add or change as required.
NOISE	1) Bearing failure	Replace bearings.
	2) Rust	Rust can be caused by entrance of water or humidity. Flush and thoroughly clean drive. Take steps to prevent further entrance of water and use a lubricant with good rust-inhibiting properties.
	3) Extended shut-down or improper storage	When drives are not properly prepared for extended shut-down or storage in a moist atmosphere or a temperature condition which will cause condensation, destructive rusting of bearings, gears and shafts/seals will take place. Clean and replace parts as required.
	4) Overloaded	Overloading can cause loud operation. Refer to OVER-HEATING, Source No. 2.
	5) Refer to VIBRATION Source No. 3	
	6) Refer to OVER-HEATING, Sources No.'s 2 & 4	

GREASE LEAKINGS	1) Worn lip seals	Replace defective seals.
	2) Plugged breather	Breather must be free of any obstructions. Clean breather as required.
	3) Gear case joints	Tighten fasteners or remove and recoat with Locktite before tightening. If this does not stop leakage, remove housing, clean surfaces and replace gaskets or apply new sealing compound.

DISASSEMBLY AND ASSEMBLY

Never perform any work on the gear reducer or coupling until you are absolutely certain that the prime mover cannot be remotely or automatically started. Clean up area around unit before disassembly to keep parts clean and to keep them in proper order for re-assembly. Keep in mind that parts usually go back together in reverse order of disassembly. Provide wooden blocks for storing machined parts in order to prevent damage to machine surfaces. Before starting disassembly, carefully review typical parts list and assembly drawing of unit.

Refer to Dwg. No. 05-07923 or 05-02108

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

2. Disconnect and, if necessary, remove the mixer shaft (29) from the drive.

3. Remove hex nut (7) and separate the clamp assembly from the gear housing (5).

4. Remove socket head cap screws (22) and remove reducer shaft housing (23) with the shaft assembly from the gear housing.

5. Remove retaining ring (17) and pull gear (18) off of quill shaft (24). Remove retaining ring (19). The reducer quill shaft (24), with bearing and seals, can now be pressed out of the housing (23).

6. Remove socket head cap screws (16) and remove motor (1) from gear housing (5). Loosen socket head set screws (3) and remove pinion (4) from motor shaft.

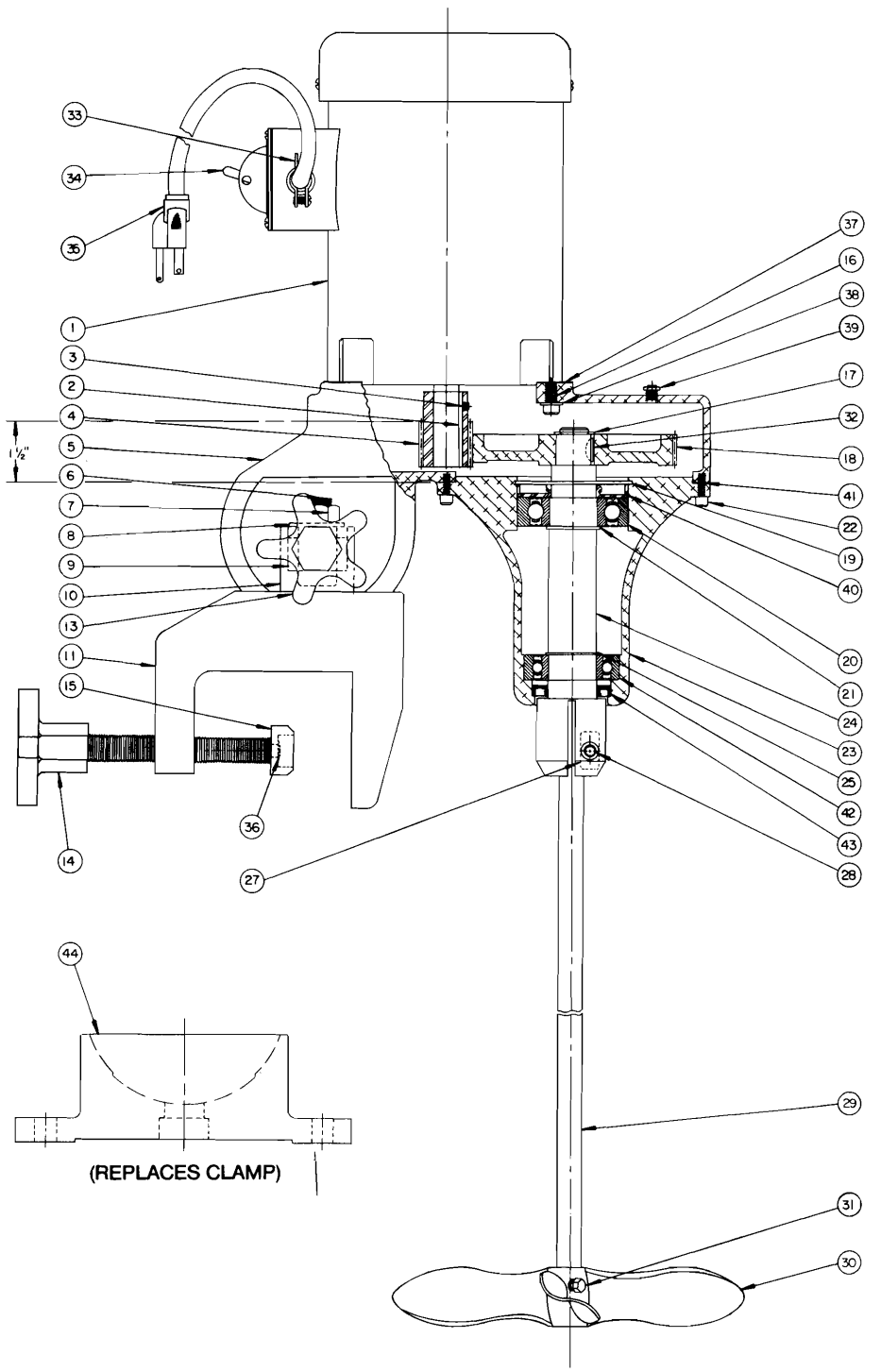
7. Clean all parts thoroughly. Before assembly, examine components carefully for signs of wear and replace if necessary.

8. Reverse the preceding instructions for assembly. Be certain to position the pinion (4) on the motor shaft to the dimension shown on the drawing. This will insure full gear (18) face contact with the pinion.

The sliding wedge (9) has a limited amount of travel and can top out against the hex bolt (6) before the drive can be securely locked to the clamp. If this happens, remove the wedge lock screw (13) and tighten hex nut (7) until the drive can just be moved in the clamp socket. Replace the wedge lock screw and tighten it.

MODEL G & GA MIXER PARTS, 1/4 AND 1/3 H.P.

Dwg. No. 05-07923

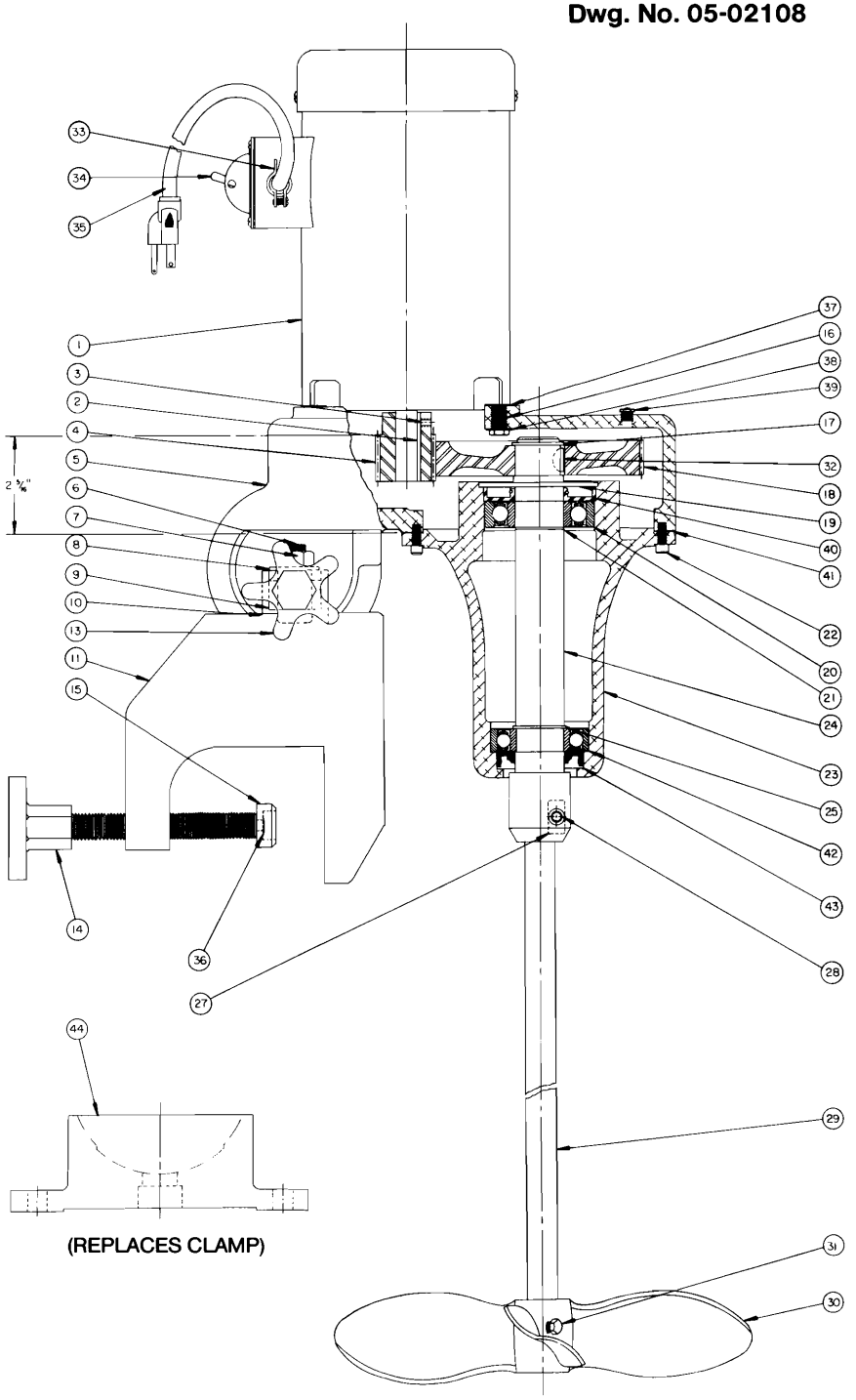


PART NO.	DESCRIPTION
1	MOTOR
2	KEY
3	SOCKET HEAD SET SCREW (2)
4	PINION •
5	GEAR HOUSING
6	BOLT
7	NUT
8	WASHER
9	SLIDING WEDGE
10	WEDGE BASE
11	CLAMP
13	WEDGE LOCK SCREW
14	STAR WHEEL SCREW
15	FOOT
16	SOCKET HEAD CAP SCREW (4)
17	RETAINING RING •
18	GEAR •
19	RETAINING RING •
20	BEARING •
21	RETAINING RING •
22	SOCKET HEAD CAP SCREW (4)
23	QUILL HOUSING
24	QUILL
25	RETAINING RING •
27	KEY
28	SOCKET HEAD CAP SCREW
29	SHAFT
30	PROPELLER
31	HEX HEAD CAP SCREW (2)
32	KEY
33	CORD CONNECTOR
34	SWITCH
35	CORD
36	RETAINING RING
37	GASKET •
38	LOCK WASHER
39	BREATHER
40	LIP SEAL •
41	GASKET •
42	BEARING •
43	LIP SEAL •
44	CUP BASE (OPTIONAL)

• RECOMMENDED SPARE PARTS

MODEL G & GA MIXER PARTS, 1/2 THRU 5 H.P.

Dwg. No. 05-02108



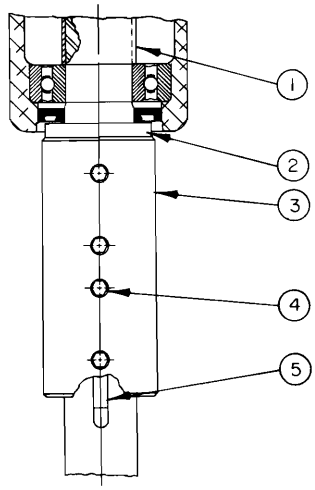
(REPLACES CLAMP)

PART NO.	DESCRIPTION
1	MOTOR
2	KEY
3	SOCKET HEAD SET SCREW (2)
4	PINION •
5	GEAR HOUSING
6	BOLT
7	NUT
8	WASHER
9	SLIDING WEDGE
10	WEDGE BASE
11	CLAMP
13	WEDGE LOCK SCREW
14	STAR WHEEL SCREW (2)
15	FOOT (2)
16	HEX HEAD CAP SCREW (4)
17	RETAINING RING •
18	GEAR •
19	RETAINING RING •
20	BEARING •
21	RETAINING RING •
22	SOCKET HEAD CAP SCREW (4)
23	QUILL HOUSING
24	QUILL
25	RETAINING RING •
27	KEY
28	SOCKET HEAD CAP SCREW
29	SHAFT
30	PROPELLER
31	HEX HEAD CAP SCREW (2)
32	KEY
33	CORD CONNECTOR
34	SWITCH
35	CORD
36	RETAINING RING (2)
37	GASKET •
38	LOCK WASHER
39	BREATHER
40	LIP SEAL •
41	GASKET •
42	BEARING •
43	LIP SEAL •
44	CUP BASE (OPTIONAL)

• RECOMMENDED SPARE PARTS

ALTERNATE COUPLING

Dwg. No. 05-08370



PART NO.	DESCRIPTION
1	BEARING SPACER
2	OUTPUT SHAFT
3	COUPLING
4	SOCKET HEAD SET SCREW (8)
5	KEY

FLANGE LOCK COUPLING

DISASSEMBLY AND ASSEMBLY
DWG. No. 05-09508

The flange ring coupling assembly is a keyless shaft-flange coupling connector providing mechanically the same characteristic as a shrink fit. It is, however, easily adjustable and removable thus facilitating simple assembly and disassembly. Since torque is transmitted by friction between functional surface, condition of contact surfaces and proper tightening of the locking screws are of great importance.

DISASSEMBLY

1. Disconnect the mixer shaft (5) from the drive, by removing the socket head cap screws (8)

2. Loosen locking screws (7) in several stages by aprox. ¼ turns, following a diametrical opposite sequence.

NOTE: Locking assemblies feature self-releasing tapers.
However, if for some reason thrust rings jam, a light tap on 3 equally spaced heads of loosened screws will positively release connection.

3. Although flange coupling (3) and locking assembly (6) are normally removed together, removal of locking assembly (6) only from deep counterbores is accomplished by inserting pull out screws in threads located under cadmium plated locking screws (4).

ASSEMBLY

DO NOT USE MOLYDEBUM-DISULFIDE, e.g., MOLYKOTE OR NEVER-SEEZE.

1. Insert locking assembly (6) into flange coupling (3) and slide it onto output shaft (2).

2. After checking correct flange coupling position, handtighten 3 or 4 equally spaced locking screws (7) until initial contact is established.

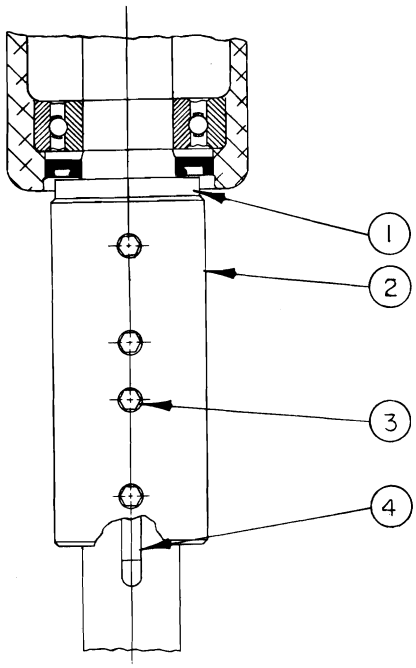
3. Use torque wrench and set it approximately 11.5 ft-lb. Torque screws in either a clockwise or counter clockwise sequence, using only ¼ turns (it is not necessary to tighten in a diametrically opposite pattern) for several passes until ¼ turns can no longer be achieved.

4. Still apply overtorque for 1 or 2 more passes. This is required to compensate for a system-related relaxation of locking screws since tightening of a given screw will always relax adjacent screws. Without overtorquing, an infinite number of passes would be needed to reach specified tightening torque.

5. Reset torque wrench to 11 ft-lb. and check all locking screws. No screw should turn at this point, otherwise repeat step "4" for 1 or 2 more passes. It is not necessary to recheck tightening torque after equipment has been in operation.

ALTERNATE COUPLING – SLEEVE TYPE

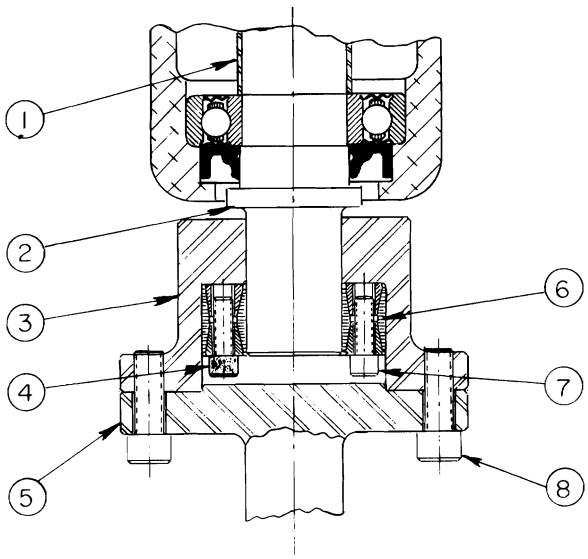
Dwg. No. 05-08370



PART NO.	DESCRIPTION
1	BEARING SPACER
2	OUTPUT SHAFT
3	COUPLING
4	SOCKET HEAD SET SCREW (8)
5	KEY

ALTERNATE COUPLING – FLANGE TYPE

Dwg. No. 05-09508



PART NO.	DESCRIPTION
1	SPACER
2	OUTPUT SHAFT
3	FLANGE COUPLING
4	PLATED LOCKED SCREW (2)
5	MIXER SHAFT
6	LOCKING ASSEMBLY
7	LOCKING SCREW (10)
8	SOCKET HEAD CAP SCREW (4)

MAINTENANCE RECORD

Date	WORK PERFORMED

NOTES