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# SERVICE INSTRUCTIONS

MODEL D, DH & DA  
DIRECT DRIVE PORTABLE MIXERS  
MANUAL NO. 05-07885  
REVISED 08/99

CUSTOMER:

P.O. NO.:

ITEM NO:

MIXER MODEL NO.:

MIXER SERIAL NO.:

MIXER HP:

MIXER DRIVE DRAWING NO.:

DATE:

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## **FOREWORD**

The information contained in this service instruction manual covers MixMor Model D portable clamp-on direct drive mixers.

The model is determined by the type of motor on the mixer. The following are descriptions of the models. "D" & "DH" — Electric motor driven, A.C. or D.C.

"DA" — 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 drive 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 INSTRUCTIONS**

### **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. Do not use an extension.

### **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 or coupling. Tighten the socket head cap screw in the hollow quill shaft or socket head set screws in the coupling.

### **IMPELLER**

When mixers are furnished with two impellers the upper impeller should be positioned midway between the lower impeller and the normal liquid level. If one of the impellers has a stabilizing ring on it, it must be used as the lower impeller and attached to the end of 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.

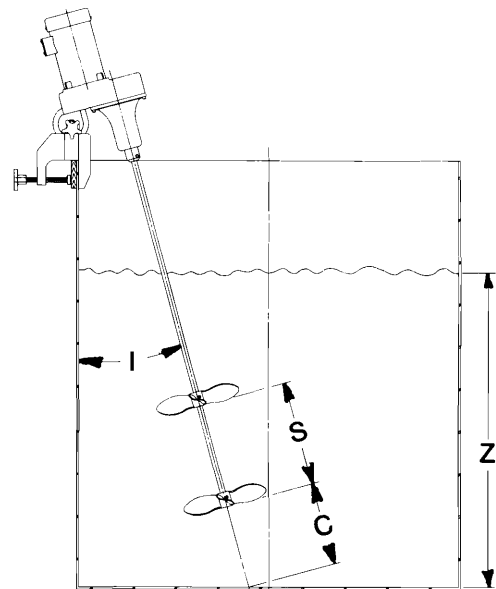
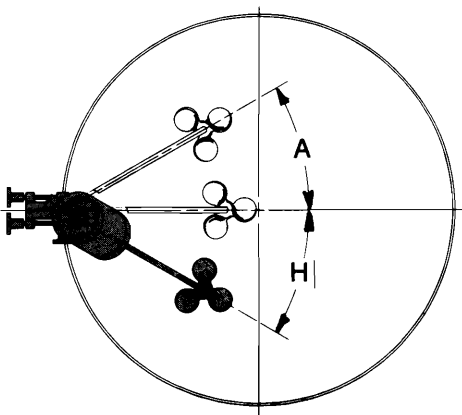
To change the position of the mixer, loosen the wedge lock screw and move the drive into the desired position and tighten the wedge lock screw. The sliding wedge has a limited amount of travel and can top out against the hex bolt before the drive can be securely locked to the clamp. If this happens, remove the wedge lock screw and tighten hex nut until the drive can just be moved in the clamp socket. Replace the wedge lock screw and tighten it. Refer to DISASSEMBLY AND ASSEMBLY INSTRUCTIONS, page 6.

## 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



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

## **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, or excessive heat. 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. 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.

## **LUBRICATION**

All the bearings in the drive housings are permanently lubricated, double sealed and do not require additional lubrication.

## TROUBLESHOOTING

It is advisable to periodically inspect your mixer 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.	Foreign particles will cause excessive wear. Take steps to prevent entrance of particles.
OVERHEATING	1) 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.
	2) Bearing failure	Replace bearings
NOISE	1) Bearing failure	Replace bearings
	2) Rust	Rust can be caused by entrance of water or humidity. 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 and shafts/seals will take place. Clean and replace parts as required.
	4) Overloaded	Overloading can cause loud operation. Refer to OVERHEATING, Source No. 1.
	5) Refer to VIBRATION, Source No. 3	

## **DISASSEMBLY AND ASSEMBLY**

Never perform any work on the drive 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. 05-02226 or 05-08468.

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 (23) from the drive.
3. Remove hex nut (7) and separate the clamp assembly from the quill housing (16).
4. Remove pipe plug (5) and with a long arm hex key loosen both socket head set screws (4).
5. Remove socket head cap screws (3) and separate motor from housing (16).
6. Press the quill shaft (20) with bearing (18) and lip seal (27) out of quill housing (16).
7. Remove retaining ring (17) and press bearing (18) off of quill shaft (20). Slide off lip seal (27).
8. Reverse the preceding instructions for assembly.

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 (11) and tighten hex nut (7) until the drive can just be moved in the clamp socket. Replace the wedge lock screw and tighten it.

Refer to Dwg. No. 05-02209.

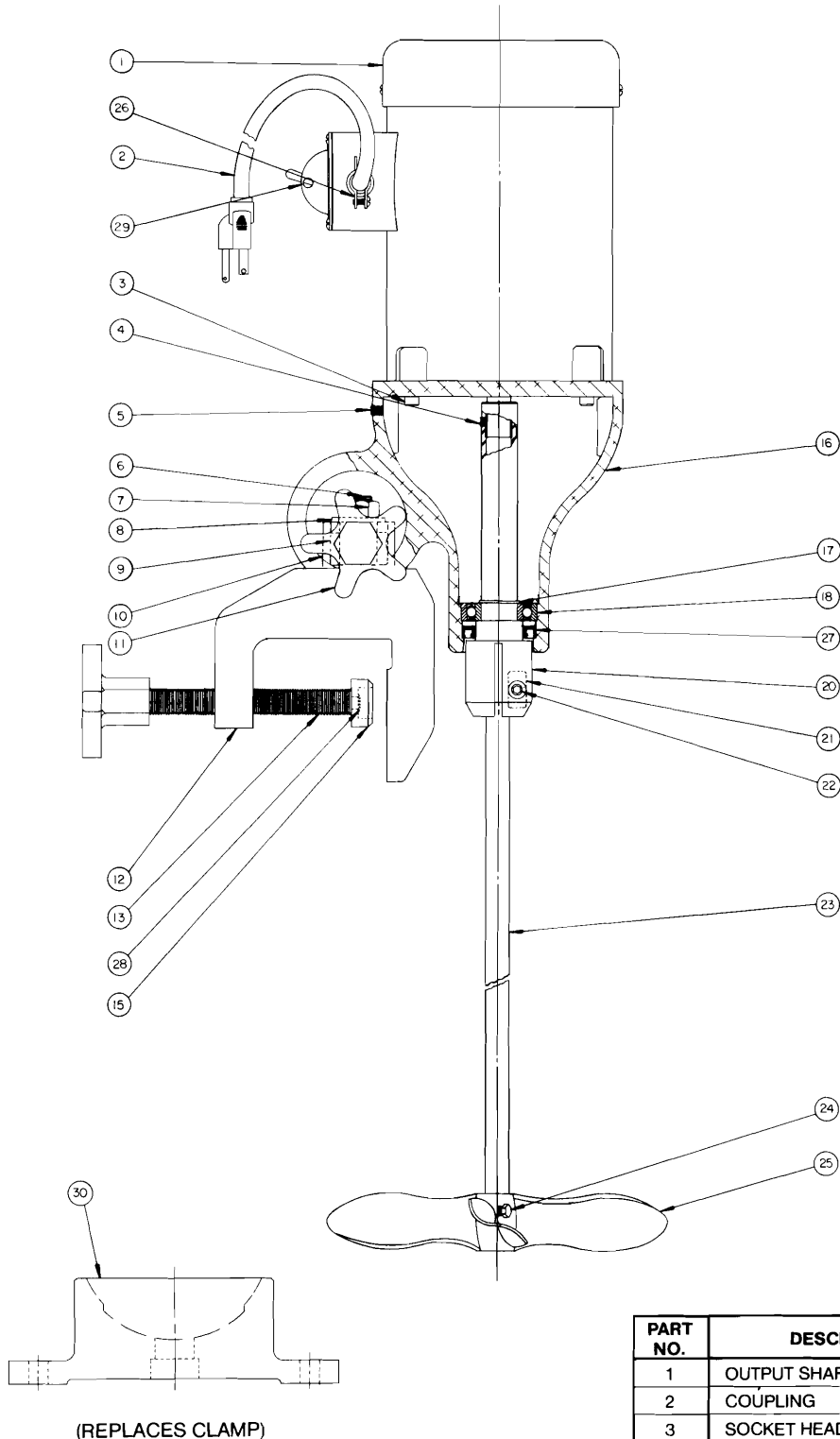
1. Disconnect the power to the motor. Be certain that the mixer cannot be remotely or automatically started.
2. Disconnect and, if necessary, remove the mixer shaft (25) from the drive.
3. Remove hex nut (6) and separate the clamp assembly from the quill housing (18).
4. Remove pipe plug (4) and with a long-arm hex key loosen both upper socket head set screws (3).
5. Remove socket head cap screws (2) and separate motor from housing (18).
6. Press the quill shaft (22) with bearing (20) and lip seal (30) out of quill housing (18).
7. Loosen lower socket head set screws (3) and remove coupling (17) from quill (22).
8. Remove retaining ring (19) and press bearing (20) off of quill shaft (22). Slide off lip seal (30).
9. Reverse the preceding instructions for assembly.

The sliding wedge (8) has a limited amount of travel and can top out against the hex bolt (5) before the drive can be securely locked to the clamp. If this happens, remove the wedge lock screw (10) and tighten hex nut (6) until the drive can just be moved in the clamp socket. Replace the wedge lock screw and tighten it.



**MODEL D & DA MIXER PARTS**

D 1/4 & 1/3 H.P.  
 DA 1/3 & 1 H.P.  
 Dwg. No. 05-02226

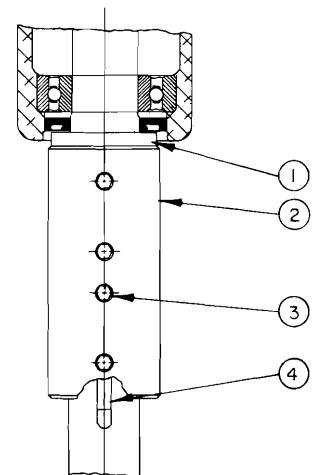


PART NO.	DESCRIPTION
1	MOTOR
2	CORD
3	SOCKET HEAD CAP SCREW (4)
4	SOCKET HEAD SET SCREW (2)
5	PIPE PLUG
6	BOLT
7	NUT
8	WASHER
9	SLIDING WEDGE
10	WEDGE BASE
11	WEDGE LOCK SCREW
12	CLAMP
13	STAR WHEEL SCREW
15	FOOT
16	QUILL HOUSING
17	RETAINING RING •
18	BEARING •
20	QUILL
21	SHAFT KEY
22	SOCKET HEAD CAP SCREW
23	SHAFT
24	HEX HEAD CAP SCREW
25	PROPELLER
26	CONNECTOR
27	LIP SEAL •
28	RETAINING RING
29	SWITCH
30	CUP BASE (OPTIONAL)

• RECOMMENDED SPARE PARTS

**ALTERNATE COUPLING**

Dwg. No. 05-08467



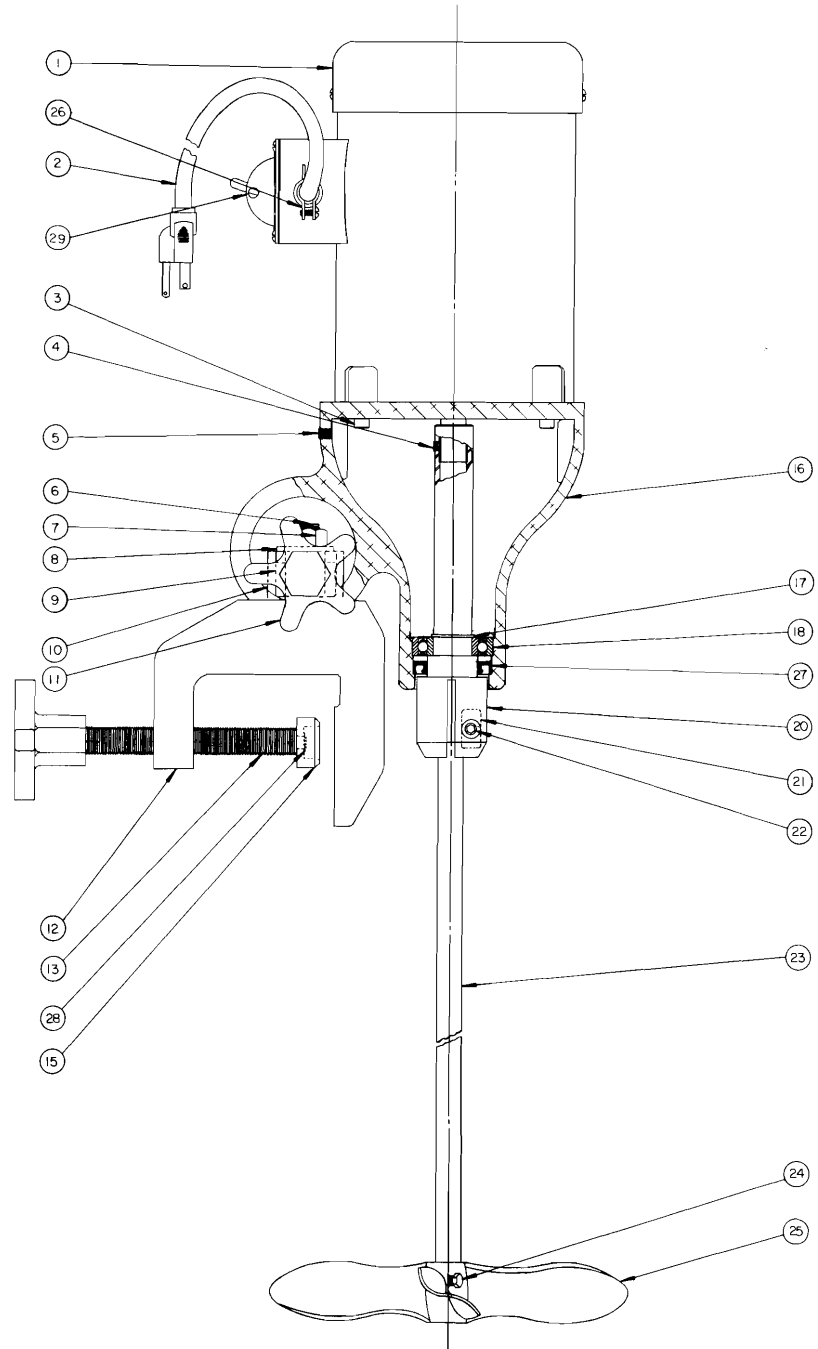
PART NO.	DESCRIPTION
1	OUTPUT SHAFT
2	COUPLING
3	SOCKET HEAD SET SCREW (8)
4	KEY

# MODEL D MIXER PARTS

D 1/2 & 3/4 H.P.  
Dwg. No. 05-08468

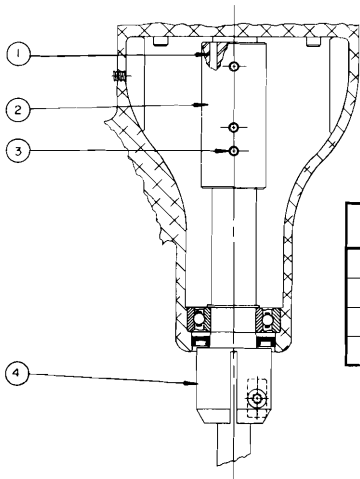
PART NO.	DESCRIPTION
1	MOTOR
2	CORD
3	SOCKET HEAD CAP SCREW (4)
4	SOCKET HEAD SET SCREW (2)
5	PIPE PLUG
6	BOLT
7	NUT
8	WASHER
9	SLIDING WEDGE
10	WEDGE BASE
11	WEDGE LOCK SCREW
12	CLAMP
13	STAR WHEEL SCREW
15	FOOT
16	QUILL HOUSING
17	RETAINING RING •
18	BEARING •
20	QUILL
21	SHAFT KEY
22	SOCKET HEAD CAP SCREW
23	SHAFT
24	HEX HEAD CAP SCREW
25	PROPELLER
26	CONNECTOR
27	LIP SEAL •
28	RETAINING RING
29	SWITCH
30	CUP BASE (OPTIONAL)

• RECOMMENDED SPARE PARTS

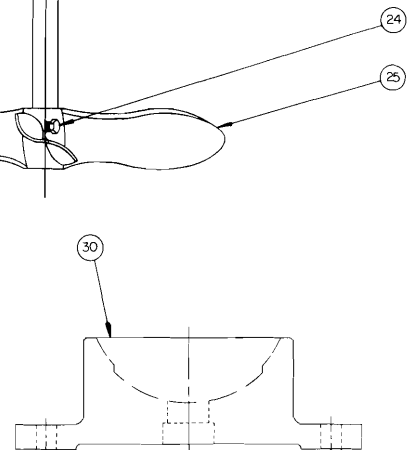


## ALTERNATE COUPLING

Dwg. No. 05-08469



PART NO.	DESCRIPTION
1	KEY
2	COUPLING
3	SOCKET HEAD SET SCREW (6)
4	QUILL



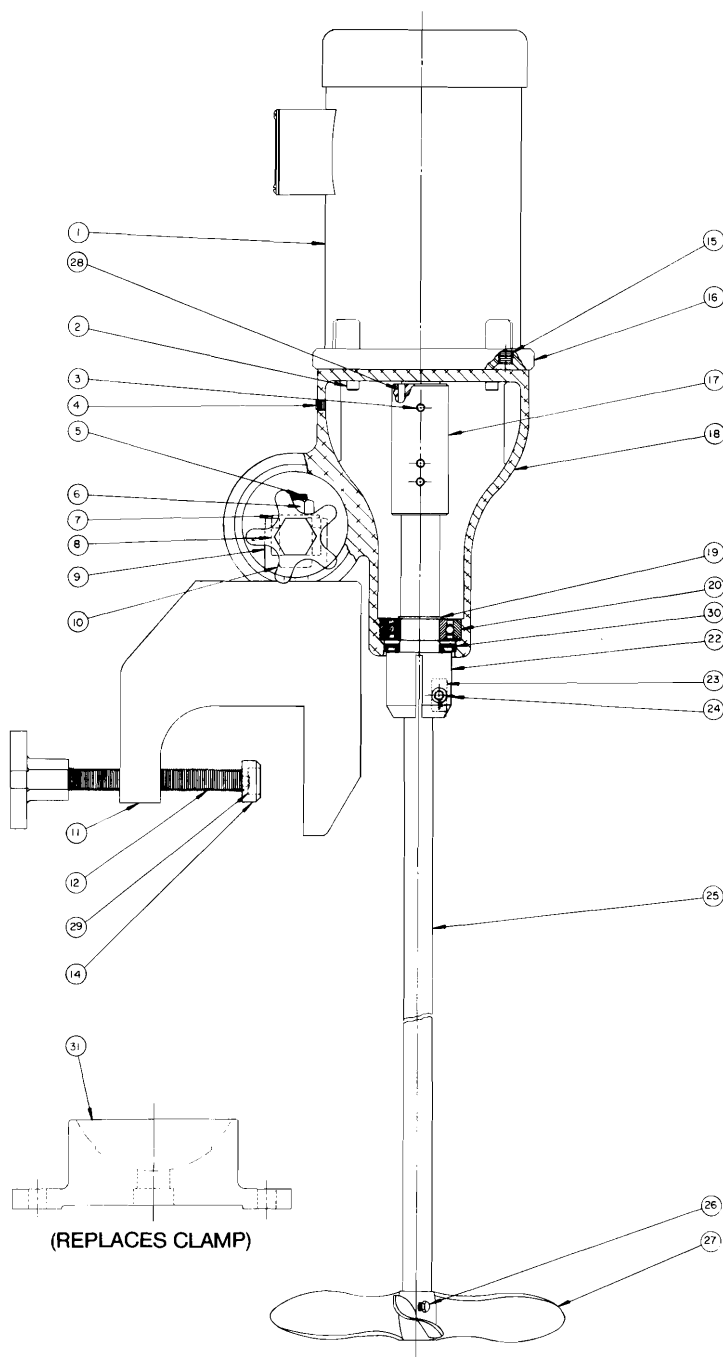
(REPLACES CLAMP)

# MODEL D & DA MIXER PARTS

D & DH 1 thru 5 H.P.

DA 2 & 4 H.P.

Dwg. No. 05-02209

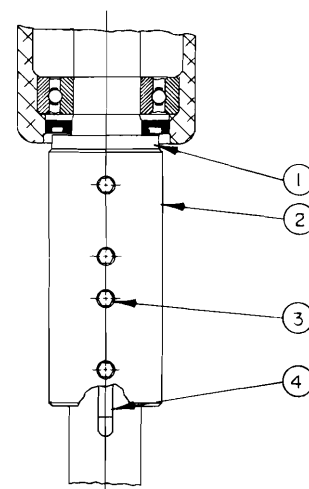


PART NO.	DESCRIPTION
1	MOTOR
2	SOCKET HEAD CAP SCREW (4)
3	SOCKET HEAD SET SCREW (6)
4	PIPE PLUG
5	BOLT
6	NUT
7	WASHER
8	SLIDING WEDGE
9	WEDGE BASE
10	WEDGE LOCK SCREW
11	CLAMP
12	STAR WHEEL SCREW
14	FOOT
15	SOCKET FLAT HEAD CAP SCREW (4)
16	ADAPTER PLATE
17	SLEEVE COUPLING
18	QUILL HOUSING
19	RETAINING RING •
20	BEARING •
22	QUILL
23	SHAFT KEY
24	SOCKET HEAD CAP SCREW
25	SHAFT
26	HEX HEAD CAP SCREW
27	PROPELLER
28	KEY
29	RETAINING RING
30	LIP SEAL •
31	CUP BASE (OPTIONAL)

• RECOMMENDED SPARE PARTS

## ALTERNATE COUPLING

Dwg. No. 05-08470



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

**MAINTENANCE RECORD**

**Date**

**WORK PERFORMED**

**NOTES**