



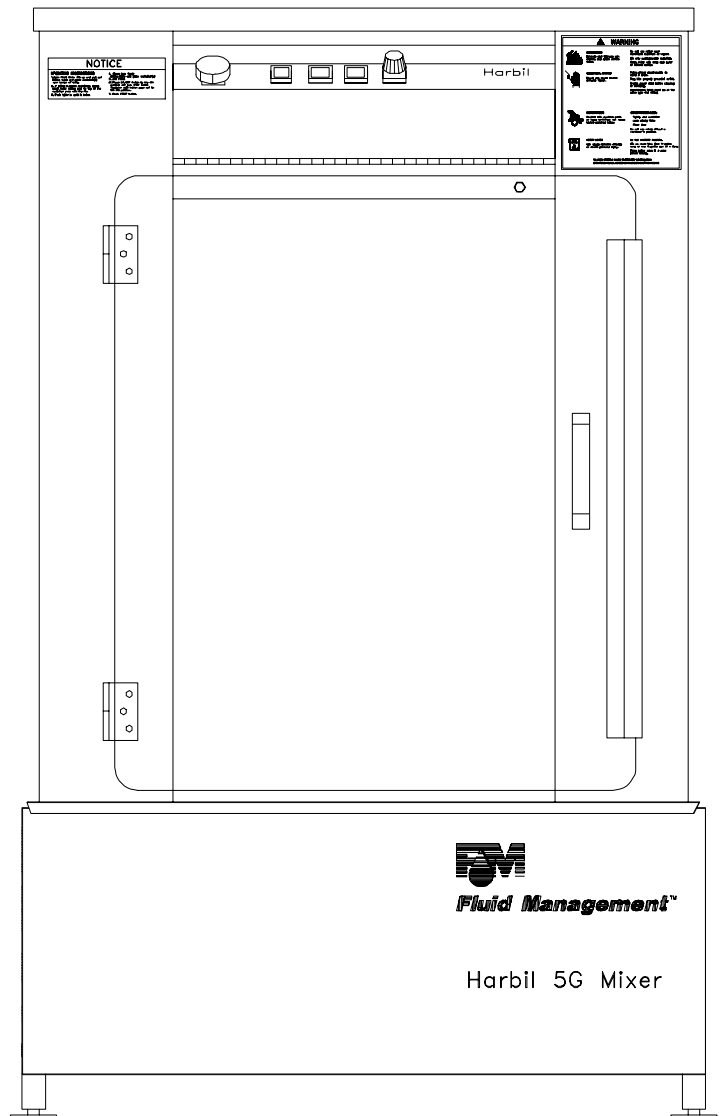
Fluid Management®

HARBIL®

**5G High Speed
Paint Mixer**

**Instruction
Manual**

Part # - 4700510
Rev. D
11/10/97



CONFIDENTIAL

**PROPERTY OF *FLUID MANAGEMENT*[®]
(C) COPYRIGHT 1999 *FLUID MANAGEMENT*
AS AN UNPUBLISHED WORK ALL RIGHTS RESERVED**

**This material cannot be copied or disclosed to others without
the prior written permission of *Fluid Management*.**

***FLUID MANAGEMENT* A Unit of IDEX, Corp.**

1023 Wheeling Road
Wheeling, Illinois 60090-5776

Voice (708) 537-0880
US (800) 462-2466
Fax (708) 537-5530

Table Of Contents

SAFETY INFORMATION-----5
INTRODUCTION-----7
PRODUCT DESCRIPTION-----7
UNPACKING DIRECTIONS-----10
ELECTRICAL CONNECTIONS-----11
ALIGNING AND LEVELING MIXER-----13
GETTING TO KNOW YOUR PAINT MIXER-----15
PERFORM OPERATIONAL TEST-----17
IMPORTANT INFORMATION-----18
BASIC OPERATION-----19
MAINTENANCE PROCEDURES-----22
TROUBLE-SHOOTING CHART-----24
SERVICING AND REPAIR-----29
OPENING MIXER-----30
REMOVING SHAKE FRAME-----32
TESTING SHAKE MOTOR-----36
CHANGING SHAKE MOTOR-----37
CHANGING THE V-BELT-----38
REMOVING CIRCUIT BOARD-----39
INSTALLING RUBBER PAD-----40
REPLACING / ADJUSTING DC MOTOR OR REPLACING
OPTO-COUPLER-----41
REPLACING SUPER-STRUTS-----44
REPLACING CRANKSHAFT-----51
REASSEMBLING MIXER-----54
PARTS SECTION-----57
PARTS: SHEET METAL AND OUTER FRAME-----58
PARTS: CONTROL BOX ASSEMBLY-----62
PARTS: SHAKE FRAME-----66
PARTS: CLAMPING MOTOR ASSEMBLY-----74
PARTS: TOP PLATE ASSEMBLY-----76
PARTS: CRANKSHAFT ASSEMBLY-----78
PARTS: FRONT DOOR ASSEMBLY-----80

**SAFETY
INFORMATION**

MIXER WARNING LABELS

You should become familiar with important warning labels which are affixed to the mixer, as well as the symbols which appear throughout this manual. These warnings have been included to help you safely perform your job.

Please read all warning labels that are on the mixer. Keep them clean so they are easy to read. If the warning labels become damaged or unreadable, new labels can be purchased from Fluid Management. See the parts list in the back of the manual for ordering information.

SAFETY NOTICE INFORMATION

The two main safety notices used in this manual are **Warning** and **Caution**. Notices in this manual will look like the example below:

Warning Notice

WARNING: ELECTRICAL HAZARD



Do not operate the mixer with the door open. Disconnect power before servicing.

A **Warning** notice tells you about a hazard that could cause serious injury to you or extensive damage to the mixer. This information is placed at the beginning of the manual to emphasize the importance of safety to your well being.

When you see a **Warning** notice in this manual, read it carefully. Before continuing with the operation of the mixer, take all necessary precautions to avoid potential injury.

Caution Notice

CAUTION: ELECTRICAL HAZARD



All electrical components must be kept dry. Never place containers of liquid on or near the control box.

SAFETY INFORMATION

A **Caution** notice tells you about a danger that could cause injury to you or minor damage to the mixer. When you see a **Caution** notice in this manual, read it carefully and be sure you understand it before continuing.

Information Notice

NOTE: _____



If the cabinet vibrates, loosen the locking nuts on the right front leveling foot and slightly adjust the length.

An **Information** notice gives details that will assist you in efficiently using the mixer. When you see an **Information** notice in this manual, know that it is there to save you time and energy.

INTRODUCTION

The Harbil 5G High Speed Paint Mixer is a versatile, automatic mixer designed with concern for safety, reliability and ease of use. Its features include:

- Heavy-duty, high-capacity components and a durable finish for long wear.
- Vibration-free mixing for blending and conditioning paint.
- Versatile mixing times from 30 seconds to 3 minutes
- Adaptability for pint, quart, gallon and 5-gallon containers.

Important safety features are

- Automatic shut off if the door is opened during the shaking operation.
- Fully visible red STOP switch for emergency shut off.

PRODUCT DESCRIPTION**SPECIFICATIONS**

Height 45 3/8" (115.25 cm.)

Width 27 1/2" (69.8 cm.)

Depth 27 1/2" (69.8 cm.)

Weight 525 lb. (238.1 kg.)

CONTAINER DIMENSIONS

Maximum height 17.5" (44.5 cm.)

Minimum height 3.8" (9.2 cm.)

Diameter 12.0" (30.5 cm.)

TYPICAL ELECTRICAL SUPPLY

See name plate for specific information.

120 V \pm 10%, 60 Hz 13.5 Amp

220 V \pm 15%, 50 Hz

SPARE PARTS ORDER

Fluid Management Parts Order Form

Photocopy and use this form to
Mail or fax orders to:

Fluid Management A unit of IDEX / **Phone:** 1(800) 462-2466
1023 Wheeling Road | **Fax:** 1(847) 537-5530
Wheeling, IL 60090

Sold To:

Ship To:

Purchase Order Number _____

Ship Via: _____ Collect Prepaid

Taxable Tax Exempt (Fax copy of exemption certificate.)

QUANTITY	PART NUMBER	DESCRIPTION	UNIT PRICE
	S		
	S		
	S		
	S		
	S		
	S		
	S		
	S		
	S		
	S		
	S		
	S		
	S		

Comments: _____

Signature

Date:

UNPACKING DIRECTIONS

UNPACKING DIRECTIONS

INSPECT THE CRATE FOR DAMAGE

IMPORTANT:



If any damage is found, notify the carrier at once and arrange for inspection in order to claim recovery. Claims for damage must be made by the consignee (YOU). The carrier assumes full responsibility upon acceptance of shipment and will not entertain any claims by the consignor (Fluid Management).

UNPACKING AND SETUP

Refer to the Unpacking and Setup Instructions affixed to the shipping carton in a mailing pouch.

ELECTRICAL CONNECTIONS

CONNECTING TO THE POWER SOURCE

NOTE:



The unit must be plugged into a dedicated electrical line with no other equipment using the same circuit.

1. Connect the mixer to a separate, dedicated circuit; for example: 120 volt, 20 ampere. The mixer requires a single, grounded outlet. No other equipment is to be used on this dedicated line. See “GROUNDING” on page 12.
2. The following chart represents the wire gauge size required for the distance from the load center to the grounded receptacle.

DISTANCE	25 ft	50 ft	100 ft	150 ft	200 ft	250 ft	300 ft	400 ft	500 ft
GAUGE SIZE 220V	14	14	12	10	10	8	8	6	6
GAUGE SIZE 115V	14	12	8	6	6	4	4	2	2

Figure 1 Minimum Wire Gauge

EXTENSION CORDS

Extension cords for 220 VAC models are not recommended. If an extension cord is to be used, it should not be combined with others. Use only a 3-wire extension cord that has a 3-pole grounding plug. Power should be provided by a 3-pole receptacle that will accept the plug on the product. Make sure that your extension cord is in good condition. It must have # 16 AWG conductors up to 25 feet long. An extension cord 25 feet long, but no longer than 50 feet is permissible provided it has conductors of at least # 12 AWG. It must be heavy enough to carry the current your product will draw. An undersized cord will cause a drop in line voltage resulting in loss of power and overheating.

GROUNDING

In the event of an electrical short circuit, grounding reduces the risk of electrical shock by providing an escape wire for the electric current. The 3-prong plug, equipped with grounding wire, must be plugged into a 3-slot receptacle that is properly installed and grounded in accordance with all local codes and ordinances.

DANGER:



Improper use of the grounding plug can result in a risk of electric shock.

DO NOT connect the grounding wire to a flat-blade terminal. The wire with the insulation having an outer surface that is green (with or without yellow stripes) is the grounding wire.

Check with a qualified electrician or serviceman if you are not sure how to ground this machine. **Under no circumstances should you modify the plug if it does not fit the outlet.**

ALIGNING AND LEVELING MIXER

ALIGNING THE STRUTS

1. Make sure that the power is removed from the mixer.
2. Remove the top cover of the unit. Save the screws.
3. Check the inner frame and struts by grasping the frame at the top. Vigorously rock the frame back and forth to see that all struts move freely on their supports. No kinking in the springs should occur at the bottom of the struts. The shake frame will return to the center position and appear level when it comes to rest.
4. If one or more of the struts is not seated properly, it (they) can be realigned as follows:
 - Remove the sheet metal covering designated as upper rear cabinet in Figure 6 on page 30.
 - Raise the inner frame closest to the unseated strut. The frame should be high enough for the strut pin to clear the strut body.
 - Carefully lower the frame while guiding the pin into the strut body. Take care not to raise the frame so high that the other struts become unseated.
 - Repeat this procedure for each misaligned strut.
5. Move the mixer to its permanent, leveled area. Leave ample room around the paint mixer to facilitate maintenance and safe operation.

LEVELING

Although the mixer is leveled by the manufacturer, variations in floor surfaces may necessitate further adjustment.

WARNING:



Improper leveling may cause severe damage to the paint mixer when in mixing operation.

1. Level the mixer by adjusting the four (4) feet as necessary.
2. Lock the feet into place by tightening the lock nut to the frame insert.

REMOVE SHIPPING INSERTS

After you have plugged the mixer into a dedicated power line and leveled it, inspect to be sure that you have removed the shipping materials inside the mixer.

Refer to Figure 3 on page 16 for a diagram of the control panel.

1. Make sure the front door of the paint mixer is closed. **A safety switch prevents the operation of the paint mixer while the door is open.**
2. Apply power to the paint mixer by placing the POWER switch in the ON position.
3. Turn the button labeled EMERGENCY STOP clockwise until the button pops out to the ON position. If the button does not turn, then it is already in the ON position. **To stop or turn off the paint mixer, push the button to the OFF position.**
4. Push the UP button. Wait several seconds until the UP light goes out and the top plate raises high enough for you to remove the shipping inserts.
5. Open the front door of the paint mixer. Remove the shipping inserts and the wooden disc insert. If there is not enough room to remove the inserts, then push the UP button again.
6. Be sure that you **save the plywood and the foam rubber discs**. These will be used with 5-gallon pails.
7. Before performing an operational test, read the following information **Getting To Know Your Mixer**.

GETTING TO KNOW YOUR PAINT MIXER

General Locations

- *CONTROL PANEL* - All controls are in one location.
- *DOOR SAFETY SWITCH* - The Door must be closed continuously to operate the paint mixer.
- *WARNING STICKERS* - Please read these important messages for YOUR safety.
- *ADJUSTABLE FEET* - The leveling feet adjust in order to level the mixer.

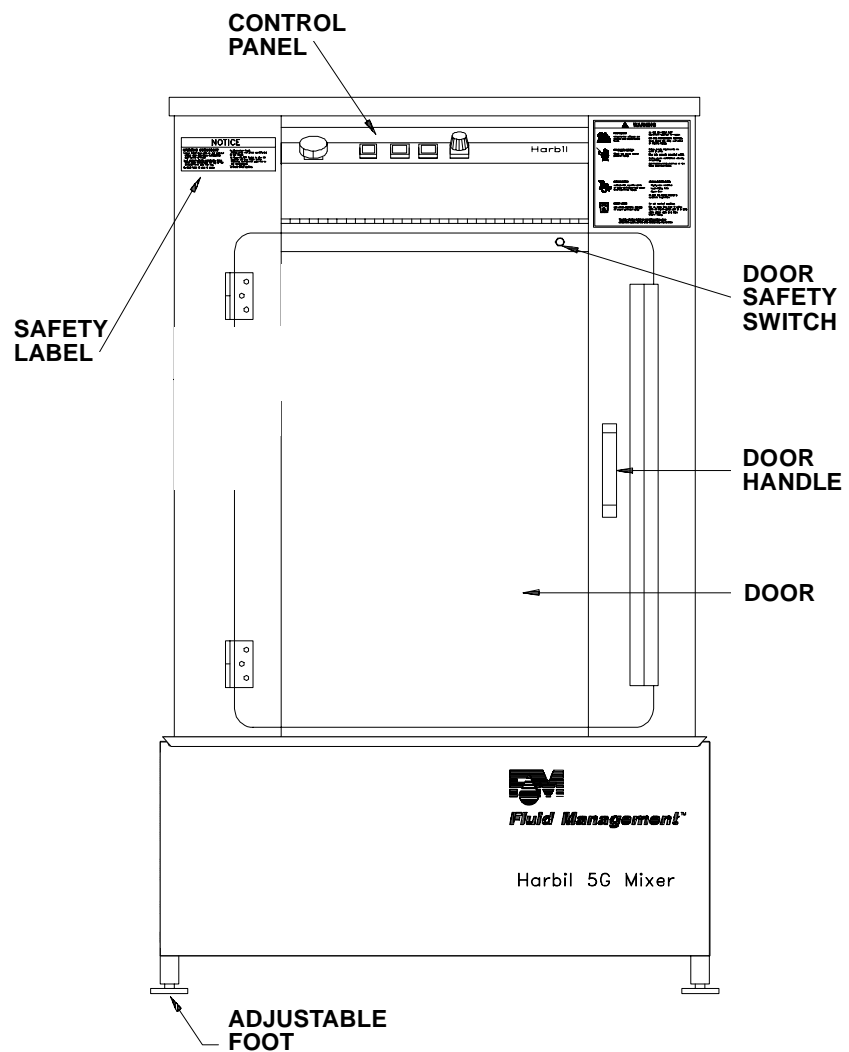


Figure 2 General Locations

Control Panel

- *EMERGENCY STOP* button for quickly stopping the mixer.
- *POWER* rocker switch for applying power to the machine.
- *UP* button for raising the top pressure plate.
- *START* button for activating the mixer.
- *TIMER* for setting the desired mix time from 30 seconds to 3 minutes.

NOTE:



The *POWER* switch must be in the ON position and the *EMERGENCY STOP* must be turned clockwise until it pops up for the machine to function.

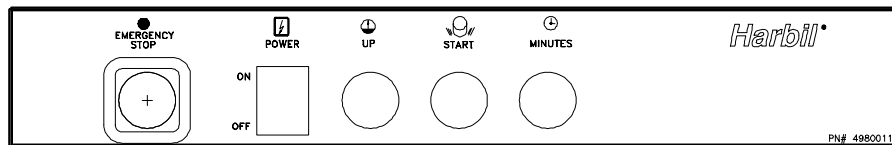


Figure 3 Control Panel

**PERFORM
OPERATIONAL
TEST**

1. Turn to “BASIC OPERATION” on page 19 to be sure you understand how to operate this mixer before beginning this test.
2. Plug in the mixer.
3. To perform this test, use two one-gallon containers, followed by a five-gallon container, and perform these steps:
 - With the one-gallon containers in position on the table, set the TIMER to its minimum value.
 - Twist the EMERGENCY STOP to release it.
 - Depress the POWER switch.
 - With one hand on the EMERGENCY STOP, depress the START switch. The unit should cycle automatically--clamping down and starting the shake cycle with a smooth, vibration-free movement.
4. If vibrations are noticed, immediately press down the EMERGENCY STOP switch.
 - *Mild vibrations* may occur because the unit is not properly leveled. Try slipping a piece of paper under each of the four (4) adjustable feet. If the paper easily slides under a foot (feet), then the mixer is not solidly contacting the floor. Level as necessary.
 - *Severe or persistent vibrations* may be caused by a variety of problems. Check to make sure that the struts are moving freely. If they are, then contact a qualified service technician or Customer Service at Fluid Management for assistance before continuing to operate the mixer.
5. Repeat the above steps using a 5-gallon container.
6. When the unit is operating smoothly, replace and secure the top cover and upper rear cabinet with the screws.
7. Your high speed paint mixer is now ready for operation. Please read the next two sections to familiarize yourself with the machine and how to operate it safely.

IMPORTANT INFORMATION

IMPORTANT INFORMATION

Before operating the mixer, carefully read the following important information.

WARNINGS

- Verify that your paint mixer is properly levelled. Improper leveling may cause severe damage to the machine during the mixing operation.
- Always shut off the master POWER switch and unplug the mixer from the AC power outlet before servicing the paint mixer.
- THIS MACHINE IS NOT EXPLOSION-PROOF AND MUST NOT BE USED IN A FLAMMABLE ATMOSPHERE.

CAUTIONS

- Do not run the paint mixer without a container in place.
- Do not mix more than one full case (four 1-gallon cans) of paint at one time. The maximum weight limit is 80 pounds for paint and 60 pounds for stucco mixture. See “Gallon Can Placement” on page 19.
- On 5-gallon metal containers use the flake-board disc for recessed bottoms that do not have a center support. Use the discs for recessed tops. Refer to “5-Gallon Container Cut-Away View” on page 20.
- On 5-gallon plastic containers, use the foam discs for the recessed tops. **Do not use the flake board disc on plastic containers.**
- When shaking pint or quart colorant containers, use the adapter.

**BASIC
OPERATION**

Open the door. If you need to raise the top plate to accommodate the container to be mixed, turn on the POWER switch and push the UP button. Wait a few seconds until the UP light goes out. This will raise the top plate about two inches. Repeat if necessary.

NOTE:



To quickly stop the machine, push the EMERGENCY STOP button. If you open the door during the operation, the paint mixer will stop.

1. After opening the front door, place the container(s) near the center of the table. A roller is located at the front of the table to aid in placing heavier containers. The diagram below illustrates the proper gallon can placement.

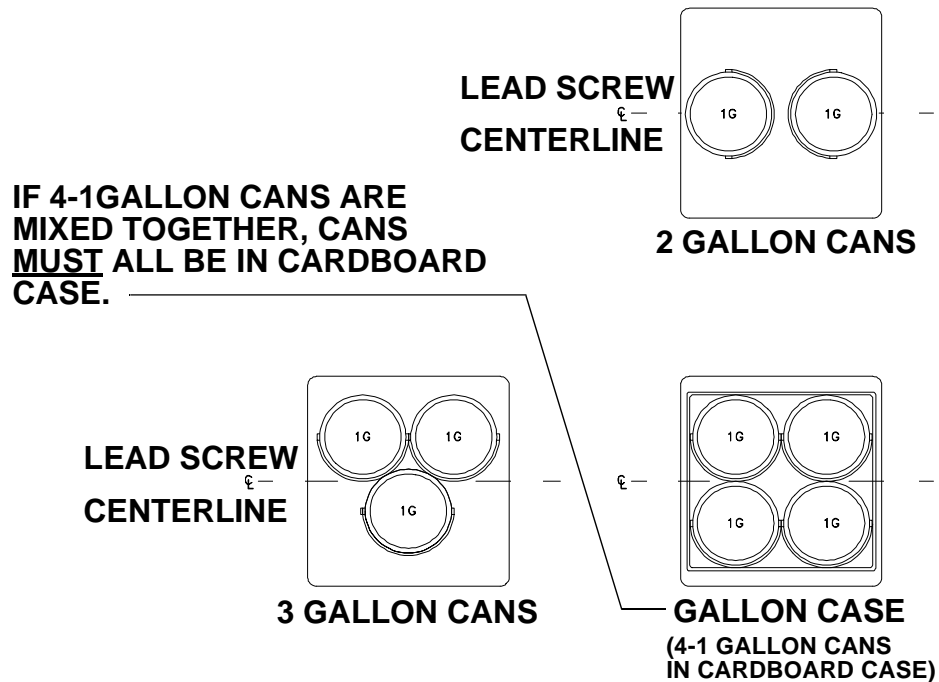


Figure 4 Gallon Can Placement

BASIC OPERATION

2. When using 5-gallon plastic or metal containers with recessed lids, place the foam disc on top of the container even with the rim. NOTE: Both a thick and a thin disc come with the mixer. The foam disc eliminates flexing of the container. On metal containers with recessed bottoms and no center support, place the flake board disc underneath the container.

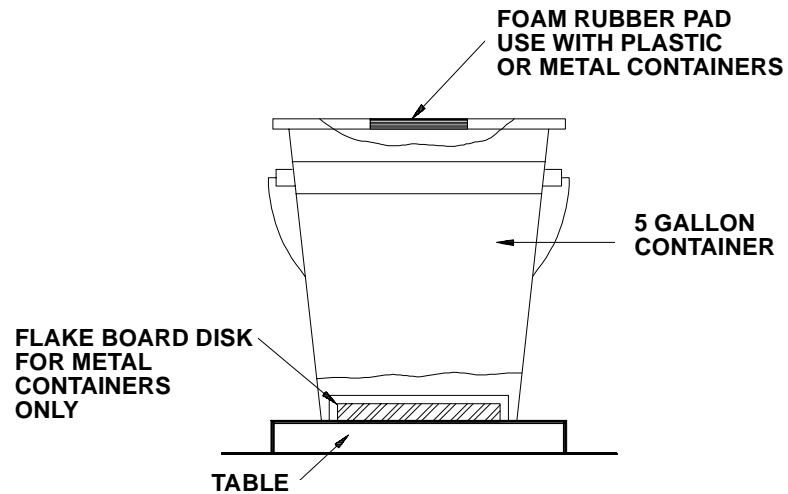


Figure 5 5-Gallon Container Cut-Away View

3. Close the door firmly. **The paint mixer will not operate with the door open.**

4. Set the timer on the control panel to the desired shaking time.
5. Apply power to the mixer by pressing the POWER rocker switch to the ON position and turning the EMERGENCY STOP button clockwise until it pops out to the ON position. If the button does not turn, then it is already in the ON position. **To stop the paint mixer, depress the EMERGENCY STOP button.**
6. Push the START button. The paint mixer will go through the following sequence:
 - The START light will come on.
 - The paint mixer will automatically move the top plate down and hold the container in place.
 - The paint mixer will shake the container for the set amount of time.
 - The START light will turn off to indicate that the shake cycle is completed.
 - The paint mixer will raise the top plate about 2 inches. Allow a few seconds to pass after the UP light goes out to give to top plate time to raise.
7. Remove the paint container.

MAINTENANCE PROCEDURES

MAINTENANCE PROCEDURES

To ensure safe, dependable operation of the paint mixer, follow the maintenance schedule detailed below:

WEEKLY
Lubricate the following items with SAE 20 oil:
<ul style="list-style-type: none">• Top pressure plate nut (accessed through the right and left side doors)
<ul style="list-style-type: none">• Threaded lead screw (accessed through the front door)

EVERY 3 MONTHS
Lubricate the Super-Struts with SAE 20 oil:
<ul style="list-style-type: none">• Apply oil to the Super-Strut pins so that the oil will flow down the bushing.
<ul style="list-style-type: none">• Lubricate the struts on the <u>both sides</u> of the mixer.

TROUBLE-SHOOTING CHART

TROUBLE-SHOOTING CHART

Using the chart below, locate the problem in the first column, then select the probable cause to check and action to take from the next two columns. The problems are arranged from the simplest to the most complex.

Where appropriate, refer to the Servicing and Repair section to correct the problem.

PROBLEM	CHECK	ACTION
The paint mixer does not start.	<ul style="list-style-type: none"> ✓ if mixer attached to receptacle. ✓ receptacle for voltage. ✓ if the front door is not closed. ✓ if the POWER switch is in the ON position and operating properly. The EMERGENCY STOP button should not be depressed. ✓ 6.3 AMP fuse. ✓ 5 amp Slo-Blo fuse. ✓ PCB connector. <p>May be problem with printed circuit board.</p>	<ul style="list-style-type: none"> • Connect to power source. • Contact electrician. • Close the front door. • Turn on POWER switch. Put the EMERGENCY STOP button in the ON position. • Replace fuse. • Replace fuse. • Reestablish PCB connector. • Call Customer Service. • Replace printed circuit board.

TROUBLE-SHOOTING CHART

<p>The top plate does not move in a downward direction.</p>	<ul style="list-style-type: none"> ✓ for loose/broken wire in the DC motor cable. ✓ for loose/broken wire in the DC motor cable. ✓ START switch mechanism on the control panel for a loose connection. ✓ DC motor. <p>May be problem with printed circuit board.</p>	<ul style="list-style-type: none"> • Reconnect loose wire or replace broken wire. • Reconnect loose wire or replace broken wire. • Tighten connections at the START switch. • Replace START switch mechanism. • Using volt meter, measure voltage at DC motor or call Customer Service. • Replace DC motor. • Call Customer Service. • Replace printed circuit board. •
<p>The top plate does not move in an upward direction.</p>	<ul style="list-style-type: none"> ✓ for voltage at the DC motor. ✓ for broken wire in the DC motor cabling. ✓ for problem with the DC motor. ✓ for problem with the UP switch mechanism on the control panel. <p>May be problem with printed circuit board.</p>	<ul style="list-style-type: none"> • Use voltage meter or contact Customer Service for assistance. • Replace broken DC motor cabling. • Contact Customer Service. • Replace DC motor. • See wiring schematic and test with volt meter. • Replace the UP switch mechanism. • Call Customer Service. • Replace printed circuit board.
<p>Paint mixer runs before the top plate clamps on the container.</p>	<ul style="list-style-type: none"> ✓ binding of the top plate. <p>May be problem with printed circuit board.</p>	<ul style="list-style-type: none"> • Clean and oil lead screws. • Call Customer Service. • Replace printed circuit board.

TROUBLE-SHOOTING CHART

<p>Paint mixer will not shut off.</p>	<ul style="list-style-type: none"> ✓ timer control on the front control panel. ✓ if relay is stuck in the closed position. ✓ for bad timer . <p>May be problem with printed circuit board.</p>	<ul style="list-style-type: none"> • Replace if necessary. • Replace relay. • Replace timer. • Call Customer Service. • Replace printed circuit board.
<p>The shake motor has voltage and hums, but it will not run.</p>	<ul style="list-style-type: none"> ✓ for low line voltage. ✓ V-belt tension. ✓ motor capacitor. ✓ shake motor. 	<ul style="list-style-type: none"> • Confirm that the mixer is on a dedicated line. • Correct tension. • Replace motor capacitor. • Replace shake motor.
<p>An excessive amount of vibration occurs.</p>	<ul style="list-style-type: none"> ✓ if mixer is out of balance. ✓ if adjustable leg is broken or damaged. ✓ for broken strut. 	<ul style="list-style-type: none"> • Level by adjusting the legs. • Replace adjustable leg. • Replace broken strut.
<p>The START light is on and nothing happens.</p>	<ul style="list-style-type: none"> ✓ if the DC motor coupling set screw is loose. ✓ for broken wire in the DC motor cabling. ✓ for problem with the DC motor. ✓ for problem with printed circuit board. 	<ul style="list-style-type: none"> • Tighten the DC motor coupling set screw. • Replace DC motor cable. • Replace DC motor. • Call Customer Service. Replace printed circuit board.

TROUBLE-SHOOTING CHART

<p>The START light is on and the top plate clamps on the container, but mixer will not run.</p>	<ul style="list-style-type: none"> ✓ to make sure that the mixer is on a dedicated line. ✓ if front door closed. ✓ if the problem is a loose motor coupling set screw. ✓ the reset button. ✓ for loose or broken wire in the shake motor cabling. ✓ shake motor. 	<ul style="list-style-type: none"> • Connect to dedicated line. • Close the door. • Tighten DC motor coupling set screw. • Press blue reset button located on overload relay. • Tighten or replace wire. • Replace shake motor cabling if necessary. • Replace wire. • Contact Customer Service for assistance. • Replace the shake motor.
<p>The mixer starts slowly and then increases to normal speed in a few seconds.</p>	<ul style="list-style-type: none"> ✓ shake motor V-belt tension. 	<ul style="list-style-type: none"> • Adjust the shake motor V-belt tension.
<p>The DC motor runs, but the top plate does not move.</p>	<ul style="list-style-type: none"> ✓ for a loose set screw in one of the DC motor couplings. ✓ key and set screw on timing gears. 	<ul style="list-style-type: none"> • Tighten set screw(s). • Tighten key and set screw.
<p>The mixer stops before completing shake cycle.</p>	<ul style="list-style-type: none"> ✓ for broken or loose wire in the DC motor cabling. 	<ul style="list-style-type: none"> • Replace DC motor cable.
<p>The mixer speeds up and slows down. The START light is blinking.</p>	<ul style="list-style-type: none"> ✓ if the front door is making contact with the safety switch in the control box. ✓ for a broken wire in DC motor cabling. 	<ul style="list-style-type: none"> • Adjust safety switch. • Replace DC motor cable.

NOTE:

SERVICING AND REPAIR

GENERAL INFORMATION

If you do not feel confident about disassembling the paint mixer or replacing a part, PLEASE DO NOT ATTEMPT THE PROCEDURE. Should problems or question arise, contact Customer Service at Fluid Management.

Carefully read all of the instructions before you begin. For component identification and location, please refer to the Parts Section of this manual.

SAFETY PROCEDURE

Warning

WARNING: ELECTRICAL HAZARD



Always shut off the POWER switch and unplug the mixer before servicing.

Caution

CAUTION:



Wear your safety glasses to prevent possible injury.

OPENING MIXER

REMOVE THE EXTERIOR PANELS

1. Using a medium-size screwdriver or 1/4" nut driver, remove the sheet metal screws securing the top cover. Lift it off the mixer.

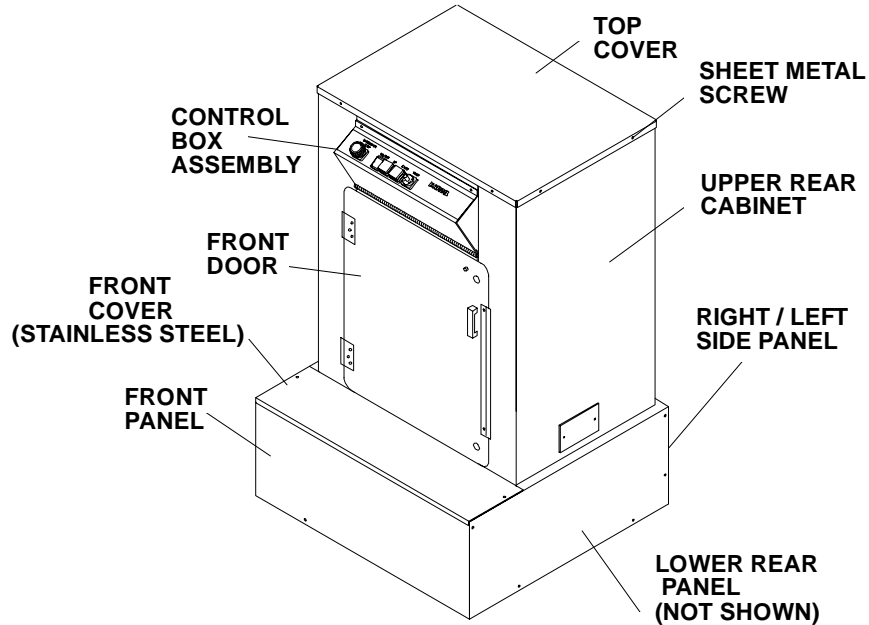


Figure 6 Removing the Mixer Coverings

2. In the same manner, take off the upper rear cabinet (3-sided piece) covering the sides and back, and set to the side of the work area.
3. If your machine has a 4-sided skirt, remove it now.
4. At the back of the mixer, squeeze the power supply strain relief with a pair of pliers, and pull it off the cord. Move the back panel away from the machine (the cord will still be attached).
5. Remove the right and left side panels, and the lower front panel.
6. To prevent damage, remove the mixer door by lifting the door off its pins.

7. If your machine has an Opto-Coupler:
 - Remove the two (2) screws and lower control box cover.
 - Unplug the 3-pin connector to the PC board at the right side of the control box.
 - Remove the 3 tie wraps.
 - On the outside of the control box, unscrew the strain relief nut on the Opto-Coupler cable running to the right side of the control box.
8. Cut the upper wire tie wrap securing the three (3) cables to the outer frame at the left side of the machine.
9. Remove the remaining front sheet metal covering. Carefully prop the front piece (two front columns with control box assembly) to the side of the machine, being careful to not damage the cords.

REMOVING SHAKE FRAME

Some service procedures involve removing the shake frame. Read all of the following instructions. If you have any doubt about performing these procedures, please contact Customer Service at Fluid Management. For component identification and location, refer to the Parts Section of this manual.

1. Remove the sheet metal covering as described under “Removing the Mixer Coverings” on page 30.
2. To facilitate the reassembly process, mark or prepare a drawing of the four (4) wires running from the left side of the terminal block to the control box. Figure 7 on page 32 is a typical layout, although variations may occur.
3. Using a small blade screwdriver, disconnect these four (4) wires.
4. Pull the cable containing these four (4) wires through the two (2) tie wraps, or snip and remove the two (2) tie wraps with side cutters.

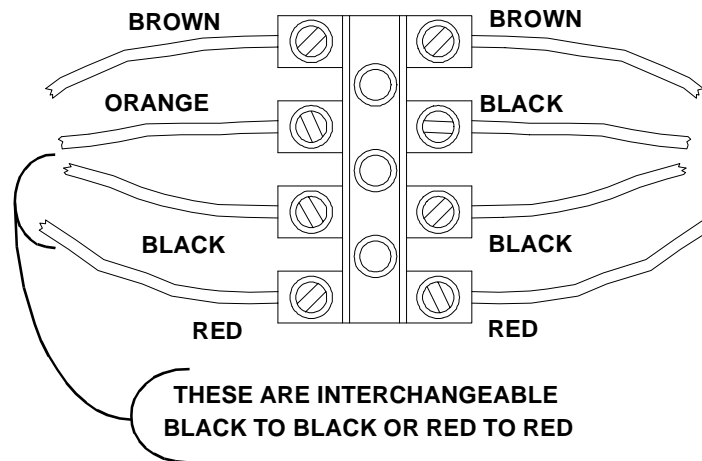


Figure 7 Disconnecting the 4 Wires at the Terminal Block

5. Follow the cable to the strain relief, located on the inside of the hole where the cable goes through the shake frame. Unscrew the strain relief and pull the cable through the hole.

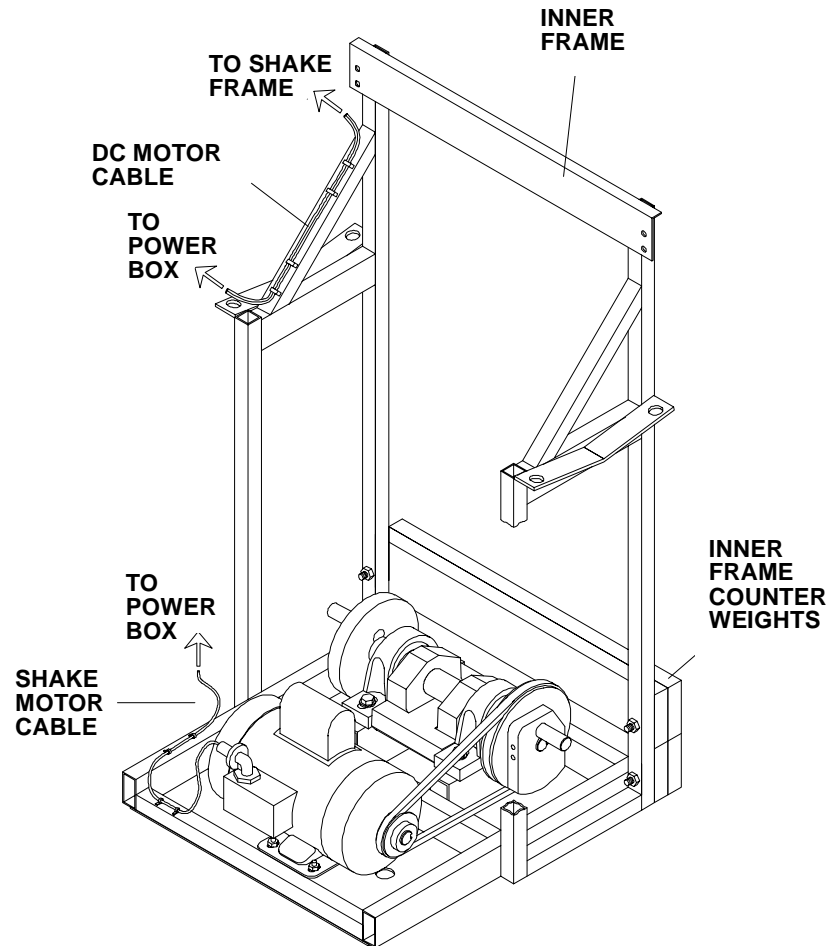


Figure 8 Removing the Shake Frame

REMOVE THE COUNTERWEIGHTS

CAUTION:



The weights for the inner frame weight 21 pounds each!

1. In order to access the nuts on the flange bearings, and the rear screws and nuts on the pillow block bearings, remove the two (2) lower inner frame counterweights. **DO NOT REMOVE** the two upper inner frame counterweights. Use two (2) 1/2" wrenches, or a ratchet and a 1/2" wrench, take off the two (2) lower nuts and screws holding the lower weights to the inner frame to allow access to the crankshaft.
2. With two (2) 1/2" wrenches or a ratchet and a 1/2" wrench, loosen **BUT DON'T REMOVE**, the four (4) screws securing the flange bearings to the shake frame. Remove the four (4) nuts.

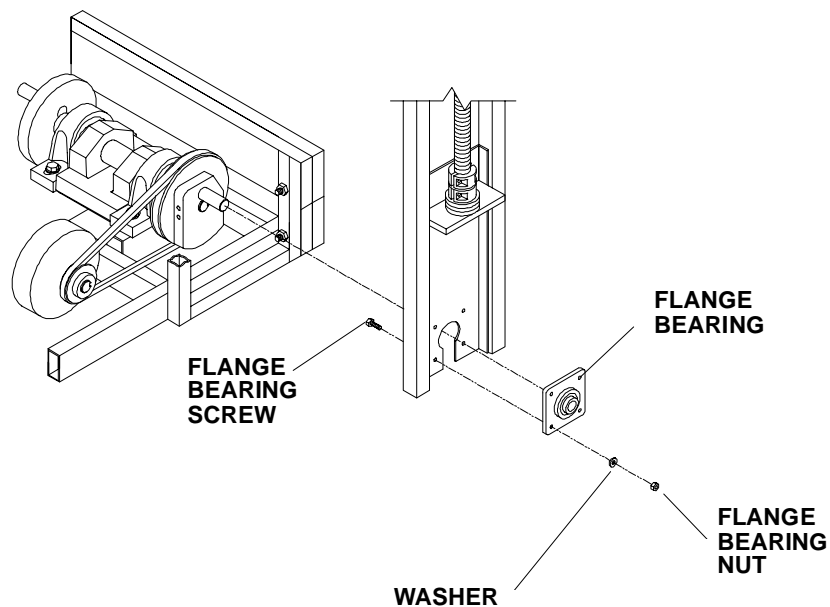


Figure 9 Flange Bearings

3. With a 1/8" hex wrench, loosen the two (2) set screws holding the crankshaft to the flange bearings. Remove the flange bearings. If necessary, use a wheel puller to pry the flange bearing from the crankshaft.

CAUTION:



Be careful when removing the shake frame. It may swivel or fall forward while working on the next step.

CAUTION:



Be careful when lifting.

The shake frame weighs over 200 pounds.

4. Position one person at the back of the mixer to hold the shake frame. Using a 1/2" socket or open-end wrench, remove the two (2) nuts and screws holding the swivel rods to the inner frame.

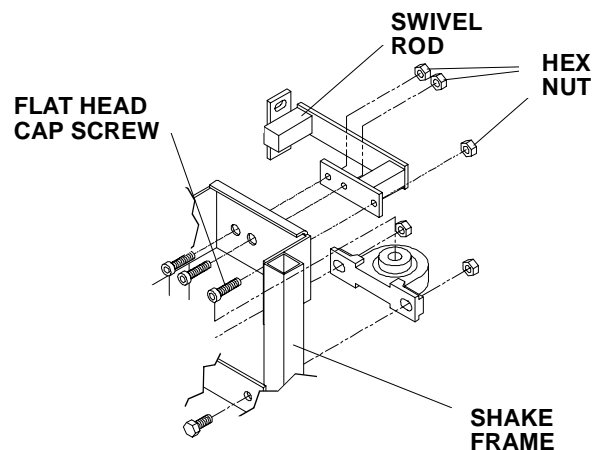


Figure 10 Nuts and Screws Holding Swivel Rods

5. Repeat steps 2 - 4 on the other side.
6. With the assistance of another person, lift up and pull out the complete shake frame.

TESTING SHAKE MOTOR

Read all of the following instructions. If you have any doubt about performing these procedures, please contact Fluid Management.

For component location and identification, refer to the Parts Section of this manual.

WARNING: ELECTRICAL HAZARD



To carry out this test you will need 120 volts which could cause electrical shock.

1. Place an empty pail on the table and close the door firmly. Turn on the paint mixer and push the START button. Give the paint mixer enough time to lower the top plate onto the pail. (A roller is provided to aid in loading pails.)
2. Turn off the paint mixer and unplug the electrical cord.
3. Remove the front plate, lower front panel and right side panel.
4. Remove the motor cover.
5. Take a 3-conductor jumper cable, which has a plug at one end and stripped wires on the other end, and connect the wires to the shake motor.
6. Plug the jumper cord into a wall outlet (120 volts or appropriate voltage).
 - If the shake motor starts to run, then the cable or the relay is bad.
 - If the shake motor does not run, it has to be replaced.
7. Unplug and remove the jumper cord from the shake motor.
8. Reassemble the mixer by returning the motor cover and lower panel to their correct positions.

CHANGING SHAKE MOTOR

Read all of the following instructions. If you have any doubt about performing these procedures, please contact Customer Service at Fluid Management.

Turn to the Parts Section of this manual for component identification and location.

1. Unplug the electrical cord.
2. Remove the front plate, lower front panel, and right/left side panel.
3. Make a drawing of the wire to the terminal connections, then disconnect the wires from the shake motor.
4. Remove the four (4) hold-down screws on the motor.
5. Remove the V-belt from the pulley on the motor.
6. Remove and replace the motor.
7. Remove the pulley from the old motor by loosening the set screw.
8. Reposition the wires on the new shake motor by following the drawing made in Step 3.
9. Reinstall the pulley on the new motor.
10. Put the V-belt on the balance groove pulley, then on the motor pulley.
11. Align the motor pulley with the groove pulley on the crankshaft.
12. Install and tighten down the four (4) motor hold-down screws while keeping tension on the belt.
13. **Be sure to adjust the shake motor for proper tension on the V-belt. The deflection should be approximately 3/16" at five (5) pounds of pressure.**
14. Reassemble the paint mixer by reversing these instructions.
15. With a paint container in position, perform a test run of the mixer to be sure that it is operating correctly.

CHANGING THE V-BELT

Read all of the following instructions. If you have any doubt about performing these procedures, please contact Customer Service at Fluid Management.

Refer to the Parts Section for component identification and location.

1. Unplug the electrical cord.
2. Remove all the sheet metal covering as described under “REMOVE THE EXTERIOR PANELS” on page 30.
3. Loosen the screws and nuts on the flange bearings.
4. Slide the shake frame on the right side of the crankshaft.
5. Remove the flange bearing on the right side of the machine.
6. Loosen the shake motor mounting screws and slide the motor toward the crankshaft, thereby loosening the V-belt. Remove the V-belt.
7. Put the new V-belt on the balance groove pulley, then on the motor pulley.
8. Install and tighten down the four (4) motor hold-down screws while keeping tension on the belt.
9. Be sure to adjust the shake motor for proper tension on the V-belt. The deflection should be approximately 3/16" at five (5) pounds of pressure.
10. Reassemble the paint mixer by reversing these instructions.

REMOVING CIRCUIT BOARD

Read all of the following instructions. If you have any doubt about performing these procedures, please contact Customer Service at Fluid Management.

Turn to the Parts Section for component identification and location.

WARNING: ELECTRICAL HAZARD



The mixer must be unplugged before attempting this procedure. There is a chance of electrical shock.

1. Unplug the electrical cord.
2. Remove the sheet metal screws on the control panel and slowly swing it down.
3. Remove the top cover.
4. Remove the push-on type connector at the bottom of the printed circuit board. Pull the connector with alternating left and right force away from the circuit board. It is not necessary to loosen the screws on the connector.
5. Remove the four (4) screws and hold nuts that attach the circuit board to the control panel.
6. Install the new board with the push-on the connector.
7. Reinstall the control panel and the top cover.
8. Connect the electrical cord.

INSTALLING RUBBER PAD

Read all of the following instructions. If you have any doubt about performing these procedures, please contact Customer Service at Fluid Management.

For component identification and location, consult the Parts Section of this manual.

When attaching the rubber pad to the top plate, use **Loctite Super Bonder #416 Instant Adhesive**. Follow the instructions on the adhesive for the drying time. Use protective gloves when applying the adhesive.

1. To remove the old pad, use a scraper.
2. Apply a non-flammable solvent to remove the old adhesive.
3. Apply the permanent adhesive to the pad. Follow the glue pattern shown in the diagram below:

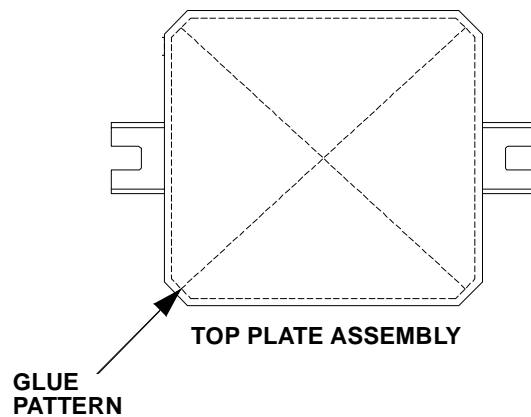


Figure 11 Glue Pattern

4. Making sure the pad is positioned properly, attach the pad to the plate and hold in position for about 2 minutes.
5. After attaching the pad, place a case of four (4) 1-gallon cans on the table.
6. Turn on the mixer. Allow the top plate to lower onto the case.
7. Turn off the mixer and unplug the electrical cord as a safety precaution.
8. Allow the adhesive to dry overnight.

REPLACING / ADJUSTING DC MOTOR OR REPLACING OPTO COUPLER

The DC motor needs adjusting if it is making excessive noise while the top plate is moving. Adjustments are also required when reinstalling or replacing the motor. Some units have an opto-coupler and black disc over one of the lead screws. If the opto-coupler flails, it must be changed.

Read all of the following instructions. If you have any doubt about performing these procedures, please contact Customer Service at Fluid Management.

Refer to the Parts Section for component identification and location.

DC Clamping Motor Replacement/Adjustment

1. **Make sure that the power is off.**
2. Remove the top cover.
3. If you only need to readjust the DC motor, execute the following steps:
 - loosen the four (4) mounting screws that connect the DC motor to the frame.
 - Loosen the one (1) Allen set screw from the DC motor coupling half.
 - Assure that the DC motor is properly aligned and fully tighten the four (4) mounting screw.
 - Tighten the one (1) set screw on the coupling half.

If you need to replace the motor, go to the next step.

4. Disconnect the red and black motor leads from the terminal block. If an opto-coupler is found, it may be necessary to cut a cable tie. (*Not all mixers have opto-coupler.*)
5. Remove the four (4) screws that connect the DC motor to the shake frame.
6. Loosen the one (1) Allen set screw from the DC motor coupling half and pull off of the shake frame and lead screw.
7. Remove the coupling half from the old motor and save for later use.
8. Place the coupling half onto the new motor.

9. While aligning the coupling half to the lead screw, place the new DC motor in the shake frame using the four (4) screws. **Do not fully tighten at this point.**
10. Mount the DC motor coupling onto the lead screw by tightening the allen set screw.
11. Assure that the DC motor is properly aligned and fully tighten the four (4) mounting screws.
12. Connect the red and black motor leads to the terminal block.
13. Replace the top cover.
14. Connect power to the mixer.
15. Perform the operational test.

Replacing Opto-coupler

1. **Make sure that the power is off.**
2. Remove the top cover.
3. Disconnect the cable connector from the opto-coupler.
4. Remove the old opto-coupler and discard.
5. Remove all silicone rubber cement from the mounting bracket.
6. Press the new opto-coupler into place on the mounting bracket.
7. Place the cable connector back onto the opto-coupler.
8. Place a small amount of Dow Corning, Indoor/outdoor Silicone Sealant (or equivalent pliable compound) behind each of the two (2) penetrations of the mounting bracket.
9. Allow sufficient time for compound to cure.
10. Replace the top cover.
11. Connect power to the mixer.
12. Perform the operational test.

NOTES

REPLACING SUPER- STRUTS

Read all the directions carefully. If you do not feel comfortable disassembling the mixer or replacing a part, do not attempt the procedure. Refer to the Parts Section for component identification and location.

REMOVING THE EXTERNAL PANELS

1. **Unplug the electrical cord.**
2. Remove the top cover and lift it off the mixer.
3. Remove the upper rear cabinet (3-sided piece), front cover, and right and left side panels, as shown in Figure 6 on page 30.
4. Set the covers to the side of the work area.

REMOVING THE STRUTS

1. Locate the four (4) Super-Struts to be replaced. **You will be replacing the struts on one side at a time.**

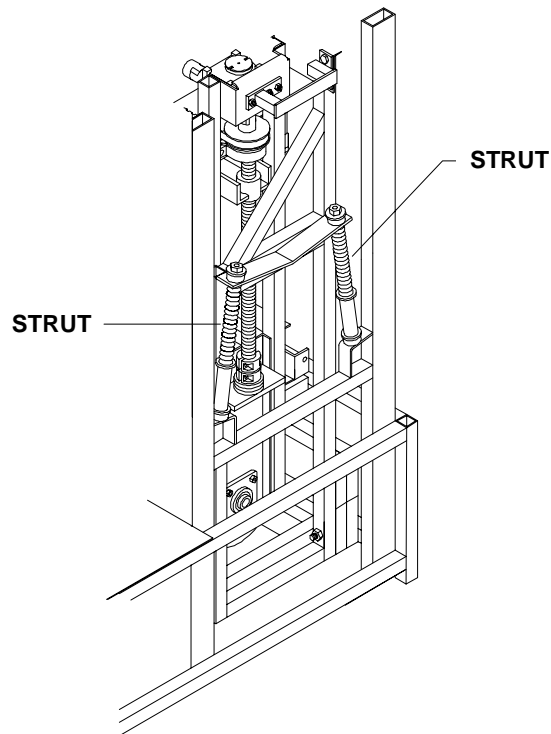


Figure 12 Locating the Struts

2. Locate the hole in the strut pin. Insert the end of the 1/8" hex key into the hole to prevent the pin from rotating while loosening the bolt. If no hole is observed, grasp the pin with vice grips and loosen the nut.

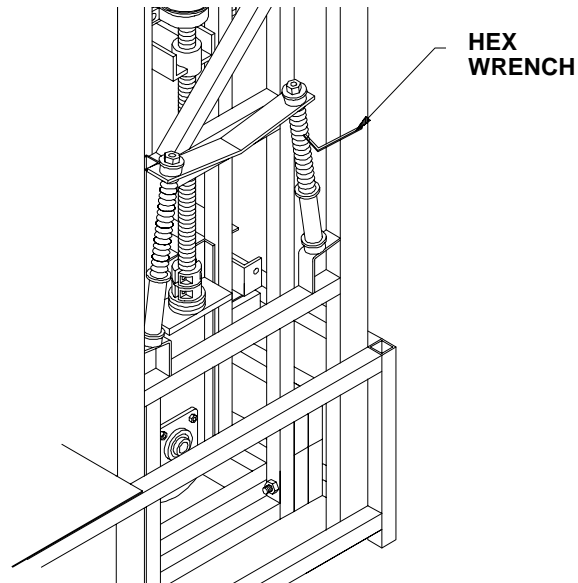


Figure 13 Keeping the Strut Pin from Rotating

3. Beginning on the right side, use a box end or adjustable wrench to remove the top nuts, washers, and rubber grommets on both struts. Remove the hex wrench from the hole in the strut pin.

REPLACING SUPER-STRUTS

- Using the 2" x 4' wooden board for leverage, lift the shake frame in the center until the two (2) strut pins are raised high enough to clear the strut bodies.

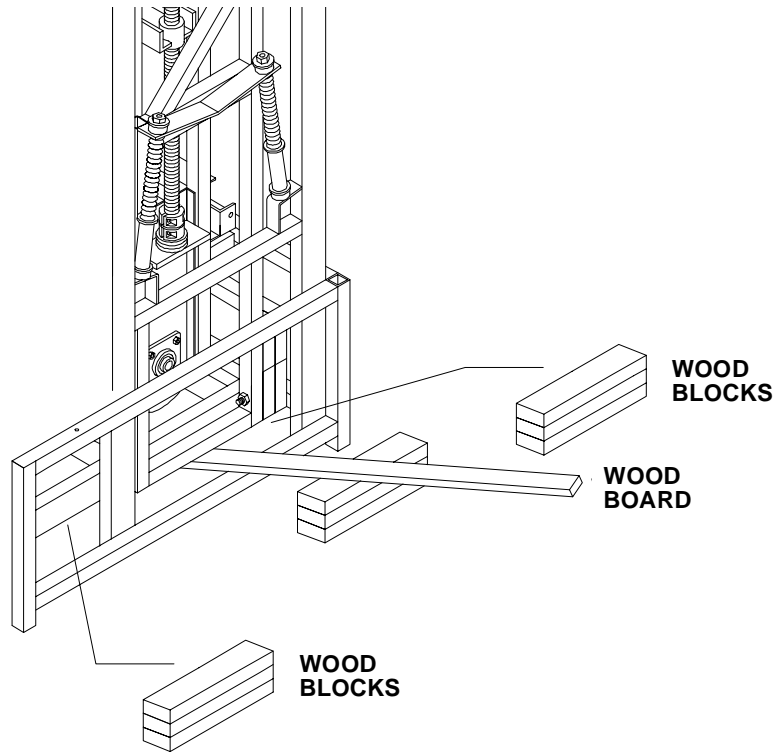


Figure 14 Lifting the Inner Frame

- Have a second person place three (3) 2" x 4" blocks under the front and rear inner frame for support as shown below.
- Remove both strut pins, bodies, and springs from the frame.

INSTALLING THE SUPER-STRUTS

Refer to the Super-Strut assembly drawing for parts locations:

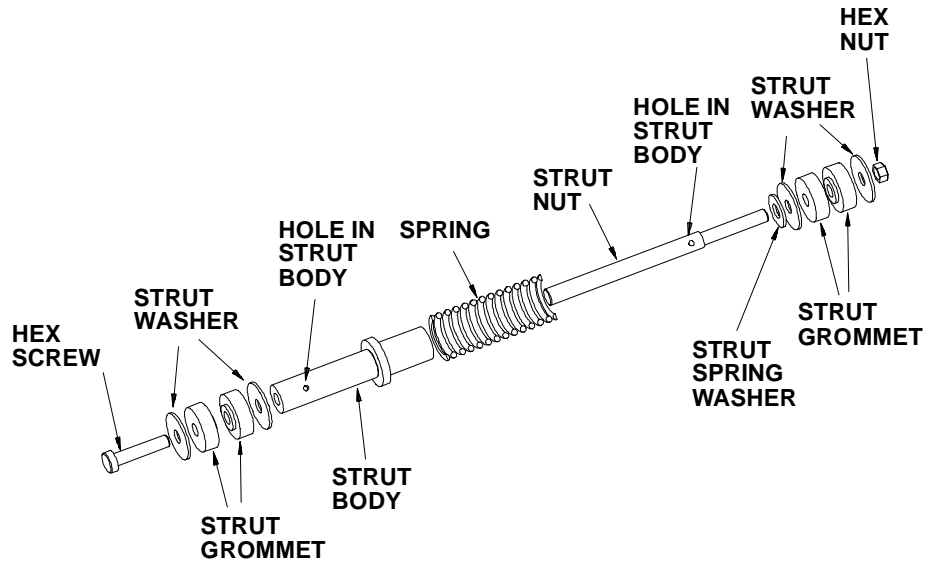


Figure 15 Super-Strut Assembly

REPLACING SUPER-STRUTS

1. Beginning with the REAR strut install the new strut body, washers, rubber grommets, and bottom screw on the outer frame. **NOTE: When installing the rubber grommets, the two shouldered ends must face each other with the mounting bracket between them as shown in the figure below.**
2. Hand tighten until snug.
3. Repeat Step 1 for the FRONT strut. Install the new strut pins, washers, rubber grommets, and top nuts on the inner frame as shown in the figure below. Hand tighten until snug.

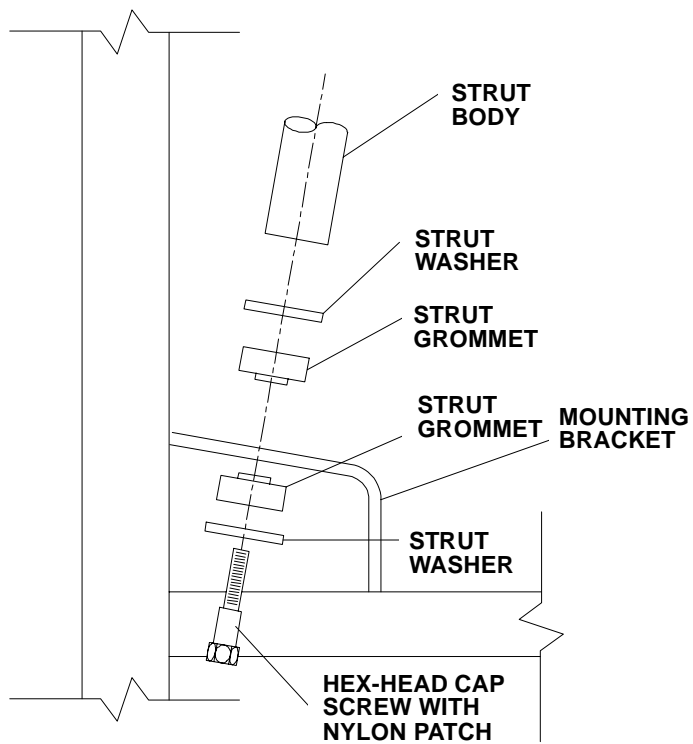


Figure 16 Replacing the Front Strut

4. Using the 2" x 4' board, lift the inner frame and install both springs on the strut bodies, then remove the blocks from under the inner frame.
5. Lift the inner frame again with the 2" x 4' board as a lever. This will allow you to align and insert the strut pins into the strut bodies. **NOTE: Use care when installing the pins in order to prevent damage to the inner bushing.**
6. Make sure that the springs are centered. Push with your thumb to click them into place.

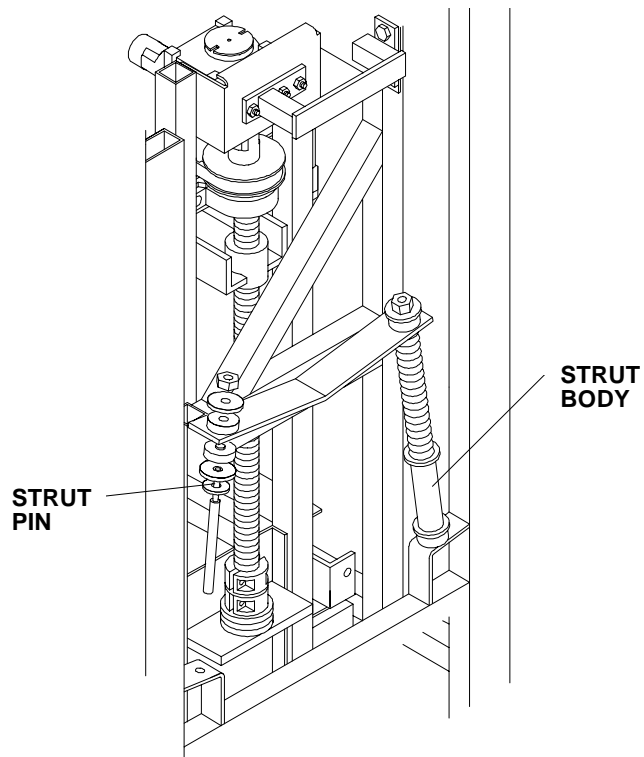


Figure 17 Replacing the Strut Shafts

REPLACING SUPER-STRUTS

7. Beginning with the FRONT strut, tighten the top nut until the bottom rubber grommet is compressed 1/2".
8. Tighten the BOTTOM screw until the top rubber grommet is also compressed to 1/2".
9. Moving to the REAR strut, tighten the TOP nut until the bottom rubber grommet is compressed 1/2".
10. Insert the 1/8" hex wrench into the strut pin and tighten the BOTTOM screw until the top rubber grommet is compressed to 1/2". Remove the hex wrench from the strut pin.
11. To change the struts on the other side of the mixer, repeat these steps beginning with Step 1 under "REMOVING THE STRUTS" on page 44.

REPLACING CRANKSHAFT

Please read all the directions before attempting this procedure. If you do not feel comfortable about disassembling the mixer or replacing a part, please do not attempt it. Should questions arise, contact Customer Service at Fluid Management.

Turn to the Parts Section for component identification and location.

ACCESS THE CRANKSHAFT

1. **Unplug the electrical cord.**
2. Remove the sheet metal covering. Refer to “REMOVE THE EXTERIOR PANELS” on page 30.
3. Remove the shake frame and counterweights. See “REMOVING SHAKE FRAME” on page 32.

REMOVE THE CRANKSHAFT

1. Using two (2) 1/2" wrenches, loosen the four (4) nuts and screws holding the motor to the inner frame.

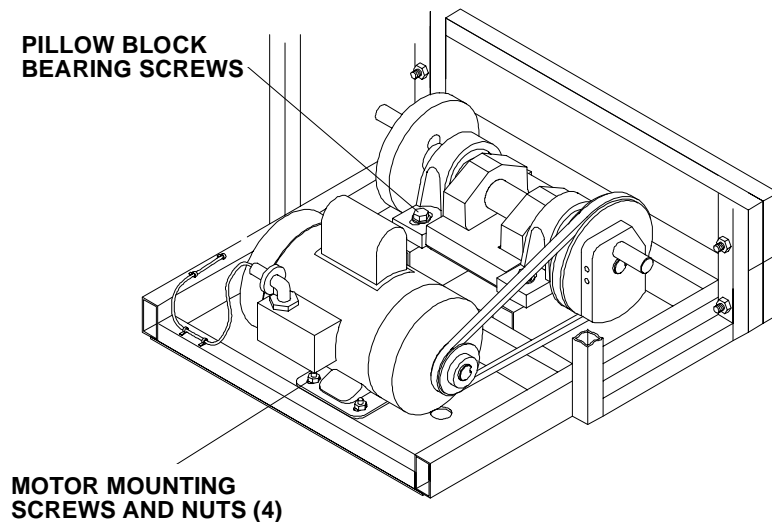


Figure 18 Removing the Crankshaft

2. Remove the old V-belt.

REPLACING CRANKSHAFT

3. Remove and discard the four (4) pillow-block screws holding the crankshaft.
4. Remove and discard the old crankshaft assembly.

INSTALL THE NEW CRANKSHAFT

1. **The mounting surfaces must be flat before installing the new assembly.**
2. Set the new crankshaft assembly onto the pillow-block mounting pads. Facing the back of the machine, look at the V-groove balance-plate pulley. It should be on your left. Adjust, if necessary.
3. Install the new crankshaft assembly with new washers, nuts and 7/16-14" hex screws. Drop these into position, but don't tighten at this time.
4. Align the pillow blocks over the crankshaft mount. **It may be necessary to remove the motor in order to align, then tighten, the screws on the crankshaft.** If so, follow these steps:
 - Lift the front of the machine with the 2" x 4' wooden board and place the blocks under the board.
 - Remove the four (4) hold-down screws on the motor.
 - Move the motor out of the way.
5. Align the crankshaft assembly assuring that it is parallel to the rear surface of the inner frame. Measure the distance between the inner frame weights and the rear edge of the crankshaft. The measurement on each side of the crankshaft should be the same.
6. First tighten the front nuts and screws; then tighten the others.
7. Remove the old motor pulley with a hex wrench and a wheel puller.
8. Install the new pulley using the old square key. Do not tighten the pulley set screw at this time.
9. Reinstall the motor, if it was moved.

10. Inspect the V-belt and replace if necessary. Check the alignment of the belt and the pulleys. Now tighten the pulley set screw on the motor pulley.

IMPORTANT: Adjust the belt tension to approximately 3/16" deflection at five (5) pounds of pressure before tightening the motor screws.

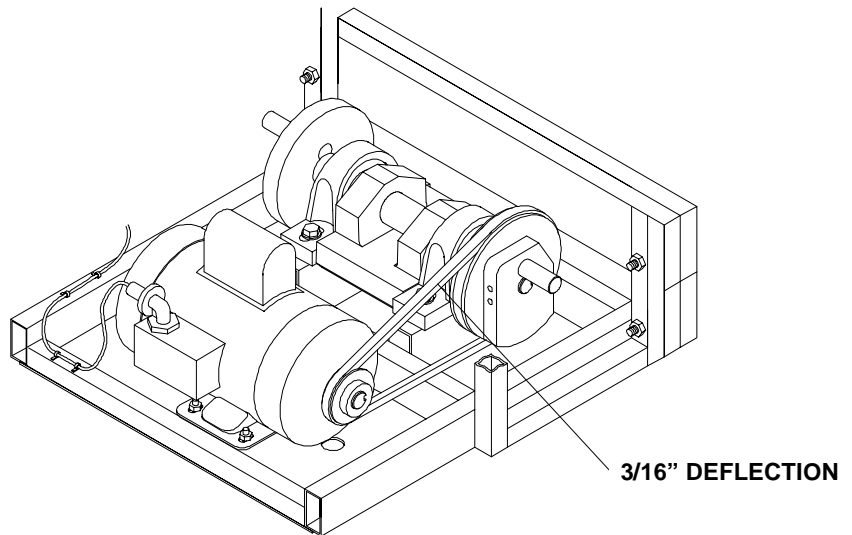


Figure 19 Measuring 3/16" Deflection

11. Tighten the four (4) mounting screws on the motor while applying tension to the V-belt.

REASSEMBLING MIXER

Two people are required to lift the shake frame into the mixer.

1. With one person on each side of the shake frame, lift the shake frame into the mixer and rest it on the crankshaft. **NOTE: the four (4) screw holes in the swivel rods must be properly aligned with the holes in the inner frame. The second person supports the top of shake frame so it will no fall forward.**
2. Place the washers on the screws and insert them into the swivel rods. Guide the screws into the holes in the inner frame. NOTE: The screws are inserted from the inside of the swivel rods.
3. Place the nuts on the screws, but do not tighten them all the way. Repeat steps 2 and 3 on the other side of the mixer.
4. Before mounting the flange bearings, lubricate them with lithium-based grease.
 - Rotate the collar of the flange bearing so that the two (2) set screws are facing up, then place the flange bearing on the end of the crankshaft.
 - Tighten the set screws holding the crankshaft to the flange bearing.
 - Use the 2" x 4' board to lift the shake frame in order to tighten the four (4) nuts securing the flange bearing to the shake frame.
 - Insert the screws from the inside of the shake frame, then place the washers and nuts on the outside of the flange bearing and hand tighten.
5. Standing in front of the mixer, verify that the shake frame is centered inside the inner frame. There must be equal clearance between the shake frame and the inner frame on both sides of the mixer. Adjust if necessary.
6. Tighten the four (4) nuts and screws holding the swivel rods to the inner frame. Insert the wrench on the inner side of the shake frame and tighten one screw on the right and left sides. Again verify that the shake frame is properly centered before tightening the other three (3) nuts all the way on each side of the mixer.
7. Reinstall the inner frame weights.

8. Thread the grey control box cable through the hole in the shake frame and through the tie wraps. If the tie wraps were removed, install new ones.
9. Tighten the strain relief.
10. Using your wiring diagram, connect the four (4) wires leading from the grey cable to the shake frame terminal block.
11. Reposition the sheet metal covering and secure with the sheet metal screws. If using a ratchet, do not apply too much pressure to the self-drilling sheet metal screws.
12. Place the door in its proper position.
13. Secure the top cover.

TEST PROCEDURE

1. **Push the shake frame vertically and horizontally back and forth to verify freedom of motion.**
2. Plug in the mixer.
3. Place a gallon can of paint in the mixer.
4. Turn on the mixer to verify that it is working properly. Make any necessary adjustments.
5. Dispose of remaining used parts.

NOTES

**PARTS
SECTION**

This section is designed to assist you in

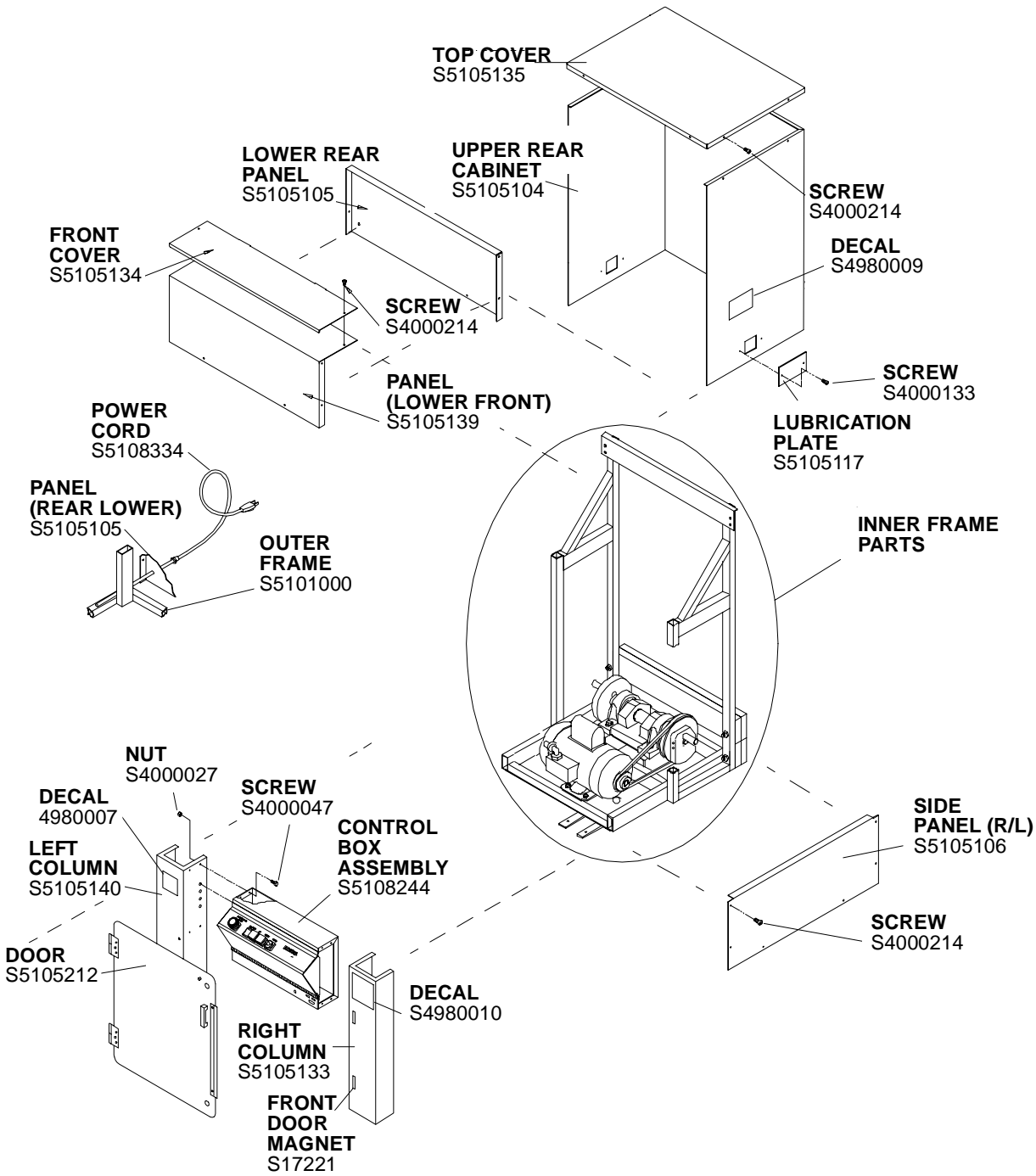
- Performing service function
- Identifying parts

**ALL REPAIRS MUST BE DONE BY
QUALIFIED SERVICE PERSONNEL**

IMPORTANT: Part numbers do change from time to time; therefore, call Customer Service to verify part numbers before placing an order. This is particularly important for machines built prior to 6/95.

PARTS: SHEET METAL AND OUTER FRAME

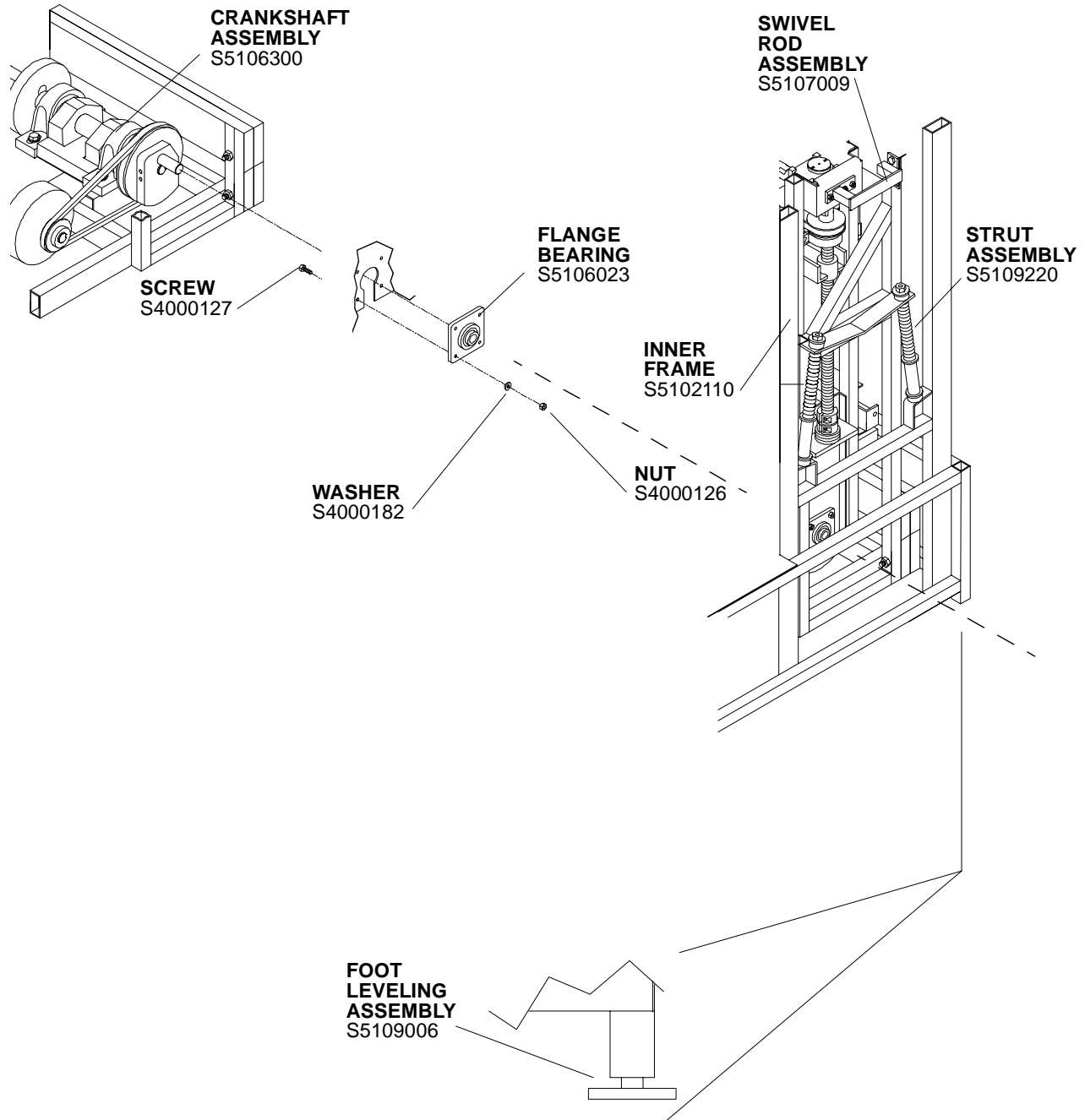
PARTS: SHEET METAL AND OUTER FRAME



PARTS: SHEET METAL AND OUTER FRAME

PART NO	DESCRIPTION	NO REQ
S17221	FRONT DOOR MAGNET, 5G	2
S4000027	NUT, HEX (NO. 10-32 W/ NYLON PATCH, PACKAGE OF 12) <u>P/N S4000419</u>	8
S4000047	SCREW, SOCKET HEAD CAP (NO. 10-32 X 1/2")	8
S4000133	SCREW, PAN HEAD SHEET METAL (NO. 8 X 1/2", SLOT)	4
S4000214	SCREW, SELF DRILLING HEX SHEET METAL (NO. 8 X 1/2")	53
S4700510	5G INSTRUCTION MANUAL (NOT SHOWN)	1
S4980007	DECAL, NOTICE - "OPERATING INSTRUCTIONS"	1
S4980009	DECAL, NOTICE - "SEE OPERATOR'S MANUAL FOR LUBRICATION"	2
S4980010	DECAL, WARNING - "WARNING AND CAUTION"	1
S5101000	OUTER FRAME (ONLY), 5G	1
S5105104	CABINET (UPPER REAR), 5G	1
S5105105	LOWER REAR PANEL, 5G	1
S5105106	SIDE PANEL (RIGHT AND LEFT), 5G	2
S5105117	LUBRICATION PLATE, 5G	2
S5105133	RIGHT COLUMN, 5G	1
S5105134	FRONT COVER (STAINLESS STEEL), 5G	1
S5105135	TOP COVER, 5G	1
S5105139	FRONT PANEL, 5G	1
S5105140	LEFT COLUMN, 5G	1
S5105212	DOOR ASSEMBLY	1
S5108244	CONTROL BOX ASSEMBLY, COMPLETE (USA), 5G	1
S5108334	INCOMING CORD, 16 FEET	1

PARTS: SHEET METAL AND OUTER FRAME

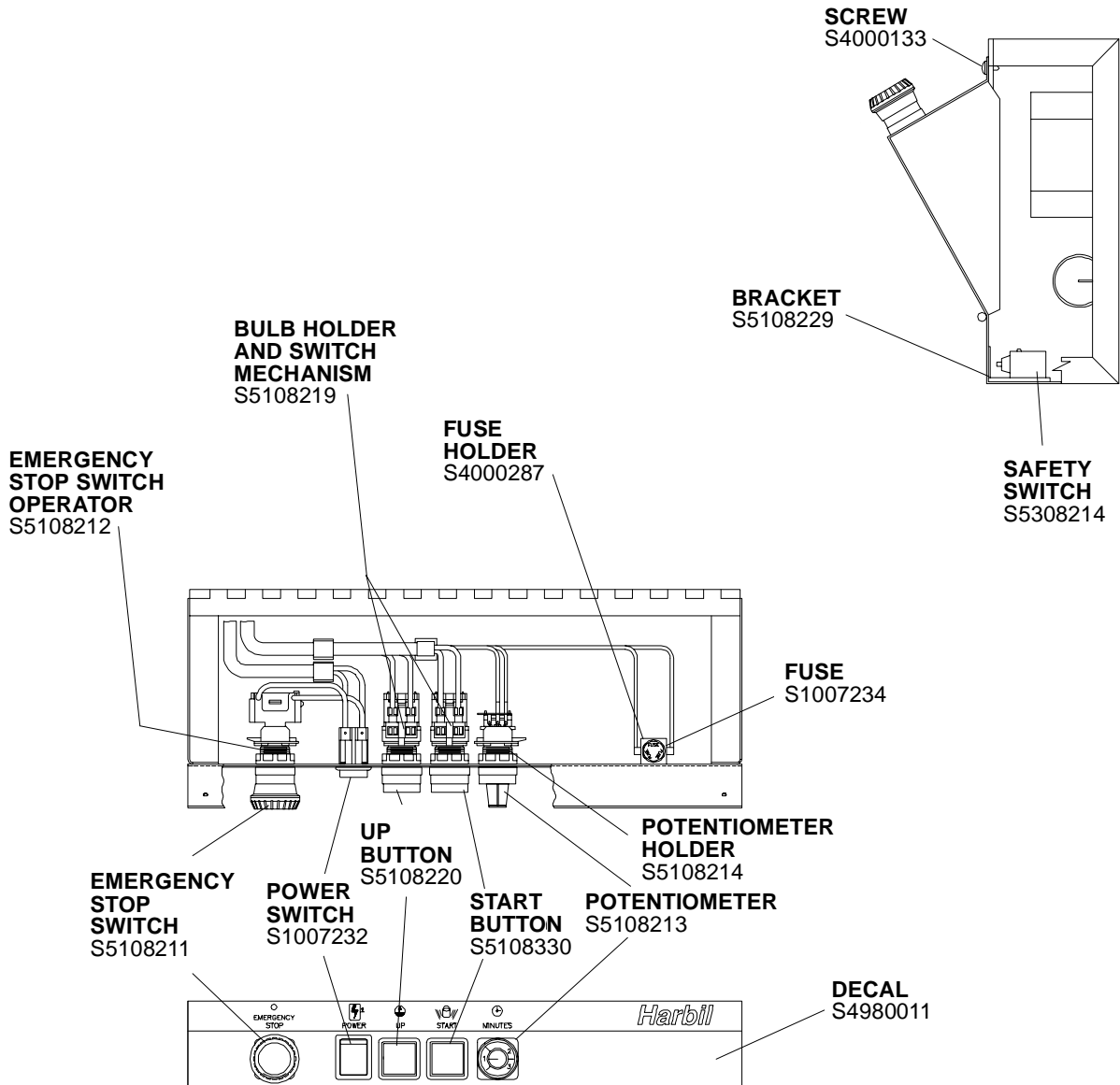


PARTS: SHEET METAL AND OUTER FRAME

PART NO	DESCRIPTION	NO REQ
S4000126	NUT, HEX (5/16-18, W/ NYLON PATCH, PACKAGE OF 12) <u>P/N 4000441</u>	20
S4000127	SCREW, HEX HEAD CAP(5/16-18 X 1-1/4"PACKAGE OF 12) <u>P/N4000442</u>	8
S4000182	PLAIN WASHER, 11/32" ID X 5/8" OD	16
S5106023	FLANGE BEARING ASSEMBLY, COMPLETE, 5G	2
S5106300	CRANKSHAFT ASSEMBLY, COMPLETE, 5G (INCLUDES CRANKSHAFT, COUNTERWEIGHTS, BAL- ANCE PLATE,COUNTERWEIGHT BALANCE PULLEY AND PILLOW BLOCK BEARINGS)	1
S5102100	INNER FRAME (ONLY), 5G	1
S5103182	SHAKE FRAME, 5G COMPLETE	1
S5107009	SWIVEL ROD ASSEMBLY	2
S5109006	LEVELING FOOT ASSEMBLY, 5G	4
S5109220	SUPER-STRUT SHOCK ASSEMBLY	4

PARTS: CONTROL BOX ASSEMBLY

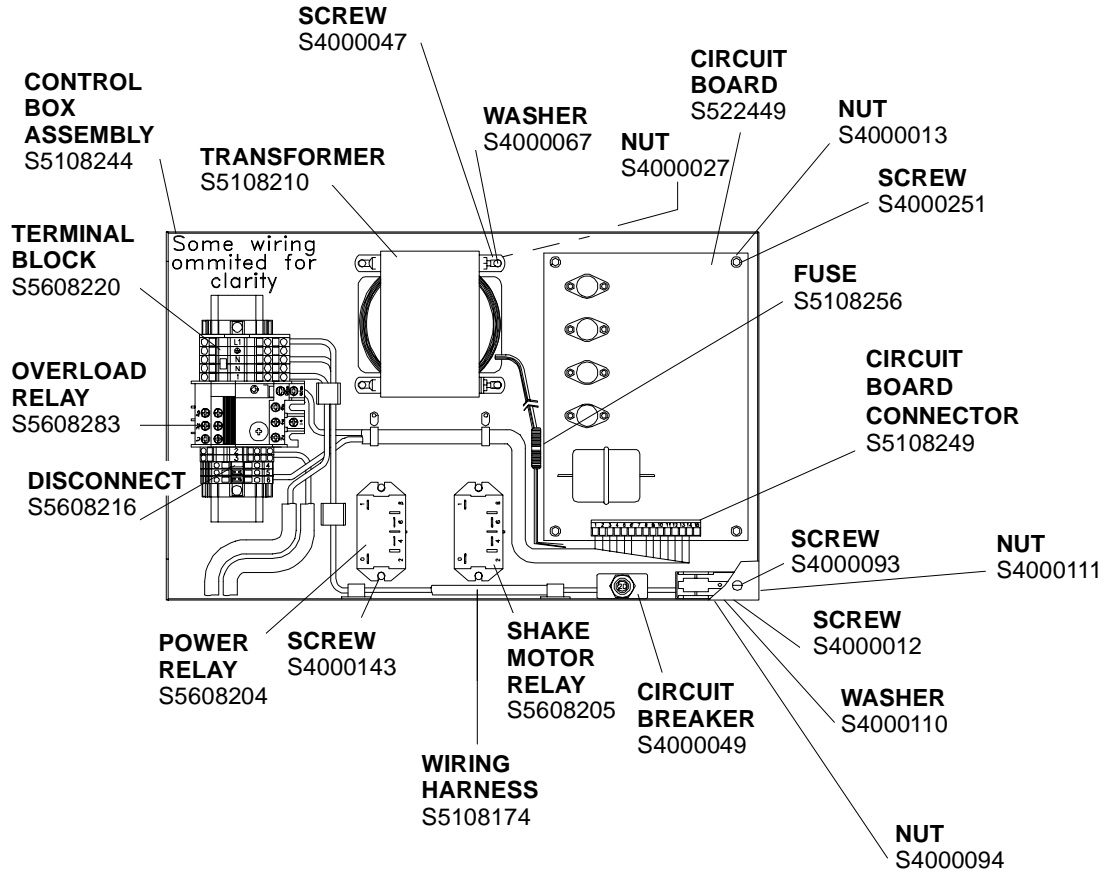
**PARTS:
CONTROL BOX
ASSEMBLY**



PARTS: CONTROL BOX ASSEMBLY

PART NO	DESCRIPTION	NO REQ
S1007232	MAIN ON/OFF SWITCH, RED	1
S1007234	FUSE (5 AMPERE, FAST BLOW)	1
S4000133	SCREW, PAN HEAD SHEET METAL (NO. 8 X 1/2", SLOT)	2
S4000287	FUSE HOLDER (PANEL MOUNT)	1
S4980011	DECAL - 5G MIXER CONTROL PANEL	1
S5108211	ON/OFF EMERGENCY STOP SWITCH (SWITCH ONLY)	1
S5108212	ON/OFF EMERGENCY STOP SWITCH (OPERATOR ONLY)	1
S5108213	POTENTIOMETER (1 MEGOHM (30 SECONDS TO 3 MINUTES)	1
S5108214	POTENTIOMETER HOLDER (INCLUDES TIMER DIAL AND KNOB)	1
S5108216	BULB, START AND UP SWITCH (NOT SHOWN)	2
S5108219	BULB HOLDER AND SWITCH MECHANISM (START AND UP SWITCH)	2
S5108220	UP PUSH BUTTON, RED	1
S5108229	FRONT DOOR SAFETY SWITCH BRACKET, 5G	1
S5108330	START PUSH BUTTON, GREEN	1
S5308214	FRONT DOOR SAFETY SWITCH (MICRO), 5G	1

PARTS: CONTROL BOX ASSEMBLY

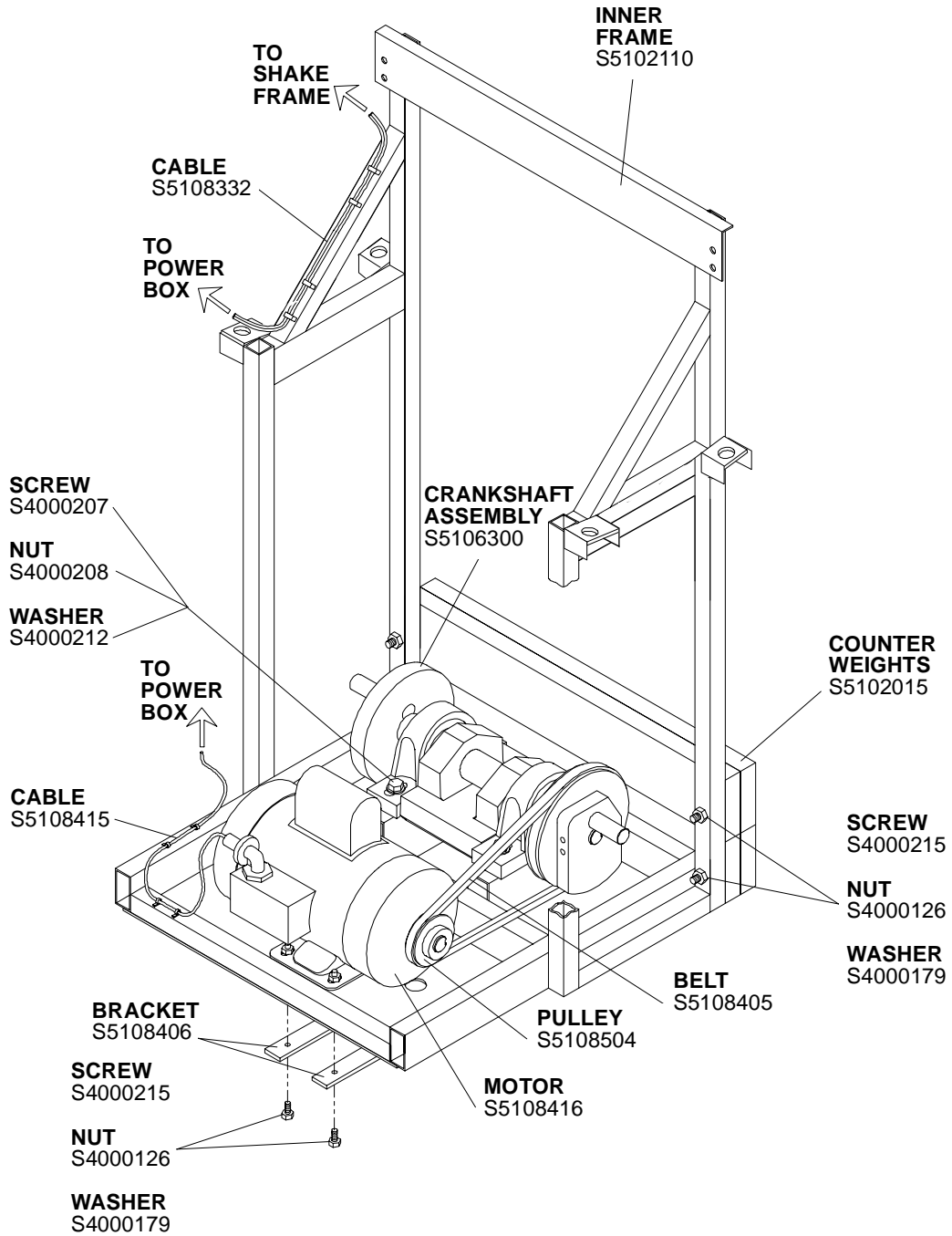


PARTS: CONTROL BOX ASSEMBLY

PART NO	DESCRIPTION	NO REQ
S22449	PRINTED CIRCUIT BOARD (USA)	1
S4000012	SCREW, PAN HEAD CAP (NO. 6-32 X 5/16", SLOT, PACKAGE OF 12 P/N <u>S4000416</u>)	2
S4000013	NUT, HEX (NO. 6-32, KEP, PACKAGE OF 12 P/N <u>S4000417</u>)	4
S4000027	NUT, HEX (NO. 10-32, WITH NYLON PATCH, PACKAGE OF 12, P/N <u>S4000419</u>)	4
S4000047	SCREW, SOCKET HEAD CAP (NO. 10-32 X 1/2")	9
S4000049	CIRCUIT BREAKER (20 AMPERE)	1
S4000067	LOCK WASHER, NO. 10, EXTERNAL TOOTH	4
S4000093	SCREW, PAN HEAD CAP (NO. 6-32 X 1-1/4", SLOT, PACKAGE OF 12, P/N <u>S4000400</u>)	2
S4000094	NUT, HEX (NO. 6-32, WITH NYLON PATCH, PACKAGE OF 12, P/N <u>S4000437</u>)	2
S4000110	PLAIN WASHER, NO. 6 X 3/8" OD	2
S4000111	NUT, SPEED (NO. 8)	2
S4000143	SCREW, SOCKET HEAD CAP (NO. 10-32 X 3/4")	3
S4000251	SCREW, PAN HEAD CAP (NO. 6-32 X 1", SLOT)	4
S5108174	CONTROL BOX WIRING HARNESS, 5G (INCLUDES CONTROL BOX, WIRING HARNESS H1, H2, H3)	1
S5108201	PRINTED CIRCUIT BOARD (USA), 5G	1
S5108210	TRANSFORMER, 5G, 120V/50-60 HZ	1
S5108244	CONTROL BOARD ASSEMBLY COMPLETE	1
S5108249	CONTROL BOARD CONNECTOR	1
S5108256	FUSE, 6.25 AMPS, SLOW BLOW	1
S5608204	POWER RELAY	1
S5608205	SHAKE MOTOR RELAY	1
S5608216	TERMINAL BLOCK DISCONNECT	1
S5608220	TERMINAL BLOCK ASSEMBLY	1
S5608283	OVERLOAD RELAY	1

PARTS: INNER FRAME

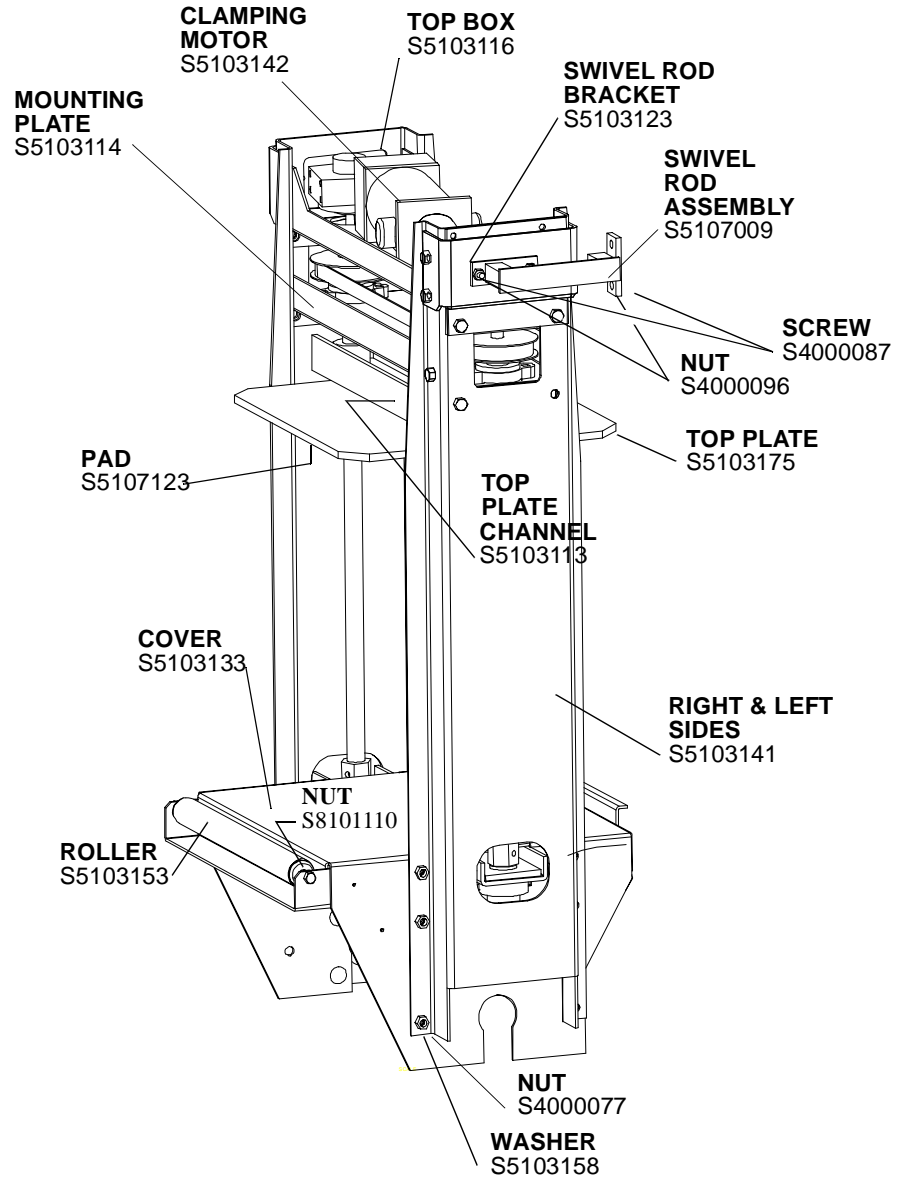
**PARTS: INNER
FRAME**



PART NO	DESCRIPTION	NO REQ
S4000126	NUT, HEX (5/16-18, W/ NYLON PATCH, PACKAGE OF 12) <u>P/N 4000441</u>	8
S4000127	SCREW, HEX HEAD CAP (5/16-18 X 1-1/4" ,PACKAGE 12) <u>P/N 4000442</u>	4
S4000179	PLAIN WASHER, 5/16" ID X 5/8" OD	8
S4000207	SCREW, HEX HEAD CAP (1/2-13 X 1-3/4")	4
S4000208	NUT, HEX (1/2-13, WITH NYLON PATCH)	4
S4000212	PLAIN WASHER, 17/32" ID X 1-1/8" OD	4
S4000215	SCREW, HEX HEAD CAP (5/16-18 X 3-1/2")	4
S5102015	INNER FRAME COUNTERWEIGHT (1" X 3-1/2" X 21-1/16" LONG)	4
S5102110	INNER FRAME (ONLY), 5G	1
S5106300	CRANKSHAFT ASSEMBLY, COMPLETE, 5G (INCLUDES CRANKSHAFT, COUNTERWEIGHTS, BALANCE PLATE, COUNTERWEIGHT BALANCE PULLEY AND PILLOW BLOCK BEARINGS - 5G)	1
S5108332	DC MOTOR CABLE (4-CONDUCTOR, 48-1/2" LONG)	1
S5108405	SHAKE MOTOR V-BELT, 5G (4L330)	1
S5108406	SHAKE MOTOR SUPPORT BRACKET, 5G	2
S5108415	SHAKE MOTOR CABLE (3-CONDUCTOR, 66" LONG)	1
S5108416	SHAKE MOTOR ASSEMBLY, 5G (3/4 HP - 1725 RPM) (INCLUDES SHAKE MOTOR PULLEY AND SHAKE MOTOR- CABLE)	1
S5108504	SHAKE MOTOR PULLEY, 5G (2.6" OD)	1

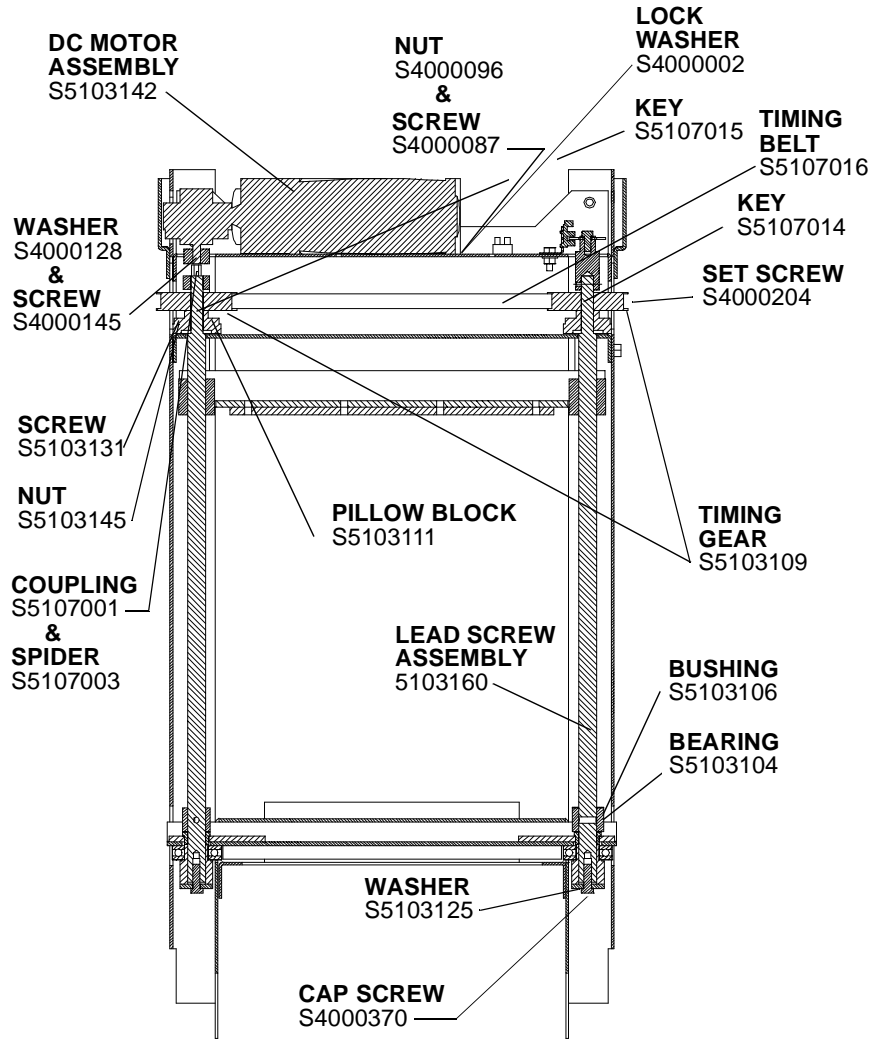
PARTS: SHAKE FRAME

**PARTS: SHAKE
FRAME**



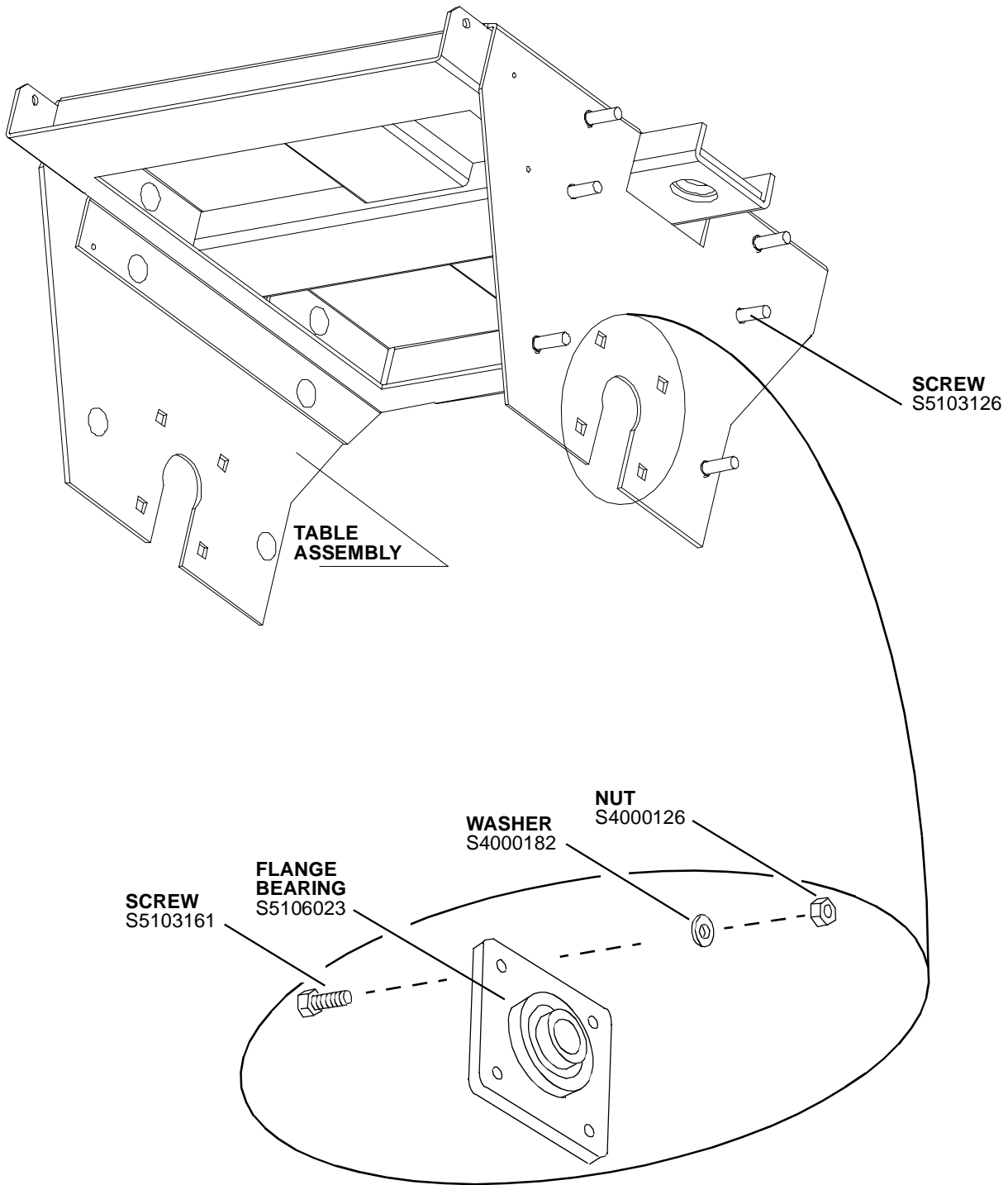
PART NO	DESCRIPTION	NO REQ
S4000077	NUT, HEX (3/8-16, WITH NYLON PATCH (TABLE MOUNTING SCREWS))	12
S4000087	SCREW, PAN HEAD (3/8-16, WITH NYLON PATCH (4 - DC MOTOR MOUNTING SCREWS AND 4 - SWIVEL ROD MOUNTING, PACKAGE OF 12, P/N <u>S4000435</u>)	4
S4000096	NUT, HEX (1/4-20, WITH NYLON PATCH, 4-LEAD SCREW BEARING, 4 SWIVEL ROD, & 4 -TOP PLATE MOUNTING SCREWS, PACKAGE OF 12, P/N <u>S4000438</u>)	8
S4000327	LOCTITE SUPER BONDER NO. 416 INSTANT ADHESIVE (1-OZ BOTTLE FOR RUBBER PAD, NOT SHOWN)	1
S5103113	TOP PLATE CHANNEL	1
S5103114	LEAD SCREW BEARING MOUNTING PLATE	
S5103116	TOP BOX (12/31/96 OR LATER)	1
S5103123	SWIVEL ROD BRACKET	2
S5103133	STAINLESS STEEL TABLE COVER	1
S5103141	SHAKE FRAME SIDE (LEFT & RIGHT)	1(2)
S5103142	DC MOTOR/GEARBOX ASSEMBLY (1/17/97 OR LATER)	1
S5103147	SHAKE FRAME SIDE, RIGHT	1
S5103153	TABLE ROLLER	1
S5103158	PLAIN WASHER, 13/32" ID X 3/4" OD (TABLE MOUNTING SCREWS)	12
S5103175	TOP PLATE ASSEMBLY	1
S5107009	SWIVEL ROD ASSEMBLY, 5G	2
S5107123	TOP PLATE RUBBER PAD, 5G	1
S8101110	NUT, HEX (1/4-20, JAM)	2

PARTS: SHAKE FRAME



PART NO	DESCRIPTION	NO REQ
S4000002	LOCK WASHER, 1/4", SPLIT (4 - DC MOTOR MOUNTING SCREWS AND 4 - TOP PLATE ASSEMBLY MOUNTING SCREWS)	8
S4000087	SCREW, PAN HEAD (3/8-16, WITH NYLON PATCH (4 - DC MOTOR MOUNTING SCREWS AND 4 - SWIVEL ROD MOUNTING) AVAILABLE ONLY IN PACKAGE OF 12, <u>PART NO. S4000435</u>	8
S4000096	NUT, HEX (1/4-20, WITH NYLON PATCH) (4-LEAD SCREW BEARING, 4 SWIVEL ROD, & 4 -TOP PLATE MOUNTING SCREWS) AVAILABLE ONLY IN PACKAGE OF TWELVE - <u>PART NO. S4000438</u>	12
S4000128	PLAIN WASHER, 1/4" (2-DC MOTOR COUPLING HALF & 4-LEAD SCREW BEARING MOUNTING SCREWS)	6
S4000145	SCREW, SOCKET HEAD CAP (NO. 10-32 X 1-1/2") (DC MOTOR COUPLING HALF)	2
S4000204	SCREW, SET (NO. 10-32 X 1/2", CUP POINT SOCKET) (TIMING BELT PULLEY SET SCREW)	2
S4000370	SCREW, HEX HEAD CAP (5/16-18 X 3/4", WITH NYLON PATCH) (SHAKE FRAME ASSEMBLY SCREWS)	20
S5103104	THRUST BEARING	2
S5103106	FLANGED BUSHING	2
S5103109	TIMING GEAR	2
S5103111	LEAD SCREW PILLOW BLOCK BEARING	2
S5103125	WASHER, LOWER LEAD SCREW	2
S5103131	SCREW, CARRIAGE (1/4-20 X 1")	4
S5103142	DC MOTOR ASSEMBLY	1
S5103145	LEAD SCREW TOP PLATE NUT	2
S5103160	LEAD SCREW ASSEMBLY (12/31/96)	2
S5107001	COUPLING ASSEMBLY, COMPLETE (GEARBOX TO LEAD SCREW), 5G(INCLUDES COUPLER HALVES AND COUPLING SPIDER)	1
S5101003	COUPLING SPIDER	1
S5107014	KEY, TIMING GEAR (LEFT TIMING GEAR - 1/8" X 1/8" X 3/4" LONG)	1
S5107015	KEY, TIMING GEAR (RIGHT TIMING GEAR - 1/8" X 1/8" X 1-1/4" LONG)	1
S5107016	TIMING GEAR BELT, 5G	1

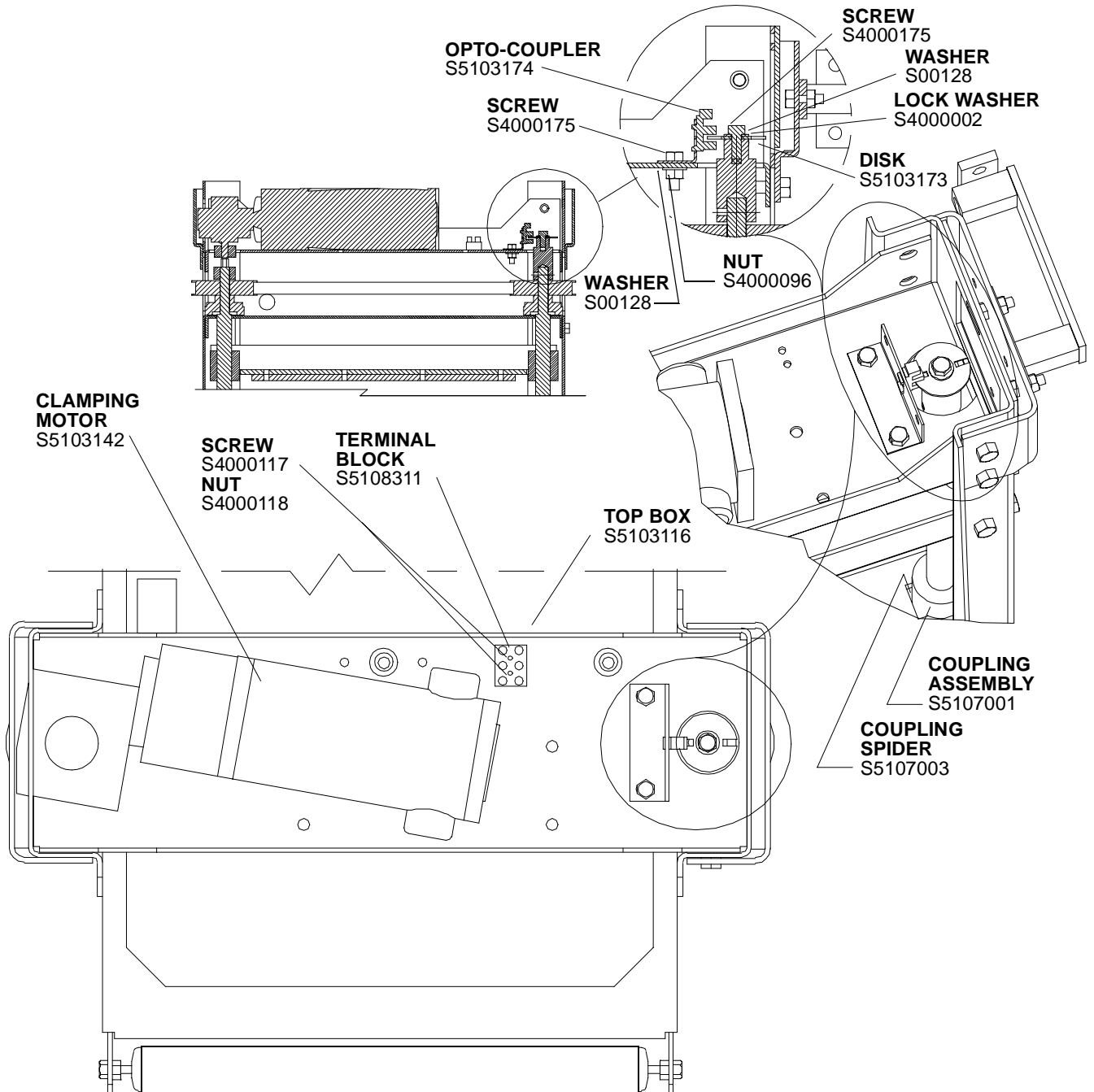
PARTS: SHAKE FRAME



PART NO	DESCRIPTION	NO REQ
S4000126	NUT, HEX (5/16-18, WITH NYLON PATCH) SHAKE FRAME ASSEMBLY SCREWS, PACKAGE OF 12, P/N S4000441)	8
S4000182	PLAIN WASHER (11/32" ID X 5/8" OD)	8
S5103126	SCREW, ROUND HEAD RIBBED NECK (3/8-16 X 7/8") (TABLE MOUNTING SCREWS)	12
S5103161	SCREW, CARRIAGE (5/16-18 X 1))	8
S5103156	TABLE ASSEMBLY, COMPLETE, 5G (INCLUDES STAINLESS STEEL TABLE COVER)	1
S5106023	FLANGE BEARING ASSEMBLY (INCLUDES PLATE, BEARING AND MOUNTING HARDWARE)	2

PARTS: CLAMPING MOTOR ASSEMBLY

**PARTS:
CLAMPING
MOTOR
ASSEMBLY**

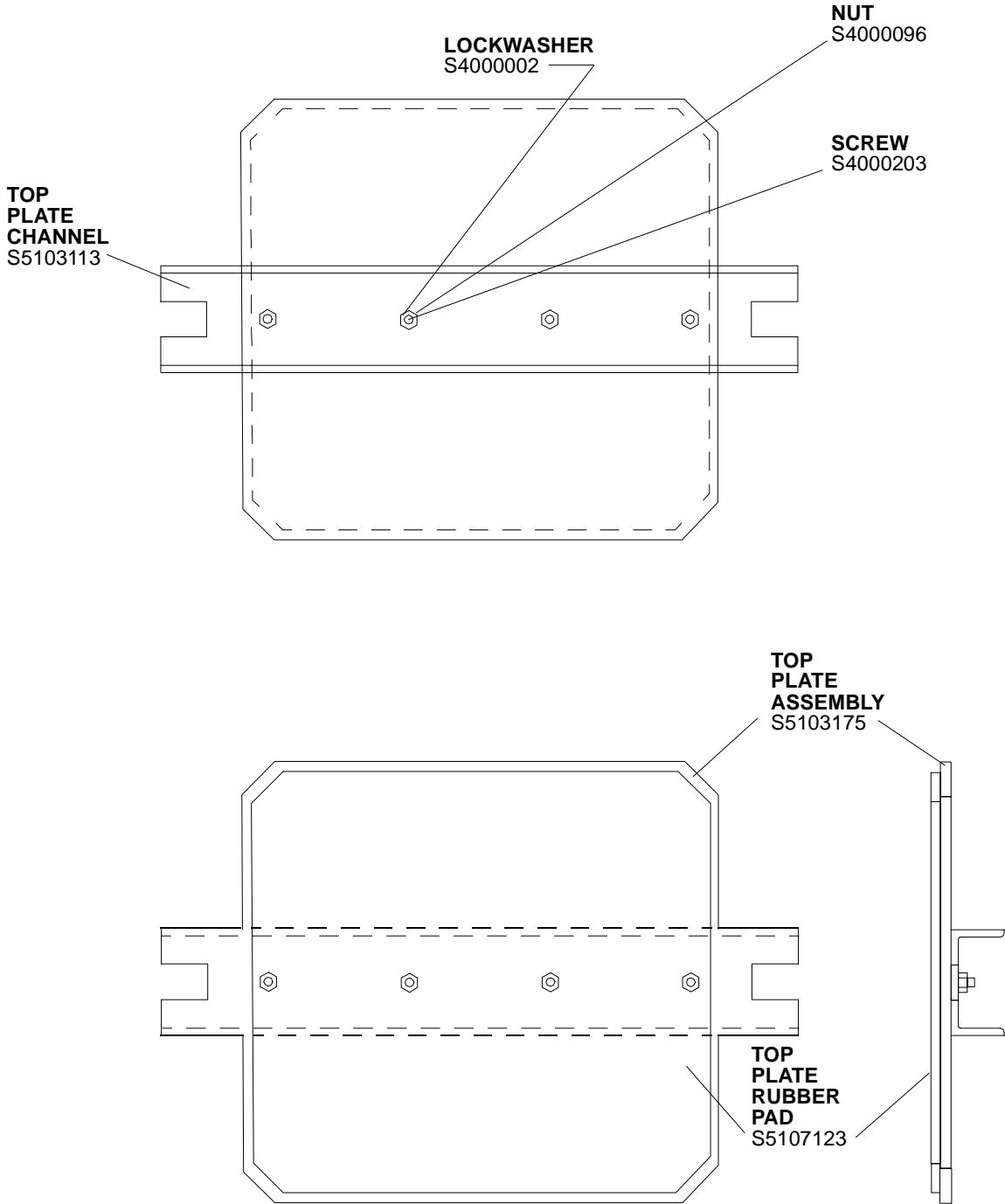


PARTS: CLAMPING MOTOR ASSEMBLY

PART NO	DESCRIPTION	NO REQ
S00128	WASHER, 1/4" ID, 5/8" OD	2
S1621260	OPTO COUPLER SPACER, 5G (5G PRODUCT NO. 5400000 OR 5G WITH OPTO COUPLER RETROFIT KIT ONLY)	1
S1621270	OPTO COUPLER DISC, 5G (5G PRODUCT NO. 5400000 OR 5G WITH OPTO COUPLER RETROFIT KIT ONLY)	1
S1621400	OPTO COUPLER ASSEMBLY, COMPLETE, 5G (INCLUDES OPTO COUPLER, BOARD, CABLE AND DISC - 5G PRODUCT NO. 5400000 OR 5G WITH OPTO COUPLER RETROFIT KIT ONLY)	1
S1621420	OPTO COUPLER DISC ASSEMBLY, 5G (INCLUDES LOCK WASHER, OPTO COUPLER DISC, OPTO COUPLER, SPACER AND SCREW - 5G PRODUCT NO. 5400000 OR 5G WITH OPTO COUPLER RETROFIT KIT ONLY)	1
S4000117	SCREW, 4-40 X 3/4"	2
S4000118	NUT, 4-40 X 3/4", NYLOC	2
S4000096	NUT, HEX (1/4-20, WITH NYLON PATCH PACKAGE OF 12 - <u>P/N S4000438</u>)	8
S4000175	SCREW, 1/4-20 X 1/2", FLANGE HEAD, PACKAGE OF 12 - <u>P/N S4000402</u>)	2
S5108311	3-POSITION TERMINAL BLOCK	1
S5103116	TOP BOX	
S5103142	DC CLAMPING MOTOR	1
S5103173	OPTO-COUPLER DISC	1
S5103174	OPTO-COUPLER	1
S5107001	COUPLING ASSEMBLY, COMPLETE (GEAR BOX TO LEAD SCREW INCLUDES COUPLER HALVES AND COUPLING SPIDER)	1
S5107003	COUPLING SPIDER	2

PARTS: TOP PLATE ASSEMBLY

**PARTS: TOP
PLATE
ASSEMBLY**

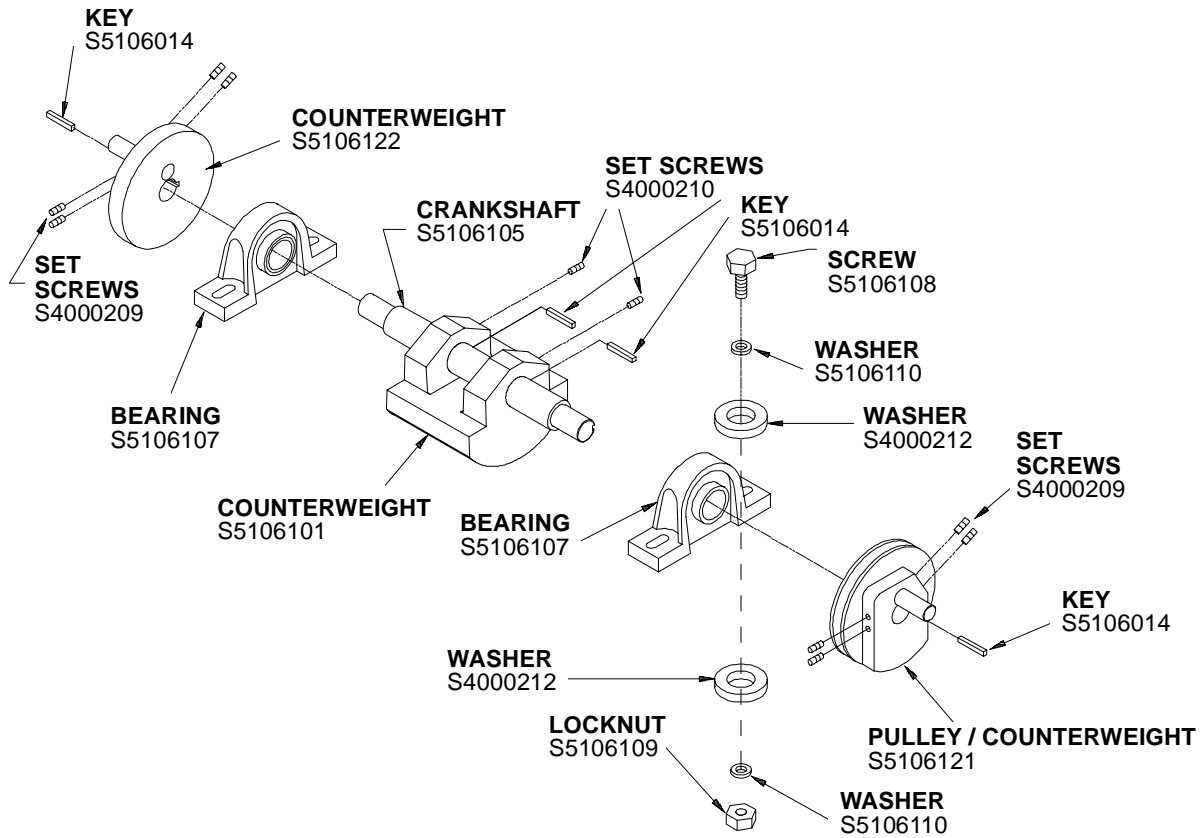


PARTS: TOP PLATE ASSEMBLY

PART NO.	DESCRIPTION	NO. REQ
S4000002	LOCK WASHER, 1/4", SPLIT	4
S4000096	NUT, HEX (1/4-20, WITH NYLON PATCH, PACKAGE OF 12 <u>P/N 4000438</u>)	4
S4000203	SCREW, FLAT HEAD CAP (1/4-20 X 1", SOCKET) - NOT SHOWN	4
S4000327	LOCKTITE SUPER BONDER NO. 416 INSTANT ADHESIVE (1 OZ. FOR RUBBER PAD - NOT SHOWN)	1
S5103113	TOP PLATE CHANNEL, 5G	1
S5107123	TOP PLATE RUBBER PAD, 5G	1
S5103175	TOP PLATE ASSEMBLY, COMPLETE, 5G (INCLUDES TOP PLATE AND RUBBER PAD)	1

PARTS: CRANKSHAFT ASSEMBLY

PARTS: CRANKSHAFT ASSEMBLY

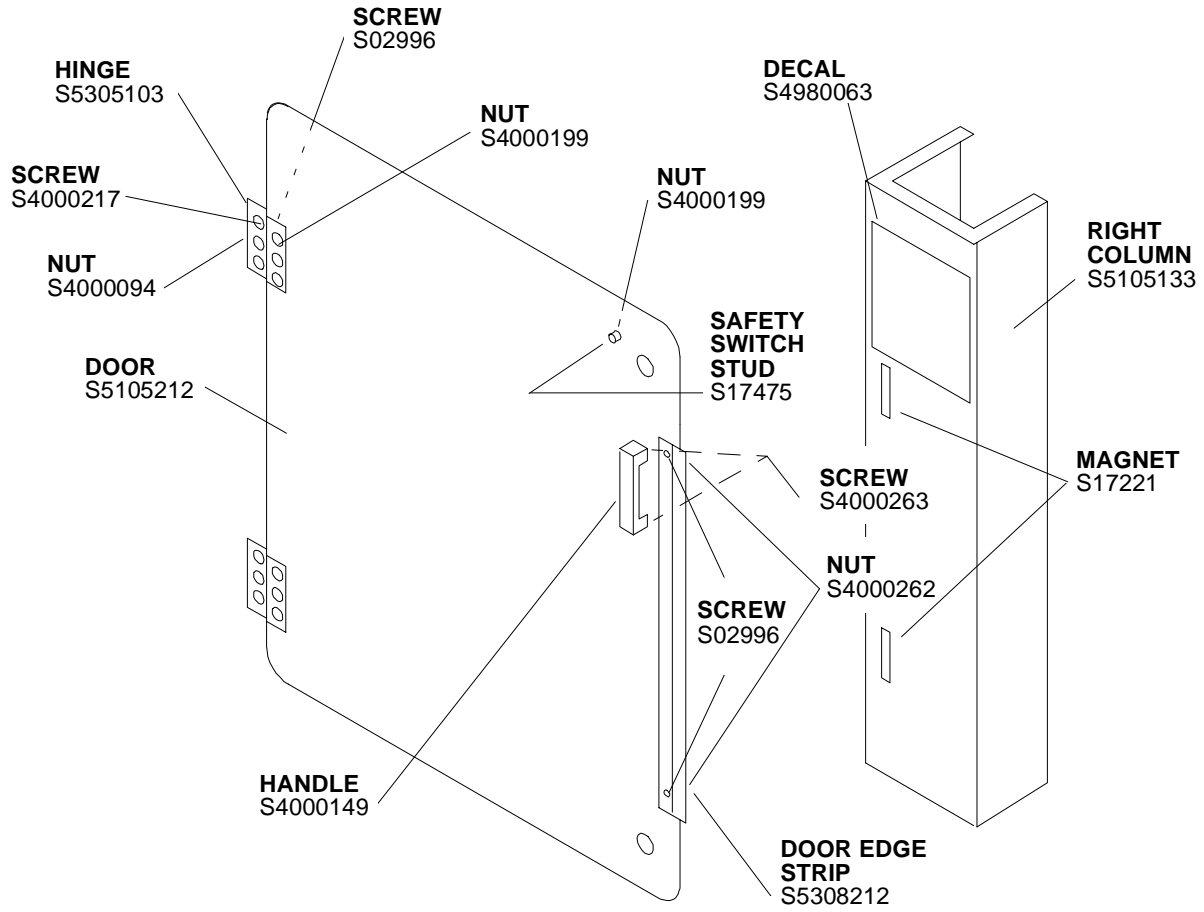


PARTS: CRANKSHAFT ASSEMBLY

PART NO	DESCRIPTION	NO REQ
S4000209	SCREW, SET (1/4 - 20 X 3/4", SOCKET)	8
S4000210	SCREW, SET (5/16 - 18 X 3/4", SOCKET)	2
S4000212	PLAIN WASHER, 17/32" ID X 1-1/8" OD	8
S5106014	KEY, BALANCE PLATE PULLEY AND CENTRIFUGAL COUNTER-WEIGHT (1/4" X 1/4" X 1-1/4" LONG)	4
S5106101	CENTRIFUGAL COUNTERWEIGHT, 5G	1
S5106105	CRANKSHAFT (ONLY), 5G	1
S5106107	CRANKSHAFT PILLOW BLOCK BEARING, 5G	2
S5106108	SCREW, HEX HEAD CAP (7/16 - 14 X 2", SOCKET)	4
S5106109	LOCKNUT (7/16 - 14, WITH NYLON PATCH)	4
S5106110	WASHER, 15/16" OD X 15/32" ID	8
S5106121	BALANCE GROOVE PULLEY COUNTERWEIGHT, 5G	1
S5106122	BALANCE PLATE COUNTERWEIGHT, 5G	1
S5106300	CRANKSHAFT ASSEMBLY COMPLETE (INCLUDES CRANKSHAFT, COUNTERWEIGHT, COUNTERWEIGHT, BALANCE PLATE, COUNTERWEIGHT BALANCE PULLEY AND PIL- LOW BLOCK BEARINGS - 5G)	1
S5108405	V-BELT, 5G, 4L330 (NOT SHOWN)	1

PARTS: FRONT DOOR ASSEMBLY

**PARTS: FRONT
DOOR
ASSEMBLY**



PARTS: FRONT DOOR ASSEMBLY

PART NO.	DESCRIPTION	NO. REQ
S02996	SCREW, FLAT HEAD CAP (NO. 6-32 X 1/2", PHILLIPS)	8
S17221	FRONT DOOR MAGNET, 5G	2
S17475	SAFETY SWITCH STUD, FRONT DOOR, 5G	1
S4000094	NUT, HEX (NO. 6-32, WITH NYLON PATCH PACKAGE OF 12, <u>P/N 4000437</u>)	6
S4000149	DOOR HANDLE	1
S4000199	NUT, HEX (NO. 10-24, ACORN)	1
S4000217	SCREW, FLAT HEAD CAP (NO. 6-32 X 1/2", SLOT)	6
S4000262	NUT, HEX (NO. 6-32, ACORN)	8
S4000263	SCREW, TRUSS HEAD CAP (NO. 10-24 X 5/8", SLOT)	2
S4980063	DECAL, "WARNING"	1
S4900864	DECAL, "WARNING", LEFT SIDE (NOT SHOWN)	
S5105133	RIGHT COLUMN, 5G	1
S5105212	PLASTIC FRONT DOOR (ONLY), 5G	1
S5105213	PLASTIC FRONT DOOR ASSEMBLY, COMPLETE, 5G (INCLUDES HINGE SET AND HANDLE)	1
S5305103	FRONT DOOR PIN-TYPE HINGE SET, 5G	2
S5308212	FRONT DOOR MAGNET STRIP, 5G	1

LIMITED WARRANTY ON EQUIPMENT

If within two years from the date of shipment or two years from the proven date of installation, any equipment covered by this manual shall prove to be defective in materials or workmanship upon examination by FLUID MANAGEMENT, U.S., L.L.C. ("SELLER"), SELLER will supply identical or substantially similar replacement equipment or parts, or at SELLER's option, will repair or allow credit for such equipment. In addition, within the United States and Canada, labor costs are covered for one year following shipment or proven installation date for repairs to the following components: crankshafts, motors, speed reducers, circuit boards, relays, relay panels, power supplies, transformers, frames, gear pumps, solenoid valves, can holders, bearings and clutch springs. All labor must be approved in advance by SELLER and performed by a Fluid Management Authorized Service Center.

PURCHASER MUST NOTIFY SELLER OF A WARRANTY CLAIM WITHIN THIS PERIOD. NO RETURNS ARE AUTHORIZED WITHOUT A RETURN GOODS AUTHORIZATION FORM. Any repair or replacement provided hereunder shall be warranted against defects in material or workmanship for the unexpired portion of the equipment warranty. This warranty does not cover software, which is covered by separate warranty.

DISCLAIMER

THIS WARRANTY SHALL BE APPLICABLE ONLY IF THE EQUIPMENT SHALL BE THE PROPERTY OF THE ORIGINAL PURCHASER OR USER, AND SHALL HAVE BEEN PROPERLY USED, OPERATED AND MAINTAINED IN ACCORDANCE WITH THE MANUAL OR INSTRUCTIONS PROVIDED WITH THE EQUIPMENT AND FOR THE PURPOSE FOR WHICH SOLD. NORMAL WEAR AND TEAR IS NOT COVERED BY THIS WARRANTY. THIS WARRANTY SHALL NOT BE APPLICABLE IF THE EQUIPMENT OR ANY PART THEREOF HAS BEEN REPAIRED OR REPLACED BY THE BUYER WITHOUT THE SELLER'S PRIOR PERMISSION OR HAS BEEN SUBJECTED TO ANY ACCIDENT, CASUALTY, MISAPPLICATION, ALTERATION, ABUSE OR MISUSE.

NO OTHER WARRANTY, EITHER EXPRESS OR IMPLIED, AND INCLUDING A WARRANTY OR MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, HAS BEEN OR WILL BE MADE BY OR ON BEHALF OF SELLER OR BY OPERATION OF LAW WITH RESPECT TO THE EQUIPMENT AND ACCESSORIES OR THEIR INSTALLATION, USE, OPERATION, REPLACEMENT OR REPAIR.

SELLER SHALL NOT BE LIABLE BY VIRTUE OF THIS WARRANTY, OR OTHERWISE, FOR ANY INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGE RESULTING FROM THE USE OR OPERATION OF THE EQUIPMENT, WHETHER OR NOT SELLER WAS APPRISED OF THE POSSIBILITY OF SUCH DAMAGES.

IRRESPECTIVE OF ANY STATUTE, THE BUYER RECOGNIZES THAT THE EXPRESS WARRANTY SET FORTH ABOVE IS THE EXCLUSIVE REMEDY TO WHICH IT IS ENTITLED AND WAIVES ALL OTHER REMEDIES, STATUTORY OR OTHERWISE. REPAIR OR REPLACEMENT SHALL BE BUYER'S SOLE REMEDY UNDER THIS WARRANTY.

EQUIPWTY.5G
Last revised: 01/96

Part No. 4700510

Rev. D

11/10/97

Fluid Management

**1023 Wheeling Road
Wheeling, Illinois 60090-5773**

Telephone: (708) 537-0880

1-800-462-2466

Fax (708) 537-5530