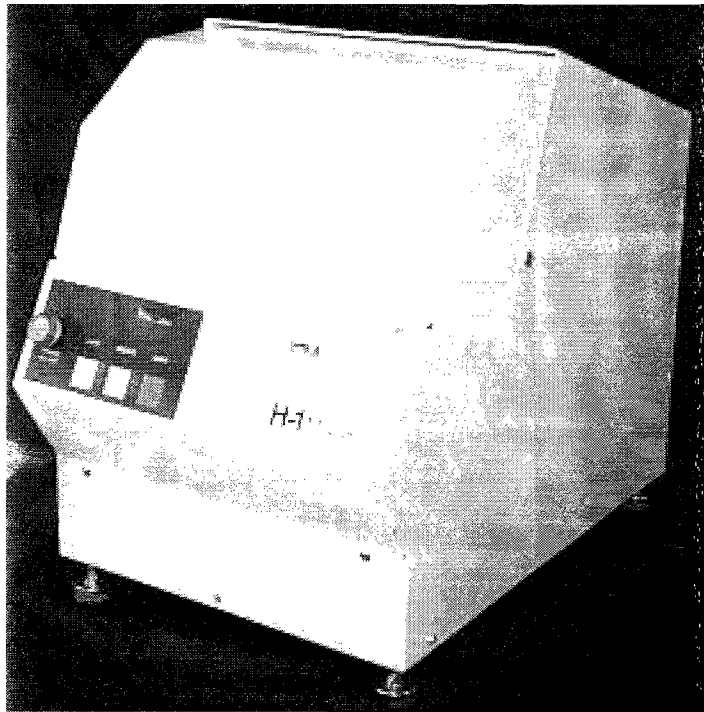




Fluid Management®

***H-1 High Speed
Paint Mixer***

***Operating and
Instruction
Manual***



Part # 24743

Rev. C

01/02/00

CONFIDENTIAL

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**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.

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.

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 H-1 High Speed Paint Mixer is a basic, automatic mixer designed with concern for safety, reliability and ease of use. It is specifically designed to be placed on a table, counter top or space-saver stand. The gear drive assembly requires no lubrication. The belt should last for many years with occasional adjustments. It is a nearly maintenance free device that should deliver many years of reliable service. Its features include:

- Heavy-duty, high-capacity components and a durable finish for long wear.
- Vibration-free mixing for blending and conditioning paint.
- Pre-set mixing times with solid state electronic controls and touchpad.
- Automatic shut off if the door is opened during the mixing operation.

SPECIFICATIONS

Height 22-3/4" (55.8 cm.) *WITH DOOR OPEN*

Width 15" (40.7 cm.)

Depth 23-1/2" (59.7 cm.)

Weight 93 lbs. (42.2 kg.)

Motor 1/3 HP (Draws 6.0 Amps @ 120 VAC)

TYPICAL ELECTRICAL SUPPLY

See name plate for specific information.

120 V \pm 10%, 60 Hz 20 Amp

220 V \pm 15%, 50 Hz 15 Amp

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* - Read these important messages for safety.
- *ADJUSTABLE FEET* - The feet adjust to balance the mixer.

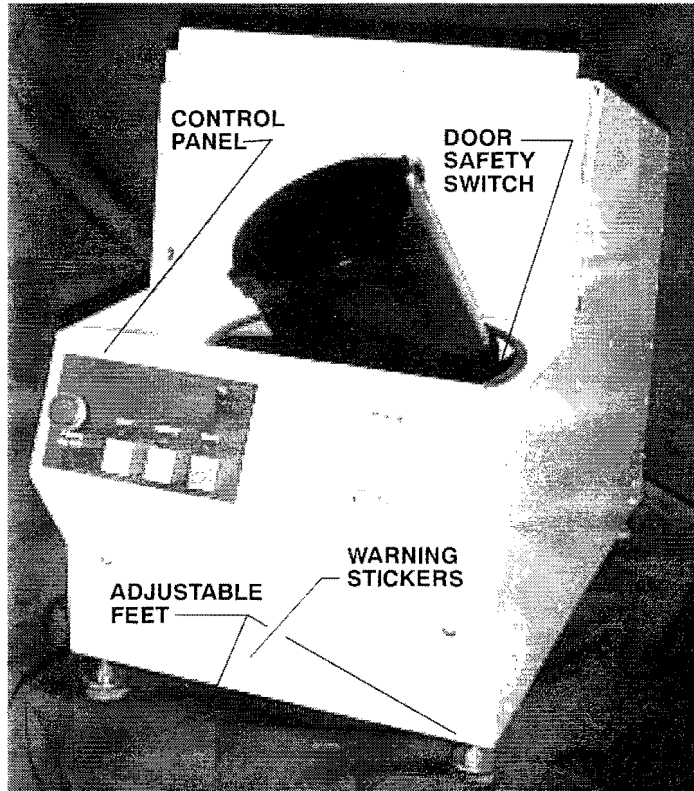


Figure 1 General Locations

Control Panel Push-buttons

- *POWER ON/OFF* pushbutton switch for applying power to the machine.
- *LIGHT* membrane pushbutton switch for mixing lighter colors for short periods of time.
- *MEDIUM* membrane pushbutton switch for mixing pastels and moderately tinted colors for normal periods of time.
- *DARK* membrane pushbutton switch for mixing dark or heavily tinted colors for longer periods of time.

Control Panel Displays

- *NUMERIC DISPLAY* for displaying total numbers of mixing cycles and time remaining to a cycle.
- *LIGHT* indicator illuminates when mixing short mixing time.
- *MEDIUM* indicator illuminates when mixing medium mixing time.
- *DARK* indicator illuminates when mixing long mixing time.

NOTE:



The *POWER* switch must be illuminated, indicating that power is ON before the numeric display shows cycle count or before the H-1 can be operated.

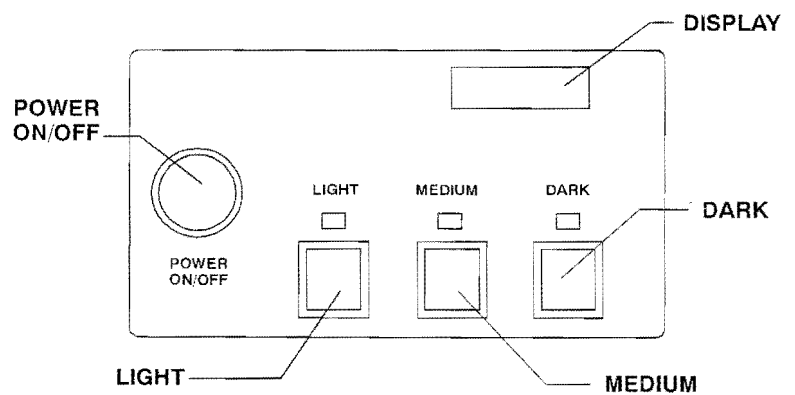


Figure 2 Control Panel

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

WARNINGS

- Verify that your paint mixer is properly balanced on the floor. Improper balance may cause severe damage to the machine during the mixing operation. All feet must be adjusted so as to be firmly contacting the floor.
- Always shut off the POWER 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 run the paint mixer before removing shipping bolts and blocks.

INSTALLATION

UNPACKING AND SETUP

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).

REMOVE SHIPPING BLOCKS

1. Carefully tilt the the base cabinet at an angle providing access to the lower part of the mixer.
2. Remove two (2) bolts and one (1) screw holding shipping blocks.
3. Set the mixer down and open the door.
4. The shipping blocks are joined together with a long cord. Use this cord to pull the blocks to the opening and lift out of the mixer.
5. With the shipping blocks removed, return the mixer to the upright position.

BALANCING

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

WARNING:



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

1. Balance 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. Ordinarily, the easiest way to adjust the unit is to leave three (3) legs locked and adjust the fourth leg until it is snug. At this point, all four (4)

legs should be firmly contacting the table or counter top.

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 13.
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 3 Minimum Wire Gauge

EXTENSION CORDS

Extension cords for 220 VAC models are not recommended. If an extension cord is to be used for 110 VAC models, it should not be combined with other extension cords. 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 # 18 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 can cause a drop in line voltage resulting in loss of power, overheating and damage to the electronics.

Amps	Volts	Gage	Length
1.4	120	18	25

Figure 4 Extension Cord Length

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 (See "Adapter Usage" on page 13)

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.**

WARNING:



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.

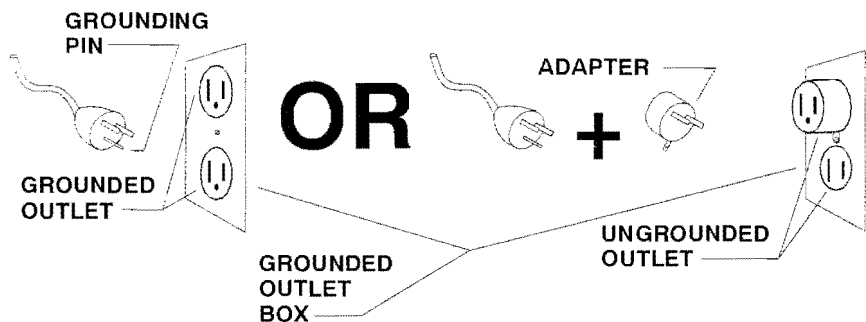


Figure 5 Adapter Usage

BASIC OPERATION

1. Open the door.
2. Place a can of paint in the mixer with the bail at the top.
3. Close the door. **A safety switch prevents operation of the paint mixer while the door is open.**
4. Apply power to the paint mixer by pressing the POWER switch. Power is applied when the green push-button is illuminated.

NOTE: When power is applied to the mixer, and when it is not in a mixing cycle, the numeric display will show the number of cycles that the unit has been operated.

5. Push one of the three (3) membrane mix pushbutton.

NOTE: The LIGHT membrane pushbutton switch is used for 90 seconds of mixing time. The MEDIUM membrane pushbutton switch is used for 120 seconds of mixing time. The DARK membrane pushbutton switch is used for 180 seconds of mixing time. At this point, the mixer will start mixing. The appropriate indicator light will illuminate during the mixing period and the numeric display will start counting down the remaining time.

6. After the mixer has stopped, open the door and remove the container of paint. **Power need not be removed if the mixer is in frequent use. Turn off power at the end of the working period.**

WARNING:



This equipment does not use can lid clamps. To avoid leakage and spills, a can lid sealer (Fluid Management P/N 6000000) should be used.

***SEE BACK COVER OF THIS MANUAL FOR
SPECIAL OFFER ON CAN LID SEALER!***

MAINTENANCE PROCEDURES

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

AS NEEDED
Cleaning:
<ul style="list-style-type: none"> • Clean all accessible inside surfaces with soap and water.
<ul style="list-style-type: none"> • Clean control panel surfaces with soap and water.
<ul style="list-style-type: none"> • Clean all outside cabinet surfaces with soap and water.

EVERY 6 MONTHS OR 75000 CYCLES
Adjustments:
<ul style="list-style-type: none"> • Adjust and level feet as needed.
<ul style="list-style-type: none"> • Adjust belt tension as needed.

EVERY 3 YEARS OR 75000 CYCLES
Lubricate with SAE 10 oil:
<ul style="list-style-type: none"> • Lubricate the sleeve bearings on the motor. (<i>Every year for heavy duty use</i>)
Change drive belt.

EVERY 10 YEARS OR 75000 CYCLES
Lubricate with high speed grease:
<ul style="list-style-type: none"> • Lubricate ball bearings on motor. (<i>Every 3 years for heavy duty use</i>)

MAINTENANCE PROCEDURES

Use the table below to record your maintenance on the Super-Struts every three months.

CAUTION:



Never lubricate gears, as this could cause slippage if belt is contaminated. Keep belt clean, dry and free of soap and water.

LUBRICATION & MAINTENANCE RECORD			
CYCLES	COMPONENT	DATE	<input checked="" type="checkbox"/> BY:
75,000	Feet		
75,000	Belt		

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 power. ✓ receptacle for voltage. ✓ if the front door is not closed. <p>Motor overload may be tripped.</p> <p>May be problem with printed circuit board.</p> <ul style="list-style-type: none"> ✓ door limit switch. 	<ul style="list-style-type: none"> • Connect to power source. • Contact electrician. • Close the front door. • Allow motor to cool. • Call Customer Service. • Replace printed circuit board. • Replace as required.
Paint mixer will not shut off.	<ul style="list-style-type: none"> ✓ timer control board. ✓ if relay is stuck in the closed position. <p>May be problem with printed circuit board.</p>	<ul style="list-style-type: none"> • Replace if necessary. • Replace if necessary. • Call Customer Service. • Replace printed circuit board.
The shake motor has voltage and hums, but it will not run.	<ul style="list-style-type: none"> ✓ for low line voltage. ✓ V-belt tension. ✓ V-belt ✓ motor. 	<ul style="list-style-type: none"> • Confirm that the mixer is on a dedicated line. • Correct tension. • Replace as needed. • Replace motor.

TROUBLE-SHOOTING CHART

<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. 	<ul style="list-style-type: none"> • Balance by adjusting the legs. • Replace adjustable leg.
<p>The POWER light is on and nothing happens.</p>	<ul style="list-style-type: none"> ✓ if the motor connections. ✓ for broken wire motor cabling. ✓ for faulty contact block on power switch. ✓ for problem with the motor. ✓ for problem with printed circuit board. 	<ul style="list-style-type: none"> • Tighten motor connections as required. • Replace motor cable as needed. • Replace motor cable as needed. • Replace motor. • Call Customer Service. Replace printed circuit board.
<p>The POWER light does not turn on and nothing happens.</p>	<ul style="list-style-type: none"> ✓ for problem with POWER switch, light or operator button. 	<ul style="list-style-type: none"> • Replace as needed.
<p>The POWER light does not turn on and mixer runs normally.</p>	<ul style="list-style-type: none"> ✓ for problem with POWER switch, light. 	<ul style="list-style-type: none"> • Replace as needed.
<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 mixer speeds up and slows down.</p>	<ul style="list-style-type: none"> ✓ if the door is making partial contact with the safety switch. 	<ul style="list-style-type: none"> • Adjust safety switch.
	<ul style="list-style-type: none"> ✓ for a damaged wire in motor cabling. 	<ul style="list-style-type: none"> • Replace motor cable.

**SERVICING
AND REPAIR**

GENERAL INFORMATION

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

Carefully read all of the instructions before you begin. For component identification and location, 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.

CHANGING POWER SWITCH

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.

WARNING: ELECTRICAL HAZARD



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

1. Unplug the power cord from the electrical outlet.
2. Remove the two (2) screws at the top of the control panel and save for later use.
3. Lift the control panel off of the mixer enough to expose the wiring.
4. Unplug the wire Harness from the rectangular 6-pin connector. This will free the control panel from the mixer.
5. Remove the control panel and place to the side.
6. Remove the replacement switch assembly from the shipping container.
7. Unplug the two (2) brown wires from the terminals labeled **3** and **4** on the defective switch assembly.
8. Plug the same two (2) brown wires into the terminals labeled **3** and **4** on the replacement switch assembly.
9. Unplug the brown and blue wires from the terminals labeled **(X1)** and **(X2)** on the defective switch assembly.
10. Plug the same two (2) blue and brown wires into the terminals labeled **X1** and **X2** on the replacement switch assembly. *(The blue wire must be terminated on the X2 terminal.*
11. Remove the defective switch assembly and discard.
12. Mount the replacement switch assembly in the panel.
13. Re-connect the rectangular 6-pin connector and place the control panel back on the front of the mixer with the bottom edge behind the front panel of the cabinet.
14. Fasten the control panel with the two (2) screws.

CHANGING 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.

WARNING: ELECTRICAL HAZARD



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

1. Unplug the power cord from the electrical outlet.
2. Remove the two (2) screws at the top of the control panel and save for later use.
3. Lift the control panel off of the mixer enough to expose the wiring.
4. Unplug the wire Harness from the rectangular 6-pin connector. This will free the control panel from the mixer.
5. Remove the control panel and place to the side.
6. Remove the screws that secure the cover to the bottom of the frame and lift the cover and place to the side.
7. The motor is foot mounted to a bracket with four (4) bolts. Using two (2) open end wrenches, remove the bolts, washers and nuts and save for mounting the replacement motor. This will free the belt.
8. Remove the cover plate from the end of the motor exposing the motor wiring.
9. Take note of how the motor leads are terminated and remove the leads.
10. Using an 1/8" allen wrench, loosen the set screw that captivates the small pulley from the motor shaft and save pulley for the replacement motor.
11. Discard the defective motor.
12. Install the small pulley on the replacement motor shaft and tighten the set screw.
13. Remove the cover plate from the end of the replacement motor and terminate the leads in the same locations as the defective motor was wired.

14. Place the cover plate back on the motor and secure with the screws.
15. Hold the replacement motor in place, putting the belt on the pulleys and mount with the bolts that were removed earlier.
16. Adjust tension and tighten the mounting bolts.
17. Place the cover back on the frame and secure with the screws that were removed earlier.
18. Reconnect the rectangular 6-pin connector and fasten the control panel with the two (2) screws that were removed earlier.

CHANGING OR ADJUSTING 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.

WARNING: ELECTRICAL HAZARD



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

1. Unplug the power cord from the electrical outlet.
2. Remove the two (2) screws at the top of the control panel and save for later use.
3. Lift the control panel off of the mixer enough to expose the wiring.
4. Unplug the wire Harness from the rectangular 6-pin connector. This will free the control panel from the mixer.
5. Remove the control panel and place to the side.
6. Remove the screws that secure the cover to the bottom of the frame and lift the cover and place to the side.
7. Unplug the wire Harness from the white, square 9-pin connector. This will free the control panel from the mixer.
8. The motor is foot mounted to a bracket with four (4) bolts. Using two (2) open end wrenches, loosen the bolts.
9. Remove the belt and install the replacement belt as needed.

10. Pull the motor, applying tension to the belt and tighten the bolts.
11. Place the cover back on the frame and secure with the screws that were removed earlier.
12. Reconnect the rectangular 6-pin connector and fasten the control panel with the two (2) screws that were removed earlier.

CHANGING CONTROL PANEL

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. Disconnect power from the mixer.
2. Remove the two (2) screws at the top of the control panel and save for later use.
3. Lift the control panel off of the mixer enough to expose the wiring.
4. Unplug the wire Harness from the rectangular 6-pin connector. This will free the control panel from the mixer.
5. Remove the control panel and place to the side.
6. Re-connect the rectangular 6-pin connector and place the control panel back on the front of the mixer with the bottom edge behind the front panel of the cabinet.
7. Fasten the control panel with the two (2) screws.

**PARTS
SECTION**

This section is designed to assist you in

- Performing service functions

and

- Identifying parts.

All repairs must be performed by qualified service personnel.

TERMS: Unless prior arrangements have been made, parts will be shipped UPS-COD. All prices are F.O.B. Wheeling, Illinois, and are subject to change without notice.

In all correspondence or phone orders for parts, please state model number and serial number of the Miller Mixer.

Order less than \$25.00 will be assessed a \$5.00 handling charge.

RETURNS: No parts are to be returned without prior authorization. A Returned Goods Authorization number is required.

EQUIPMENT MAINTENANCE LOG

RECORD MODEL NUMBER HERE: _____

RECORD SERIAL NUMBER HERE: _____

SERVICE DATE	DESCRIPTION & PARTS REPLACED <small>(STATE IF UNDER WARRANTY)</small>	SERVICED BY

PARTS SECTION

SERVICE DATE	DESCRIPTION & PARTS REPLACED (STATE IF UNDER WARRANTY)	SERVICED BY

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 South Wheeling Road | Fax: 1(847) 537-5530
Wheeling, IL 60090

Sold To:

Ship To:

P.O. Number _____

PHONE # (____) ____ - ____

Ship Via: _____ Collect Prepaid

Taxable Tax Exempt (Fax copy of exemption certificate.)

QUANTITY	PART NUMBER	DESCRIPTION	UNIT PRICE

Comments: _____

Name (Please print) _____ Signature _____ Date: _____

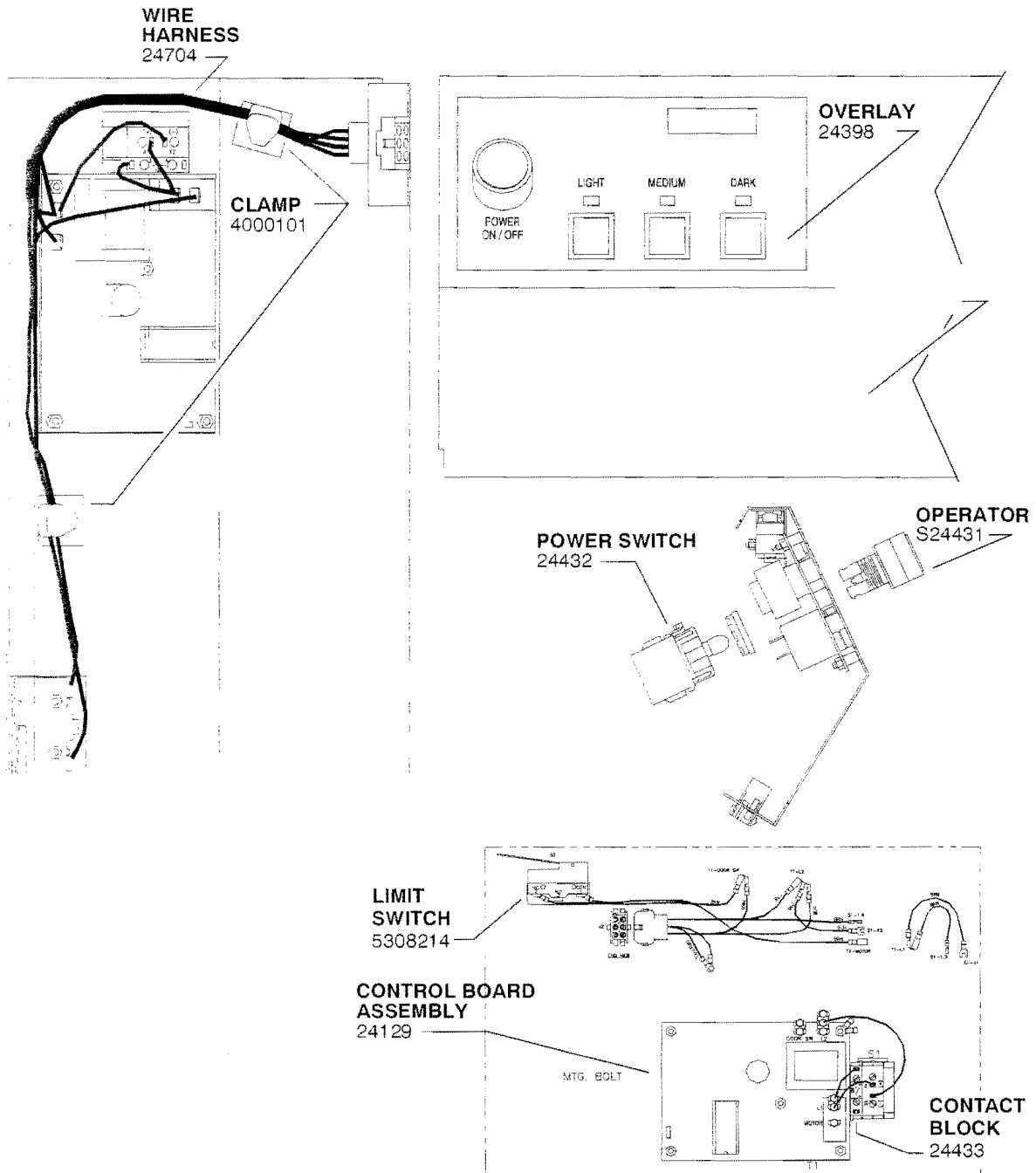


Figure 4 Control Panel

PART NO	DESCRIPTION	NO REQ
24129	CONTROL ASSEMBLY WITH 3-SWITCH PCB	1
24398	OVERLAY	1
24431	POWER SWITCH OPERATOR	1
24432	POWER SWITCH BODY	1
24433	CONTACT BLOCK	1
24696	CONTROL PANEL ASSEMBLY	1
24704	WIRE HARNESS, CONTROL PANEL	1
4000101	CABLE CLAMP	2
5308214	SAFETY LIMIT SWITCH	1

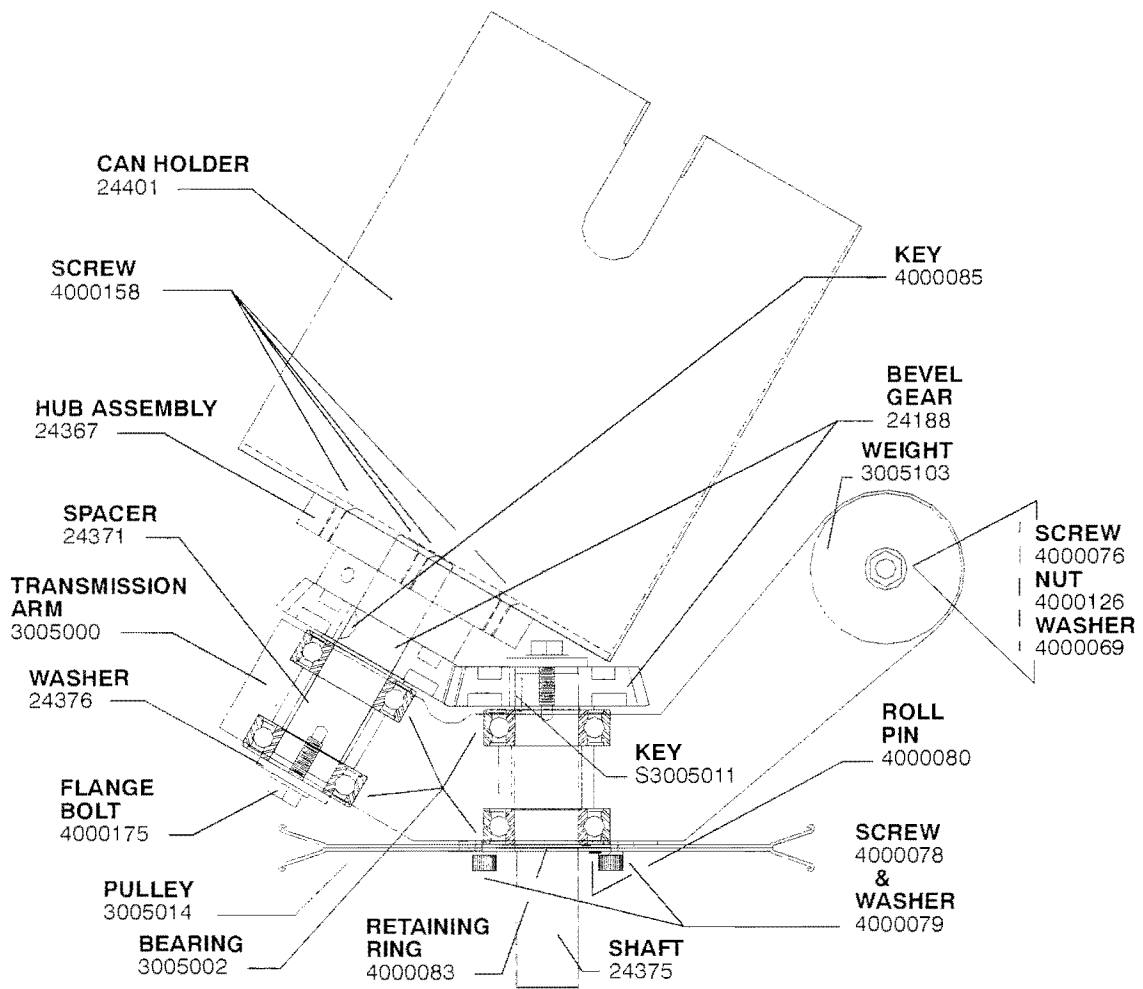


Figure 5 Transmission Arm Assembly

PART NO	DESCRIPTION	NO REQ
00630	MOTOR, 1725 RPM, 230VAC (NOT SHOWN)	1(230V UNITS)
07105	"V" BELT, 38" LONG (NOT SHOWN)	
16249	MOTOR, 1725 RPM, 115VAC (NOT SHOWN)	1(115V UNITS)
24188	BEVEL GEAR, 37 TEETH	2
24367	HUB ASSEMBLY WITH SHAFT	
24371	BEARING SPACER	2
24375	MAIN SHAFT	1
24376	WASHER, 1.28" OD X 0.28 ID X 0.135	2
24401	CAN HOLDER	1
24705	WIRE HARNESS, CABINET (NOT SHOWN)	1
24825	POWER CORD (NOT SHOWN)	1
3005000	TRANSMISSION ARM	1
3005002	BEARING	4
3005011	KEY, SQUARE, 3/16" X 7/16"	1
3005014	MAIN DRIVE PULLEY, 8" DIA	1
3005103	COUNTER WEIGHT	1
4000069	FLAT WASHER, 3/8" ID X 3/32"	2
4000076	SCREW, 5/16-18 X 1/2"	1
4000078	SCREW, 1/4-20 X 3/4"	4
4000079	SPLIT WASHER, 1/4 "	4
4000080	ROLL PIN, 3/16" X 3/4"	2
4000083	RETAINING RING	1
4000085	KEY, WOODRUFF, 3/16"	1
4000126	NUT, 5/16-18	1
4000158	SCREW, 10-32 X 5/8", SOCKET HEAD	4
4000175	SCREW, 1/4-20 X 1/2"	2
30007025	MOTOR PULLEY (NOT SHOWN)	1

