Service Manual

Model 2102
Side Lug Drive
Top and Bottom
Case Sealer

Life Data Labs Inc.
Cherokee, AL
Q01002 HPA2102(RH)

MARQ Packaging Systems Inc.
P.O. Box 9063
Yakima, WA 98903

Warranty Information

This information is needed for your warranty. Please fax to MARQ c/o Shawna Sanders after initial installation. If no date is received, then the company will use the shipping date for the date the warranty begins.

Machine# _____

Company Name _____
Company Address _____
_____

Phone# _____
Fax# _____

Date Of Installation _____

Purchased From _____

Head of Maintenance _____

PO Box 9063
Yakima, WA 98909
Phone: (509) 966-4300
FAX: (509) 452-3307
Email: info@marq.net

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MARQ Packaging Systems, Inc. was founded in 1965 by Ted Marquis to design and manufacture economical and reliable case erector/bottom sealers. We have expanded our manufacturing producing a complete line of case packers, partition assembler/inserters, case erector/bottom sealers, case sealers, and trayforming equipment available with or without the Q.C. (Quick Change) option. MARQ machines seal cases with either hot melt, cold glue, pressure sensitive tape or any combination thereof. Also available are uniform sealers, random sealers, and case vibrators. MARQ innovations have helped establish new standards in many areas of the packaging industry. Each MARQ machine is designed to adjust to case sizes outside its standard making MARQ's line of basic machines adaptable to hundreds of uses.

MARQ's 65,000 square foot plant, located near the Yakima International Air Terminal, is staffed with design engineers, craftsmen, and a sales force who team up for a one-on-one effort with each of MARQ's customers. We at **MARQ Packaging Systems, Inc**. take pride in the fact that our products bear the MARQ of Quality and Excellence.

Over 30 years of complete customer satisfaction has proven the reliability of the combined forces of the case sealer and the computer.

If parts are required for your MARQ Case Sealer, they may be obtained from MARQ Packaging, 3801 W. Washington Ave, Yakima, WA 98903.

THE ONE AND ONLY CAM (COMPUTER ADJUSTABLE MACHINE)
CASE PACKER, PARTITION ASSEMBLY/INSERTING, CASE ERECTING, CASE SEALING AND TRAYFORMING MANUFACTURER.

Introduction

Manual Overview
This manual contains information needed to operate, maintain, and troubleshoot your machine. The following page describes the general safety precautions you should take when you operate the Case Sealer.

The main body of the manual contains information on the machine and its operation. The various controls are described. Operating Procedures are shown in step by step detail. Toward the end of the manual you will find maintenance and troubleshooting information.

The Appendixes contain a Sequence of Operation based on the electrical and program flow. Also included in the Appendixes is a list of suggested spare parts.

The final page of this manual contains warranty information.

Throughout this manual:
- The names of all **BUTTONS**, **KEYS** and **SWITCHES** will appear in **BOLD CAPITAL LETTERS**.
- Left and right references are made when standing at the hopper end of the machine and looking at the discharge end.
- Optional Features will be marked with an asterisk (*).

If you are viewing the manual on a computer screen:
- Click on most page references to jump to that page.
- Click on the footer on any page to jump to the table of contents.

Satisfactory operation of the MARQ Case Sealer depends on proper application, correct installation, and proper maintenance. In addition, modifications to the equipment may result in less than satisfactory performance.

Contact Information:
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Email: info@marq.net
Internet: www.marq.net

PLEASE READ YOUR MANUAL BEFORE OPERATING YOUR MARQ EQUIPMENT

Precautions: **Always maintain operator safety!**
Before working on your Case Sealer, disconnect all incoming power.

Turn off all electrical and air connections to this equipment before repairing, cleaning or removing jammed cases.

Do not put hands or tools into equipment while the Case Sealer is operating.

Do not operate the Case Sealer without all guards and safety mechanisms in place.

Do not where neckties, jewelry, loose clothing, or other items that can become caught in moving parts or mechanisms in the vicinity of the Case Sealer.

Wear all company-specified personal protective equipment while operating the Case Sealer.

Do not operate, troubleshoot, or maintain the Case Sealer while under the influence of any type of drug or alcohol.

Always observe all safety warnings and notices on the machine and in this manual.

Do not use flammable or toxic cleaning fluids such as gasoline, benzene, or ether when cleaning and maintaining the Case Sealer.

Safety Features
The Case Sealer is equipped with an Emergency Stop button. This red pushbutton is located on top of the main electrical panel on the right hand side of the machine. Press the Emergency Stop button to immediately stop machine operation. This button must be pulled back up by hand before the machine can be restarted.

Safety Guarding with interlocks is available for all MARQ machines. Machines equipped with Safety Guarding cannot be started unless ALL guard doors are closed. If any doors are opened while the machine is running the system will immediately shut down. The doors must be shut and the machine must be reset in order to restart.

! Special Caution !
Do not tamper with any interlock guard switches.

DANGER	TURN ELECTRICAL AND AIR OFF BEFORE CLEANING OR REPAIRING MACHINE	DANGER

Specifications

Main Drive Unit Motor: ..... O.P.D.R. Motor

Voltage: ..... 230V 3 Phase

Transformer: 1.0KVA

Air Required: ..... 3 CFM @ 80PSI per cycle

Controller: ..... NA

Sealant: ..... MARQ Tape Head

Production Rate: ..... 15 Cases Per Minute

Case Type: ..... Regular Slotted Cases (RSC)

Paint: ..... Dark Gray

Options

The following is a list of included options for machine #Q01002 HPA2102(RH), built for Life Data Labs.

- Raised Lug Drive 7-8"
- Spare Parts Kit #801-35
- Low Tape, Tape Out with Beacon
- 230V 3 Phase Electrical

NOTE: It is very important that once the machine arrives it is checked carefully for any damage that may have occurred in transit. Since MARQ's terms are F.O.B. Yakima, it is your responsibility to contact the carrier and file any necessary damage claims with them.

Each MARQ Case Sealer is tested prior to shipping to ensure proper operation. Due to variations in case sizes, packing conditions, bulge and weight, it may be necessary to make minor changes in the settings discussed below to obtain optimum performance and operation.

Leveling & Adjusting Height

The Case Sealer should be leveled for proper height using the machine's adjustable legs.

- The standard infeed deck height is set at 25-27"
- The machine should not be resting on casters during operation.

Electrical Connections

The following electrical connections are required:

- Main Drive Shaft - 230v AC 3 ph 3/4 HP
- Control Box - 110v AC 1ph 60 Hz
- Other voltages are available on request.

Air Connections

An air supply capable of delivering the required volume of air at 80 psi should be connected to the machine using a filter/regulator/lubricator. Air line requirements between the compressor and the machine should be as follows:

- 1/2” pipe 0–25 ft.
- 3/4” pipe 25–60 ft.
- 1” pipe 50 ft. or over.

Adjusting Air Cylinder Speed

Most of the air valves on the machine have exhaust restrictors to control the speed of the air cylinders they operate. To increase the speed of an air cylinder, open the exhaust restrictor until the desired speed is reached. To decrease the speed of an air cylinder, close the exhaust restrictor until the desired speed is reached. See page 17, Solenoid Valves for more on adjusting the air flow.

Conveyors

For optimal performance powered conveyors should always be used in conjunction with MARQ Sealers. The infeed conveyor should be powered at .75 feet per second to insure case separation at the gate.

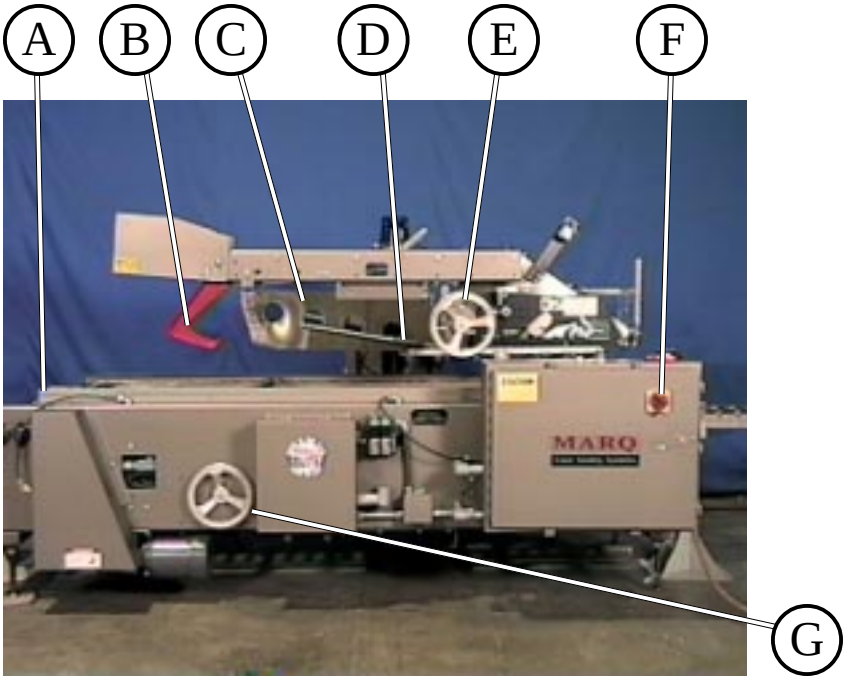
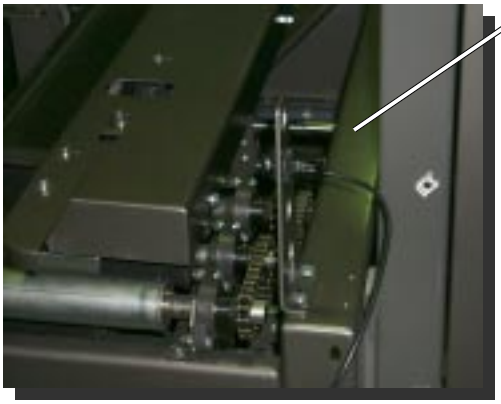


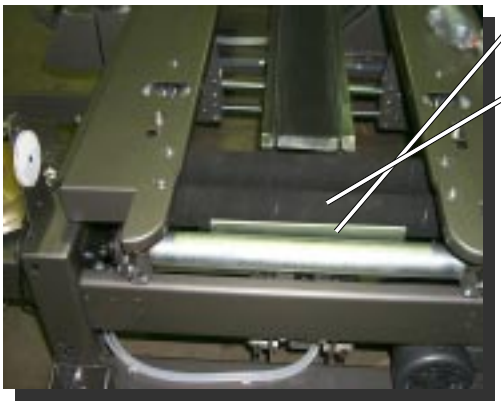
figure 12-1. High Performance Case Sealer (Standard FrameShown)

A. Gate area
B. Kicker
C. Flap divider
D. Major Flap Folding Arms
E. Side Compression Rollers Adjustment Handwheel
F. Main Disconnect
G. Side Rails Adjustment Handwheel



When a case reaches the gate, it is detected by the gate photo eye.

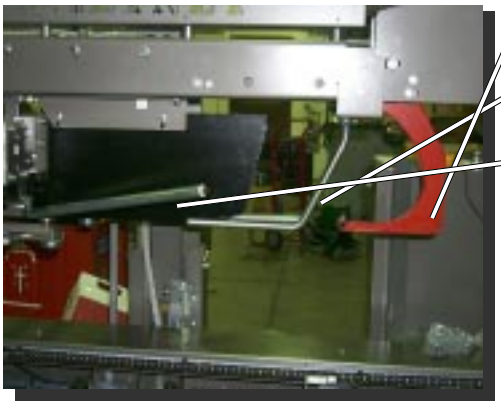
figure 13-1. Gate Photoeye



The gate drops to allow the case to enter the machine.

Power rollers push the case into the machine, so that the side lugs can transfer the case through the machine.

figure 13-2. Gate and Power Rollers



The kicker folds the trailing minor flap.

Folding rods fold the leading minor flap.

The major flaps are folded over by major flap folding arms.

figure 13-3. Flap Folders

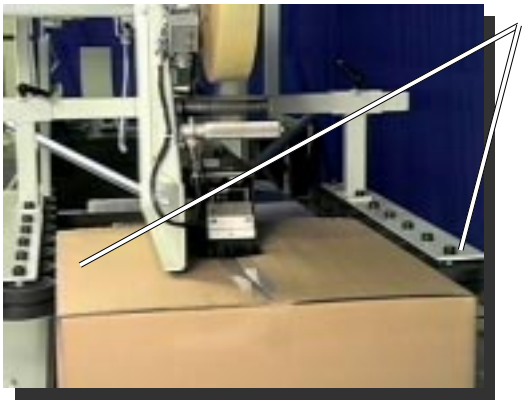


figure 14-1. Side Compression Rails

Side compression rollers keep the major flaps pushed in for correct sealing. The top majors are sealed and the case exits the machine.

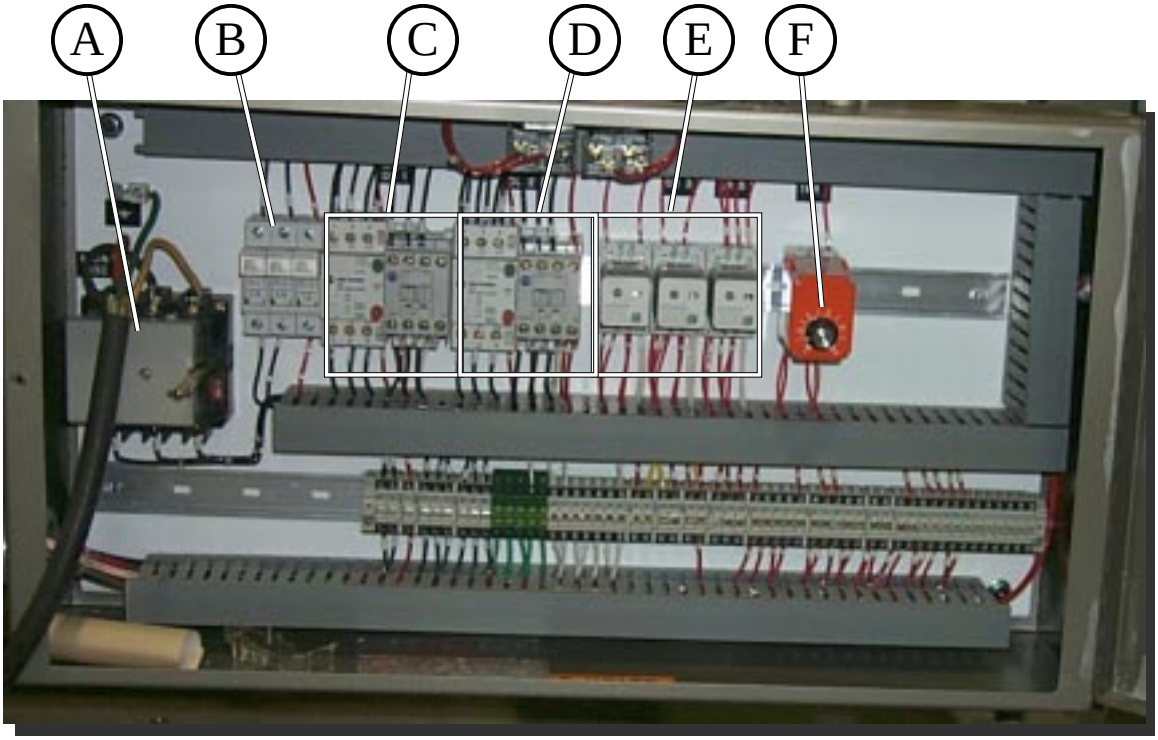


figure 15-1. Main Electrical Panel

A. Main Disconnect

B. Fuses

C. Side Lug Drive Motor Relay and Overload

D. Powered Infeed Rolls Motor Relay and Overload

E. Guard Door Relay (1CR) *
Gate Relay (2CR)
Flight Lug Disable Relay (3CR)

F. Gate Timer

Components: Main Air Prep Unit

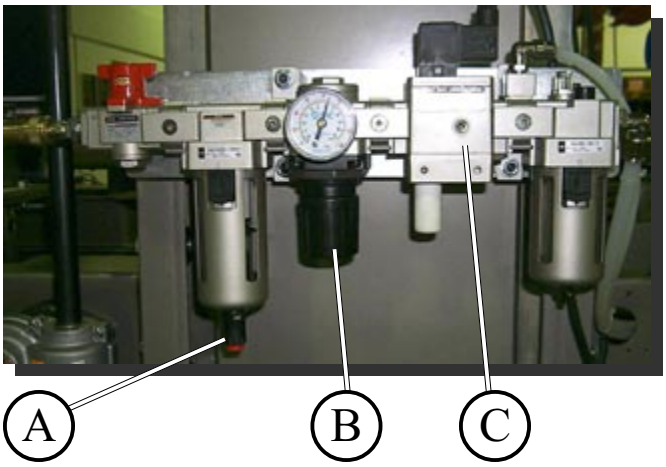


figure 16-1. Main Air Prep Unit

figure 16-2. Air Gate

figure 16-3. Pressure Gauge

Main Air Prep Unit

The main air prep unit has a two-position gate valve that directs or shuts off high-pressure air to the machine. (See fig. 16-2)

Air Pressure Regulator/Filter/Lubricator

A sight gauge shows the amount of the air pressure in pounds per square inch (psi). For the machine to operate correctly this must read at a constant 80 psi. (See fig. 16-3)

The regulating hand knob adjusts the air pressure. It is located just below the sight gauge. Pulling down and turning the knob clockwise increases air pressure. Pushing the Knob back up locks adjustment in place. (See fig. 16-3 or 16-1B)

figure 16-4. Air Filter

The filter assembly removes debris from the air system. (See fig. 16-4)

On the bottom of the filter assembly casing there is a screw-type pet cock for draining accumulated moisture. (See fig. 16-1A)

A soft start adjustment screw lets you adjust the speed of the airflow being applied to the machine. (See fig. 16-1C)

figure 16-5. Oil Reservoir

An oil reservoir supplies lubricant to the air lines. (See fig. 16-5)

Adjust the amount of oil supplied in the air system by turning the adjustment knob on top of the oil reservoir. A window allows for counting of the drops supplied. Adjust lubricant for 1 drop for every 10-15 cases. Turn either left (positive) to increase, or right (negative) to decrease. (See fig. 16-6)

figure 16-6. Oil Window

The oil reservoir is filled with a non-detergent hydraulic oil. A 10W or transmission fluid will work in this system as long as it is a non-detergent oil.

figure 17-1. Parker Hanafin Solenoid Valves

figure 17-2. Manual Override

figure 17-3. Exhaust Restrictors

Solenoid Valves

A solenoid valve (fig. 17-1) receives an electrical signal from the controller to shuttle a plunger back and forth. The plunger directs air from the air lines to the air-driven devices on the machine.

The manual override is a small blue screw on the top of the solenoid valve (fig. 17-2). It can be turned, using a screwdriver, to override the electrical signal, which causes the plunger to shift and direct air from the "B" port of the valve to the "A" port, causing the cylinder to actuate.

The exhaust restricters are located on the bottom of each valve (fig. 17-3). Turn the screws to increase (counter-clockwise) or decrease (clockwise) the air flow.

Valves

1 SOL Gate
2 SOL Kicker
3 SOL Air Dump

Components: Air Cylinders

figure 18-1. Rexroth Air Cylinder

Air Cylinder

An air cylinder houses a piston that is driven back and forth by high-pressure air that actuates the air-driven devices on the machine. (fig 18-1)

Cushion Adjustment Screws

The cushion adjustment screws are set screws that are turned to adjust the travel of the piston into the cushion. Turning the screw clockwise increases the cushion and allows the piston rod to ratchet at a higher rate of speed. This adjusts the cylinder stroke.

figure 19-1. Zerk Fitting on Tolomatic Gearcase

Side Lug Assembly

- Side Lugs
  The side lugs are "L" shaped pieces of metal mounted on a drive chain which moves the cases through the machine.

- Side Lug Motor
  The side lug motor is a .75 HP motor that powers the side lug drive chains that transfer cases through the machine.

- Micro Limit Switch
  The micro limit switch is mounted under the side lug drive chain to signal the position of the side lugs to the controller. The side lugs trip the switch arm on the limit switch as they rotate around the drive chain.

Brake/Clutch Module

The brake/clutch module is a 90 volt AC assembly that starts and stops the side lug drive chain as it transfers cases through the machine. This allows cases to be stopped at each station for the performance of various operations.

Gearbox

The gearbox is a set of gears that transfers the power from the motors horizontally to drive the machine's side lug drive chain. PLEASE REFER TO THE MAINTENANCE SECTION OF THIS MANUAL FOR LUBRICATION INSTRUCTIOINS. FAILURE TO LUBRICATE GEAR BOX PROPERLY MAY CAUSE MACHINE FAILURE AND VOID YOUR WARRANTY.

Sprocket and Chain Drive Assemblies

A set of motor driven idler sprockets and chains drive the machine's side lugs.

Tol-O-Matics

All Float-A-Shaft gear boxes have been lubricated at the factory with Anderol® 786. However, units require more lubrication prior to operation. See the Weekly Maintenance section for further details.

Components: Sensing Devices

figure 20-3. Gate Enable and F.B. Disable Switches and tKicker Photoeyes

figure 20-1. Top Tape Supply Sensors

figure 20-2. Bottom Tape Supply Sensors

Limit Switches (LS)

1 Gate Enable

When made while a case is at the gate photoeye the gate is dropped allowing the case to enter.
The Gate Enable switch is located beneath the right rail. It is the second switch from the infeed end of the machine.

2 F.B. Disable

If the case is still entering when the FB Disable switch is made then the motor is stopped until the case has cleared the gate photoeye.
The F.B. Disable switch is located beneath the right rail. It is the first switch from the infeed end of the machine.

3 Arch Safety *

If this switch is made during arch adjustment the adjustment motor will be disabled until the direction select switch is set to the opposite direction.

Top Low Tape *
Top No Tape *

When the Low Tape switch is released the yellow beacon will come on and the display will indicate a low tape situation. When the No Tape switch is released the yellow beacon will flash, the machine will hold, and the display will indicate a no tape situation.

Photoeyes (PE)

1 Gate

When the gate photoeye is made and the Side Lug reaches the point specified in the GATE_POINT variable, the gate drops allowing a case to be pulled into the machine by the power rolls.

2 Kicker Off
3 Kicker On

When both eyes are blocked by the case the kicker is fired. When the first eye is unmade by the case the kicker is retracted.
Both the Kicker photoeyes are mounted above the right rail.

Bottom Low Tape *
Bottom No Tape *

When the Low Tape switch is released the yellow beacon will come on and the display will indicate a low tape situation. When the No Tape switch is released the yellow beacon will flash, the machine will hold, and the display will indicate a no tape situation.

figure 21-1. Main Disconnect Switch

figure 21-1. Stop Button

figure 21-2. Start Button

The main control console consists of buttons located on the left side of the machine. These buttons allow the operator to start and stop the machine.

Main Disconnect

This switch, located on the front of the main electrical panel, is the main power switch for the machine. To run the machine it must be in the On position. **Always set this switch to Off before maintaining or repairing the machine.**

STOP

The **STOP** is a button that immediately stops the machine when pushed down. There are two stop buttons located on the machine. One on the right side on top of the electrical panel and one on the left side on the control panel.

START

To start the machine pull up on **STOP** button and press the **START** button. The **START** button is also used as a reset button after an emergency stop.
There are two start buttons located on the machine. One on the right side on top of the electrical panel and one on the left side on the control panel.

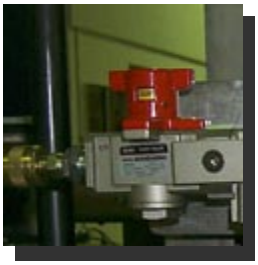


figure 22-1. Air Gate

figure 22-2. Air Pressure Gauge

figure 22-3. Stop Button

figure 22-4. Start Button

Start-up

Verify that the electrical and the pneumatic connections are established as per instructions contained in Installation (page 11).

1. Turn the **MAIN AIR VALVE** (located on the main air line) to the **SUPPLY** position. The valve has two positions, **SUPPLY** and **EXHAUST**.

2. Check the air pressure gauge next to the air regulator and make sure the air pressure is set at 80 psi.

3. Pull up the both **EMERGENCY STOP** buttons.

4. Press either **START/RESET** button.

Normal Shutdown

1. Depress the **EMERGENCY STOP** button.

2. Turn the main power switch to **OFF**.Located on the front of the Electrical Panel.

3. Remove the air supply from the machine and turn the **MAIN AIR VALVE** to **EXHAUST**.

Emergency Shutdown

1. Press the **EMERGENCY STOP** button on the main control console.

Note: The Emergency stop procedure should only be used when a case becomes jammed in the machine or other simular situations. For normal shutdown refer to normal shutdown procedures.

Clearing Jams

1. Shutdown the Case Sealer by pressing the EMERGENCY STOP button.

2. Remove the case and any debris or corrugated fiber, being careful not to allow the debris to fall into any part of the machine.
   NOTE: Refer to the troubleshooting guide for possible corrective actions to prevent future jamming.

3. Carefully inspect machine for any debris fallout.

4. Account for all tools, parts, and materials.

5. Start up the Case Sealer as described in the Startup Procedure on this page and check for proper operation.

Changeover

1. Shutdown the Case Sealer as described under Normal Shutdown on page 22.

2. Remove any cases from the machine.

3. Using a sample case, perform the following adjustments for the next case to be run. Each adjustment is described on the following pages.
   Bottom Rails, page 24
   Arch, page 24
   Top Guide Rails, page 25
   Note: Some adjustments may not be necessary for every case size.

4. Startup the machine as described on page 22 and run a few cases and examine results to verify correct adjustments.

Motorized Adjustments *

There are no motorized adjustments on this machine.

Motorized Adjustments are made using the adjustment controls on the top of the main electrical panel. There are two controls for the adjustment: a direction select switch and a jog button.

When making adjustments set the direction select switch to the desired direction of movement, then press the corresponding jog button. The assembly will move in the direction selected. Hold the jog button down until the assembly nears the desired position. Release the jog button to stop the movement.
NOTE: Allow about 1/8 - 1/4" when releasing the jog botton for the movement to stop completely.

CAUTION
Turn Off All Electrical And Air Connections To This Equipment Before Repairing, Cleaning Or Removing Jammed Cases.
Do Not Put Hands Or Tools Into Equipment While Case Sealer Is Operating.

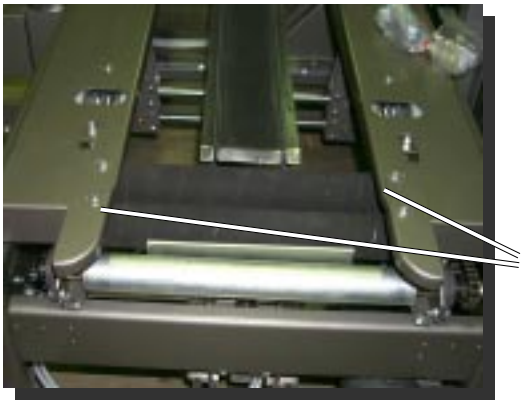


figure 24-1. Side Rails

Side Rails

NOTE: Make sure the machine is running when adjusting the side rails. The gear box could become out of line if the adjustment is made without the machine running. This will result in damage to the gear box.

Using the width adjusting handwheel move the side rails in or out. Leave about $^{1}/_{16}$" on each side for allowance.

figure 24-2. Adjustment Handwheel

The width adjusting handwheel is located on the right infeed end of the machine.

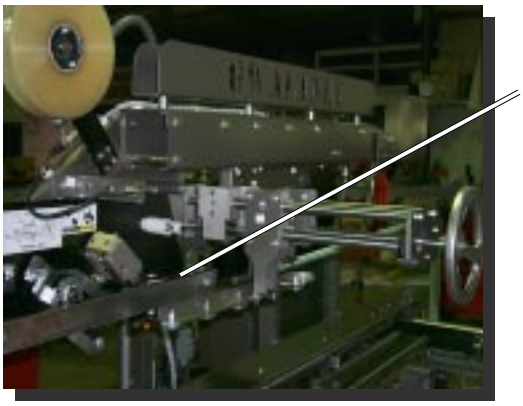


figure 24-3. Arch

Arch Assembly

The top carriage should be adjusted so that the case, after all flaps have been folded, is ¼" or less from the tape head.

Use the adjustment handwheel located at the base of the arch support on the left hand side of the machine to adjust the arch as needed.

figure 25-1. Adjustment Handwheel for Side Compression Rollers

figure 25-2. Adjustment Handwheel for Top Major Flap Folders

Side Compression Rollers

The side compression rollers should be adjusted so there is 1/8" to 3/16" from the sides of the case and the guide rails. To adjust the side compression rolls, use the handwheel located on the left side of the arch.

Major Flap Folders

The major flap folders should be adjusted so that the flaps are folded over without being damaged. To adjust the major flap folders, use the handwheel located on the right side of the arch.

Maintenance

DANGER TURN ELECTRICAL AND AIR OFF BEFORE CLEANING OR REPAIRING MACHINE DANGER

Daily Preventive Maintenance

1. Clean the Machine.
   - Clean off dust, product accumulation, grease, etc.
   - Blow out all motor filters with an air hose.
   - Vacuum cups must be kept clean.

2. Check the electrical safety switches for correct operation.

IMPORTANT NOTE:

The lubricant in the gear box must be checked and changed on a regular basis. Failure to do so may cause equipment damage or failure. Now is the time to set up a maintenance schedule and follow it closely. The following instructions are reprinted from BOSTON GEAR BOX, manufacturer:

> *"… it is important that the proper type of oil be used since many oils are not suitable for the lubrication of gears. Various types of gearing require different types of lubricants.*
>
> *The lubricant must remain free from oxidation and contamination by water or debris, **since only a thin film of oil stands between efficient operation and failure**. To assure long service life, the reducer should be periodically drained (preferably while warm) and refilled to the proper level with a recommended gear oil. Under normal environmental conditions oil changes are suggested after the initial 250 hours of operation and thereafter at regular intervals of 2500 hours."*

This has to be done. **Failure to do so may void your warranty**. MARQ recommends oil be changed even more often than the manufacturer recommends due to varying stress and conditions. See Weekly Preventative Maintenance, next page.

IMPORTANT

When applying grease to moving parts MARQ recommends the use of Lithium #1 or #2 Grease. DO NOT USE WD-40. WD-40 gumms up and causes seals to wear out.

DANGER TURN ELECTRICAL AND AIR OFF BEFORE CLEANING OR REPAIRING MACHINE DANGER

Weekly Preventive Maintenance

1. Check the air system lubricators for fluid level and fill as needed.
   - Check the sight gauge on the lubricator to determine fluid level.
   - Remove the fill cap on the lubricator and add oil (ATF fluid).
   - Refer to vendor documentation for further instructions.

2. Check the operation and tightness of mounting hardware of all limit switches.
   - Tighten the mounting hardware of the limit switch using a screwdriver.
   - Run the machine and check to make sure the trip mechanism on the limit switch actuates correctly.
   - Remove and replace the limit switch if the trip mechanism does not actuate.

3. Check the air cylinders, the control valves, and the air lines for leaks and loose connections.
   - Tighten mounting bolts and air lines if needed.
   - Remove and replace air lines to the solenoid valve if needed.

4. Check the solenoid valves for leaks and loose connections.
   - Tighten the mounting screws and the air lines if needed.
   - Remove and replace the air lines to the solenoid valve if needed.

5. Bleed the air lines.

6. **Check the oil level in the gear box. After an initial 80 hours of operation, drain the oil and refill with Mobil 600W Cylinder Oil or the equivalent.**
   NOTE: Oil will flow from air hole in gear box if overfilled. Damage to seals in gear box could be possible.
   - Remove the oil fill cap from the gear motor.
   - Fill the oil reservoir with cylinder oil.

7. Grease the bearings and the running shafts using a grease head.

8. Lubricate the flight chain using chain lube.

9. Check all the chains and fasteners for tightness.

10. Periodic re-lubrication of the Tol-o-matics Float-A-Shaft is also necessary for optimum performance. When re-lubricating, inject ½-1oz. of Anderol 786 or equivalent into gear case via the grease zerk provided.

IMPORTANT

When applying grease to moving parts MARQ recommends the use of Lithium #1 or #2 Grease. DO NOT USE WD-40. WD-40 gumms up and causes seals to wear out.

Maintenance

DANGER TURN ELECTRICAL AND AIR OFF BEFORE CLEANING OR REPAIRING MACHINE DANGER

Monthly Preventive Maintenance

1. Check all the sprockets for alignment and tighten the set screws.

2. Check the entire machine for loose and worn parts.

3. Clean out the air line filters.

4. Check the photo eye switches for correct operation.

Semi-annual Maintenance

1. Check the air cylinders and rebuild them if necessary.

2. Check all the air lines, the valves, and connections for leaks.

Air/Filter/Regulator Maintenance

The air/filter/regulator is a group of modules sealed by O-rings. See page 20 for picture and operation of each module.

Each module can be removed by releasing the brackets that hold the modules together. If air is leaking between the modules, replace the O-rings.

The filter that removes debris from the air is located in the air filter module. To clean this filter, remove the housing. Pull down the black release, turn the housing so that the two notches line up and then pull the housing off. Unscrew the black cap that holds the filter on. Wash the filter in soap and water and replace it in its original position. To put the housing back on, line up the notches then push in and turn until the black release snaps into position.

The soft start module can be cleaned in soap and water. Remove the electrical switch located at the top of the soft start module. (DO NOT WASH THE ELECTRICAL SWITCH.) Disassemble the soft start module and clean the interior with soap and water. (Make sure that it is properly reassembled.)

IMPORTANT

When applying grease to moving parts MARQ recommends the use of Lithium #1 or #2 Grease. DO NOT USE WD-40. WD-40 gumms up and causes seals to wear out.

DANGER TURN ELECTRICAL AND AIR OFF BEFORE CLEANING OR REPAIRING MACHINE DANGER

Problem	Cause	Solution
Air-driven device does not actuate on the machine.	Bad solenoid valve.	Manually check the operation of the solenoid valve. • Turn the **MANUAL OVERRIDE** button on the appropriate solenoid valve. • Remove and replace the solenoid valve if the cylinder is not actuated when the **MANUAL OVERRIDE** screw is pressed. — Press the stop button on the Main Electrical Box, and place the valve of the Main Air Prep Unit to the exhaust position. — Remove the top cover of the box enclosures. — Unwire and remove the solenoid valve. — Replace it with a new solenoid valve. — Rewire and secure airlines to new valve. — Reapply air and power to machine and test new solenoid valve. — Please refer to vendor documentation for further details.
	Not enough air pressure from the main air prep unit.	If turning the **MANUAL OVERRIDE** screw does not actuate the cylinder, check the air supply to the solenoid valve. • Make sure the main air valve is in supply, on the main air prepunit. • Make sure the air regulator gauge is set at 80 psi. • Pull down and turn the knob on top of the air regulator to adjust the air pressure if necessary. (Turning the knob to the right increases air pressure.) Pushing back up will lock the adjustment in place. • Make sure the air lines from the main air Prep Unit to the solenoid valve are not kinked or blocked.

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Troubleshooting

DANGER TURN ELECTRICAL AND AIR OFF BEFORE CLEANING OR REPAIRING MACHINE DANGER

Problem	Cause	Solution
Air-driven device does not actuate on the machine. (cont')	Not enough air pressure from the main air prep unit. (cont')	• Remove and replace the diaphragm in the air regulator if air pressure is still insufficient. — Turn the main air valve on the Main Air Prep Unit to Exhaust. — Unscrew and remove the regulator's body. — Remove and check the condition of the regulator's diaphragm. — Install a new diaphragm in the regulator is needed, and reassemble. — Reapply air and lift Stop, check air pressure and insure that it's 80psi. • Please refer to vendor documentation for further details.
	Not enough air to the valve.	Check to be sure that air is supplied to the solenoid valve. • Make sure the air lines are not kinked or blocked. • Make sure the air lines are securely connected between the solenoid valve and the cylinder. • Make sure there is not oil or water buildup in the air lines. • Adjust the amount of oil supplied in the air lines by turning the adjustment screw on top of the lubricator. Turn the adjustment screw clockwise to decrease the amount of oil supplied to the air lines. A window next to the lubricator allows you to count the drops of oil supplied. • The air luricator should be adjusted to supply one drop of oil into the air lines for every 10 cases moved through the machine.

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DANGER TURN ELECTRICAL AND AIR OFF BEFORE CLEANING OR REPAIRING MACHINE DANGER

Problem	Cause	Solution
Air-driven device does not actuate on the machine. (cont')	Cylinder movement sluggish or slow.	Adjust the cylinder cushion restrictor if movement of the cylinder appears sluggish, or slow for the last 1" of travel. • The cushion adjustment screws are screws that are turned to adjust the last 1" of travel of the piston. Turning the screw clockwise increases the cushion and allows the piston rod to move at a high rate of speed until the piston rod hits the cushion. The cushion slows the piston rod down for the last 1" of the stroke. This adjustment quiets and saves ware on the cylinder.
	Cylinder does not actuate properly.	Remove and replace the cylinder if it still does not actuate properly. • Press the stop button and turn the valve on the Main Air Prep Unit to Exhaust. • Remove the air line to the cylinder. • Remove the cylinder from it's mount. • Secure the new cylinder to the mount. • Resecure the air line to the cylinder. • Reapply air to the machine by turning the valve on the Main Air Prep Unit in the Supply Position. • Lift the stop button, to engage the Air Dump Soft Start. • Manually actuate the cylinder by pressing the manual overide on the appropriate valve, and check for proper operation.

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Troubleshooting

DANGER TURN ELECTRICAL AND AIR OFF BEFORE CLEANING OR REPAIRING MACHINE DANGER

Problem	Cause	Solution
Cases jammed or not transferred in the MARQ Case Sealer.		Remove all jammed cases from the Case sealer. • Determine the location of the jam. • Stop the machine if it does not automatically stop. ***NOTE:*** *The machine will usually stop automatically when jams occur.* • Push the **EMERGENCY STOP** button on the main control panel. • Remove the jammed cases. • Inspect location of jam and check for cause, and possibly worn, or faulty parts. • Restart the machine and check for smooth operation.
	If cases are not being transferred, make sure that air is supplied to the machine.	• Check the supply of air to the solenoid valves that drive the cylinders. • Turn the **MANUAL OVERRIDE** screw on the appropriate solenoid valve, to see if valve operates properly.

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DANGER TURN ELECTRICAL AND AIR OFF BEFORE CLEANING OR REPAIRING MACHINE DANGER

Problem	Cause	Solution
Cases jammed or not transferred in the MARQ Case Sealer. (cont')	Bad solenoid valve.	Change the solenoid valve if the cylinder does not actuate when the **MANUAL OVERRIDE** screw is turned. ***NOTE:*** *Disconnect air before moving screws on solenoid* • Disconnect Air • Remove the allen head screws on the face of the solenoid valve. • Unplug the solenoid valve from the manifold. • Plug a new solenoid into the manifold. • Make sure gaskets are installed, when replacing the valve. • Secure valve to the manifold with the allen head screws. • Check for air leaks around new valve. • Please refer to vendor documentation for further details. • Make sure air pressure is supplied to the solenoid valve if the **MANUAL OVERRIDE** screw does not actuate the cylinder. • Make sure the guage on the air regulator is reading "80 psi." • Turn the knob on top of the air regulator to adjust the air pressure if necessary (pulling down and turning the knob to the right increases the air pressure, pushing up on the adjustment knob locks the adjustment in place). • Make sure the air lines from the air prep unit to the solenoid valve, and from the solenoid valve to the cylinder, ar not kinked or blocked. ***NOTE:*** *A red LED light on the top of the solenoid valve illuminates when an electrical signal is received by the valve.*

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Troubleshooting

DANGER TURN ELECTRICAL AND AIR OFF BEFORE CLEANING OR REPAIRING MACHINE DANGER

Problem	Cause	Solution
Cases jammed or not transferred in the MARQ Case Sealer. (cont')	Bad diaphram in regulator.	Change the regulator's diaphragm if air pressure is still insufficient. • Close the main air valve, and press the Emergency Stop button. • Unscrew the regulator's body. • Remove and check the condition of the regulator's diaphragm. • Install a new diaphragm in the regulator if needed. • Open the main air valve, and lift the Stop button. • Please refer to vendor documentation for further details.
	No air pressure to valve.	Check to be sure that air is supplied to the solenoid valve.
	Blocked air lines.	Check to be sure the air lines are not kinked or blocked.
	Poor air connections.	Check to be sure the air lines are securely connected from the solenoid valve to the cylinder.
	Oil buildup in air lines.	Check to be sure there is not oil buildup in the air lines. • Adjust the amount of oil supplied in the air lines by turning the adjustment knob on top of the lubricator. Turning the adjustment knob clockwise decreases the amount of oil supplied in the air lines. A window next to the lubricator allows you to count the drops of oil being supplied. • The air lubricator should be adjusted to supply one drop of oil into the air lines for every 10 to 15 cases moved through the machine.

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DANGER TURN ELECTRICAL AND AIR OFF BEFORE CLEANING OR REPAIRING MACHINE DANGER

Problem	Cause	Solution
Cases jammed or not transferred in the MARQ Case Sealer. (cont')	Make sure that the mechanical components of the machine are operating correctly.	• Adjust the cylinder cushion if the movement of the cylinder appears sluggish during the last 1" of movement. To adjust the cushion, turn the small screw on the side of the cylinder with a screwdriver. Turning the screw clockwise increases the cushion and allows the cylinder to move at a higher rate of speed without hitting, excessively hard, the end of it's stroke.
	Drive chain for the machine needs lubrication.	• Use a chain lube on the drive chain to keep it lubricated.
	Chain tension needs to be adjusted.	• Loosen the two nuts on the mounting bracket of the drive chain's idler. (Infeed end of the machine.) • Move the mounting bracket in or out as needed using the 3/8" nuts (moving the bracket toward the chain will increase the tension.) ***NOTE:*** *Loosen the 3/8" nut on top of sprocket mount before adjusting tension, after adjustment retighten.* • For the motors, loosen the 4 bolts on the gear box that hold the motor in place, and slide motor back for tension.
	Drive chain is worn or broken.	Remove and replace the drive chain. • Remove master link on chain. • Count the number of pitches on the chain. • Cut new 40 pitch chain to the same length by counting the pitches. • Install new chain and reconnect with master link. • Tension chain by loosening the four bolts on the gear box that hold the motor in place, and slide the motor back for tension, retighten the four mounting bolts.

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Troubleshooting

DANGER TURN ELECTRICAL AND AIR OFF BEFORE CLEANING OR REPAIRING MACHINE DANGER

Problem	Cause	Solution
Cases jammed or not transferred in the MARQ Case Sealer. (cont')	Bad motor.	Remove and replace the motor that drives the drive chain if needed. • Press the Emergency Stop and turn off the Main Disconnect on the Electrical Panel. • Remove the electrical conduit connected to the motor. • Remove the connector on the chain between the motor and the driven shaft. • Remove the mounting bolts of the motor, to the gear box. • Remove the motor from the gear box, by sliding motor away from the gear box. • Secure a new motor on the gear box with the mounting bolts. • Reconnect the drive chain and electrical connections on the motor. • Restart and check for any excessive noise coming from that motor. • Please refer to vendor documentation for further details.
Kicker is not operating.	Debris and\or fluid in the air system.	Remove dirt or fluid from the air system.
	Wire is loose to the solenoid valve, or in the electrical panel.	Check wiring connections. ***NOTE:*** *There may be wire connections in the junction boxes, in the machine.*
Kicker is slow.	Flow controls on valve are adjusted incorrectly.	• Increase or decrease the air speed to the valve, open the exhaust restrictor until the desired speed is reached. • The exhaust adjustment on top adjusts the cylinder speed in 1 direction. The adjustment on bottom adjusts the speed in the opposite direction.

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DANGER TURN ELECTRICAL AND AIR OFF BEFORE CLEANING OR REPAIRING MACHINE DANGER

Problem	Cause	Solution
Machine does not start.	Guard doors are open (optional)	Close all guard doors (optional).
	No power to the Disconnect, or disconnect is shut off.	• Check electrical connections
	Blown fuse.	• Check fuses.
	Motor heater tripped.	• Push the reset on motor overloads. If this continues, check wiring and electrical connections for the motor, also check the amp draw of that motor using an Amp Meter.
Flaps are not sealed.	Tape out or improper threading.	• Check tape head for tape, and for proper tape threading.
	Arch too high.	• Check height of arch to insure tape is resting on case or just off the top of case.

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Appendix A: Sequence Of Operations

Q01002 HPA2102(RH)

Power Supply

1. 230 VAC power is applied through the 1KVA transformer outlet through a fuse (3FU) to wire #3. Wire #3 applies power to the control rung.
2. 230 VAC (L1 & L2) provide power to the starter for the main drive motor (1MTR) and the starter for the infeed motor (2MTR)
3. Pulling up on the Stop button and closing any guard doors (optional) applies power to wire #4.
4. Pressing the Start button applies power through the normally closed contacts of the drive motor overload (1OL) and the infeed motor overload (2OL) to energized wire #6.
5. Wire #6 turns on the main drive (1M), through the normally closed contacts of 3CR.
6. Wire #6 turns on the air dump valve applying plant air to the system.
7. Wire #6 turns on the infeed motor starter (2M).
8. Wire #6 energizes a contact of 2M which latches across the start button.
9. Wire #6 powers up the running circuits.

Gate Operation

1. When the case comes to the front of the sealer it makes the Gate Photoeye (1PE) to power up wire #10. When a flight lug reaches the Gate Enable Switch (1LS) then wire #22 is energized.
2. If the the No Tape option is not used then this powers up wire #11 through a jumper else wire #11 is powered up if the No Tape option still detects tape on the reels.
3. Wire #11 turns on the Gate Relay (2CR).
4. A normally open contact of 2CR closes bypassing 1LS to continue the gate drop even after the enable switch is released. Also bypassed is the contact of 5CR to allow the case through the gate even if the No Tape option detects no tape during the infeed process. This prevents the gate from coming up under a still entering case.
5. Wire #11 also turns on the Gate Delay Timer (1TMR). This is used for fine adjusting of the point at which the case is actually allowed to enter.
6. A normally open contact of 2CR closes to energize the Gate Solenoid (1SOL) through the normally closed contacts of 1TMR at its time out.
7. If, while the case is at the gate, the flight lug reaches the Flight Bar Disable switch (2LS) the Flight Lug Disable relay (3CR) is energized the latches itself through a normally open contact.
8. The circuit stays with 1SOL energized until the back of the case unmakes the Gate Phot eye (1PE). This releases 2CR.
9. The latch contact across the Gate Enable switch (1LS) and 5CR (No Tape Option) is released. The Gate Delay Timer (1TMR) is also released.
10. The now opened contacts of 2CR and 1TMR release 1SOL to send the gate up.
11. The Flight Lug Disable relay (3CR) is released allowing the flight lugs to continue.

Kicker Operation

1. The Kicker (rear minor flap tucker is activated when both photo eyes (2PE and 3PE) have been made by the case.
2. Set the second photo eye so that the kicker is activated at the proper time by the leading edge of the case.
3. Set the first photo eye so that the kicker deactivates at the proper time to keep the minor flap tucked, but not to interfere with the next case.

figure 39-1. MARQ Part# 270

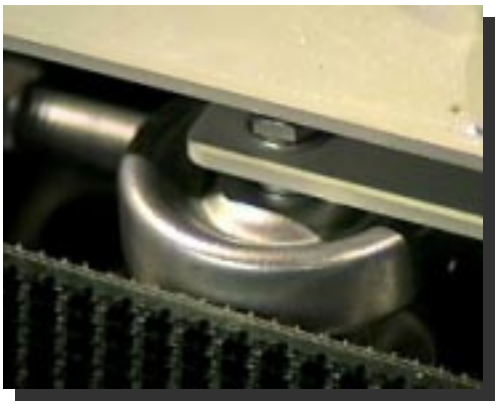

figure 39-2. MARQ Part# 289

figure 39-3.MARQ Part# 794

SPK 801-32
Spare Parts Kit
Includes the Following Parts

MARQ Part# 9000-3
1 24V Parker Air Valve

MARQ Part# 7216-8
1 Parker Air Cylinder Kit; RODGLN, 1.5-2.5

MARQ Part# 7216-8A
1 Parker Air Cylinder Kit; RDSEAL, 1.5-2.5

MARQ Part# 269
1 3/4" 2 Bolt Flange Bearing

MARQ Part# 270
1 1" 2 Bolt Flange Bearing

MARQ Part# 870
1 1 1/4" 4 Bolt Flange Bearing

MARQ Part# 289
2 Skate Wheels

MARQ Part# 1230
1 Tolomatic Float-A-Shaft LH Gearcase 0223

MARQ Part# 794
1 Tolomatic Float-A-Shaft RH Gearcase 0224

MARQ Part# 5226
1 AB Contactor; 120V, N/O

MARQ Part# 7278-1
1 AB Photoeye; PLRVCTV, 3M ACDC

Appendix B: Spare Parts Kit

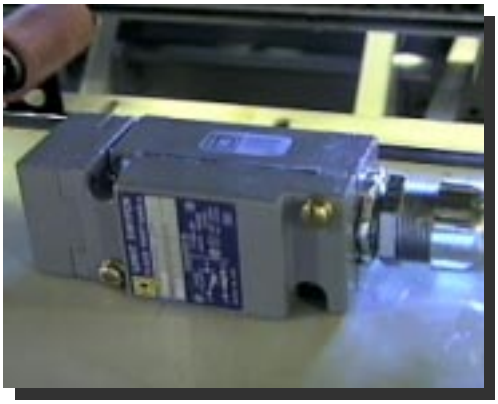

figure 40-1. MARQ Part# 101

figure 40-2. MARQ Part# 104

figure 40-3. MARQ Part# [D8PS]

MARQ Part# 1501
1 AB Relay; 120V AC, 60Hz

MARQ Part# 101
1 C54A2 Limit Switch (fig 40-2)

MARQ Part# 104
1 1.5" Switch Actuator (fig. 40-3)

MARQ Part# [D8PS]
2 60A17/267 Idler Sprockets

MARQ Part# [1A158-1PS]
10 60WM2 Link Attachments

MARQ Part# 285
4 Rollflex Rolls

Tol-O-Matic, Inc.

3800 County Road 116
Hamel, MN 55340
Ph: 478-8000
Fax: 478-8080
Toll-Free: 1-800-328-2174

Boston Gear Box

The Company warrants that all 700 Series reducers will be free from defects in material and workmanship of the lifetime of the product.

Oil Seals are considered to be a replaceable maintenance items.

Any products which shal be proved to the Company's satisfaction to have been defective at the time of delivery in these respects will be replaced or repaired by the Company by its option. Freight is the responsibility of the customer. The Company's liability under this warranty is limited to such replacement and repair and is shall not be held liable in any form of action for direct or consequential damages to property or person. THE FOREGOING WARRANTY IS EXPRESSLY MADE IN LIEU OF ALL OTHER WARRANTIES WHATSOEVER, IMPLIED OR STATUTORY AND INCLUDING; WITHOUT LIMITATION THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS.

No employee, agent, distributor, or other person is authorized to give additional warranties on behalf of Boston Gear, nor to assume for Boston Gear any other liability in connection with any of its products, except an officer of Boston Gear by a signed writing.

Call Toll Free for the name and location of your local Distributer: 1-800-225-5280
(In Massachusetts, call 617-328-5690)

Vendor Websites

Aurora - www.aurorabearing.com
SquareD - www.squared.com
Parker - www.parker.com
Piab - www.piab.com
Festo - www.festo.com

Warranty

The warranty for parts or components not manufactured by seller is limited to the warranty as issued by the original equipment manufacturer. No warranties, either express or implied, are made by seller with respect to parts or components not manufactured by seller.

Seller warrants the equipment and parts manufactured by the seller to be free of defective workmanship and materials for a period of one year from the date of shipment from Yakima, Washington. Seller's sole obligation under this warranty is limited to replacing or repairing defective parts found by seller after seller's inspection to be defective, without charge, F.O.B. place of shipment, excluding installation. Seller reserves the right to inspect any claimed defect, repair defective part of install replacement parts, and to perform any adjustment incident satisfactory operation of the equipment.

This warranty applies only to the original customer-owner of the equipment and is not transferable with subsequent resale.

Seller's warranty shall not apply to any equipment or parts that have been improperly maintained, or repaired and/or altered by persons other than the seller. Seller's warranty shall not apply to any equipment and parts damaged by misuse, neglect, or accident. Seller's warranty shall not apply to any equipment and/or parts which have been improperly installed.

No other warranties, either express or implied, as to description, quality, merchantability, fitness for a particular purpose, or any other matter is made by seller. No course of dealing or usage or trade not expressly set forth in this section shall be admissible to explain, modify or contradict seller's warranty in any way.

Seller shall not in any event be liable for incidental or consequential damages or for loss of property resulting from any breach of warranty of this agreement or defect in the equipment or part.

Seller shall not in any event be liable for the failure of the equipment or parts to comply with any federal, state, or local law.

Notes

Notes