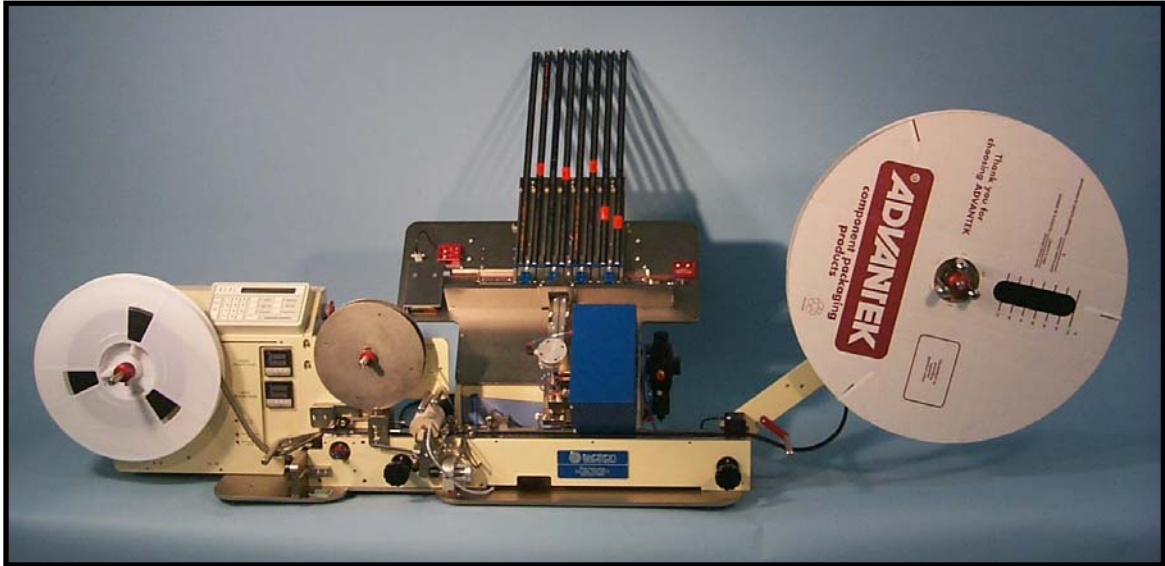


1020 TAPER USER'S MANUAL



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CHAPTER 1

OVERVIEW

INTRODUCTION

The EXATRON Model 1020 is a computer controlled, eight tube input, automatic taping machine designed to load delicate surface mount or other unique electronic component packages into sealed delivery tape, ready for shipment. The internal electronic controller of the Model 1020 monitors the tape drive speed and acceleration, the dual independent temperature controllers, the "full-tape" take up reel sensor, and the total pocket counter. No external control is required.

A variety of Model 1020 options are available, including thermal seal or pressure sensitive adhesive, or *both* methods of tape sealing. The Model 1020 easily accommodates devices ranging from 8-mm through 72-mm size, in any pitch, with total throughput in excess of 3000 per hour. Adjustments for new carrier and cover tape sizes are quick. Change overs take less than two minutes and require only a #8 Allen driver. This procedure is easily performed by the operator during normal production runs.

Prepared devices are loaded in tubes at the top of the Model 1020, then indexed by our exclusive eight-tube automated octoloader to the pick and place site. The taping system pick-up head lifts each device individually and positively positions it in the carrier tape for transport to the cover tape sealing head. After the device has been securely sealed into place in the pocket of the carrier tape by thermal adhesive or pressure sensitive adhesive ("PSA") cover tape, the completed tape winds onto a take-up reel for delivery.

This user's manual provides operation and maintenance information for the Model 1020 stand-alone taping machine. Please read this manual completely before beginning the taping procedure.

Environmental Operating Specifications

As specified in the table shown below, EXATRON equipment is designed to withstand the impact of any physical environment that it may be used in. Periodic maintenance as prescribed in this section and in Chapter 6 will ensure that emergency "down time" is kept to a minimum.

	HANDLER/HOT CHAMBER	HANDLER/TAPING SYSTEM
TEMPERATURE	40° to 115° F, 5° to 45° C	40° to 105° F, 5° to 40° C
RELATIVE HUMIDITY	20% to 85%, noncondensing	20% to 80%, noncondensing

Airborne dust and moisture, if present, will naturally settle on all surfaces of your taping system. If allowed to build up, dust can eventually block sensors, clog solenoids, fill up the filters of cooling fans and generally inhibit the smooth movement of devices through the taping system. The best defense against this kind of contaminant is to dust the taping system off with blasts of compressed air at least every 8 hours.

ESD Grounding

All Model 1020 taping system chassis' are directly connected through the power supply to earth ground. All guide rails, shuttles and tube holders are connected to earth ground. The taping system's power supply ground is directly connected to earth ground.

DTBT (Device To Be Taped) Materials

Component packages vary as to the materials from which they're made. The composition and size of packages can cause wear on the parts of the taping system with which they come into contact. Heavy, rough-surfaced DTBTs will cause taping system wear faster than lighter, smoother materials.

The best defense against the effects of the DTBT material on a taping system is to ensure that the taping system is properly adjusted for the package it is running. The position of the taping system pick and place head must be directly over the DTBT and should be as close as possible while still swinging clear of the pick-up site. This position is easily adjusted as necessary by means of the "SET GAP" sequence in the Power Up routine. If you have any questions regarding taping system adjustment issues, please contact the EXATRON Customer Service Department toll-free at: 1-800-EXA-TRON.

BASIC ELECTRICAL CONNECTIONS

Main Power

Main power is supplied to the Model 1020 through one power cord which plugs into a standard 110v, 60Hz AC outlet, and leads to a filtered line power supply unit attached to the system via Molex connector.

CPU/Tape Drive Power

Power for the system controller and tape drive assembly is supplied by the power supply unit described above. Thus, all parts of the system may be powered up or powered down by a single switch. EXATRON recommends that the power supply unit be plugged into a reliable line conditioner and emergency backup battery system.

Electrical Requirements

- ◆ Handlers shipped within the United States are factory pre-wired for 110 VAC, 60 Hz, unless otherwise specified.
- ◆ Handlers are shipped to the following destinations pre-wired for the following voltages unless otherwise specified:
 - Japan - 100 VAC, 50 Hz
 - Continental Europe - 240 VAC, 50 Hz
 - United Kingdom - 220 VAC, 50 Hz
 - Hong Kong - 220 VAC, 50 Hz
- ◆ Connect the power cord to earth-grounded power outlets only.
- ◆ If the taping system is to be used in an electrically noisy environment or near large electromechanical equipment, EXATRON recommends the use of a reliable power conditioner to filter line noise, surges, and spikes which can cause the taping system to operate improperly or become damaged.
- ◆ Ambient systems require 3 Amps at 110 VAC. Hot Chamber handlers require 7 Amps at 110 VAC. Handlers with Lasers require 5 - 10 Amps at 110 VAC.

Electricity supplied to the system must be within the recommended operating range. If the line voltage drops too low, the system may not function properly and may be seriously damaged. Verify that correct operating line voltage is present. If it is not, contact EXATRON for assistance. **SERVICE CALLS MADE TO THE CUSTOMER FACILITY TO CORRECT PROBLEMS CAUSED BY IMPROPER ELECTRICAL SUPPLY ARE NOT COVERED BY THE EXATRON WARRANTY.**

BASIC AIR CONNECTIONS

Main Air Connection

Located on the outside of the power supply unit of the Model 1020 is an air regulator with a pressure gauge and a filter. Before using the Model 1020, make certain that a compressed air line of 80 psi (+/- 3 psi) is attached to the fitting of the air regulator.

Changeover Kit Air Line

The Model 1020 has one 1/4" diameter flexible plastic air line diverging into two pathways on the outside of the taping machine's changeover kit. Plug this air line into the available compressed air outlets mounted on the side of the power supply to supply the pick and place site and tape drive assembly with air.

Air Requirements

The system requires a **dry** (having a dew point of 36° F to 38° F) air pressure supply of 80 PSI/5 CFM minimum, filtered. This air supply must be **clean** (containing no particulate matter greater than 5 microns in size) and **oil-free**. To maintain these levels of pressurized air quality, replace the coalescing air filter (EXATRON part #GPA-97-075) in the air regulator of your taping system after every 6000 hours or 12 months of operation, whichever comes first; or if your air regulator registers a pressure drop of 15 PSI.

Moisture of any kind will travel through external and internal air lines. This moisture will coat these air lines and the insides of the taping system's electrical solenoids, causing them to stick or to stop functioning altogether. The best defense against this kind of contaminant is to prevent it from occurring in the first place by maintaining the clean air supply described above.

If the air lines are allowed to become discolored or the moisture traps become overfilled, damage to the system will occur. The only corrective action to take at that point is to replace all of the air lines and to completely clean all of the solenoids supplied by those air lines.

Equipment damage due to improper air supply is not covered by the EXATRON warranty.

DIRTY FILTER



CLEAN FILTER



EXATRON SAFETY FEATURES

PLEASE READ AND UNDERSTAND THIS ENTIRE USER'S MANUAL BEFORE USING YOUR EXATRON TAPING SYSTEM. THE FOLLOWING SAFETY PROCEDURES MUST BE FOLLOWED AT ALL TIMES.

Electrical Hazards

If your EXATRON system is equipped with safety covers, never operate the taping system without them. Never remove the safety covers. Never defeat any electrical interlock switch supplied with the system.

High Internal Voltages: In most cases, there are no high voltages used inside the Model 1020 taping system electronics.

High voltage enters the taping system from your facility's electrical line current and is present in the EXATRON 1020 power supply. Only qualified service technicians should do any repair work on the power supply. Make sure to use qualified service technicians when attempting to repair any portion of the system that uses high electrical voltages.

Compressed Air

Your EXATRON taping system requires a compressed air supply.

Connect the system to an 80 PSI +/- 3 PSI, clean air source. Please refer to the "Air Requirements" section earlier in this chapter for further details.

Using compressed air can be hazardous. It is the responsibility of the customer to properly train all taping system operators in every aspect of the safety practices associated with the use of compressed air.

NEVER operate any EXATRON equipment which requires compressed air without an approved air regulator and shutoff valve.

Moving Parts

Most moving parts of the Model 1020 taping system have structural covers. **NEVER OPERATE THE TAPING SYSTEM WITH ANY COVER REMOVED.** Be careful to keep your fingers away from any moving parts of the taping system. Keep all loose-fitting clothing away from moving parts.

Do not attempt to service the taping system in any way when any part of the taping system is in motion. Use the **PAUSE** button on the taping system controller to stop the taping system's operation, or turn the taping system off before attempting to access any moving part of the taping system.

Overall System Safety

Typically, the taping system is simply one part of a complete test system in use at a given customer facility. It is the responsibility of the user to properly train all taping system operators in all of the safety practices required for every component of the user's test handling system(s.)

EXATRON SUPPORT SERVICES

TOLL-FREE TELEPHONE CUSTOMER SERVICE LINE

For factory technical support, call 1-800-EXA-TRON, between 8:00 AM and 5:00 PM Pacific time, Monday through Friday or e-mail us anytime at service@exatron.com. When calling, please have your EXATRON equipment close at hand, along with the following information:

- The **exact wording** of any messages that appeared on your taping system display.
- A description of what happened and what you were doing when the problem occurred.
- A description of how you tried to solve the problem.

WHO TO CALL AT EXATRON:	800-EXA-TRON, TOLL-FREE 408 629-7600, DIRECT 408 629-2832, FAX
TO PLACE AN ORDER:	RUTH KURIMOTO, HANDLING SYSTEMS
SPARE PARTS:	DENISE SMITH
CUSTOMER SERVICE:	DAVID LEDEZMA
PURCHASING:	LINDA FINN
GENERAL MANAGER:	ERIC HAGQUIST
<i>IF ALL ELSE FAILS:</i>	ROBERT HOWELL, PRESIDENT

Standard Warranty

All EXATRON products are under warranty for one year from the date of purchase. EXATRON agrees to repair any mechanical or electrical assembly, subassembly, or entire unit which fails during normal use within its first year. The Customer agrees to follow the recommended maintenance procedure as defined in the User's Manual.

All warranty work must be performed at the EXATRON factory. As described below, in-house service by our customers themselves on non-laser components of the handling equipment is encouraged.

EXATRON does not warrant the following:

1. Damage caused by improper packaging of equipment returned to EXATRON for repair.
2. Damage caused by the freight forwarder.
3. Damage caused by acts of God: flood, fire, earthquake, etc.
4. Damage caused by equipment connected to improper power line voltages.
5. Operator abuse.
6. Interface hardware not manufactured by EXATRON.
7. Test contactors.
8. Damage caused by equipment connected to improper air supply: contaminated with oil, water, dirt, etc.

Customer In-House Service

Except in the case of the Model 1910 or Model 1960 Laser Marker, EXATRON encourages customer in-house equipment service by qualified technical personnel and tries to make in-house service as easy as possible to perform. There are no "Void Warranty" warning stickers on EXATRON handling equipment. EXATRON will even honor the warranty on a unit when an in-house repair attempt leads to further damage to the unit. By using the built-in diagnostic software and diagnostic tools, it is usually possible for the operator to isolate a problem quickly and effect a repair.

Offshore Warranty Service

An EXATRON system purchased in the United States and then shipped offshore will be warranted through EXATRON in California. Replacement parts are furnished for a period of one year from date of purchase with the exception of replacement test contactors. In most cases, it will not be necessary to return the worn part from the offshore user location.

To receive offshore service support, the taping system must be purchased through your local EXATRON Representative or an extended warranty/service agreement must be purchased directly from your local EXATRON Representative.

Please supply the following information when requesting offshore service or replacement parts:

1. The part number(s) required. If the part number is not known, photocopy the part and fax the photocopy to EXATRON.
2. The Model number of the handling system.
3. The type of device being run by the handling system, such as: DIP, SOIC, SOJ, PLCC, LCC, SIP, PGA, PCB, ZIP, etc.
4. The Serial number of the handling system.
5. The full shipping address.
6. Any special shipping or customs instructions.
7. Method of shipment, such as: Federal Express, UPS, DHL, U.S. Mail, or the name of your chosen freight forwarder.

In most cases, faxed requests and shipment of replacement parts orders are processed within twenty-four hours of receipt by EXATRON.

CHAPTER 2

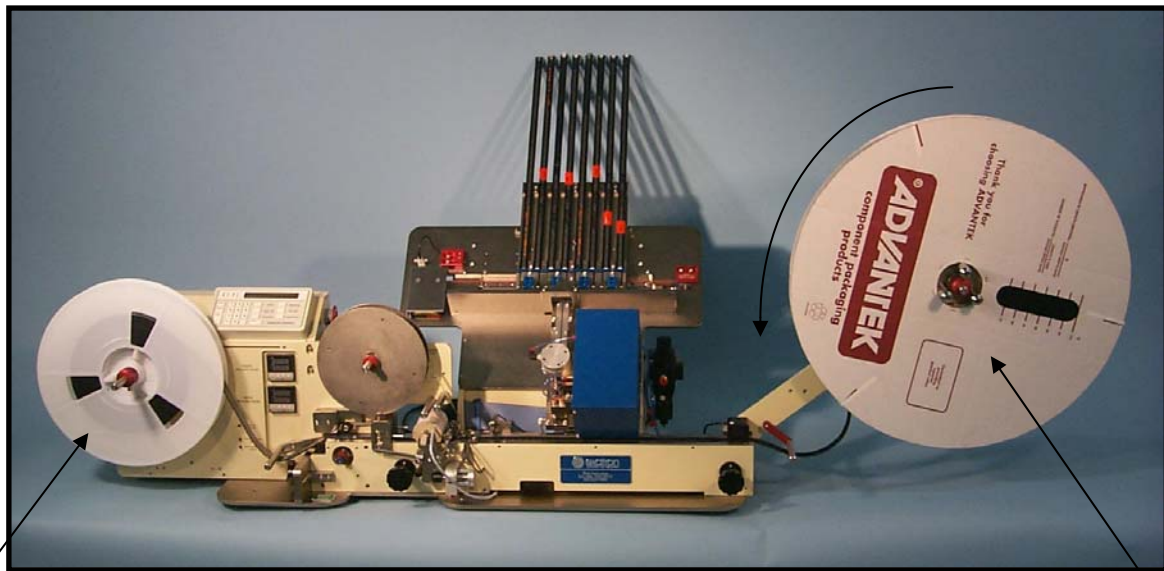
Tape and Reel Setup

TAKE-UP REEL

1. Loosen the thumbscrew on the locking hub of the take-up wheel drive shaft located on the extreme left of the tape and reel machine. Remove the hub and place an empty take-up reel onto the drive shaft.
2. With the three hub pins aligned to the three pinholes in the center of the reel, slide the locking hub over the reel and back into place
3. Tighten the thumbscrew to lock the take-up reel in position.

SUPPLY REEL

Slide the carrier tape supply reel onto the three center prongs of the supply wheel so that the carrier tape unwinds from the top of the reel toward the left as shown below.



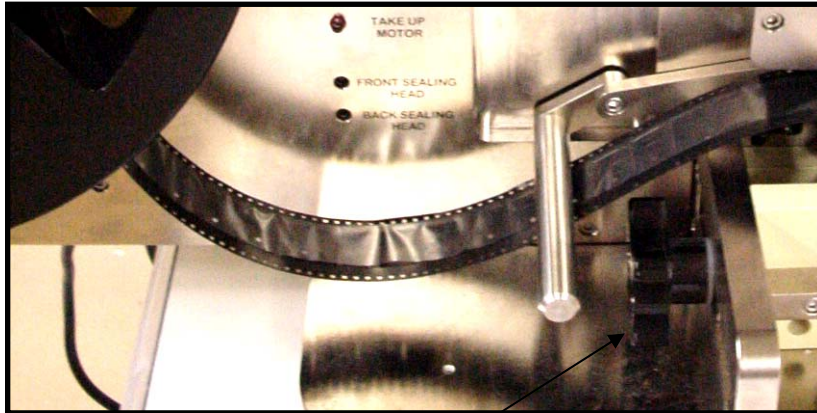
Take-up Reel

Supply Reel

CARRIER TAPE TRACK WIDTH

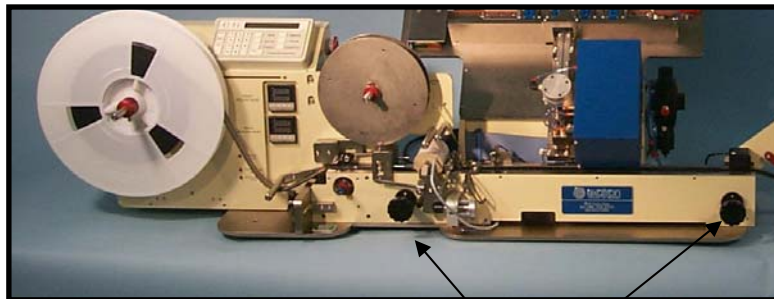
Adjust the width of the track to the width of the carrier tape:

1. Loosen the large black track width locking knob on the left of the machine which holds the front plate in place. Do NOT adjust track width without loosening this knob first.



Track Width Locking Knob

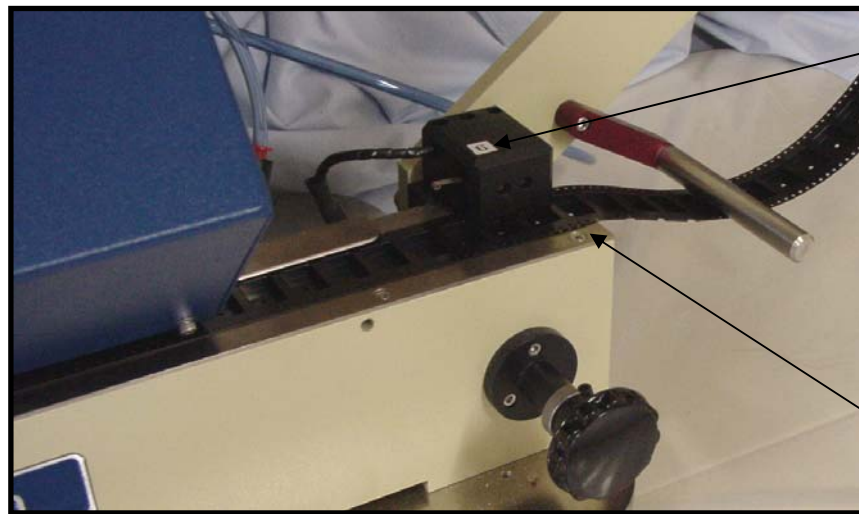
2. Turn the two track width adjustment knobs to move the front plate away from the machine until the carrier tape slides in the track freely but not loosely. The carrier tape should advance easily without binding, but also without too much lateral play in the track.



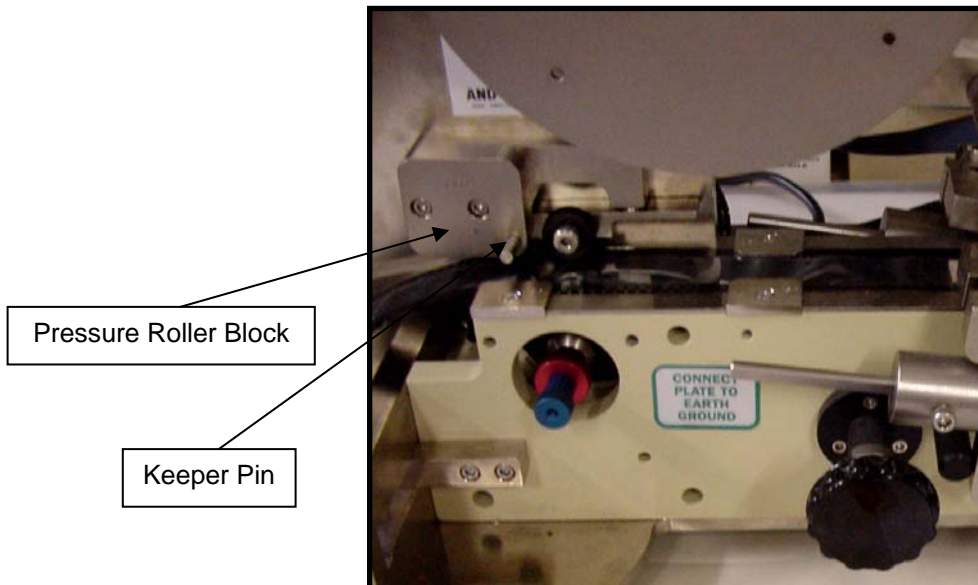
Track Width Adjustment Knobs

3. Re-tighten the large black adjustment knob on the left of the machine to secure the track in place.

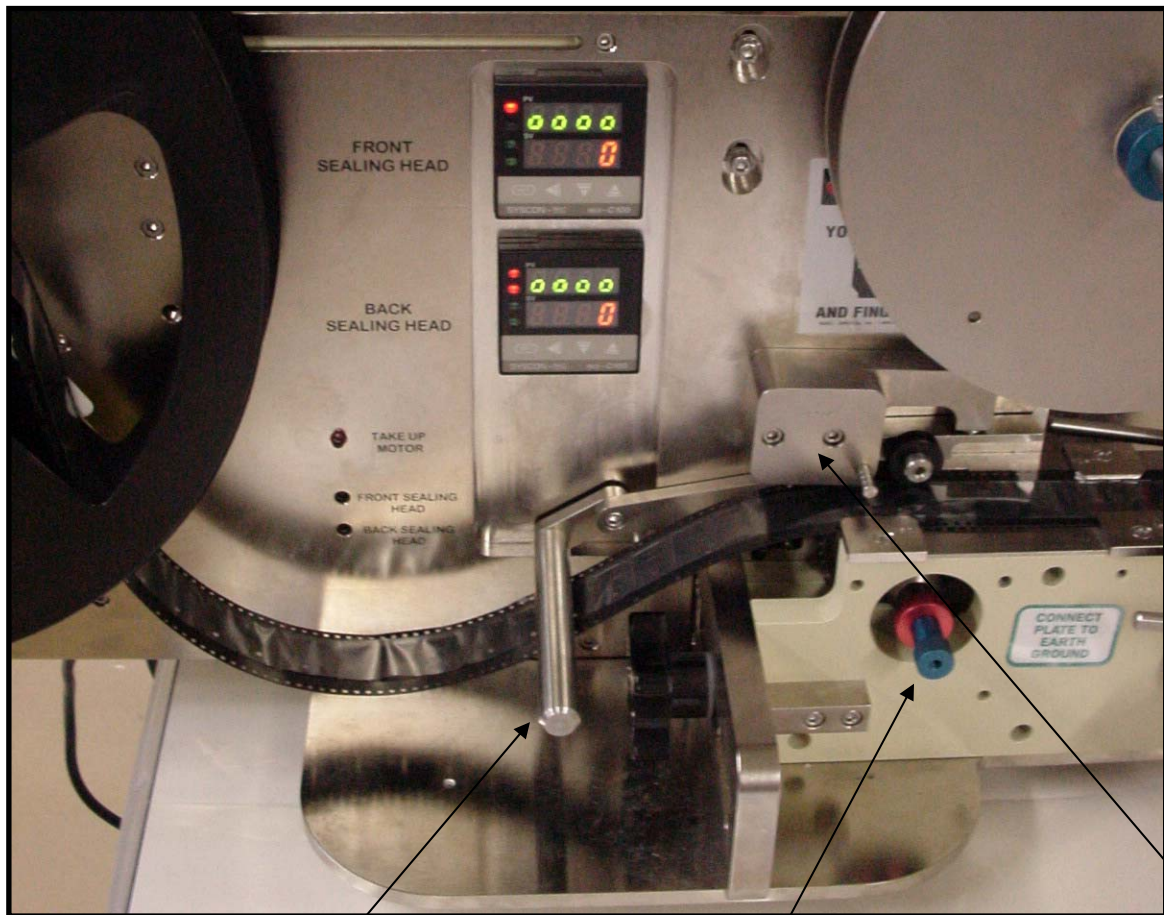
LOAD CARRIER TAPE



1. Feed the leading end of the carrier tape ("leader,") toward the cover tape guide as shown above making sure that the rear edge of the tape is under the flange at the rear of the track.
2. Continue feeding the carrier tape leader under the sealing heads. The sealing heads should be raised above the level of the carrier tape at this point.
3. When the carrier tape leader in the track reaches the pressure roller assembly, raise the pressure roller arm with your index finger. Slide the keeper pin into the pressure roller block assembly to hold it in the raised position while you feed the carrier tape along the track underneath.



4. Feed the carrier tape under the projecting rocker arm and insert the carrier tape leader into the take up reel according to the manufacturer's specifications. Wind the carrier tape around the take up reel until it is secured in place. The carrier tape should move freely back and forth underneath the rocker arm.



Take Up Reel Rocker Arm

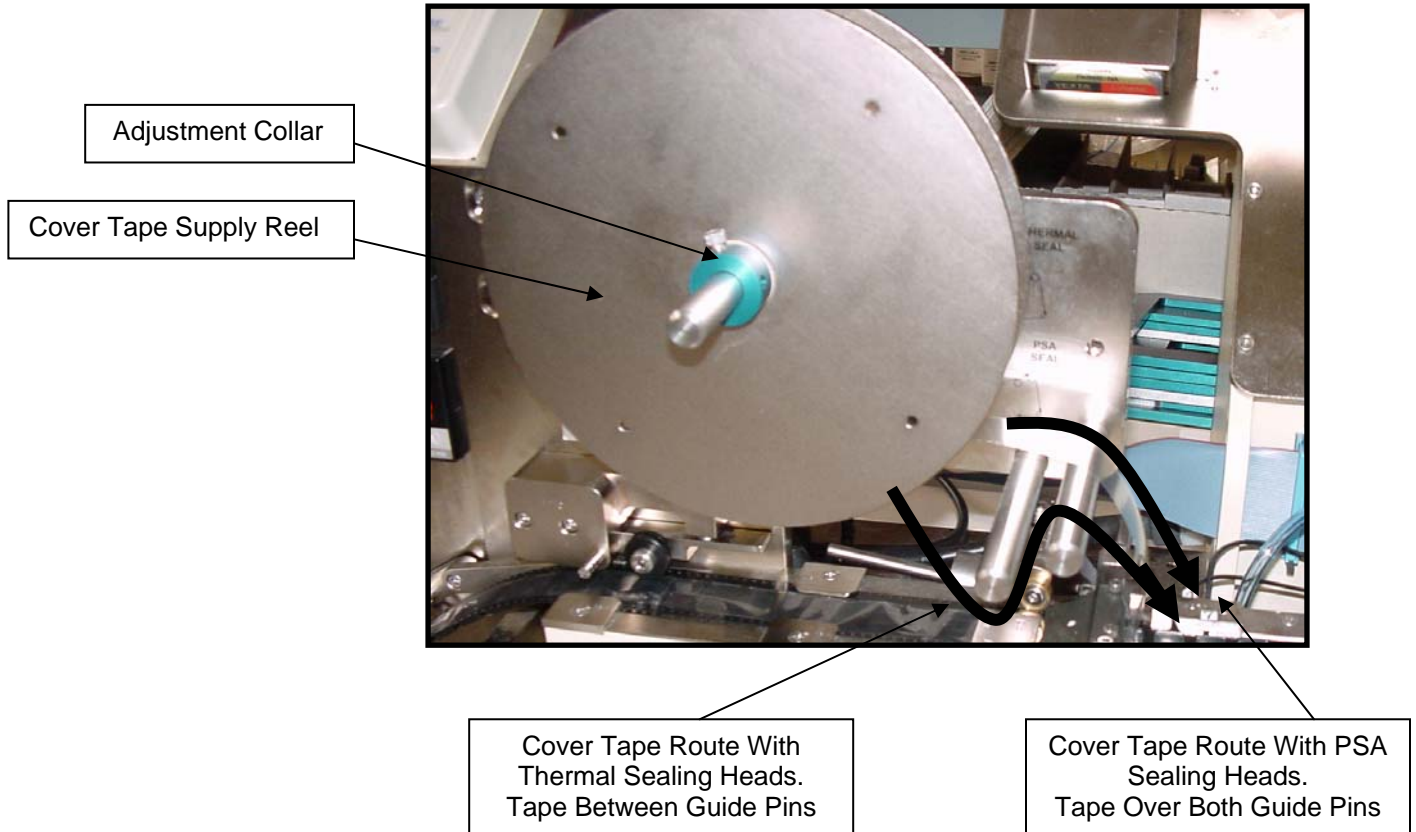
Gear Drive Assembly

Pressure Roller Block

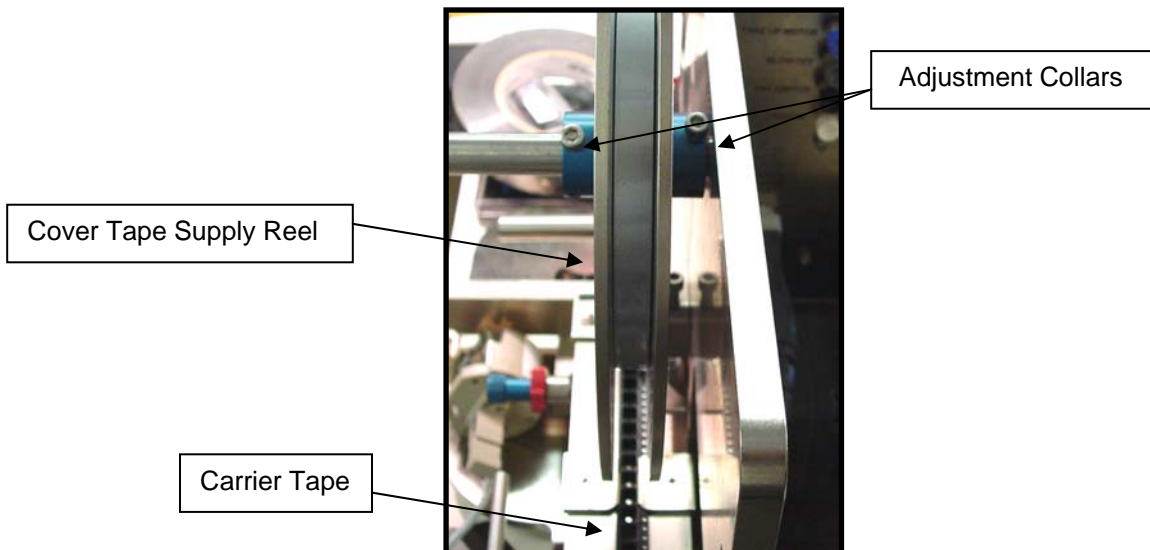
5. Align the carrier tape with the gear drive. Loosen the blue nut on the gear drive assembly. This will allow the gear to move laterally. Adjust the gear teeth to fit with the backside track of the carrier tape. Retighten the blue nut. Next turn the gear using the red thumbscrew section of the gear assembly. This should cause the carrier tape to advance freely towards the take-up reel.

LOADING THE COVER TAPE

1. Suspend a roll of cover tape on the cover tape supply reel rod in the center of the machine between the two blue delrin supply reel adjust collars.



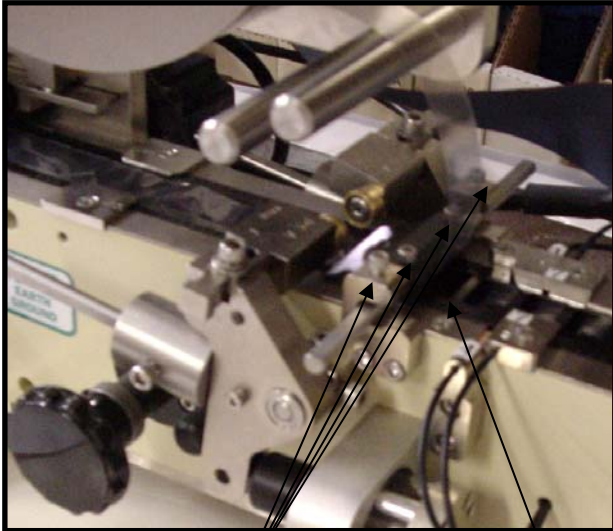
2. Viewing from above, position the cover tape supply reel centered over the carrier tape in the carrier tape track. Tighten the adjustment set screw on each supply reel adjust collar to secure the cover tape supply reel in this position on the rod.



- As shown below, the cover tape unwinds from the bottom of the reel toward the cover tape guide assembly on the right. For Thermal Sealing Heads feed the cover tape under the first projecting pin of the cover tape guide assembly, and over the second pin. For PSA Sealing Heads feed the cover tape over both pins.

PSA SEALING HEADS

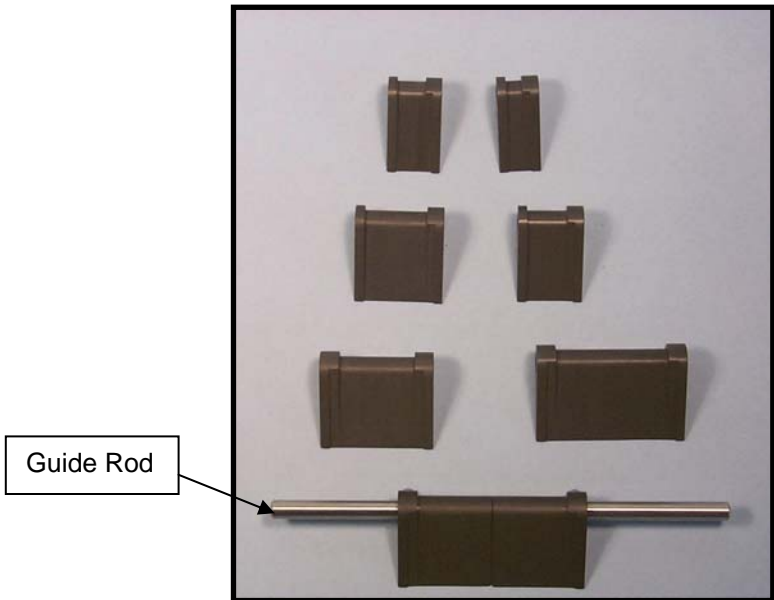
THERMAL SEALING HEADS



Guide Block Adjustment Screws.
Same for both types.

Sealing Tape Guide Block

Example Of Guide Blocks



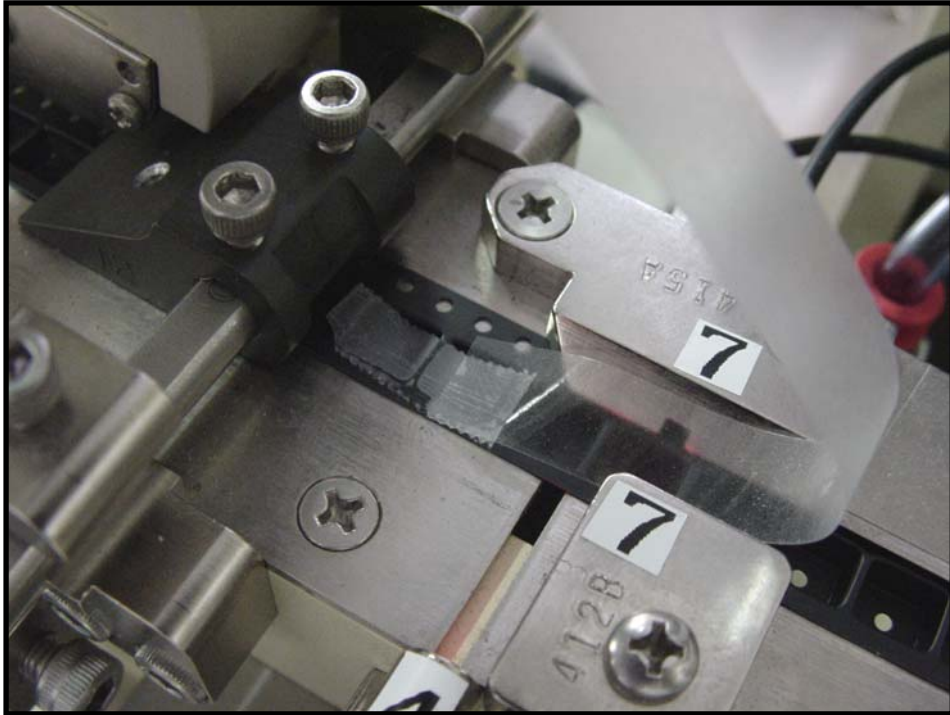
4. Adjust the sealing tape guide block to the carrier tape. There are two sets of grooves on the under side of the guide block. The outer set of grooves guides the carrier tape. The inner set of grooves guides the sealing tape. Loosen the Guide Block Adjustment Screws. Insert the Guide Rod through the Guide Block. Place the Guide Block with the Guide Rod into the "Guide Rod Retaining Brackets". Next push the guide block down so that it is flush against the carrier tape. Tighten down all four adjustment screws on the guide block assembly. The carrier tape should now be inside the outer set of grooves on the guide block.



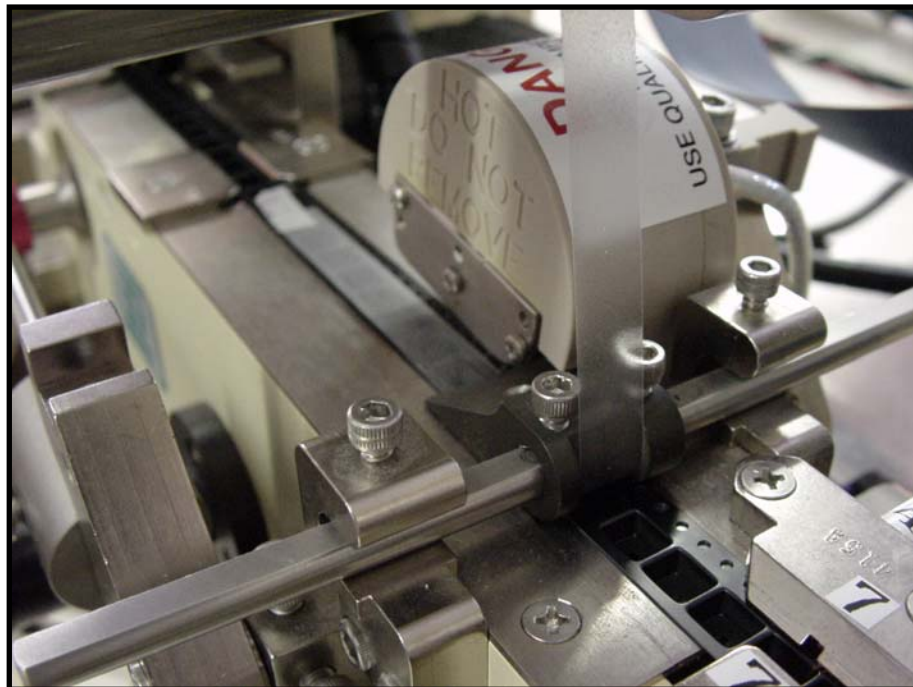
Guide Rod Retaining Bracket

Guide Block Adjustment Screws.

5. Use a piece of scotch tape to attach the cover tape to the carrier tape.



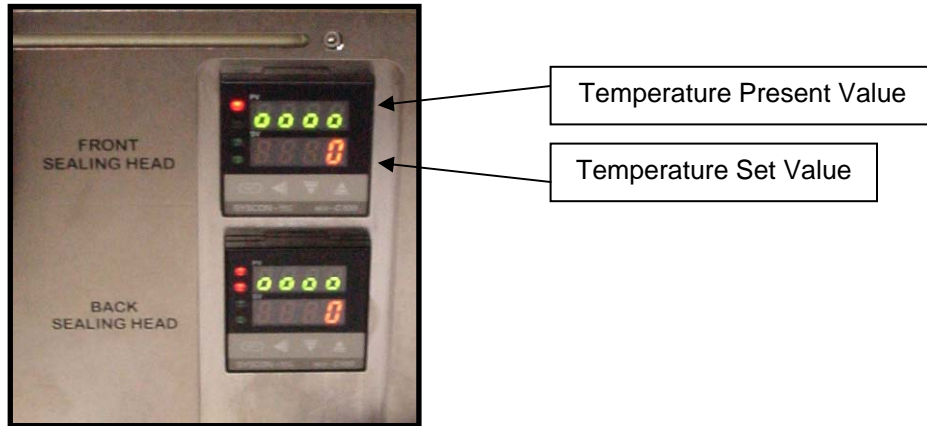
6. Feed the cover tape under the guide block assembly. Manually turn the carrier tape gear drive to advance the tape as needed. Advance the tape until approximately five inches of cover tape extends past the sealing heads. The cover tape should now be in-between the inner set of grooves on the guide block.



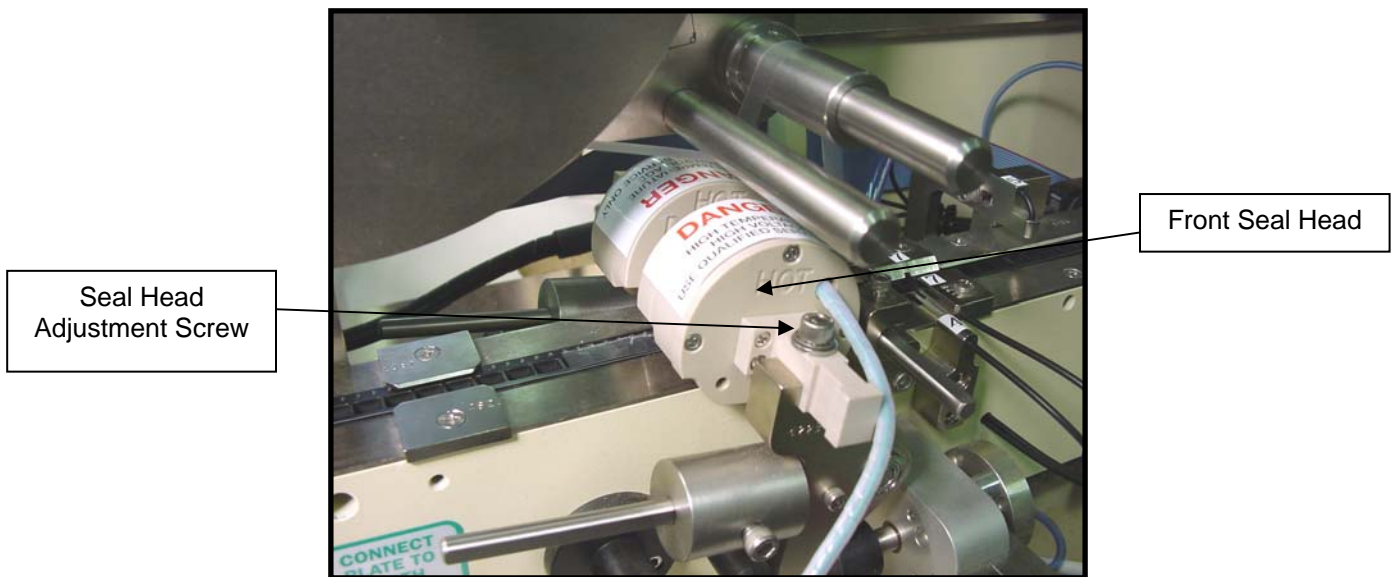
ALIGNING THERMAL SEAL HEADS

To align thermal seal heads, use the following steps.

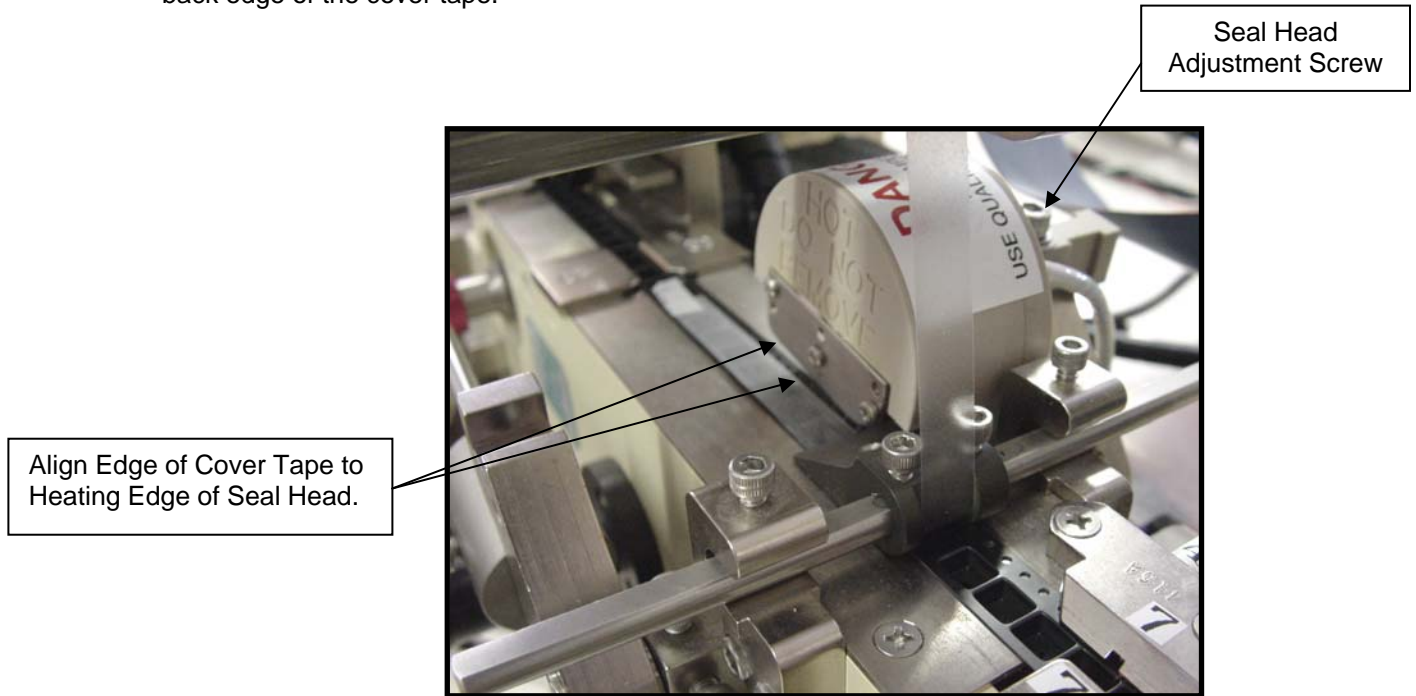
1. Make sure the heaters are off and that the thermal heads are cool. There are two readouts for each seal head heater. The top line is the present value (PV) and the bottom line is the set value (SV). Set the bottom line to 0 degrees and wait until the sealing head is at ambient room temperature.



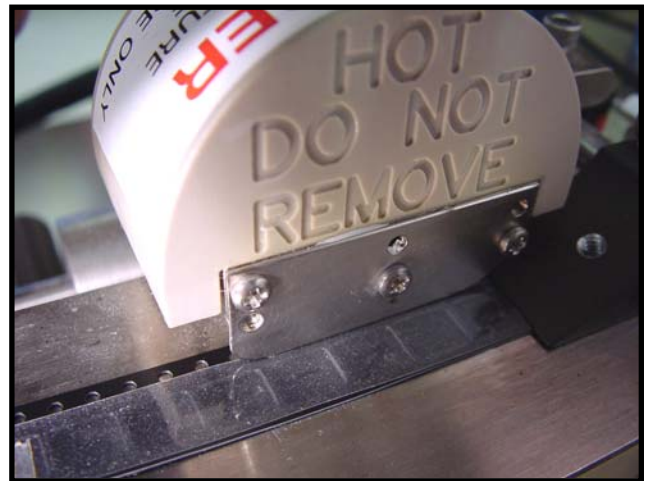
2. Remove the front seal head. Use a #10 size hex wrench and remove the seal head adjustment screw. Remove the seal head and place it aside.



3. Loosen the adjustment screw on the back seal head. Adjust the head so that it is directly over the back edge of the cover tape.

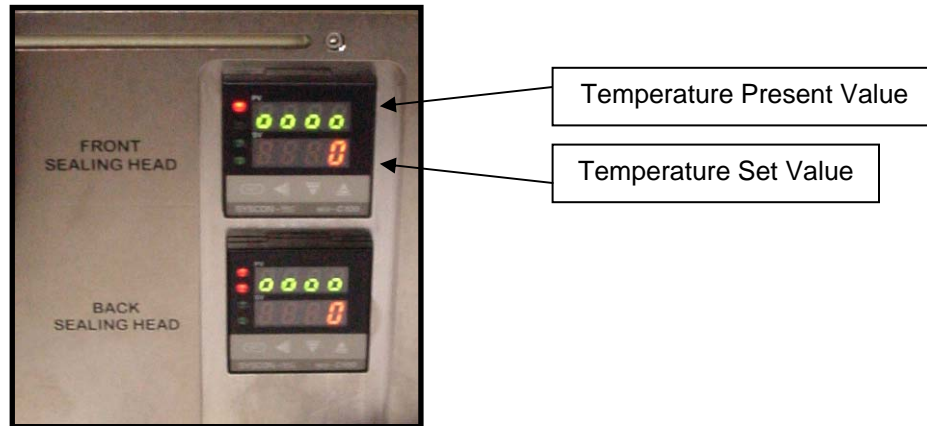


4. Manually engage the back seal head and confirm that the edge of the seal head is aligned with the back of the cover tape. Make sure that the track holes on the carrier tape are not blocked by the cover tape.



5. With the seal head engaged, tighten down the adjustment screw.
6. Repeat this process with the front sealing head.

7. Once both heads are aligned, turn the heat to the sealing heads back on. Set the bottom line on both heaters to 350 degrees. Wait until the top line reads 350.



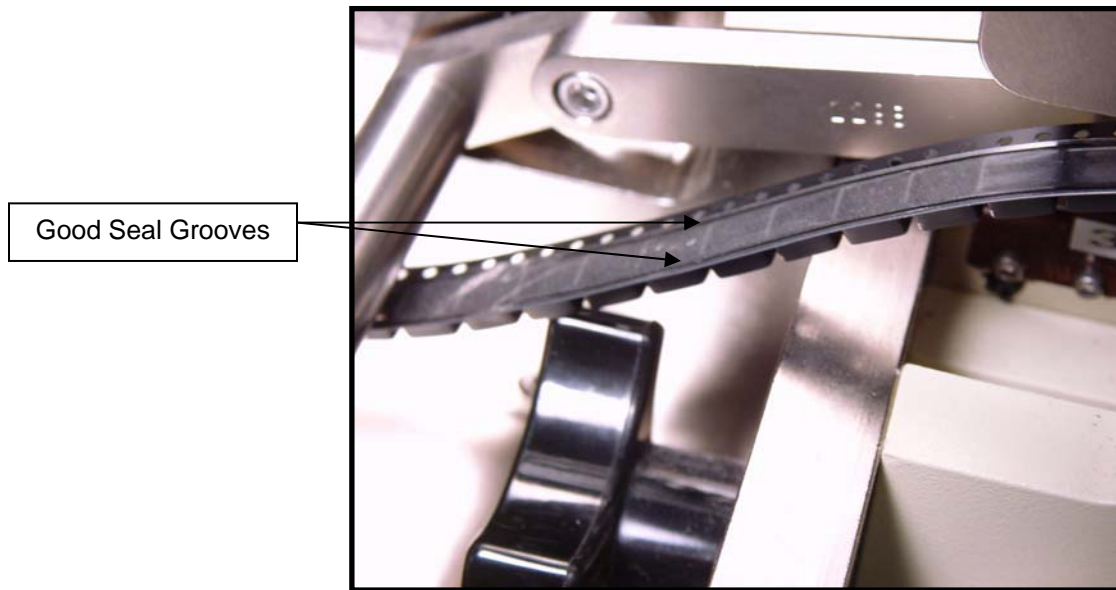
8. After the sealing heads have warmed up, check the seal on the cover tape. Manually engage both seal heads. Apply pressure to the cover tape for 3 to 5 seconds. Use the rocker arm to engage the heads - **DO NOT TOUCH THE HEADS DIRECTLY WHEN THE HEAT IS TURNED ON!** This should cause a good seal to the carrier tape. Manually advance the carrier tape and visually inspect the seal.

TEMPERATURE CHANGE EXAMPLE –

To change the set temperature from 300°C to 250°C:

- Press the SET button on the lower left of the temperature control display.
- The red digit which lights up is ready to be set.
- Press the Left Arrow key to shift the digit which lights up to the tens digit.
- Press the Up Arrow key until the “0” changes to “5”
- Press the Left Arrow key to shift the digit which lights up to the hundreds digit.
- Press the Down Arrow key until the “3” changes to “2”
- Press the SET key again. All of the set value digits light up again.

EXAMPLE OF GOOD SEAL



9. At the microterminal press the **[MANUAL]** key. Next press the **[Delete]** key. This will run the carrier tape for several pockets with the seal heads engaged. If the seal is good, you can continue with the next chapter "Operating Procedure".

NOTE: You may need to practice this adjustment a few times by running the machine briefly at the start of a job and inspecting the seal for quality.

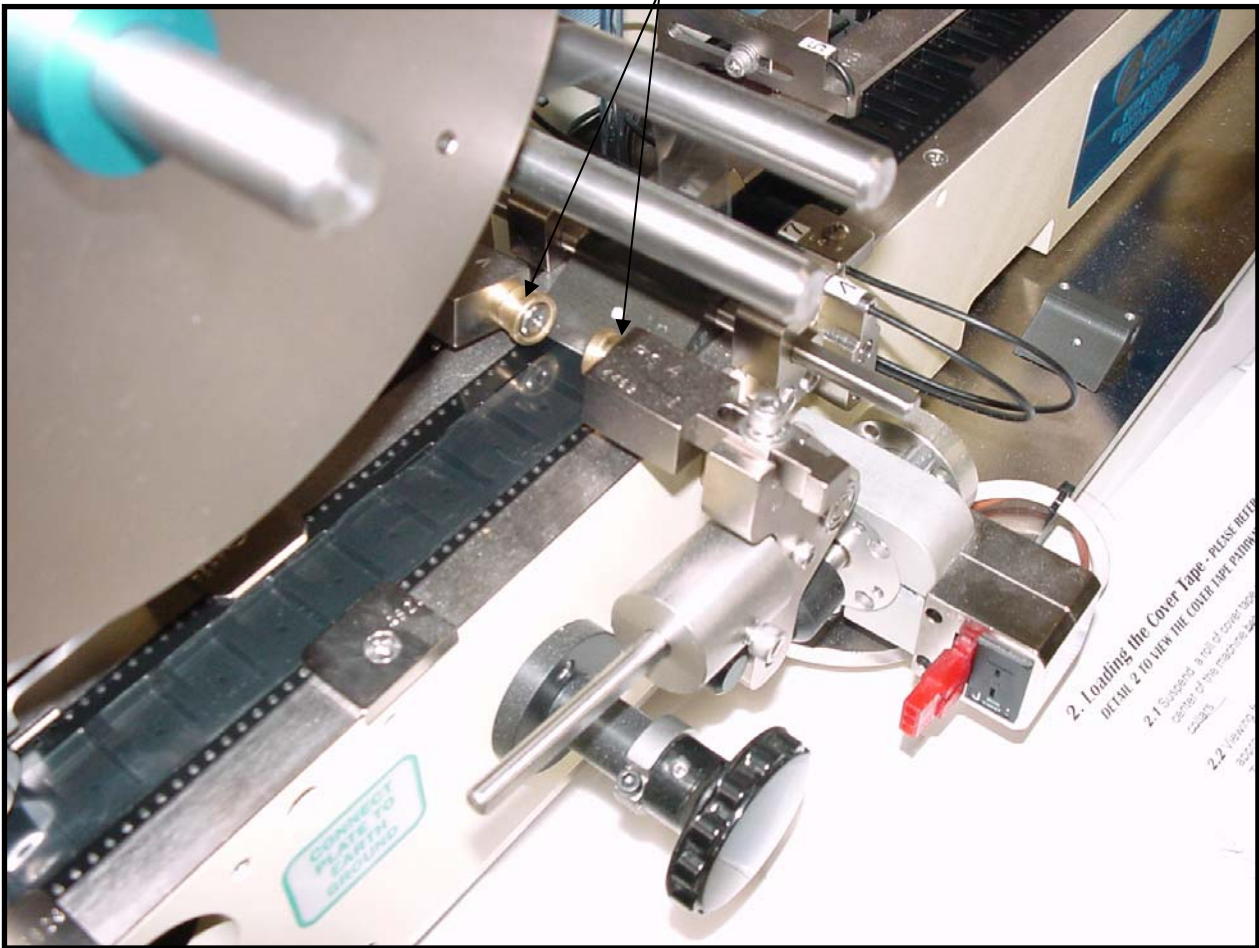
ALIGNING PRESSURE SEAL HEADS

Aligning pressure seal heads (PSA) is the same as with thermal seal heads with two exceptions.

1. The route of the cover tape through the guide pins is different. See "Loading Cover Tape".
2. There are no heaters to set.

After the heads are aligned, at the microterminal press the **[MANUAL]** key. Next press the **[Delete]** key. This will run the carrier tape for several pockets with the seal heads engaged. If the seal is good, you can continue with the next chapter "Operating Procedure".

ALIGNMENT WITH PSA HEADS



CHAPTER 3

Operating Procedure

THE EXATRON OCTOLOADER

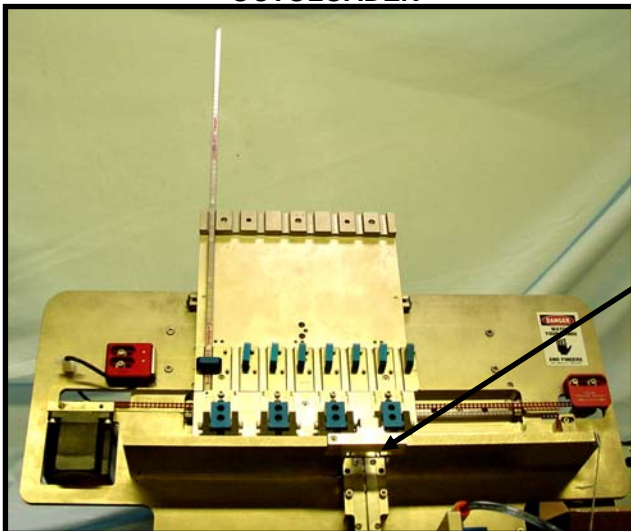
EXATRON'S eight-tube capacity automatic tube loading mechanism, called the Octoloader, will automatically load any device supplied in tubes into your EXATRON taper system. The Octoloader assembly snaps onto the taper for easy conversion from one device size/type to another.

The Octoloader is a moving plate that holds tubes of devices and is controlled by the taper's CPU via a stepper motor. During production, the plate automatically moves from side to side, positioning each tube above the taper input track. When the input track becomes empty, the Octoloader automatically searches for tubes with devices. A sensor mounted at the junction of the input track allows the Octoloader to "see" a device jam, if one occurs. The Octoloader will then stop moving to prevent damage to the jammed device. In addition, the Octoloader has an automatic "wiggle" cycle that will attempt to clear the jam automatically, without operator assistance.

To Install Full Tubes Into The Octoloader:

1. Tubes are installed upside down into the Octoloader.
2. Raise the blue anodized tube gates, if present on the Octoloader, so that they are in the open or "up" position.
3. Remove the stopper from the top of a full tube of devices. Hold the lower half of the tube in your right hand and place the index finger of the left hand over the top of the tube to prevent the devices from spilling.
4. While blocking the open end of the tube with your finger, invert the tube and rest that end of the tube and your finger against the Octoloader main plate next to the tube gate at an approximately 45° angle.
5. While continuing to hold the tube with your right hand, move the index finger of your left hand out of the way of the open end of the tube. Keep the open end of the tube resting against the Octoloader to prevent spilling the devices and raise the bottom end of the tube until it is completely upside down. Press the tube into place in the track of the Octoloader.
6. Close the tube gate over the tube to complete installation. Repeat this process for each additional tube.

OCTOLOADER

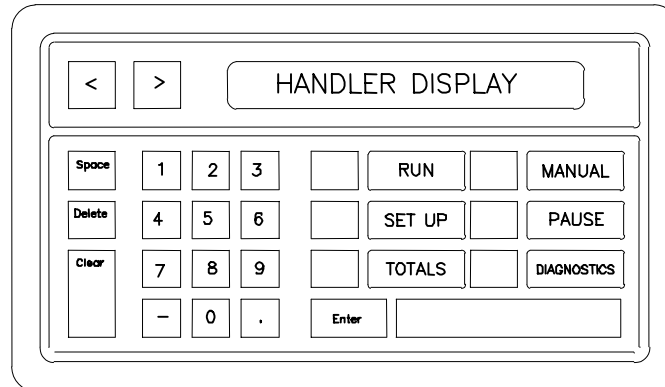


OCTO / INDEX GAP



BEGINNING THE PRODUCTION RUN

1. Load the carrier tape and cover tape onto the Model 1020 as described in *Chapter 2, Tape and Reel Set Up*. Complete all steps of the set up procedure.
2. Power up the taper. The main taper power switch turns on the power to the tape and reel machine. For thermal tape systems, this switch will also turn on the heaters in the sealing heads.



3. The front panel microterminal will display the following sequence of messages while the machine runs through its power-up routine of self-checks and moves the taping “pick and place” assembly into its home position:

```

“V01. 01 Test Ok”
“EXATRON TAPE”
“TAPE 08-23-97” *
“FIND MOTOR HOME”
“JOG ROTATE”
“JOG UP”
“MOTOR HOME”
“READY TO RUN ?”
  
```

* **THIS IS THE DATE OF THE FIRMWARE REVISION. THE TAPE AND REEL FIRMWARE CHANGES REGULARLY. EXATRON OFFERS FREE FIRMWARE UPDATES UPON REQUEST, FOR THE LIFE OF THE EQUIPMENT.**

4. During power-up, the system checks the temperature of the heaters in the sealing heads of thermal machines. If the message “**NOT UP TO TEMP**” is displayed instead of “**READY TO RUN ?**” check the two temperature control displays on the front of the taping system to verify the temperatures:
 - The red digital readouts are the set temperatures. The green digital readouts are the present temperatures in the thermal sealing heads.
 - The amount of time required to heat the thermal sealing heads to the set temperature should not take more than two or three minutes. If the process takes longer, the set temperature may be too high. A temperature adjustment example is described in the following step.

5. TEMPERATURE CHANGE EXAMPLE –

To change the set temperature from 300°C to 250°C:

- Press the SET button on the lower left of the temperature control display.
 - The red digit which lights up is ready to be set.
 - Press the Left Arrow key to shift the digit which lights up to the tens digit.
 - Press the Up Arrow key until the “0” changes to “5”.
 - Press the Left Arrow key to shift the digit which lights up to the hundreds digit.
 - Press the Down Arrow key until the “3” changes to “2”.
 - Press the SET key again. All of the set value digits light up again.
6. When the message “READY TO RUN ?” is displayed, press the **[MANUAL]** button on the front panel controller. Display will read: “MANUAL” With the taping system in MANUAL mode, several keys on the controller have unique functions.
7. Inspecting Seal Quality
Press the **[6]** key. The carrier tape and the cover tape will be pulled through the sealing assembly to seal one empty pocket. Continue pressing the **[6]** key to run enough tape through the sealing assembly to seal several empty pockets. Inspect the location and quality of the seal.
- Re-adjust the position of the sealing edges (“hot shoes”) if necessary, as described earlier in *Chapter 2, Tape and Reel Set Up*.
8. Set The Tape Count
When the seal is satisfactory, press the **[2]** key to set the Tape Full Count. Enter the count number using the keypad keys, beginning with the smallest digit. Enter the 1s digit first, then the 10s digit, then the 100s digit, then the 1000s digit, etc. You may set the full tape count for any quantity of sealed pockets up to 999,999. Press **[Enter]** to set your selection.
9. Load Parts.
Load parts into the octoloader as described at the beginning of this chapter.
10. Begin Production Run.
Press **[Enter]** to exit manual mode. Display will read “READY TO RUN ?”.
Press the **[RUN]** key and parts will start being taped.

During The Run

During operation of the Model 1020, it is possible to “manually” align the various motors. Move the motors by single step increments in either direction, from almost any stopped condition. Press the **[0]** key on the front panel controller and the message “**ALL MOTORS OFF**” will be displayed.

Press the **[Enter]** button to display the message “**ALIGN MOTORS ?**”

Following the chart below, it is possible to jog the pick and place motor and the drive motor:

[4]	Jogs the Pick and Place motor one step to the left.
[6]	Jogs the Pick and Place motor one step to the right.
[7]	Jogs the Drive motor one step to the left.
[9]	Jogs the Drive motor one step to the right.
[Enter]	Returns to previous condition.

Due to the intelligent design of the Model 1020 tape loading system, error conditions rarely occur. The three most commonly encountered running mode errors and their solutions are discussed below. For a complete glossary of all status and error messages in the Model 1020, please refer to *Chapter 5, Display Dictionary*.

◆ **EMPTY POCKET?**

This error message will be displayed when an empty pocket in the carrier tape is detected. This occurs even at start-up. When this message is displayed, and if the user visually confirms that no error condition is present, press **[Enter]**. This will then override the empty pocket message until such time as a device is seen in a pocket. If another empty pocket is then seen, the “EMPTY POCKET” message will display again. If a device is placed in the pocket directly underneath the sensor, the message “**OK TO RUN? 2**” will appear. Press **[Enter]** or **[RUN]** to start the system running again.

◆ **PICK UP EMPTY?**

This message indicates that the taping system is in RUN mode and ready but no device is detected at the pick up position. Check whether there are devices in position for the taping pick-up head. Check whether the pick-up sensor is operating properly. Refer to the Diagnostics Chapter for Sensor Check diagnostic routine.

◆ **TAPE GAP LOST?**

This error condition is caused when the carrier tape is in an incorrect position. The gap between tape pockets is not lined up opposite the tape gap sensor. It is possible to move the tape in single-step moves until it is again properly aligned:

Press the **[7]** key to move the tape one step to the left.
Press the **[9]** key to move the tape one step to the right.

TIP: To *quickly* move the tape to the left until the gap between tape pockets is aligned directly opposite the sensor, press the **[4]** key. The taping system will then be ready to resume operation.

When the tape full count is reached, the message “**TAPE IS FULL**” will be displayed. If desired, the full tape may be cut and removed from the tape loader by pressing **[Delete]** now. This will run the take up and drive motors with the sealing heads engaged to create a tape leader of fifty empty sealed pockets. Or, press **[Enter]** to reset the tape full count to **0** and begin another round of operation.

MANUAL MODE FUNCTIONS

The following keypad functions are also available from WAITING FOR HANDLER mode and when the system is stopped in certain error conditions. Words inside of brackets [] represent a key on the microterminal.

When the message "READY TO RUN ?" is displayed, press the **[MANUAL]** button on the front panel controller. Display will read: "MANUAL" With the taping system in MANUAL mode, several keys on the controller have unique functions.

[Delete] Runs the take up and drive motors for a specified number of pockets (stored in RAM,) with the sealing heads engaged. This feature is to facilitate the creation of a leader on a new reel. The operator may cut the tape at the leader and separate the completed reel from the rest of the tape.

Press the **[Clear]** button to stop the motors and return to the previous mode.

[Space] Runs the take up and drive motors for a specified number of pockets (stored in RAM,) with the sealing heads disengaged.

Press the **[Clear]** button to stop the motors and return to the previous mode.

[RUN] Returns the unit to RUN mode.

[1] SEAL METHOD. "THERMAL OR PSA" will be displayed.

[1] Selects Thermal .

[2] Selects PSA.

[2] TAPE COUNT. This allows the operator to change the number of devices which will be considered a full reel. The message "FULL T = _ _ _ _" is displayed. There will be numbers displayed in the blank spaces showing the current full tape count.

Using the keypad, enter the tape count number beginning with the smallest digit; that is, enter the 1s digit first, 10s digit second, 100s digit third, etc. You may set the count for any quantity of sealed pockets up to 999,999.

If you wish to zero the counter on the tape in progress, press the **[SETUP]** button. The message "RESET COUNT? NO" is displayed first, but this can be toggled to "RESET COUNT? YES" by pressing the **[SETUP]** button again.

Press **[Enter]** to accept the YES or NO answer you select.

[3] AUTO CENTER. This feature automatically resets the pick up head at the "home" position; that is, fully up and seated at the pick up location.

[4] AUTO FIND TAPE GAP. This feature will advance the drive motor until a gap is seen between two pockets. If a gap is already in position, the motor will not move. Use this feature when the error message: "TAPE GAP LOST" is displayed.

[5] TAKE UP CHECK. Will turn on the take up motor for five seconds or until the rocker arm switch is thrown. The display will read, "TAKE UP MOTOR ON." If the motor turns a full five seconds, will return error message: "TAKE UP REEL ERR"

Press **[Enter]** to rotate another five seconds.

Press **[Clear]** to return to MANUAL mode.

- [6] Runs one complete sealing cycle; that is, it engages the sealing heads and moves one pocket through. It does not attempt to place a part in a pocket. This feature allows the operator to check the location and quality of the seal as needed.
- [7] Jogs Drive Motor one step to the left.
- [8] GAP SET. The display will read, “**SET GAP? NO.**” You may press the **[SETUP]** button to toggle the display to “**SET GAP? YES,**” then press **[Enter]** to run the tape gap setting operation. The next available pocket will be properly positioned under the gap sensor.
- [9] Enters “Stop Mode” . Display reads “STOP MODE ON/OFF”.
- [1] Stop Mode On. Handler executes one step in a part cycle and pauses.
 - [2] Loop Mode On. Handler executes one complete part cycle and pauses.
 - [3] All Modes Off. Returns to continuous part cycling.
 - [4-6] N/A
 - [7] Moves swing head up one step.
 - [8] “SET GAP? NO” Same as Gap Set above.
 - [9] Moves swing head down one step.
 - [10] Turns all motors off to allow for motor alignment.

CHANGING THE RAM

The Model 1020 allows the operator to make changes to the RAM using the following procedure:

Press the **[SET UP]** button on the front panel. The message “**CHANGE RAM? NO**” appears.

Press **[SET UP]** again to toggle the YES/NO option to YES. The message “**CHANGE RAM? YES**” appears.

Press **[Enter]**. The message “**LOAD DEFAULT NO**” appears. If you choose “**LOAD DEFAULT NO**” the tape loader will leave all RAM addresses as they were. From here, you can go either of two ways:

1. If you wish to make specific changes to the RAM, press **[Enter]** again. The display reads: “0090 DATA 01”. Proceed with “Making Specific Address Changes”.
2. If you wish to set the RAM with ROM values, press **[SET UP]** to toggle the YES/NO option to YES. Press **[Enter]**. When you choose “**LOAD DEFAULT YES**” the tape loader loads all default addresses from the EPROM to the RAM. This is called “**Blasting the RAM**” After loading the EPROM into the RAM, you may still make specific RAM changes as described below.

Making Specific Address Changes

Press **[SET UP]** or **[TOTALS]** to scroll through the addresses.

Pressing the **[SET UP]** button advances to the next larger address.

Pressing the **[TOTALS]** button goes back to the previous smaller address.

- Press the **[Space]** button to increment the upper data nibble in any individual address. This changes the number by *tens*: 10, 20, ...A0, B0, ...F0, then 00 again.
- Press the **[Delete]** button to increment the lower data nibble in any individual address. This changes the number by *ones*: 01, 02, ...0A, 0B, ...0F, then 00 again.
- Press the minus button, **[-]**, to set a specific address to FF.
- Press the zero key, **[0]**, to set a specific address to 00.
- Press the **[Clear]** button to load the default value from the EPROM into the RAM *for this specific address only*.

To exit the CHANGE RAM mode, press **[Enter]**. The message “**MOD SET UP? NO**” will appear.

If you now wish to modify any of the set-up information you just entered, press **[SET UP]** to toggle the YES/NO option to YES and make the necessary corrections.

TIP: Make certain to write down and retain any changes you make to the tape loader RAM. If you do not, you will regret this later. Permanent selections should be programmed into the EPROM. Please contact EXATRON for assistance. Our toll-free telephone number is 1-800-EXA-TRON.

If no modification is needed, press **[Enter]** again to return to the previous mode.

For some addresses, the value is the sum of all values that are turned on. An example of this is the address that specifies the motors used. To turn on all three motors, use 07 as the instruction. This is the sum of their values. To turn off the octoloader motor, subtract its value, and use 03 (tape drive value plus pickup head value) as the instruction.

Address—Motors Used			
Instruction Value	Calculation	Meaning	Configuration Typically Used By
01		Tape drive only	Model 1080
02		Pickup head only	
04		Octoloader only	
03	01 + 02	Tape drive and pickup head	Model 1050
05	01 + 04	Tape drive and octoloader	
06	02 + 04	Pickup head and octoloader	
07	01 + 02 + 04	Tape drive, pickup head, and octoloader	Model 1020

RAM ADDRESS LISTING DEFINITIONS

The following table describes each address in numerical order. This information is current as of the revision date of this manual; however, the tape and reel firmware changes regularly. Please refer to the firmware address listing later in this chapter for addresses/features specific to your system as shipped from the Exatron factory. Exatron offers free firmware updates upon request for the life of the equipment.

TABLE 1 Tape Loader RAM				
Adrs	Description	ROM	RAM Option	Comments
008F	Program Name			Label displays date of program. This should be the same date displayed on the taper panel at startup.
0090	Top of EPROM	00	00	00: Top of Model 1020 Tape Loader EPROM. NO OPERATOR CHANGES ARE ALLOWED..
0091	Thermal or PSA	FF	00, FF	Set to FF for Thermal (heat) sealing. Set to 00 for Pressure Sensitive Adhesive (PSA) tape sealing.
0092	Tape Out Check	00	00, FF	Set to 00 for the system to check and advise out of tape condition. Set to FF to turn this check off.
0093	Start Pulse Width	14	00 to FF	Adjust the start test pulse width. This is allowed to provide flexibility in interfacing between the handler and tester/programmers. Counts down in HEX in 1 millisecond steps.
0094	Remote Go	FF		For use by Exatron technicians only. No operator changes allowed.
0095	Baud Rate RS-232	0C	See Table in Interface Chapter	Stores the baud rate of the RS-232 interface between the handler system and the PC. Must be set to 0C for EXATRON RS-232 Interface on the Model 1020.
0096	Data Format	03	See Table in Interface Chapter	Stores the parity/stop/data bits. Must be set to 03 for EXATRON RS-232 Interface on the Model 1020.
0097	Remote Control	FF	00, FF	For EXATRON RS-232 Interface <u>only</u> . To run the system using the PC as the controller through the RS-232 Interface serial commands (software supplied by EXATRON,) set this address to 00. To run the system without using the PC as the controller, set this address to FF.
0098	# of Motors	01	01, 02	This defines the number of motors used in the system. 01 indicates the tape drive motor. 02 indicates the pick and place motor. 04 is octoloader motor. NO OPERATOR CHANGES ARE ALLOWED.

Adrs	Description	ROM	RAM Option	Comments
0099	Seal Down Delay	10	00-FF	Time delay after the sealing head closes on the tape before the drive motor advances the pocket. This delay provides a superior quality of seal. This delay counts down in HEX in 1 millisecond steps.
009A	Swing Head Home	31	30 – 39	Number of steps swing head moves after home sensor is found. "3" is ignored. Only second number is used. Example 34 = four steps moved after home.
009B	Old PSA / New Psa	AA	00, AA	00 = Old style PSA. AA = New style PSA.
009C	Temp Alarm	00	00, FF	Set to 00 = out of temperature alarm switch normally open. Set to FF = out of temperature alarm switch normally closed. This option is a function of the manufacturer's factory setting of this switch and does not usually require operator changes.
009D	Octoloader 8 or 4 inputs	08	08, 04, 00	08 = 8 tube input. 04 = 4 tube input. 00 = setup as 1050 model.
009E	Wiggle Octoloader	00	00, FF	00 = Wiggle octoloader on. FF = Wiggle octoloader off.
009F	Jog Octo at Power Up	00	0?, 1?	Jogs octoloader right or left upon power up, allows Octoloader to be "aligned" on power up. 0? = Jog Left. 1? = Jog Right. FOR EXAMPLE: 02 = Jog Left 2 steps; 13 = Jog Right 3 steps. 9 Steps Maximum.
00A0	Out of Pocket	FF	00, FF	00 = Skip FF = Check Sensor
00A1	Empty Pocket Check	FF	00, FF	Set to 00, the tape loader empty pocket sensor is active. Set to FF, the tape loader skips this operating check.
00A2	Full Tape 100000	0		Set the 100,000s digit for number of devices constituting a full tape. (ASCII)
00A3	Full Tape 10000	0		Set the 10,000s digit for number of devices constituting a full tape. (ASCII)
00A4	Full Tape 1000	2		Set the 1000s digit for number of devices constituting a full tape. (ASCII)
00A5	Full Tape 100	0		Set the 100s digit for number of devices constituting a full tape. (ASCII)
00A6	Full Tape 10	0		Set the 10s digit for number of devices constituting a full tape. (ASCII)
00A7	Full Tape 1	0		Set the 1s digit for number of devices constituting a full tape. (ASCII)
00A8	Check Temp Alarm	00	00, FF	Set to 00, tape loader will check the temperature in the sealing heads of thermal systems and send an error message when not up to temp. Set to FF, the system does not check the temperature.
00A9	Leader Count	1E	Hex Decode	Allows the operator to designate the number of pockets contained in the carrier tape leader at the start of a job. Uses HEX digits. Factory setting of data 1E = 30 pockets per leader.

Adrs	Description	ROM	RAM Option	Comments
00AA	Count Down	0A	Hex Decode	Allows the operator to designate the number of pockets in the carrier tape to be advanced in order to activate the take up motor. Uses HEX digits. Factory setting of data 0A = 10 pockets.
00AB	Reserve AC	FF		Not used at this time.
00AC	Foot Count	20	Hex Decode	For tapers with foot switch option Number of pockets fed per foot switch for creating leader. 20 = 32 pockets.
00AD	Inspect Yes/No	AA	00, AA, FF	00 = Yes AA = No Option FF = No
00AE	Tape Step 1000	0		Sets the 1000s digit of the number of <u>rapid</u> steps the tape drive motor will advance before slowing down to find the gap sensor and aligning the tape gap. Set as ASCII number only.
00AF	Tape Step 100	5		Sets the 100s digit of the number of <u>rapid</u> steps the tape drive motor will advance before slowing down to find the gap sensor and aligning the tape gap. Set as ASCII number only.
00B0	Tape Step 10	0		Sets the 10s digit of the number of <u>rapid</u> steps the tape drive motor will advance before slowing down to find the gap sensor and aligning the tape gap. Set as ASCII number only.
00B1	Tape Step 1	0		Sets the 1s digit of the number of <u>rapid</u> steps the tape drive motor will advance before slowing down to find the gap sensor and aligning the tape gap. Set as ASCII number only.
00B2	Pick Up Vac Delay	05	Hex Decode	Sets vacuum grab delay. Number of milliseconds delay before pickup. 05 = five second delay
00B3	Place Cycle	00	00, FF	FF = Standard 00 = Fast Load
00B4	Index Vac Delay	0A	Hex Decode	Sets index vacuum delay. Number of milliseconds delay before engaging. 0A = ten millisecond delay.
00B5	Pick Up Delay	05	Hex Decode	Delay time between part present sensor actuating and actual pick up of part. 50 millisecond default. 10 millisecond increments.
00B6	Retract Delay	05	Hex Decode	Delay time before retraction of swing head. 50 millisecond default. 10 millisecond increments.
00B7	Into Pocket Delay	05	00 to FF	Time delay prior to placing device into empty pocket to be sealed. Counts down in HEX to determine the time delay in ten millisecond steps.
00B8	Out of Pocket Delay	05	00 to FF	Time delay prior to checking out of pocket sensor. 50 millisecond default. 10 millisecond increments.
00B9	Offset 1000	0		Not used at this time.

Adrs	Description	ROM	RAM Option	Comments
00BA	Offset 100	2		Not used at this time.
00BB	Offset 10	5		Not used at this time.
00BC	Offset	0		Not used at this time.
00BD	Reserve BD	FF		Not used at this time.
00BE	Reserve BE	FF		Not used at this time.
00BF	Reserve BF	FF		Not used at this time.
00C0	Motor A R1--	2		This sequence stores the maximum step rate for Motor A, the tape drive motor. Set as ASCII Number for Tape Drive Motor. Consult EXATRON factory for details.
00C1	Motor A R-1-	4		Set as ASCII Number for Tape Drive Motor. Consult EXATRON factory for details.
00C2	Motor A R—1	0		Set as ASCII Number for Tape Drive Motor. Consult EXATRON factory for details.
00C3	Motor A F1-	4		This sequence stores the starting rate for Motor A, the tape drive motor. Set as ASCII Number for Tape Drive Motor. Consult EXATRON factory for details.
00C4	Motor A F-1	0		Set as ASCII Number for Tape Drive Motor. Consult EXATRON factory for details.
00C5	Motor A S1--	2		This sequence stores the slope of the acceleration for Motor A, the tape drive motor. Set as ASCII Number for Tape Drive Motor. Consult EXATRON factory for details.
00C6	Motor A S-1-	4		Set as ASCII Number for Tape Drive Motor. Consult EXATRON factory for details.
00C7	Motor A S--1	0		Set as ASCII Number for Tape Drive Motor. Consult EXATRON factory for details.
00C8	Motor B R1--	1		This sequence stores the maximum step rate for Motor B, the rotation stepper motor. Set as ASCII Number for Rotation Stepper Motor. Consult EXATRON factory for details.
00C9	Motor B R-1-	6		Set as ASCII Number for Rotation Stepper Motor. Consult EXATRON factory for details.
00CA	Motor B R--1	0		Set as ASCII Number for Rotation Stepper Motor. Consult EXATRON factory for details.

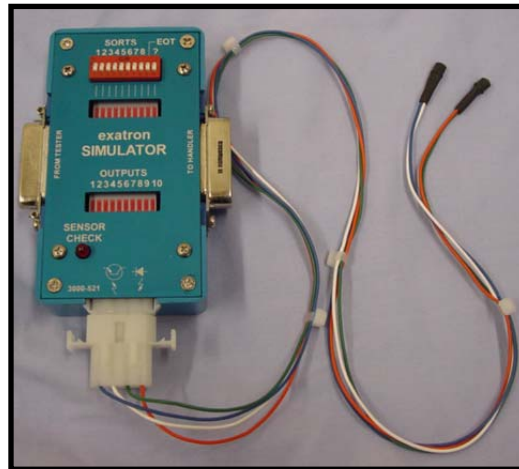
Adrs	Description	ROM	RAM Option	Comments
00CB	Motor B F1-	1		This sequence stores the starting rate for Motor B, the rotation stepper motor. Set as ASCII Number for Rotation Stepper Motor. Consult EXATRON factory for details.
00CC	Motor B F-1	0		Set as ASCII Number for Rotation Stepper Motor. Consult EXATRON factory for details.
00CD	Motor B S1--	1		This sequence stores the slope of the acceleration for Motor B, the rotation stepper motor. Set as ASCII Number for Rotation Stepper Motor. Consult EXATRON factory for details.
00CE	Motor B S-1-	6		Set as ASCII Number for Rotation Stepper Motor. Consult EXATRON factory for details.
00CF	Motor B S--1	0		Set as ASCII Number for Rotation Stepper Motor. Consult EXATRON factory for details.
00D0	Motor C R1--	2		Set as ASCII Number for Rotation Stepper Motor. Consult EXATRON factory for details.
00D1	Motor C R-1-	0		Set as ASCII Number for Rotation Stepper Motor. Consult EXATRON factory for details.
00D2	Motor C R- -1	0		Set as ASCII Number for Rotation Stepper Motor. Consult EXATRON factory for details.
00D3	Motor C F1- -	1		Set as ASCII Number for Rotation Stepper Motor. Consult EXATRON factory for details.
00D4	Motor C F - 1 -	0		Set as ASCII Number for Rotation Stepper Motor. Consult EXATRON factory for details.
00D5	Motor C S1 - -	2		Set as ASCII Number for Rotation Stepper Motor. Consult EXATRON factory for details.
00D6	Motor C S-1-	0		Set as ASCII Number for Rotation Stepper Motor. Consult EXATRON factory for details.
00D7	Motor C S - -1	0		Set as ASCII Number for Rotation Stepper Motor. Consult EXATRON factory for details.
00D8	Not Used			
00D9	Not Used			
00DA	Not Used			
00DB	Swing Step 100	0		Sets 100's digit for number of steps in full rotation of swing head.
00DC	Swing Step 10	5		Sets 10's digit for number of steps in full rotation of swing head.
00DD	Swing Step 1	9		Sets 1's digit for number of steps in full rotation of swing head.

CHAPTER 4

Diagnostics

This chapter describes the operation of the tape loader's built-in Diagnostics. These Diagnostics allow every sensor, solenoid, switch, motor, and I/O Port in the taping system to be individually tested. Use these checks to troubleshoot any problem the handler may have. Although no tools are required, an EXATRON LED checker, part #3000-052, (small blue plastic box) will be helpful in troubleshooting broken sensor/LED pairs and for testing the handler control port.

LED CHECKER



ENTERING DIAGNOSTICS MODE

To enter the DIAGNOSTICS mode, the operator must first enter the MANUAL or PAUSE mode so that automatic cycling of the system is halted. If the system is in an error condition and halted, the operator may also enter DIAGNOSTICS from such error condition.

Press the **[DIAGNOSTICS]** button on the taper control panel. When you enter diagnostics mode, the display reads "DIAGNOSTICS." In this mode, the following keys on the keypad will initiate certain diagnostic functions.



DIAGNOSTICS QUICK REFERENCE

↵ This symbol means: press the **[Enter]** button.

[1] key = SENSOR CHECK, then:

[1] Tape and Reel Sensors 0 - 7;

- 0 = Vacuum sensor
- 1 = Pick & place home position
- 2 = Device ready to be picked up
- 3 = Takeup reel slack switch
- 4 = Tape gap sensor
- 5 = Empty pocket sensor
- 6 = Out of tape sensor
- 7 = Out of pocket sensor

↵ to return to SENSOR CHECK

[2] Tape and Reel Sensors 8 - F;

- 8 = No device attached to pickup head
- 9 = Pickup head not at home position over pickup site
- A = Device in track
- B = Device at pickup site
- C = Obsolete
- D = Device at top of rail
- E = Device at octoloader gap
- F = Octoloader at home base on left

↵ to return to SENSOR CHECK

↵ To return to **DIAGNOSTICS Menu**

[2] key = OUTPUT CHECK, then:

[1] SOLENOID CHECK (intermittent action), then:

- | | |
|--|--|
| [1] Sealing head air solenoid; | Press [0] or another number key to stop action |
| [2] Vacuum solenoid at pickup head; | Press [0] or another number key to stop action |
| [3] Index cylinder; | Press [0] or another number key to stop action |
| [4] Not used; | |
| [5] Pickup site out gate; | Press [0] or another number key to stop action |
| [6] Air blast at pickup head; | Press [0] or another number key to stop action |
| [7] Pickup head solenoid; | Press [0] or another number key to stop action |
| [8] Takeup motor rotate; | Press [0] or another number key to stop action |
| [9] Not used | |
| [0] Turns OFF all solenoids; | |

↵ to return to OUTPUT CHECK

[2] SOLENOID TOGGLE CHECK (continuous action), then:

- | | |
|--|--|
| [1] Sealing head air solenoid; | Press [0] or another number key to stop action |
| [2] Vacuum solenoid at pickup head; | Press [0] or another number key to stop action |
| [3] Index cylinder; | Press [0] or another number key to stop action |
| [4] Not used; | |
| [5] Pickup site out gate; | Press [0] or another number key to stop action |
| [6] Air blast at pickup head; | Press [0] or another number key to stop action |
| [7] Pickup head solenoid; | Press [0] or another number key to stop action |

- [8] Takeup motor rotate; Press [0] or another number key to stop action
- [9] Not used
- [0] Turns OFF all solenoids; Press [0] or another number key to stop action

↵ to return to OUTPUT CHECK

↵ To return to DIAGNOSTICS Menu

[3] key = ALL MOTOR CHECK, then:

[1] DRIVE MOTOR CHECK

- [1] Rotates tape drive motor several steps to the left
- [2] Momentarily displays tape drive motor parameters as stored in RAM
- [3] Rotates tape drive motor several steps to the right
- [4] Jogs tape drive motor to left until sensor detects gap between pockets
- [5] Move or advance to next pocket
- [6] Not used
- [7] Jogs tape drive motor one step to left
- [8] Not used
- [9] Jogs tape drive motor one step to right

↵ to return to ALL MOTOR CHECK

[2] SWING HEAD CHECK (Pick and Place Motor), then:

- [1] Rotates pick and place motor down to "place" position
- [2] Momentarily displays motor parameters as stored in RAM
- [3] Rotates pick-and-place motor up to "pick" (a.k.a.: "home") position
- [4] SET GAP? allows you to change the offset number for device placement
- [5] One full pick and place cycle
- [6] Rotates drive motor 1 pocket position forward
- [7] Rotates one step up
- [8] Jog, rotate, and return to home position
- [9] Rotates one step down

↵ to return to ALL MOTOR CHECK

[3] OCTOLOADER MOTOR CHECK, then:

- [1] 1 step left
- [2] Not used
- [3] 1 step right
- [4] 2 steps left
- [5] Not used
- [6] 2 steps right
- [7] Jog left
- [8] Not used
- [9] Jog right
- [0] Motor off

↵ to return to ALL MOTOR CHECK

↵ To return to DIAGNOSTICS Menu

[4] Not used

[5] Not used

[6] key = INTERFACE CHECK, then:

[1] RS-232 CHECK. ↵ to return to INTERFACE CHECK

[2] HANDLER OUT CHECK. ↵ to return to INTERFACE CHECK

[3] SORT = (Not used on 1020)

 [1] Issue New Start; ↵ to return to INTERFACE CHECK

 ↵ To return to DIAGNOSTICS Menu

↵ Again to EXIT DIAGNOSTICS mode

**Tape Loader Sensors, 0 Through F**

TO ENTER THIS CHECK:

Display reads, "DIAGNOSTICS"

Press the [1] key.

Display reads, "SENSOR CHECK"

Press the [1] key again.

Display reads, "SEN0-7 XXXXXXXX" with the Xs representing sensors numbered 0 to 7, left to right, displayed when in the ON or CLOSED position:

- 0 = Vacuum sensor
- 1 = Pick & place home position
- 2 = Device ready to be picked up
- 3 = Take up reel slack switch
- 4 = Tape gap sensor
- 5 = Empty pocket sensor
- 6 = Out of tape sensor
- 7 = Out of pocket sensor

↩ To return to SENSOR CHECK.

Press the [2] key.

Display reads, "SEN8-F XXNNNNN " with the Xs representing sensors numbered 8 and 9 and Ns representing letters A-F, left to right, displayed when in the ON or CLOSED position:

- 8 = No device attached to pickup head
- 9 = Pickup head not at home position over pickup site
- A = Device in track
- B = Device at pickup site
- C = Obsolete
- D = Device at top of rail
- E = Device at octoloader gap
- F = Octoloader at home base on left

↩ To return to SENSOR CHECK.

Pressing the **[Clear]** button will flash the terminal's displayed message to confirm the tape loader is still in this specific diagnostic check.

Press the **[Enter]** button to EXIT this diagnostic check.

If you suspect that you have a bad sensor/LED pair, use the EXATRON LED checker #3000-052 (small blue plastic box.) This diagnostic tool is equipped with a transistor (blue/white wires) and an IR LED (orange/blue wires.)

Direct the transistor at any of the tape loader's IR LEDs. The LED on the checker should turn off. Direct the checker's LED at any of the tape loader's transistors. The corresponding number should turn OFF on the tape loader's display.

**Output Check**

TO ENTER THIS CHECK:

Display reads, "DIAGNOSTICS"

Press the **[2]** key.

Display reads, "OUTPUT CHECK "

You can perform all the same checks in one of two modes:

[1] key: "SOLENOID CHECK" This mode produces continual, *intermittent* action that can be stopped by pressing the [0] key or the [PAUSE] key. For example, the vacuum is activated in intermittent bursts, or the pickup head moves up and down until you stop the action. Pressing [Enter] to exit the mode also turns off the solenoid.

OR:

[2] key: "SOL TOGGLE CHECK" This mode produces *continuous* action that can be stopped or toggled by pressing the activating key again. For example, the vacuum is activated in a steady force until you toggle it off, or the pickup head stays down until you toggle it up. Pressing [Enter] to exit the mode also turns off the solenoid.

The following table is *true for both intermittent and continuous modes*. Press each of the tape loader's front panel controller keys 0 through 9. Each key will set the corresponding solenoid into an on/off test cycle.

<u>Front Panel Key</u>	<u>Tape & Reel Solenoid</u>
[1]	Sealing head air solenoid
[2]	Vacuum solenoid at pickup head
[3]	Index cylinder
[4]	Not used
[5]	Pickup site out gate
[6]	Air blast at pickup head
[7]	Pickup head solenoid (mechanical)
[8]	Takeup motor rotate
[9]	Not used
[0]	All solenoids off

Pressing the **[Clear]** button will flash the terminal's displayed message to confirm the tape loader is still in this specific diagnostic check.

Press the **[Enter]** button to EXIT this diagnostic check and return to the "DIAGNOSTICS" menu.

**Drive Motor Check**

TO ENTER THIS CHECK:

Display reads, "DIAGNOSTICS"

Press the [3] key.

Display reads, "ALL MOTOR CHECK"

Press the [1] key:

Display reads, "DRIVE MOTOR CHK"

[1] key: "MOVE TAPE LEFT." Tape drive motor advances tape several steps to the left; automatically returns to DRIVE MOTOR CHK.

[2] key: Momentarily displays tape drive motor parameters as stored in RAM; for example, "R235 F30 S235." Press and hold this key to view these parameters at greater length. This display is for Exatron's diagnostic procedures. Automatically returns to DRIVE MOTOR CHK.

[3] key: "MOVE TAPE RIGHT." Tape drive motor backs up tape several steps to the right; automatically returns to DRIVE MOTOR CHK.

[4] key: Jogs tape drive motor to left until sensor detects gap between pockets; automatically returns to DRIVE MOTOR CHK.

[5] key: "TEST TAPE MOTOR" Tape drive motor advances the carrier tape to the next pocket.

[6] key not used.

[7] key: "JOG LEFT." Tape drive motor jogs tape one step to the left (advancing); automatically returns to DRIVE MOTOR CHK.

[8] key not used.

[9] key: "JOG RIGHT." Tape drive motor jogs tape one step to the right (backing up); automatically returns to DRIVE MOTOR CHK.

Pressing the **[Clear]** button will flash the terminal's displayed message to confirm the tape loader is still in this specific diagnostic check.

Press the **[Enter]** button to EXIT this diagnostic check and return to the "DIAGNOSTICS" menu.

**Swing Head Check (Pick and Place Motor)**

TO ENTER THIS CHECK:
Display reads, "DIAGNOSTICS"

Press the **[3]** key.
Display reads, "ALL MOTOR CHECK"

Press the **[2]** key:
Display reads, "SWING HEAD CHECK"

[1] key: "ROTATE DOWN" Rotates pick and place motor down to "place" position over tape. Stops when sensor sees pickup head in correct position. Display reads: "PICK UP DOWN."

[2] key: Momentarily displays motor parameters as stored in RAM; for example, "R220 F20 S220." Press and hold this key to view these parameters at greater length. This display is for Exatron's diagnostic procedures. Automatically returns to ROTATION CHK.

[3] key: "ROTATE UP" Rotates pick and place motor up to "pick" position (also called "home" position.) Stops when sensor sees pick-up head in correct position. Display reads: "PICK UP AT HOME."

[4] key: "SET GAP? NO" or YES
[SETUP] toggles YES or NO.
[ENTER] confirms your choice.

If you select NO, it shows the current settings, for example: "GAP STEPS = 1033" "OFFSET = 0700".

The number of **gap steps** is the number of steps the motor must jog to get **from one pocket center to the next pocket center**. This number gives an **absolute distance**.

The **offset** number is the number of steps the tape motor advances from the point at which the **gap sensor** sees the pocket center hole to the point at which the pickup head centers a device at the nearest pocket. This number gives a **relative distance**, the starting point.

After this message display, the message "SET OFFSET = XXXX" allows you to change the offset.

Enter a gap offset by using Polish notation; that is, starting with the ones digit, then the tens, then the hundreds. For example, to enter the number 0721, press the keys [1] [2] [7] [0]. To change 0700 to 0750, you need to enter only the last 2 digits: [0] [5].

[Space] key lowers and raises the pickup head, whether it is over the tape or over the pickup site.
[Delete] key toggles the vacuum on and off.

[5] key: Will run one full pick-and-place cycle, including sealing, assuming a device is present at pick up location. If no device is present, the message "TAPE STACK EMPTY" is briefly displayed.

[6] key: Rotates drive motor 1 pocket position forward and seals the tape.

[7] key: "JOG UP" Rotates pickup head motor one step up toward pickup site; shows a message like "SWING HOME = 5".

[8] key: Motor jogs, rotates, and returns to Home position.

[9] key: "JOG DOWN" Rotates pickup head motor one step down away from pickup site; shows a message like "SWING HOME = 4".

Pressing the **[Clear]** button will flash the terminal's displayed message to confirm the tape loader is still in this specific diagnostic check.

Press the **[Enter]** button twice to EXIT this diagnostic check and return to the "DIAGNOSTICS" menu.



Swing Head to Tape Calibration Procedure

The most important calibration is the swing head check, or pickup head calibration.

To check the positioning of a device in the tape pocket:

1. Place a device in the track, and push the orange Index override button on the side of the 1020. This drops the device to the pickup site.
2. Press [DIAGNOSTICS] to enter Diagnostics mode.
3. Press [3] to enter ALL MOTOR CHECK.
4. Press [2] to enter SWING HEAD CHECK.
5. Press [3] to move the pickup head over the pickup site.
6. Press [Space] to lower the pickup head to the pickup site.
7. Press [Delete] to turn on the vacuum and attach the device to the pickup head.
8. Press [Space] to raise the pickup head.
9. Press [1] to move the pickup head over the tape pocket.
10. Press [Space] to lower the device to the pocket.
11. Press [Delete] to turn off the vacuum.
12. Press [Space] to raise the pickup head.
13. Look at the device's position in relation to the pocket.
14. If the device is not seated precisely in the center of the tape pocket, use one or both of the following procedures.

If the **device is to the left or the right of the pocket center**, as in the following figure, the tape position needs adjustment. You can adjust its placement by going to:

[DIAGNOSTICS]

[3] ALL MOTOR CHECK

[2] SWING HEAD CHECK

[4] SET GAP? NO

[SET UP] SET GAP? YES

[ENTER] SET OFFSET = [number]

Using Polish notation (reverse order), type a smaller or larger number.

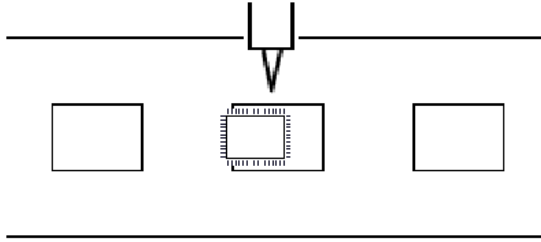
Typing a **larger number** results in devices being placed **more to the right of the tape** pocket.

Typing a **smaller number** results in devices being placed **more to the left of the tape** pocket.

[ENTER] confirms your new number.

Repeat the above procedure with a device to check your calibration.

In the following illustration, the device needs to be placed more to the right, so the operator would enter a larger offset number than the current one.



If the **device is to the front or back of the pocket center**, as in the following figure, the swing head needs adjustment. You can adjust its placement by going to:

[DIAGNOSTICS]

[3] ALL MOTOR CHECK

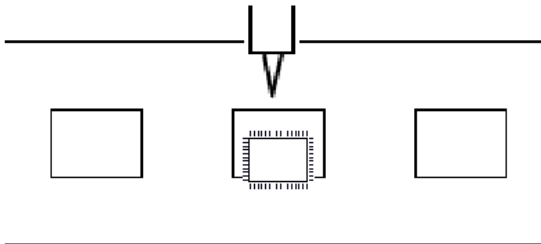
[2] SWING HEAD CHECK

[1] Move head to place position, if it is not already there

[7] Jog swing head up toward the back of the tape or

[9] Jog swing head down toward the front of the tape

In the following illustration, the swing head needs to be jogged toward the back of the tape, so the operator would press [7] several times.



**ALL MOTOR CHECK: Octoloader Motor Check**

This diagnostic tests input port C6, output port C6, C9 located on PCB #5000-397, PAL 397-5, U9.

TO ENTER THIS CHECK:

WARNING: VERIFY THAT THE OCTOLOADER IS EMPTY OF ALL DEVICES BEFORE USING THIS DIAGNOSTIC.

Handler displays **DIAGNOSTICS**

Press the **[3]** key.

Handler displays **ALL MOTOR CHECK**

Press the **[3]** key.

Handler displays **OCTO MOTOR CHK**

[1] key: "1 LEFT STEP" The octoloader moves one tube to the left.

[2] key: The handler displays the current motor settings in RAM; for example, "R200 F10 S200." This display is helpful when trying to increase the motor's speed.

[3] key: "1 RIGHT STEP" The octoloader moves one tube to the right.

[4] key: "2 LEFT STEPS" The octoloader moves two tubes to the left.

[5] Not used.

[6] key: "2 RIGHT STEPS" The octoloader moves two tubes to the right.

[7] key: "JOG LEFT" The Octoloader will move one step to the left, about .006".

[8] key: "SET # INPUTS"

[4] Press the [4] key to use 4 input tubes.

[8] Press the [8] key to use 8 input tubes.

[Enter] Press the [Enter] key to confirm your selection and return to OCTOLOADER MOTOR CHECK.

[9] key: "JOG RIGHT" The octoloader moves one step to the right, about .006".

[0] key: "MOTOR OFF" The octoloader motor is now off.

Pressing the **[Clear]** button will flash the terminal's displayed message to confirm the handler is still in this specific diagnostic check.

Press the **[Enter]** button to EXIT this diagnostic check.



INTERFACE CHECK: RS-232 Check (Control Panel Check)

TO ENTER THIS CHECK:

Display reads, "DIAGNOSTICS"

Press the [6] key.

Display reads, "INTERFACE CHECK"

Press the [1] key.

Display reads, "RS-232 CHECK"

- a) Connect a remote terminal to the Tape Loader. Verify proper communication protocol; the EXATRON defaults are: 9600 Baud, No parity, 8 data bits, 1 stop bit.
- b) Press any key(s) on the Tape Loader controller keypad. The same character displayed here should appear on the remote terminal display.
- c) Press any key(s) on the remote terminal keyboard. The same character displayed here should appear on the Tape Loader controller display.

Press the **[Enter]** button to exit this diagnostic check.



INTERFACE CHECK: Output Port

THIS CHECK IS RESERVED FOR FUTURE USE. NOT USED AS OF THIS REVISION.

TO ENTER THIS CHECK:

Display reads, "DIAGNOSTICS"

Press the [6] key.

Display reads, "INTERFACE CHECK"

Press the [2] key.

Display reads, "HANDLER OUT CHECK"

Press the **[Enter]** button to exit this diagnostic check.



INTERFACE CHECK: Input Sort Check.

THIS CHECK IS RESERVED FOR FUTURE USE. NOT USED AS OF THIS REVISION.

TO ENTER THIS CHECK:

Display reads, "DIAGNOSTICS"

Press the [6] key.

Display reads, "INTERFACE CHECK"

Press the [3] key.

Display reads, "SORT = "

This indicates which input sort of this interface is being utilized from the handler to the tape loader. "SORT = 8" tells the operator that the two systems are connected properly.

Press the **[Enter]** button to exit this diagnostic check.

CHAPTER 5

Display Dictionary

Messages which appear on the tape loader front panel controller's display are listed alphabetically below. Symbols and numbers appear first. Each entry in this section explains why the message is displayed and where applicable, how to resolve the condition. If further explanation is required, the operator is referred to the appropriate section elsewhere in this manual for details.

We are constantly adding messages to the system's operating code. If the one you need is not listed here, please contact EXATRON'S Customer Service Department for prompt assistance. For free updates to the firmware, please contact the EXATRON Sales Department.

00XX DATA XX

This is the Change RAM routine. Current RAM address data will be displayed where each X is shown above. Review the following for options allowed from the front panel controller keys:

[Enter] Exits routine; saves settings into RAM

[SET UP] Scrolls address 0090 to 00FF

[TOTALS] Scrolls address 00FF to 0090

[Clear] Reloads default value from EPROM to RAM for a specific address.

[0] Sets data to 00

[-] Sets data to FF

[Space] Incrementally changes upper nibble 0? to F?

[Delete] Incrementally changes lower nibble ?0 to ?F

ADD LEADER

This message will appear when the operator presses the **[Delete]** button from MANUAL mode or WAIT FOR HANDLER mode. This will run the take up and drive motors with the sealing heads engaged to create a tape leader of fifty empty sealed pockets for a new reel. Use this feature when you intend to cut the tape at the leader and separate the full reel from the rest of the tape.

Press the **[Clear]** button to stop the motors and return to the previous mode.

ALIGN MOTORS ?

The operator may now "jog" any of the tape loader's motorized components by one step at a time using the keypad keys as described below:

[4] Jog the pick and place motor one step left

[6] Jog the pick and place motor one step right

[7] Jog the drive motor one step left

[9] Jog the drive motor one step right

[Enter] Return to previous condition

ALL MOTORS OFF

You have pressed the **[0]** key. The power to all motors is now OFF. You may realign or move any of the motors manually. Press any tape loader controller button to continue.

BAD RESPONSE

The tape loader is in the EXATRON RS-232 INTERFACE mode. Proper communications between the tester and the tape loader must be established at the start of every test cycle. At this point, the tape loader is waiting for an “**R**” Ready, (or an asterisk, “*****” for Remote Flush Command) from the tester. However, the tester has sent some response other than an “**R**” or an “*****” and the tape loader is advising the operator that such response is not correct. Please refer to *Chapter 2, Interface Information*, of the enclosed Model 5000 user’s manual for further details.

BAD TEST RESULT

The tape loader is in the EXATRON RS-232 INTERFACE mode. If the tape loader receives an incorrect bin sort, the message, **BAD TEST RESULT**, will be displayed.

You may press the **[Enter]** button to reissue a Start Test command and the tape loader will try a second test.

You may press the **[Clear]** button to abort the test and restart operation, or send the tape loader an ASCII “*****” or “**2A**” in HEX. This will automatically flush the DUT and begin a new test cycle. Please refer to *Chapter 2, Interface Information*, of the enclosed Model 5000 user’s manual for further details.

CHANGE RAM? NO

Exits routine without making any changes to the tape loader's RAM set up parameters.

[Enter] Exit with no changes.

[SET UP] Toggle back to **CHANGE RAM ? YS.**

CHANGE RAM? YES

Allows the operator to override the tape loader's set up parameters.

[Enter] Allows changes to the RAM. Please refer to the Change RAM Procedure in Chapter 3 for further instructions.

[SET UP] Toggle back to “**CHANGE RAM ? NO**”

CHECK SUM ERROR

The PC has sent new RAM data to the tape loader. The tape loader has calculated the check sum for the file and it does not match the check sum sent by the PC.

Press the **[Enter]** button to skip past this error. From the PC, stop the job and start over again.

CHK VAC ADJUST

The tape loader has tried to pick up a device and has failed to do so. Either no device was present at the pick up location, or the sensor has failed to detect that the device was already suctioned up by the pick up head's vacuum. To resolve this condition:

1. Press the **[PAUSE]** button: "**TAPING PAUSED**" Wiggle the pick up head manually to slightly shift the device. Watch the red LED on the vacuum generator. When the LED lights up, stop wiggling the pick up head. Press any button on the tape loader's controller. The tape loader will automatically resume operation if the device is now detected.
2. Verify that the vacuum line is installed from the vacuum generator to the pick up head. Verify that the pick up head fitting is not leaking.
3. Verify that the pick up head is mechanically adjusted correctly. Perform the taping motors alignment procedure described in Chapter 3, Operating Procedure.
4. Pressing the **[Enter]** button will skip past this error, but **BE CAREFUL IN SELECTING THIS OPTION**, because pressing the **[Enter]** button will cycle the pick up head *down*, which may release the device at a wrong location.
5. Pressing the **[Clear]** button will flush the device to a reject tube.
6. Use Diagnostics/SOLENOID CHECK/<7> key to verify that the vacuum is working properly.

COUNT SET TO 0

This indicates that the tape output count has been reset to 000000. For your reference only.

CPU ERROR 1

CPU ERROR 2

CPU ERROR 3

All of the above errors are critical. The tape loader's control program has detected a major problem, and has stopped operation. Use the following procedure to resolve this problem:

1. Write down exactly which **CPU ERROR** message is displayed.
2. Write down, to the best of your knowledge, what message(s) was/were displayed by the tape loader just before the error.
3. Write down, to the best of your knowledge, what the tape loader was doing just before the error.
4. Power down the tape loader.
5. Power the tape loader back up and answer all of the **MOD SET UP ? YS** questions.
6. Resume tape loader operation.
7. Fax your notes to EXATRON as soon as possible. We will answer your fax with an explanation of what occurred, and a free software update to permanently correct the cause of the problem.

DIAGNOSTICS

You have pressed the **[DIAGNOSTICS]** button. Please refer to the *Diagnostics Chapter* of this manual for further details on using the diagnostics features.

DRIVE MOTOR CHK

Please refer to the Diagnostics section in Chapter 4 of this manual.

EMPTY POCKET ?

This error message will be displayed when an empty pocket in the carrier tape is detected. This occurs even at start-up. When this message is displayed, and if the user visually confirms that no error condition is present, press **[Enter]** This will then override the empty pocket message until such time as a device is seen in a pocket. If another empty pocket is then seen, the “**EMPTY POCKET**” message will display again. If a device is placed in the pocket directly underneath the sensor, the message “**OK TO RUN? 2**” will appear. Pressing the **[Enter]** or **[RUN]** keys will start the system running again.

EXATRON TAPE

Power-up message; no action required.

FIND MOTOR HOME

This message is part of the routine for automatically resetting the taping system pick-up head at the “Home” position, that is, fully up and seated at the device pick-up location. This routine occurs upon power up and may also be actuated by pressing the **[3]** key on the front panel controller during MANUAL MODE or other system paused conditions. The complete auto centering sequence consists of:

FIND MOTOR HOME
JOG ROTATE
JOG UP
MOTOR HOME

FULL T = *****

There will be six digits displayed following the = symbol. This refers to the number of devices the tape loader will place into a full tape before it stops. The number is adjustable up to 999,999 devices.

Use the keypad to make your selection. The tape loader accepts changes to each digit from lowest to highest, in order. First enter Ones, then Tens, then Hundreds, then Thousands, etc.

[-] The minus key will set the count to 000000.

[Enter] Sets your selection.

[Clear] Resets to the top of the tape loader's **FULL T = ******* loop.
This will also reload the tape loader's EPROM default values.

HANDLER OUT CHK

Please refer to the Diagnostics/INTERFACE CHECK: Output Port Check section in Chapter 4 of this manual for details.

HOME SENSOR ERR

The pick and place motor has attempted to move the pick up head into the "home" position, that is, fully up and seated at the pick up location, but has not succeeded. This error message may be displayed during power up of the system or during operation.

Inspect the path of the pick and place head for any jammed device or other blockage. After removing any blockage, press **[Clear]** to return to the previous condition.

If there is no physical obstacle in the path of the pick up head, you may have a worn sensor. Run the Diagnostics/SENSOR CHECK for Pick & Place Home Position sensor, described in Chapter 4 of this manual. Replace the sensor as necessary.

INTERFACE CHECK

Please refer to the Diagnostics/INTERFACE CHECK section in Chapter 4 of this manual for details.

ISSUE NEW START

The tape loader has been instructed by the operator to send a new start test pulse to the tester/PC.

JOG DOWN

The pick up head has moved down one step, about .003".

JOG LEFT

The drive motor has moved one step left, about .006".

JOG RIGHT

The drive motor has moved one step right, about .006".

JOG ROTATE

This message is part of the routine for automatically resetting the taping system pick-up head at the "home" position, that is, fully up and seated at the device pick-up location. This routine occurs upon power up and may also be actuated by pressing the **[3]** key on the front panel controller during MANUAL mode or other system paused conditions. The complete auto centering sequence consists of:

**FIND MOTOR HOME
JOG ROTATE
JOG UP
MOTOR HOME**

JOG UP

This message is part of the routine for automatically resetting the taping system pick-up head at the "Home" position, that is, fully up and seated at the device pick-up location. This routine occurs upon power up and may also be actuated by pressing the **[3]** key on the front panel controller during MANUAL MODE or other system paused conditions. The complete auto centering sequence consists of:

**FIND MOTOR HOME
JOG ROTATE
JOG UP
MOTOR HOME**

LOAD DEFAULT NO

Exits routine without reloading the EPROM default settings into the tape loader's RAM.

[Enter] will exit with no changes.

[SET UP] will toggle back to **LOAD DEFAULT YS**.

LOAD DEFAULT YS

Allows the operator to reload the tape loader's RAM with settings stored in the tape loader's EPROM.

[Enter] will load defaults from EPROM to RAM.

[SET UP] will toggle back to **LOAD DEFAULT NO**.

LOAD EPROM>RAM

The tape loader has reloaded its RAM set-up data with settings stored in the EPROM. For your reference only.

LOAD REMOTE RAM

The PC has sent new tape loader set-up data to the tape loader's RAM. Any settings previously made by the operator will be changed. No action is required, although we recommend verifying that the settings are correct after this message turns off.

MANUAL MODE

You have pressed the **[MANUAL]** button. With the taping system in MANUAL mode, several keys on the controller have unique functions:

[Delete] Runs the take up and drive motors for fifty pockets, with the sealing heads engaged. This feature is to facilitate the creation of a leader on a new reel.

You may press the **[Clear]** button to stop the motors and return to the previous mode.

[Space] Runs the take up and drive motors for fifty pockets, with the sealing heads disengaged.

You may press the **[Clear]** button to stop the motors and return to the previous mode.

[.] Runs one complete sealing cycle; that is, it engages the sealing heads and moves one pocket. It does not attempt to place a part in a pocket. This feature allows the operator to check the location and quality of the seal, as needed.

[RUN] returns the unit to Run mode.

MEMORY ERROR

The tape loader's internal memory has failed self test. Replace the 8085A CPU PCB, EXATRON part #3000-055.

MOTOR A BUSY ? (Tape Drive)**MOTOR B BUSY ?** (Rotation)

The tape loader is checking to see if the stepper motor is moving as required for each of the above tape loader components.

If this message does not go away within a few seconds, the tape loader will not operate. To resolve this condition:

1. Turn the tape loader power OFF then ON and try again.
2. Verify that the motor control cable is plugged in and is not broken.
3. Replace the Motor Driver Module and/or the Motor Control PCB.
4. Contact EXATRON for assistance and replacement parts.

MOTOR A ERROR ? (Tape Drive)**MOTOR B ERROR ?** (Rotation)

The tape loader is checking to see if the stepper motor is powering up properly as required for each of the above tape loader components.

If this message does not go away within a few seconds, the tape loader will not operate. To resolve this condition:

1. Turn the tape loader power OFF then ON and try again.
2. Verify that the motor control cable is plugged in and is not broken.
3. Replace the Motor Driver Module and/or the Motor Control PCB.
4. Contact EXATRON for assistance and replacement parts.

MOTOR A OFF (Tape Drive)**MOTOR B OFF** (Rotation)

The stepper motor being checked is now off.

MOTOR HOME

This message is part of the routine for automatically resetting the taping system pick-up head at the "home" position, that is, fully up and seated at the device pick-up location. This routine occurs upon power up and may also be actuated by pressing the **[3]** key on the front panel controller during MANUAL mode or other system paused conditions. The complete auto centering sequence consists of:

FIND MOTOR HOME
JOG ROTATE
JOG UP
MOTOR HOME

MOVE TAPE LEFT

The tape drive motor has moved several steps to the left as part of the Drive Motor Check DIAGNOSTICS routine. Refer to Chapter 4 for further details.

MOVE TAPE RIGHT

The tape drive motor has moved several steps to the right as part of the Drive Motor Check DIAGNOSTICS routine. Refer to Chapter 4 for further details.

NO RESPONSE

The tape loader is in the EXATRON RS-232 INTERFACE mode. Proper communications between the tester and the tape loader must be established at the start of every test cycle. At this point, the tape loader is waiting for an "R" Ready, (or an asterisk, "*" for Remote Flush Command) from the tester. However, the tester has not sent a response. **NO RESPONSE** will alternate with the message, **WAITING FOR R**, once every second. Please refer to *Chapter 2, Interface Information*, of the enclosed Model 5000 user's manual for further details.

NOT UP TO TEMP

The system has checked the temperature of the heaters in the sealing heads of your thermal machine and determined that it is too low. Check the two temperature control displays on the front of the taping system to verify the temperatures. If necessary, change the set temperature as described in *Chapter 3, Operating Procedure*.

O.K. TO RUN ? *

A number from 1 to 8 will be displayed in place of the asterisk shown above.

The taping system has just exited a jam-clearing cycle or error condition. The operator must press the **[RUN]** button or the **[Enter]** button to continue.

The number displayed with **O.K. TO RUN ?** indicates where the stop occurred in the taping system's operation.

PART DROPPED ?

The pick and place head sensor is not detecting a device in place during the rotation cycle. It is possible that the part has been dropped. Inspect the path of the pick and place head for any dropped device or other blockage. After removing any blockage, press **[Clear]** to resume operation.

PICK UP AT HOME

You have run the Rotation (Pick and Place Motor) Check. From DIAGNOSTICS mode, the operator has pressed the **[4]** key followed by the **[3]** key. This rotates the pick and place motor up to the "pick" position (also called "home" position.) The rotation motor stops when the sensor sees the pick-up head in the correct position and displays the above status message.

PICK UP DOWN

You have run the Rotation (Pick and Place Motor) Check. From DIAGNOSTICS mode, the operator has pressed the **[4]** key followed by the **[1]** key. This rotates the pick and place motor down to the "place" position above the next empty pocket. The rotation motor stops when the sensor sees the pick-up head in the correct position and displays the above status message.

PICK UP EMPTY ?

This message indicates that the taping system is in Run mode and ready but no device is detected at the pick up position. Check whether there are devices in position for the taping pick-up head. Check whether the pick-up sensor is operating properly. Refer to the *Diagnostics* chapter for Sensor Check diagnostic routine.

PICK UP NOT HOME

This error message indicates that the taping system is in Run mode but the pick-up head has not cycled all the way to the "home" position, that is, fully up and seated at the pick-up location.

Press the **[3]** key on the front panel controller to activate the Automatic Centering feature. The following sequence of messages will be displayed while the rotation motor moves the pick-up head into proper operating alignment:

FIND MOTOR HOME
JOG ROTATE
JOG UP
MOTOR HOME

Press **[Enter]** or **[RUN]** to start the system running again.

RAM AUTO RESET

The tape loader has detected errors in its RAM and automatically reloaded its RAM with defaults stored in EPROM. This should occur very rarely or after unexpected power line interruptions.

Replace the 8085 CPU PCB, EXATRON part #3000-055, if this message appears frequently.

READY TO RUN ?

The tape loader is itself ready to run; press the **[Enter]** button to begin operation. If there are no ready devices in the transition chute from the handler to the tape loader, there will be a delay of a few seconds while the handler communicates with the taping system and advances ten ready devices. During this brief delay, the status message "**WAIT FOR HANDLER**" will be displayed. The tape loader will then begin operating.

RESET COUNT ? NO

RESET COUNT ? YES

The RESET COUNT feature allows the operator to zero the counter on the tape in progress. The message "**RESET COUNT? NO**" is displayed first, but this can be toggled between **YES** and **NO** by pressing the **[SETUP]** button on the keypad. Press **[Enter]** to accept the **YES** or **NO** answer you select.

ROTATE DOWN

The taping system is in the Rotation Check DIAGNOSTIC. Please refer to Chapter 4 for details.

ROTATE UP

The taping system is in the Rotation Check DIAGNOSTIC. Please refer to Chapter 4 for details.

ROTATION CHECK

The taping system is in the Rotation Check DIAGNOSTIC. Please refer to Chapter 4 for details.

RS-232 CHECK

Please refer to the Diagnostics/INTERFACE CHECK: RS-232 Check (Control Panel Check) section in Chapter 4 of this manual.

SEN0-7 01234567

One or more of the numbers shown above is displayed following the word **SEN0-7**. Please refer to the Diagnostics/Test Site Sensors, 0 Through 7 Check section in Chapter 4 of this manual.

SENSOR CHECK

Please refer to the Diagnostics section in Chapter 4 of this manual.

SOLENOID CHECK

Please refer to the Diagnostics section in Chapter 4 of this manual.

TAKE UP MOTOR ON

The operator has activated the take-up motor check feature by pressing the **[5]** key on the front panel controller when the tape loader was either in MANUAL mode or other paused condition. Pressing the **[5]** key turns the take-up motor for five seconds or until the rocker arm switch is thrown, while the above status message is displayed. If the motor turns a full five seconds the error message: “**TAKE UP REEL ERR**” will be displayed. You may:

- Press **[Enter]** to rotate the take up motor another five seconds.
- Press **[Clear]** to return to MANUAL mode or other previous condition.

TAKE UP REEL ERR

You have activated the take-up motor check by pressing the **[5]** key on the front panel controller during MANUAL mode or other system paused conditions. The take up motor has turned for five seconds while attempting to advance the carrier tape until the rocker arm switch is thrown, without success. You may:

- Press the **[Enter]** button to rotate the take up reel another five seconds.
- Press the **[Clear]** button to return the system to the previous mode.

TAPE GAP LOST ?

This error condition is caused when the carrier tape is in an incorrect position. The gap between tape pockets is not lined up opposite the tape gap sensor. It is possible to move the tape in single-step moves until it is again properly aligned:

- Press the **[7]** key to move the tape one step to the left.
- Press the **[9]** key to move the tape one step to the right.

TIP: To *quickly* move the tape to the left until the gap between tape pockets is aligned directly opposite the sensor, press the **[4]** key. The taping system will then be ready to resume operation.

TAPE IS FULL

This message advises the operator that the current taping job is complete, that is, the full tape count has been reached. The operator may press **[Enter]** to reset the count to zero and begin operation again.

Or, the operator may create a tape leader of fifty empty sealed pockets by pressing **[Delete]** first. This will run the take up and drive motors with the sealing heads engaged to create a tape leader of fifty empty sealed pockets for a new reel. Use this feature when you intend to cut the tape at the leader and separate the full reel from the rest of the tape.

TAPING PAUSED

You have pressed the **[PAUSE]** button on the front panel controller. The tape loader will not operate until you select another option from the controller keypad. To restart, press the **[RUN]** key.

TEST TAPE MOTOR

The taping system is in the Drive Motor Check DIAGNOSTIC. Please refer to Chapter 4 for details.

THANK YOU *

One or more numbers will be displayed following the words **THANK YOU**. The tape loader is exiting an error condition routine correctly. The tape loader will resume operation at the end of the two-second **THANK YOU** delay.

If your tape loader is displaying excessive **THANK YOU** messages, contact EXATRON and report the number displayed with the thank you message. This number indicates what part of the program the tape loader was in just prior to displaying “**THANK YOU.**”

TRANSFER ERROR

The PC is attempting to send remote RAM data to the tape loader, but there has been a data transfer error. Turn the tape loader OFF, then ON and try again.

UART OUT ERROR

The tape loader's UART has detected an error. Turn the tape loader OFF, then ON and try again. If the problem continues, replace the tape loader's 8085A CPU PCB, EXATRON part #3000-055.

WAIT FOR HANDLER

This status message is displayed briefly at the start of operations while the handler communicates with the taping system and advances ten ready devices into the transition chute to the tape loader. The tape loader will then begin operation.

WAITING FOR R

The tape loader is in the EXATRON RS-232 INTERFACE mode. Proper communications between the tester and the tape loader must be established at the start of every test cycle. At this point, the tape loader is waiting for an “**R**” Ready, (or an asterisk, “*****” for Remote Flush Command) from the tester. If an “**R**” is received, the tape loader will close the contacts or plunge the device onto the contacts, and no operator action is required. Please refer to *Chapter 2, Interface Information*, of the enclosed Model 5000 user's manual for further details.

ZERO COUNT ERR

The operator has set the tape full quantity to 000000.

Set the count for more than 000000. Please refer to the **FULL T = ******* message earlier in this section.

CHAPTER 6 Preventive Maintenance

Overview

This chapter describes the operator's important contribution to taper productivity: keeping the Model 1020 clean and smooth running. The following preventive maintenance guidelines are divided into minimum time frames. Each maintenance function should be completed at least as often as described below and more often, as needed.

NOTE: With the exception of general-use items such as isopropyl alcohol, all cleaning products and replacement parts described in this guide are available from the Sales Department at EXATRON.

Remember, there is one common-sense rule which applies to the model 1020 taper as it does to all production equipment:

KEEP IT CLEAN -- it will work better and last longer.

IF YOUR HANDLER IS PERFORMING **FREQUENT** JAM-CLEARING OPERATIONS: "WIGGLING", "THUMPING", ETC., CHECK THE MECHANICAL ALIGNMENT OF THE HANDLER'S MOVING PARTS AND ADJUST AS NEEDED FOR SMOOTH FUNCTIONING.

Daily Maintenance AFTER 8 HOURS, OR MORE OFTEN AS NEEDED

1. Carefully remove all dust and debris from every surface of the taper using blasts of compressed air on front and back, from top to bottom of the handler. **Make certain that the compressed air is clean, dry and free from any oil.**
2. Verify that the taper is free of all loose tube stop pins, devices, screws, and other small objects.

Weekly Maintenance AFTER 40 HOURS, OR MORE OFTEN AS NEEDED

1. Wipe all metal trackwork with a clean soft cloth or tissue. Or, clean the metal trackwork with cotton swabs dipped in isopropyl alcohol. **DO NOT USE STAINLESS STEEL CLEANER OR ANY OTHER CLEANER WHICH MAY LEAVE A RESIDUE ON METAL TRACKWORK.**
2. Verify that all air hoses are tight on their fittings with no air leaks.
3. Wipe down all stainless steel surfaces (non-trackwork) with CHAMPION brand Stainless Steel Cleaner (part #TLS09-125) sprayed onto a clean cloth. **DO NOT SPRAY STAINLESS STEEL CLEANER DIRECTLY ONTO THE HANDLER. DO NOT USE STAINLESS STEEL CLEANER ON HANDLER TRACKWORK.**
4. Clean the filter on the vacuum generator (part #VGH10F-1/4-1/4.) This filter (part #VGFE10) is white when clean, and is easily visible through the clear plastic cover over the vacuum generator. **VACUUM GENERATOR MAINTENANCE IS DISCUSSED IN GREATER DETAIL AND A CALL-OUT ILLUSTRATION IS PROVIDED IN THE "VACUUM GENERATOR MAINTENANCE GUIDELINES" SECTION LATER IN THIS CHAPTER.**

DIRTY FILTER



CLEAN FILTER



- A. Disconnect the flexible plastic air tube from the swivel elbow where it attaches to the plunger assembly, by pulling the air tube straight out.
- B. Loosen the vacuum generator's gray thumb screw which holds the filter chamber in place. Remove the filter and clean it with water, or better yet, replace the filter element with a new one. Replace/reinstall filter and tighten the gray thumb screw finger tight only.

5. **Upon Power Up, or As Needed:**

Check octoloader alignment. To do so, press the **[0]** key on the taper controller to turn OFF all motors. The display will read, **ALL MOTORS OFF**. Manually move the octoloader plate all the way to the right until it stops. At this point, the left octoloader track should be centered above the input trackwork.

If all is well, press the **[Enter]** button on the handler controller. The handler display will read **ALIGN MOTORS ?** Press the **[Enter]** button again to resume operation.

If the left octoloader track is not centered above the input trackwork, press the **[Enter]** button on the handler controller once. This will turn the motors back on and the handler display will read, **ALIGN MOTORS ?**

The operator may now "jog" the octoloader by one .003" step at a time until it is properly aligned, using the keypad keys as described below:

- [1]** Jog the octoloader left, display will read, **JOG LEFT**
- [3]** Jog the octoloader right, display will read, **JOG RIGHT**

After alignment is complete, press the **[Enter]** button again to resume operation. This entire octoloader alignment procedure may be repeated as necessary. If you have any trouble with this procedure, call the EXATRON factory for assistance.

Our toll-free telephone number is 1-800-EXA-TRON.

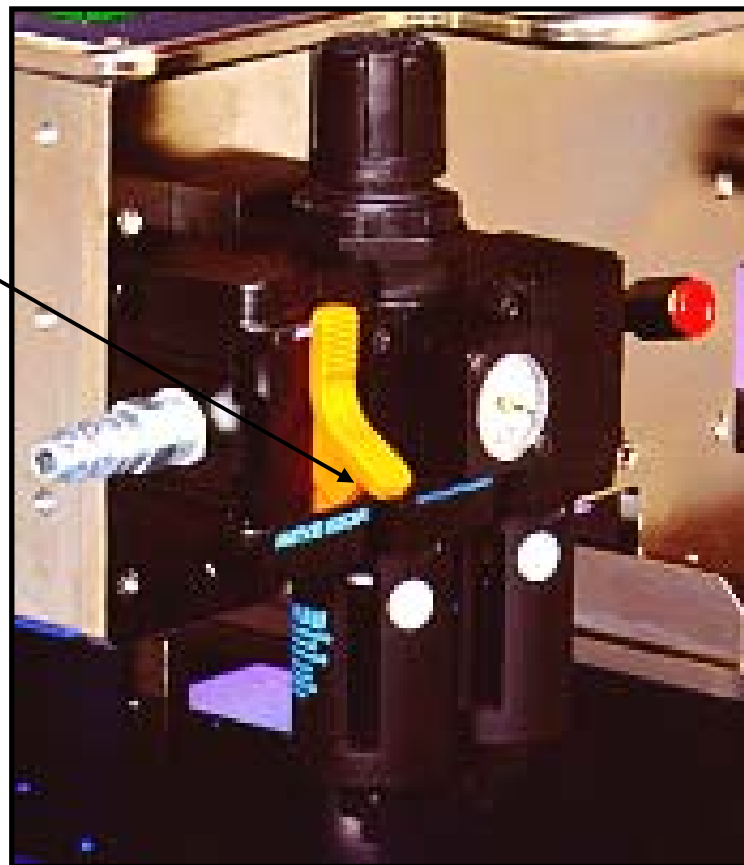
Monthly Maintenance AFTER 160 HOURS, OR MORE OFTEN AS NEEDED

1. Check all exposed flat ribbon cables for worn insulation. Replace as necessary.
2. Check all solenoid plunger tips and their dowel pins for wear. Replace as necessary.
3. Run the full DIAGNOSTICS sequence detailed in Chapter 4 of this manual to detect any malfunction in all switches, sensors, solenoids, motors, displays, and I/O ports.
4. Inspect the two-chamber filter on the WILKERSON Model #NC00440 air regulator (or equivalent):

AIR REGULATOR MAINTENANCE IS DISCUSSED IN GREATER DETAIL AND A CALL-OUT ILLUSTRATION IS PROVIDED IN THE "AIR REGULATOR MAINTENANCE GUIDELINES" SECTION LATER IN THIS CHAPTER.

- A. Remove the charcoal filter air cleaning chamber and inspect. If the black filter element is full of particles which have been extracted from the air supply, replace this filter.
 - B. Remove the air drying chamber and pour out any liquid which has been extracted from the air supply.
5. Check the operation of the air regulator's orange shutoff valve:

Main Air Flow On/Off Switch
(On Position Shown)



- A. Turn the valve OFF and verify that the air is indeed off.
- B. Turn the valve back ON.

6. If your 1020 Taper pick-up head uses a rubber suction cup, inspect and clean the rubber suction cup inside the plunger assembly:
 - A. Remove the pick-up head end piece from the fiber optic plunger.
 - B. Remove the suction cup with tweezers. Clean with isopropyl alcohol. Replace if rubber is torn or shows other signs of wear.

BLUE SUCTION CUP, EXATRON PART # PART #VC-B6. USE FOR AMBIENT TEMPERATURE APPLICATIONS. GRAY SUCTION CUP, EXATRON PART # PART #VC-B6 60G SIL. USE FOR HIGH TEMPERATURE APPLICATIONS.

Biannual Maintenance AFTER 1000 HOURS, OR MORE OFTEN AS NEEDED

Schedule your taper to be taken out of service for one day. The entire taper should be inspected by a qualified technician. The following procedures should be implemented:

1. Check for loose and/or missing nuts and bolts which may have been caused by vibration to the handler. Replace missing parts immediately. Re-tighten any loose nuts and bolts.
2. Check stepper motor set screw tightness.
3. Check the voltage of the +5 volts and +24 volts "intelligent" power supplies built into your handler. Calibrate if necessary. The acceptable voltage ranges are +5.05 volts to +5.25 volts and +22 volts to +26 volts, respectively.

To CHECK VOLTAGE:

- A. Turn the handler power OFF.
- B. Remove the blue side cover plate of the handler control box. This will expose the internal card cage. Locate the 3000B Front Panel PCB card. The Exatron part# is **5000-A89-C-3**. Locate the three posts on the right side of the card labeled **+24V** , **+5V** and **GROUND**.
- C. Attach the positive probe of a volt meter to the **+24V** post. Attach the ground probe of the volt meter to the post marked **GROUND**.
- D. Turn the handler power ON. If the voltage registers in the acceptable range, nothing further is required for the +24 volts supply. If the voltage is out of acceptable range, calibrate the +24 volts supply.

To CALIBRATE:

CAUTION - THIS POWER SUPPLY USES HIGH VOLTAGES. ONLY QUALIFIED SERVICE TECHNICIANS SHOULD CALIBRATE THE POWER SUPPLY.

- A. Remove the blue sheet metal power supply cover.
- B. Locate the blue plastic potentiometer ("pot") on the front of the +24 volts power supply, the larger of the two power supplies.
- C. With a small thin-bladed screwdriver, slowly turn the pot adjustment screw until the voltage reading moves into the acceptable range.
- D. Turn the handler power OFF and check and/or calibrate the +5 volts supply using the same method as described above for the +24 volts supply. Substitute the post marked **"+5 V"** in place of the post marked **"+24 V"** in the instructions.

NOTE: The +5 volts power supply is smaller than the +24 volts power supply and the pot adjustment screw of the +5 volts power supply must be turned **even more slowly and carefully** than the pot of the +24 volts power supply. If the +5 volts pot is adjusted too quickly, the power supply will overload and shut down for several minutes.

To order replacement parts or receive assistance with any repair, you may call the EXATRON factory toll-free at:

[800] EXA-TRON
[800] 392-8766
Direct: [408] 629-7600

Or, feel free to fax us at [408] 629-2832 with your request. Most orders are shipped within twenty-four hours of receipt of the order.

EXATRON'S Sales Department and Customer Service Department are open from 8:00 AM to 5:00 PM, Monday through Friday.

EXATRON also offers our customers a complete Service Agreement package, providing extended service support from EXATRON factory personnel or certified independent service technicians. Call us for details!

General Solenoid Maintenance Guidelines

1. Keep the solenoids as clean as possible.
2. If the taper is used with devices which have excessive mold flash, the solenoids will require cleaning regularly. The frequency is dependent upon how much mold flash gets into the solenoids.
3. NEVER use oil or lubricant of any kind on solenoids.
4. When cleaning solenoids, take care not to put excessive stress on solenoid wiring. Check all wiring for signs of wear, exposed conditions, or broken connections. Replace as needed with identical type of wire: standard or flex, same gauge, insulation, color, etc.
5. When cleaning solenoids, check the plungers to be sure there are no burrs of any kind on their shafts.
6. When mounting #SP75 or #SP62 open frame solenoids, use #40-40 screws. It is very important to not use screws which are too long and may therefore cut into the solenoid's coil. Since the taper is grounded, metal screws touching the coil would create a massive short circuit when the solenoid is turned on.
7. NEVER put a metal washer between the plunger/coil of a #SP75 or #SP62 open frame solenoid and the return spring. This will cause solenoid jams. The washer will be attracted magnetically to the body of the solenoid and will act like a brake on the solenoid plunger.
8. Wherever possible, adjust the solenoid travel/movement to be as short as possible. The solenoid power is exponentially proportional to the solenoid travel.
9. When replacing wiring on solenoids which travel, such as those on door assemblies and shuttles, always use high-flex wire. We recommend 22 AWG 150 strand high-flex wire.
10. Solenoid life is proportional to the handler environment and how often the solenoids are cleaned. We recommend that all solenoids be replaced every two million cycles as part of a good preventive maintenance program.
11. Replace any bent or damaged solenoid return springs with new parts from the EXATRON factory.
12. Refer to the hardware specifications of the Replacement Parts Chapter of this manual for the part numbers of all solenoids and springs in your handler.
13. Use the solenoid diagnostic routine for proper solenoid movement. Please refer to the Diagnostics Chapter of this manual for details.

Air Regulator Maintenance Guidelines

Some EXATRON Changeover Kits use compressed air. If your kit does use compressed air, it will also require an air regulator. A high quality air regulator with coalescing air filter and shutoff valve is supplied as part of your changeover kit. **NEVER operate any EXATRON equipment which requires compressed air without an approved air regulator and shutoff valve.**

Please refer to **FIGURE 6-1** following this section for air regulator mechanical details. Additionally, please refer to the manufacturer's data sheet at the end of this manual if necessary.

The air regulator assembly consists of:

**WILKERSON AIR REGULATOR, PART #NC00-440, AND
COALESCING AIR FILTER, PART #GPA-97-075.**

1. Check the operation of the orange shutoff valve once a month:
Turn the valve OFF and verify that the air is indeed off. Turn the valve back ON.
2. Check the PSI setting:
Some special-case changeover kits may require less than 80 PSI. However, in general, set the air regulator to 80 PSI, +/- 3 PSI.
3. Inspect the moisture trap chamber and the coalescing filter chamber. Verify that they are clean, empty and dry. There should be no oil and no water in either chamber. If they are dirty, physically disconnect the incoming air pressure supply from the air regulator and clean the trap and filter as needed.

If you find it necessary to clean the trap and/or filter more often than once a month, you should correct the problem at your in-house air compressor. Check your manufacturer's manual for the exact procedure necessary.

FIGURE 6-1
PRESSURIZED-AIR REGULATOR

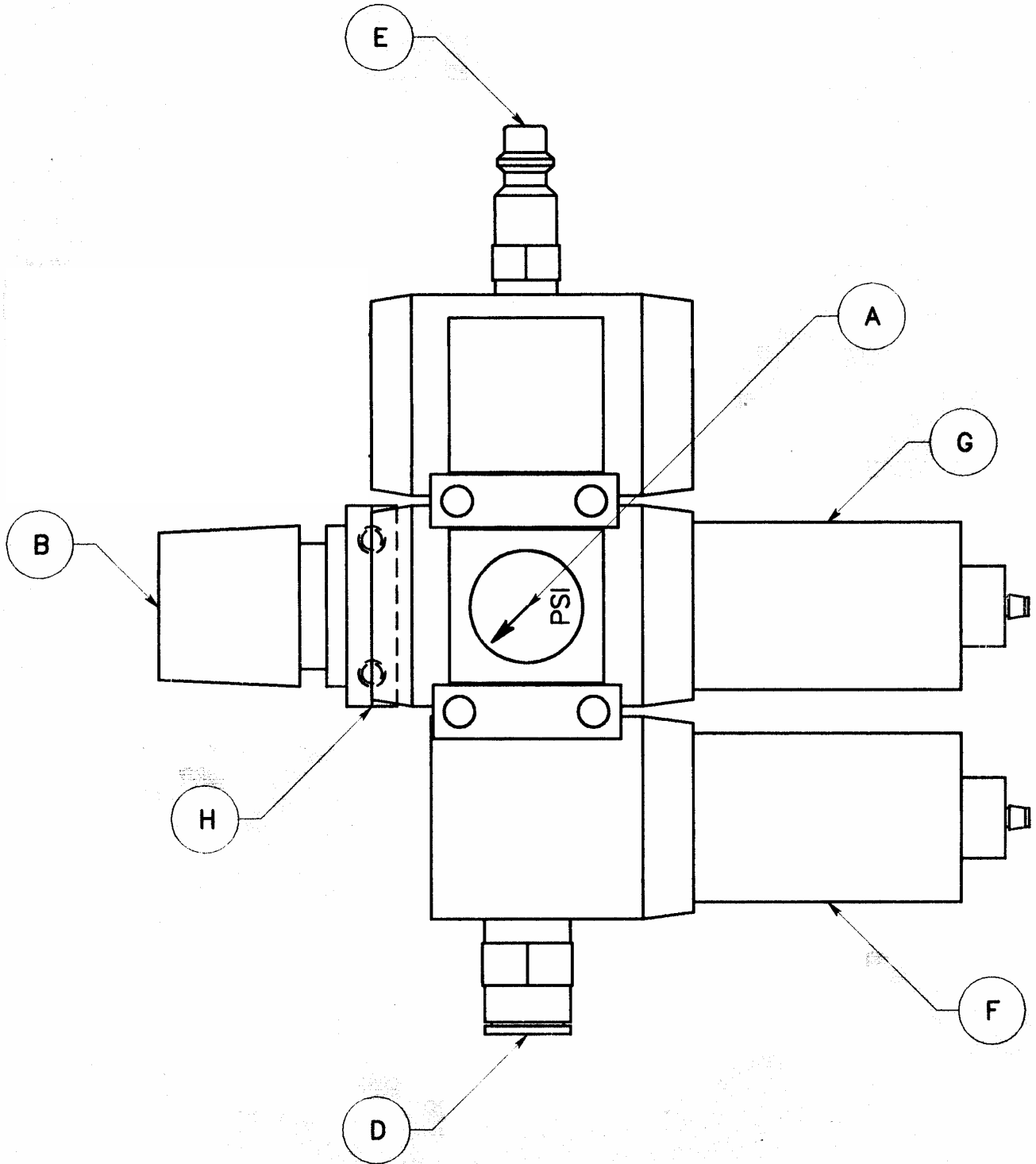
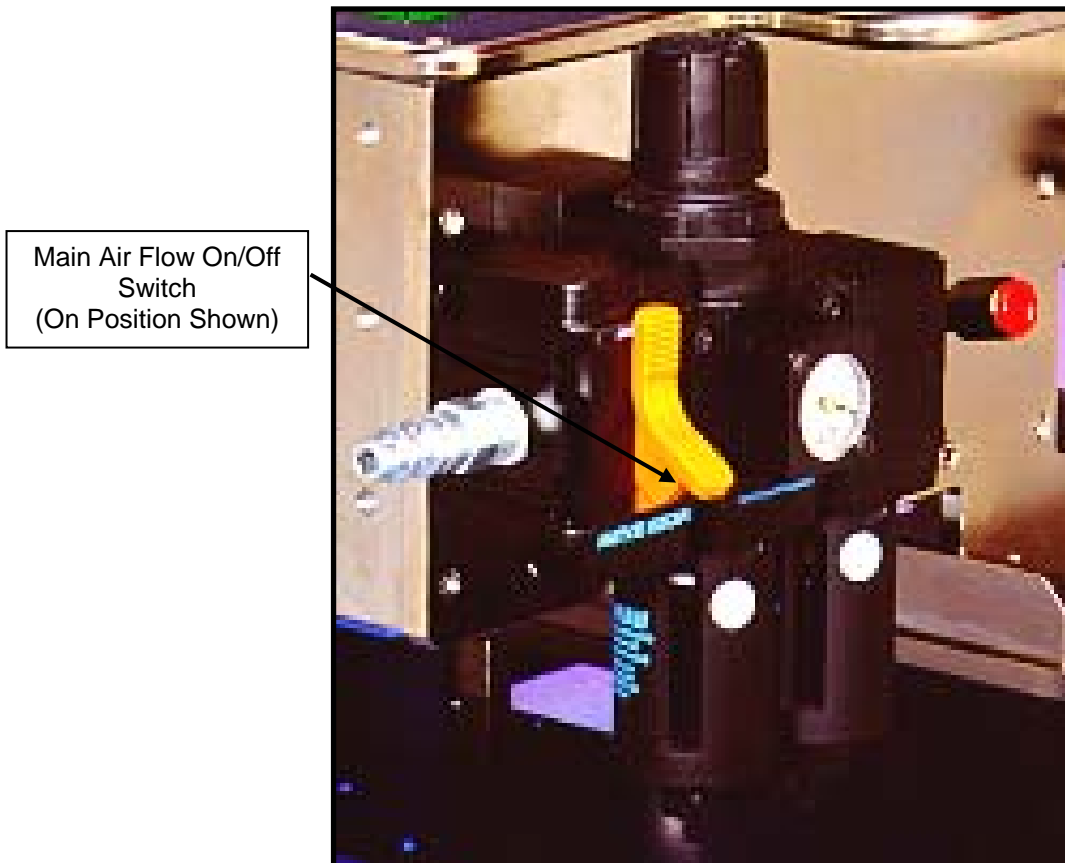


FIGURE 6-1

- A. AIR PRESSURE METER.
- B. AIR PRESSURE ADJUSTMENT.
- C. AIR ON/OFF VALVE. *Orange in color.* Some newer versions will have the orange switch as shown below.



- D. AIR OUTPUT. Connects to taper.
- E. AIR INPUT. Connects to factory air supply. Air regulators from EXATRON are equipped with pneumatic Quick Disconnect part #P341. A mating quick disconnect may be purchased by ordering EXATRON part #D341. If you choose to use a different type of quick disconnect, replace the EXATRON-supplied part as necessary. EXATRON stocks only one type of air regulator quick disconnect.
- F. COALESCING AIR FILTER.
- G. MOISTURE TRAP.
- H. MOUNTING BLOCK.

Vacuum Generator Maintenance Guidelines

Some EXATRON Changeover Kits contain a vacuum generator (a.k.a. "venturi") to create the vacuum used in the operation of the specific kit.

Please refer to **FIGURE 6-2** following this section for vacuum generator assembly mechanical details. Please note that in some cases, the venturi assembly will not include the control valves. Please refer to the manufacturer's data sheet, "PISCO Vacuum Switch," in Chapter 10 of this manual for additional information.

To Order from EXATRON:

PISCO VACUUM GENERATOR ASSEMBLY WITH CONTROL VALVES, PART #VGH10F-1/4-1/4.

PISCO VACUUM GENERATOR ASSEMBLY WITHOUT CONTROL VALVES, PART #VGH10B-1/4-1/4.

REPLACEMENT AIR FILTER, PART #VGFE10.

Inspect the vacuum generator's air filter weekly. The filter should be clean and white. These filters can be cleaned; however, EXATRON highly recommends *replacing* dirty filters with new filters instead. How frequently you need to replace the vacuum generator filter is a function of how clean your environment is and how clean the devices being run are.

REMEMBER: A Dirty Filter = Poor Handler Operation.

DIRTY FILTER



CLEAN FILTER



Figure 6-1: Vacuum Generator Closeup

Checking Vacuum Sensor Adjustment

Check the vacuum sensor adjustment. First, be aware that the vacuum sensor adjustment is a 270° total turn potentiometer. **If you try to turn it more than the 270° allowed, it will break. The vacuum generator is an expensive component and abuse is not covered by the EXATRON warranty.**

To check the vacuum sensor adjustment:

1. Turn on the vacuum using the handler's yellow vacuum override button.

The red indicator LED on the vacuum generator, which is normally off, remains off.

2. Cover the vacuum hole in the handler plunger/apply head with a device.

You will hear a noticeable change in the sound of the vacuum as it intercepts the device, and the red indicator LED should turn on.

3. If the red LED does not turn on, adjust as needed by carefully turning the potentiometer clockwise until the red LED comes on.

If the valves in the vacuum generator assembly become plugged with dirt, you may send the assembly back to EXATRON Customer Service where it will be repaired, if possible, for a fee.

REMEMBER: Damage caused by a dirty air supply is not covered by the EXATRON warranty.

If you are experiencing dirt-clogged vacuum generator valves, check the air regulator. Verify that it is clean and properly installed. Please refer to the Air Regulator Maintenance Guidelines section earlier in this chapter, and as always, contact the EXATRON factory for assistance as needed. Our toll-free telephone number is 1-800-EXA-TRON.

Calibrating Vacuum Generator

The vacuum generator setting is more or less permanent. ***It should rarely, if ever, need to be recalibrated.***

To calibrate the vacuum generator:

1. Power on with no air.

A 1 or 0 should be displayed on the LCD screen.

2. Press the Set button once.

P1 and a vacuum level number should be displayed.

3. Turn the air on, and turn on the vacuum, using either the software or the black vacuum override button.

Note the vacuum level number displayed. This is the setting with no device attached. You want the low limit to be higher than this number, so you need to add to it. A good rule of thumb is to add 7 to the number.

4. Press the green Up arrow-shaped button to increase the number displayed.

For example, if the number 50 displayed, press the up arrow button until the display reads 57.

5. Set the P2 number at 101, the maximum limit.

This number can be as high as the upper limit. Press the up or down arrows to increase or decrease the number displayed.

FIGURE 6-2
VENTURI/VACUUM GENERATOR

VALVE WIRES: RED = +24 VDC
BLACK = GROUND

VAC SENSOR
WIRING:
RED = +24 VDC
WHITE = SENSOR ON/OFF
BLACK = GROUND
GREEN = NOT USED
SHIELD = GROUND

NOTE: MISWIRED VALVE = DEAD VALVE

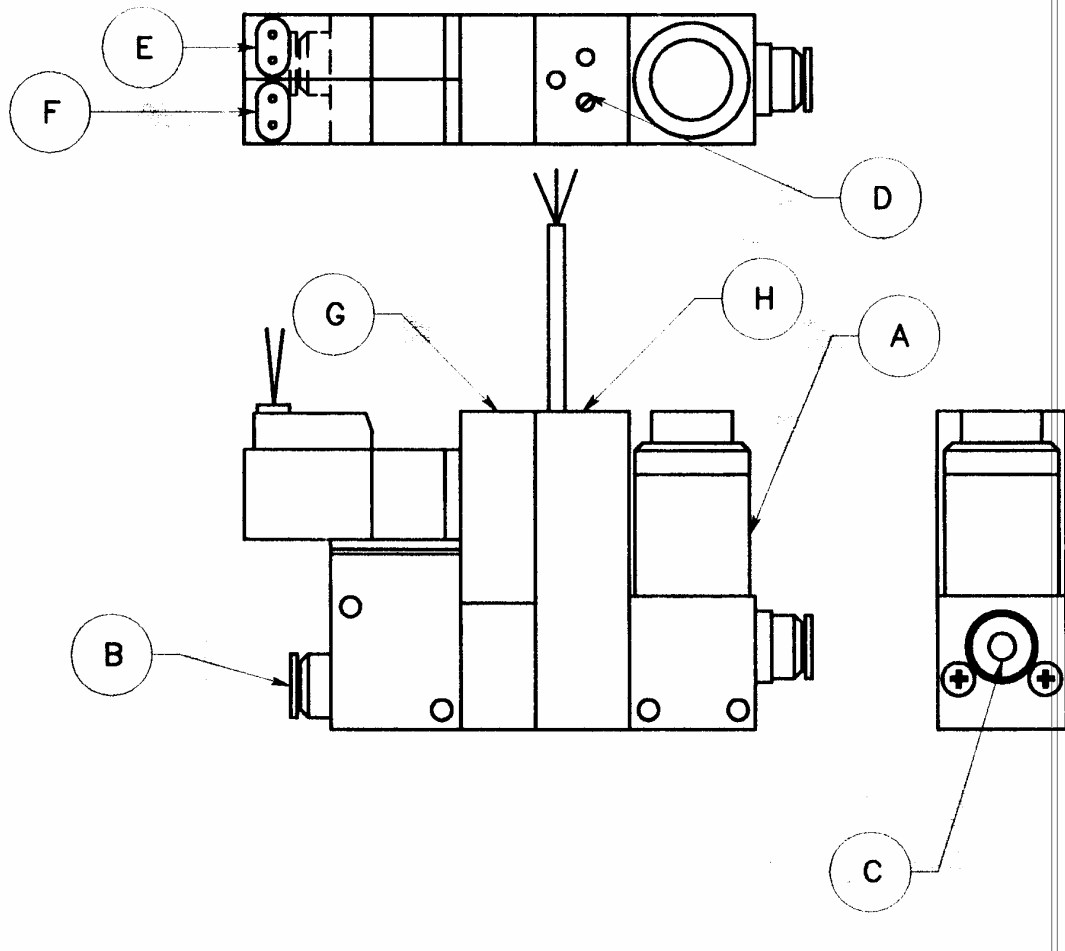


FIGURE 6-2

- A. VACUUM FILTER.
- B. AIR INPUT. *Typically 80 PSI, +/- 3 PSI.*
- C. VACUUM PORT. *Connects to Pick Up/Apply Head.*
- D. VACUUM SENSOR ADJUSTMENT POTENTIOMETER.
- E. VACUUM ON VALVE.
- F. AIR ON VALVE. *Blow-off.*
- G. VENTURI GENERATOR.
- H. VACUUM SWITCH ASSEMBLY.

Quick-Change Drive Wheel Maintenance

PLEASE REFER to drawing #tape-249 for details.

WEEKLY: Inspect the rubber drive belt on the outer surface of the quick-change drive wheel for signs of wear. For maintenance purposes, "weekly" is defined as, "after 40 hours of operation, or more often as needed."

If the drive belt shows worn spots or irregularities, call the EXATRON factory and order a replacement part number A6R6-0810180. This replacement drive belt must be installed onto your drive wheel at our factory. Therefore, schedule your tape loader to be taken out of service for a few days.

Remove the quick-change drive wheel from your system and ship it to EXATRON for replacement drive belt installation:

- Loosen and remove the two Allen screws holding the drive wheel onto the back plate of the tape loader.
- Turn the drive wheel clockwise and slide it off the tape loader.
- Pack the quick-change drive wheel, with a copy of your purchase order for the replacement drive belt, in an appropriate container and ship to:

EXATRON Automatic Test Equipment
2842 Aiello Drive
San Jose, California 95111-2154
Attention: Customer Service Department

CHAPTER 7 Troubleshooting

Setting of Vacuum Sensor for Dual Use.

In certain situations, a single vacuum sensor will control two separate handler areas. This will usually be a "Rail" area and a "Pickup" area. In these cases, the sensor must be set to accommodate both areas. This can be a delicate operation because one area may require much more pressure to perform its assigned task.

The key is to find the mean pressure setting that satisfies both areas. Follow the steps below to set a vacuum sensor for this type of "Dual Use".

1. Find both air openings that are to be monitored by the vacuum sensor.
2. Cover one of the openings with a part that will normally be used with this handler.
3. Hold the part in place and activate the vacuum for that position with the manual over ride button.
4. Check the reading on the pressure sensor. Write this data down in the chart below.
5. Deactivate the vacuum and remove the part from the opening.
6. Activate the vacuum again with the opening unblocked.
7. Again check the reading and write the data down.

Rail

A. Reading with vacuum hole open	C. Reading with part blocking the opening
Example: 20 CmHg	Example 61 CmHg
User's Reading _____	User's Reading _____

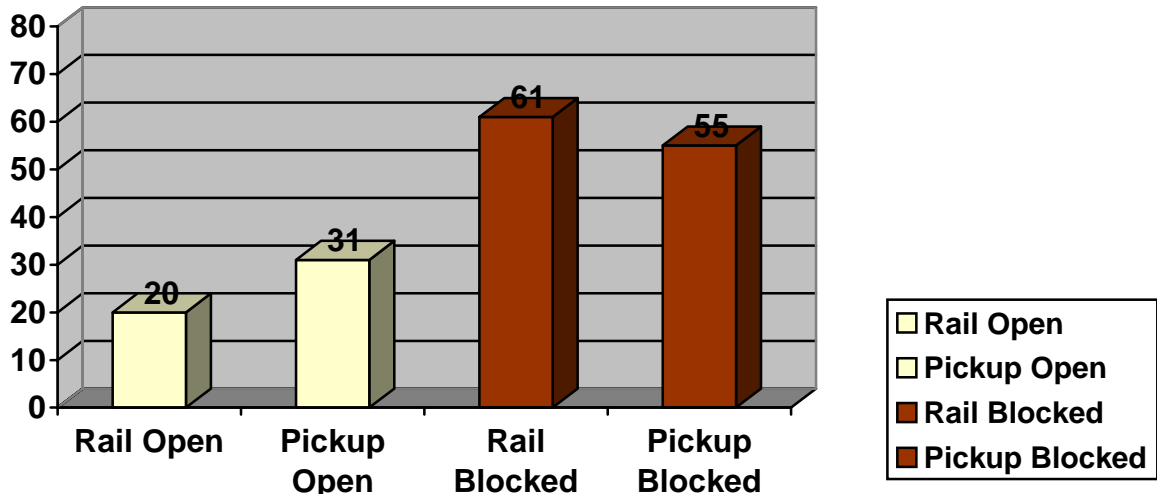
8. Now repeat steps 2-7 for the second area.

Pickup

B. Reading with vacuum hole open	D. Reading with part blocking the opening
Example: 31 CmHg	Example 55 CmHg
User's Reading _____	User's Reading _____

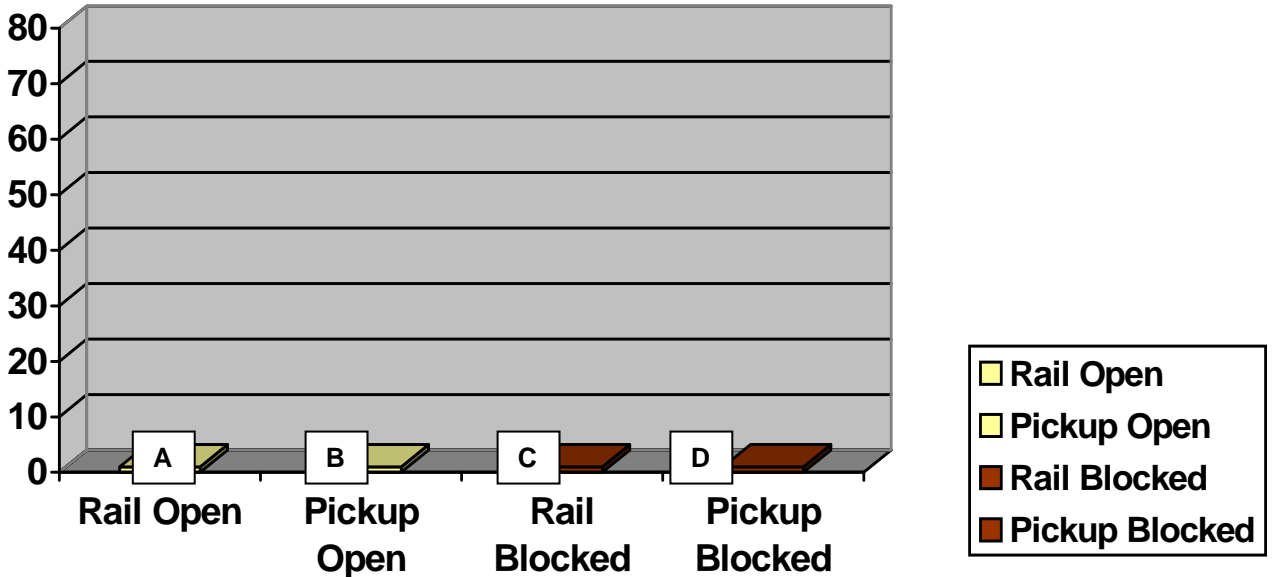
8. Chart all four readings in the graph provided.

Example Graph



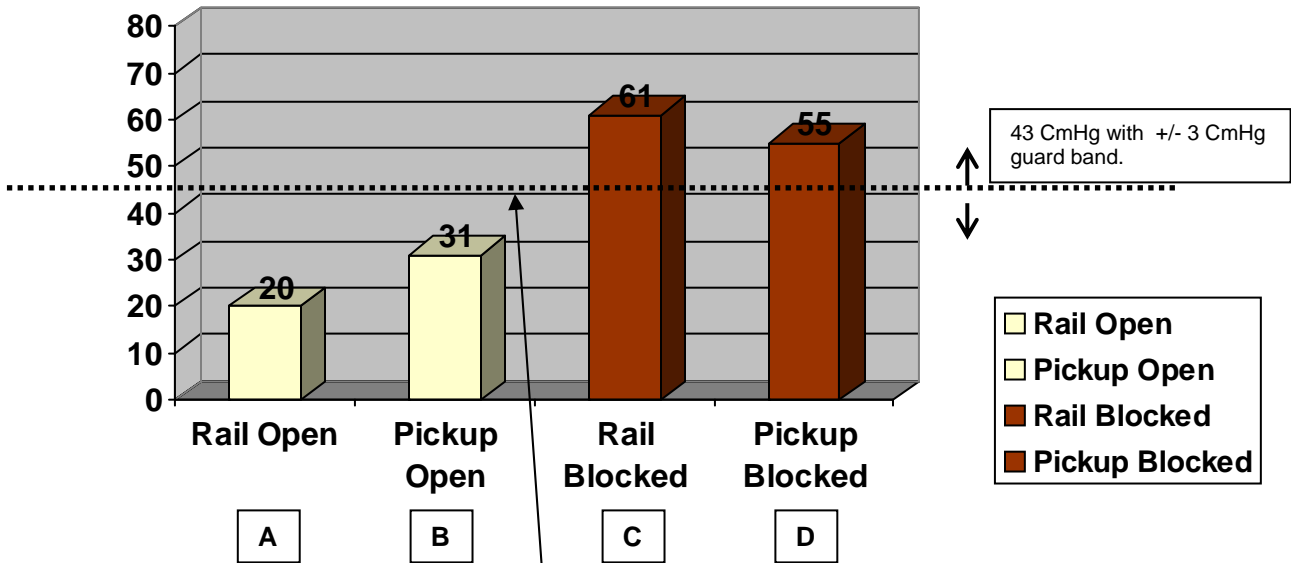
User's Graph

Use this graph to plot your readings



Write in results here and plot on graph.

9. Find the **highest** value of the two "Open" readings.
10. Find the **lowest** value of the two "Blocked" readings.
11. Find the average of these two readings. See the example below.



Calculate Average: $(31 + 55) / 2 = 43$ CmHg

This is the best setting for the Omron vacuum sensor. Make sure there is a guard band of at least +/- 3.

The graph should show this guard band readily. The arrows in the "Pickup Open" column and "Pickup Blocked" column represent this guard band for our example.

If the sensor can not be set because there is no guard band, do the following.

1. Check for pinched airlines.
2. Check for adequate air source
3. Check installation of seals and O-rings.
4. For dirty and/or bad air filters.

Now regraph the pressure readings and see if a value with enough guard band can be found.

If all else fails call Exatron at 1-800-EXA-TRON.

CHAPTER 8**Drawings****DRAWINGS - Table of Contents*****General:***

TAPE-303-1-B	1020 TAPE MACHINE ASSEMBLY
TAPE-303-2-A	1020 SIDE VIEW
TAPE-303-3-A	1020 TAPE MACHINE ASSEMBLY

Mechanical:

TAPE-190-B	CYLINDER ASSEMBLIES
TAPE-191-3-A	SEAL HEAD ASSEMBLY
TAPE-203-A	ADJUST SCREW ASSEMBLY
TAPE-211-E	PRESSURE ROLLER ASSEMBLY
TAPE-221-A	TAKE UP MOTOR ASSEMBLY
TAPE-253-A	CARRIER TAPE PATH DETAIL
TAPE-254-A	TAPE AIR CIRCUIT
TAPE-362-B	1050 SWING HEAD ASSEMBLY
TAPE-368-B	1020 SIDE WIDE
TAPE-419-B	COVER TAPE GUIDE BLOCK TOOLING

Electrical:

3000-055-C	8085A CPU, ASSEMBLY
3000-055-C3	8085A-CPU, SCHEMATIC
3000-202-B	CARD CAGE BUS PCB, SCHEMATIC
3000-202-3-A	CARD CAGE BUS PCB, ASSEMBLY
3000-223-B	3000B I/O PORT PCB, ASSEMBLY
3000-223-2-B1	3000B I/O PORT PCB, SCHEMATIC
5000-397-3-B1	QUAD STEPPER DRIVER PCB, ASSEMBLY
5000-397-2-B	QUAD STEPPER DRIVER PCB, SCHEMATIC
5000-398-3-B1	TEST SITE DRIVER PCB, ASSEMBLY

Electrical: (Cont.)

5000-398-2-B	TEST SITE DRIVER PCB, SCHEMATIC
5000-A89-C-3	3000B FRONT PANEL PCB, ASSEMBLY
5000-A89-C2	3000B FRONT PANEL PCB, SCHEMATIC
5000-A89-8-A	1020/50 TEMP ALARM WIRING
5000-M08-27-A1	TEST SITE DRIVER CABLE
5000-M15-A	FRONT PANEL CABLE
5000-M22-A2	MOTOR DRIVER CABLE
5000-M42-1-A1	CABLE TERMINATION PCB
TAPE-204-4-A	1020/50 TAPE SWITCH PCB ASSEMBLY
TAPE-247-C	1020/50 POWER SUPPLY WIRING
TAPE-247-1-E	1020/1050/1080 INTERNAL AC WIRING
TAPE-255-B	1020/1050 CARD CAGE WIRING
TAPE-256-C	1020 INPUT POWER WIRING
TAPE-257-1-C	1020/50 SEALING HEAD HEATER WIRING
TAPE-258-A	1020/50 TAKE UP MOTOR WIRING
TAPE-259-D1	1020/50 SENSOR/VALVE WIRING
TAPE-262-B	1020/50 DRIVE MOTOR ASSEMBLY
TAPE-264-C	5000/1020 FOOT SWITCH OPTION
TAPE-327-2-C	1020 OCTOLOADER WIRING
TAPE-328-B	1020 CONTROL – OCTO – SWING HEAD CABLE
TAPE-329-B	1020 INTERNAL DRIVER CABLE
TAPE-389-D	1020/50 SWING HEAD WIRING
TAPE-390-B	1020/50 TAPE I/O PORT PCB, SCHEMATIC
TAPE-421-A	1020 OCTO PLATE CABLE