CONAIR
www.conairnet.com

USERGUIDE
IMB-090-94

Self-Contained Vacuum Loader

Dustbeater (12” Dia.)
Microline (8” Dia.)

⚠ **WARNING - Reliance on this Manual Could Result in Severe Bodily Injury or Death!**

This manual is out-of-date and is provided only for its technical information, data and capacities. Portions of this manual detailing procedures or precautions in the operation, inspection, maintenance and repair of the product forming the subject matter of this manual may be inadequate, inaccurate, and/or incomplete and cannot be used, followed, or relied upon. Contact Conair at info@conairgroup.com or 1-800-654-6661 for more current information, warnings, and materials about more recent product manuals containing warnings, information, precautions, and procedures that may be more adequate than those contained in this out-of-date manual.

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SELF-CONTAINED MATERIAL LOADERS

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DESCRIPTION

Conair Franklin Modular Self-Contained Material Loaders are designed to provide consistent, trouble free pellet and regrind loading performance plus allow changes to be made that permit optional functions. The basic loader may be configured for the following applications through the use of add-on "Kits" which may be installed by the user, or included as part of the original purchase.

- Single Tube (one material loading)
- Ratio (two materials; usually virgin and regrind)
- Flange mounted control
- Remote Control (control located 10 ft, 15 ft (standard), or 20 ft away from the loader)
- Standard "Blowback" (automatic filter cleaning action)
- "Accumulator" Blowback (enhanced, automatic filter cleaning)
- Fill Sensor
- Air Operated (Positive) Discharge (12" DustBeaters Only)
- Material Line Purge

This manual will cover the operation of both the "MicroLine" (8" diameter, .14 cu ft hopper), and the "DustBeater" (12" diameter, .5 cu ft hopper) model loaders, along with all standard, modular options that could be a part of your loader; as delivered, or retrofittable in your plant.

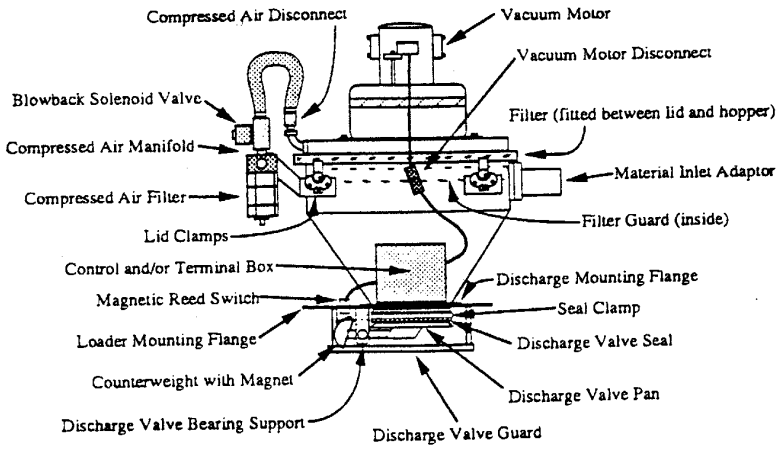


FIGURE 1
DUSTBEATER

SECTION

1

DESCRIPTION

BASIC LOADER OPERATION

Self-Contained Material Loaders provide self-contained vacuum power for the transfer of pelletized or reground materials from bins, barrels, or gaylord boxes that are in fairly close proximity to the loader location. (See Figure Two)

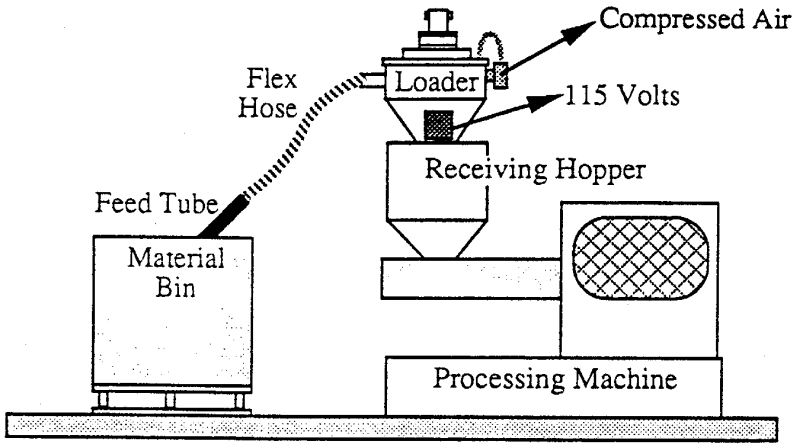


FIGURE 2

BASIC LOADER SET-UP

DESCRIPTION

SINGLE TUBE LOADER OPERATION

The loader draws the material from a "pick-up tube" or "wand", through flexible tubing, into its material hopper by the vacuum suction created by a motor/fan assembly mounted on the lid of the loader. As the material enters the hopper, it is separated from the vacuum conveying air by a cloth filter that covers the inlet of the vacuum motor. The filter prevents damage to the vacuum motor by material and prevents dust or fines from being discharged out into the air through the vacuum motor's air discharge vents.

TIME FILL OPERATION

A timer, settable by the user, adjusts the amount of "vacuum-on" time for the vacuum motor (See Figure Three). At the conclusion of the vacuum cycle, the vacuum motor turns off and the loaded material drops by gravity from the base of the loader hopper, through a "discharge valve", hinged to open by the weight of the material. Shortly after the vacuum cycle is terminated, a pulsed flow of compressed air is directed through the loader's filter to clean off the collected fines or material left from the vacuum loading cycle. This "blowback" sequence is preset at the factory for approximately 7, short duration blasts of air. The loader is designed to load, dump, blowback, and repeat the cycle as long as is required.

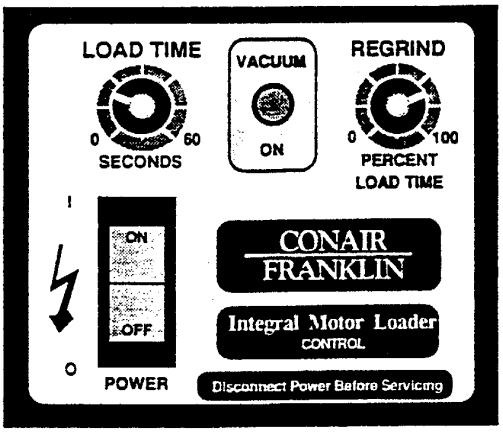


FIGURE 3

Loader Control Panel

SECTION

1

DESCRIPTION

As material is gravity dumped from the loader hopper, through the discharge valve, into whatever vessel is being filled by the loader, the loader monitors the level of material in the receiving vessel by the discharge valve position. When the discharge valve is held open by the full condition of the receiving hopper below the loader, a "level switch", built into the discharge valve, concludes that no more material is required (since the receiving vessel below the loader is full) disables the loader and sits in a "Bin Full State". As the material level of the vessel beneath the loader drops, material falls away from the discharge valve and level switch, allowing the discharge valve to close by its own counterweight, closing the "demand" level switch and allowing the loader to restart loading.

VOLUME FILL LOADER OPERATION
(Enhanced Control Only)

"Volume Fill" Loaders employ a solid state proximity sensor in the loader body that terminates the vacuum cycle when the sensor becomes covered with the material being loaded. The vacuum on timer in a volume fill loader is used to set a "maximum vacuum on-time" for the loader, in the event the sensor never "sees" material due to a conveying hose blockage, lack of material, etc..

Volume Fill operation enhances motor and brush life by providing more efficient motor on/off cycles.

DESCRIPTION

RATIO LOADER OPERATION

A Ratio Loader, designed to load two materials, usually virgin and regrind, operates identically to a Single Tube Loader as described above, with the following variation:

As the vacuum, created by the vacuum motor, draws material into the loader hopper, the material passes through a "Ratio Mixing Valve", installed on the inlet of the hopper. The valve consists of two material inlet tubes with a common outlet so that two materials may be individually selected by the control, and mixed together in the loader hopper as they are sequentially loaded. (See Figure 4)

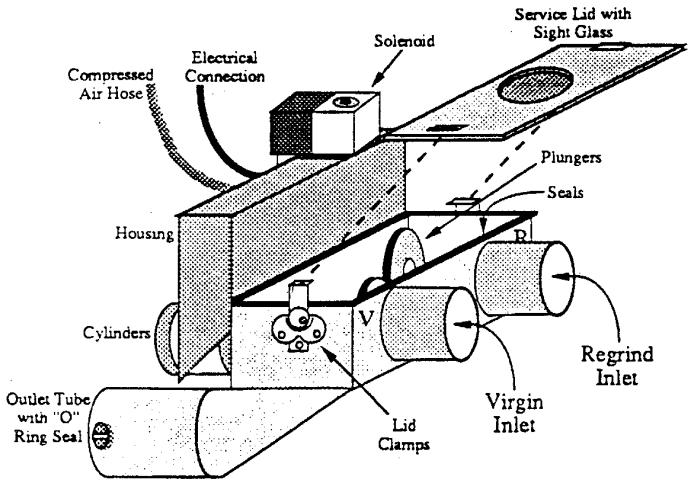


FIGURE 4

Ratio Mixing Valve

SECTION

1

DESCRIPTION

The percentage of each material is selectable by the user with a "regrind percent" knob on the face of the loader control (See figure 3). Also, the number of times that each material is selected to be loaded into the hopper with each vacuum-on cycle is selectable via a small rotary adjustment within the control (See Figure 5 for "Standard Control; See Figure 6 for "Enhanced" Control).

FIGURE 5

"Standard" Loader Control (Inside)

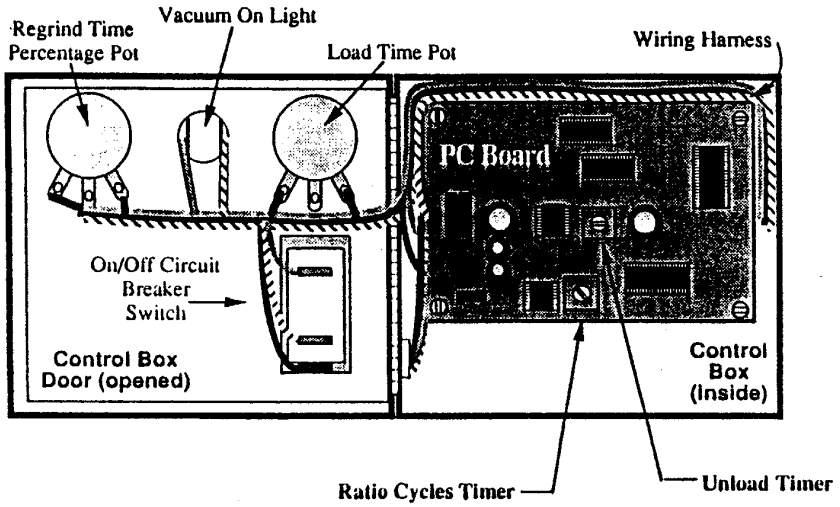
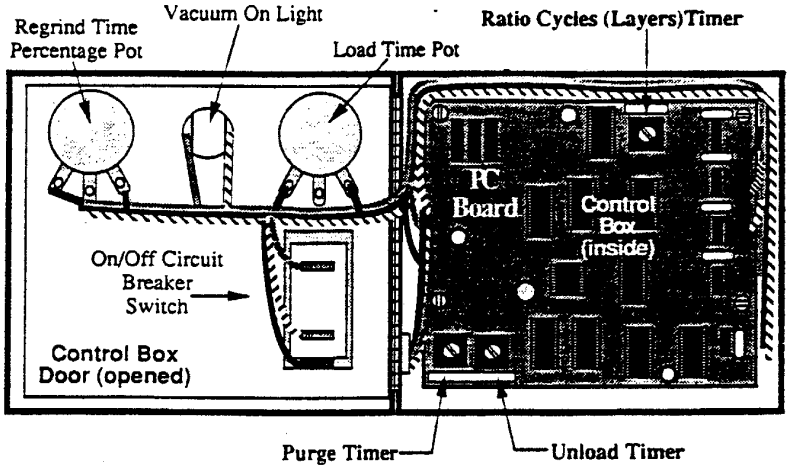
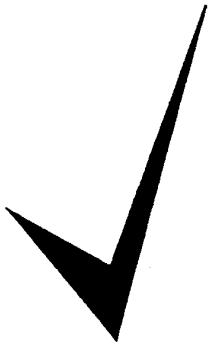


FIGURE 6

"Enhanced" Loader Control (Inside)



SPECIAL LOADERS



Conair Franklin manufactures a wide variety of loading products including an extensive line of Self-Contained Material Loaders. This instruction manual details the basic features and operation of the standard line of modular MicroLine and DustBeater Loaders. Your particular model of loader may be a variation on one of Conair's basic designs and include some features not covered in this manual.

Conair Franklin attempts to fully document, and supply to our customers, information detailing special functions and or features of Special Loaders. Usually, these special details are documented in engineering prints that accompany the loader, and these prints should always be referred to in lieu of this instruction manual.

SECTION

3

INSTALLATION

Both the MicroLine and standard DustBeater Loaders are designed to be fitted through the top of a vessel that will be receiving the material being loaded. The loader is usually bolted down to prevent mechanical vibration from disturbing the operation or position of the loader. 'In many cases, the vessel is a Conair product already including the proper hole and clamping method, but if the vessel needs to be prepared to receive the loader, the following guidelines will help in pre-drilling the vessel lid:

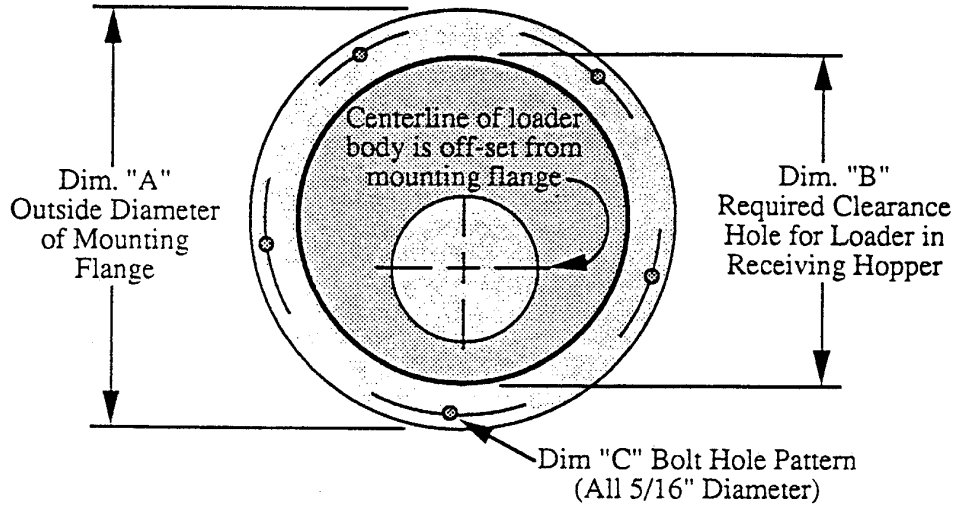


FIGURE 7

Mounting Pattern for Standard Loaders

Reference Dimension	Microline Loader (8" Dia)	DustBeater Loader (12" Dia.)
A	8 1/4"	14"
B	6 1/2"	12 1/8"
C	7 3/8" (4 holes)	13" (6 holes)

INSTALLATION

STANDARD LOADER INSTALLATION GUIDELINES:

Before mounting the loader, be sure that there is no obstruction above or below the loader that could inhibit operation.

Check the following:

Installation considerations above the loader:

1. Is the loader serviceable? Can the lid be removed easily to service the filter?

2. Is the loader positioned with the best path for the material tubing?

3. Is the control box in view of the operator (flange mounted controls)

4. Are electrical and compressed air utilities available?

Installation considerations below the loader:

1. Is there sufficient clearance below the loader for the dump valve to fully open?

2. Does the dump valve strike or rub any interior component or surface of the receiving vessel?

3. Is the surface of the receiving vessel substantial enough to hold the loader?

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3

INSTALLATION

Many vessels have pre-sized loader openings that may interfere with the protective guard that is installed below the mounting flange of the loader (See Figure 1, Page 1). If you experience difficulty in installing the loader into a hopper opening due to lack of clearance between the protective guard of the loader and any mounting adaptor or hopper liner, **the guard of the loader may be removed to allow for proper clearance.** The guard is supplied only to provide under-flange protection for the loader when it is removed from the receiving vessel, so the guard may be discarded to accommodate installation.

POSITIVE DISCHARGE LOADER INSTALLATION

The DustBeater model loader (only) has the ability to be equipped with a "Positive Discharge" valve on its base in lieu of the standard gravity discharge valve shown in Figure 1. A positive discharge is a pneumatically driven dump valve that provides positive opening and closing of the loader base for more effective loading and dumping of material. In most respects, a positive discharge loader has the same dimensions and may be installed using the same installation guidelines described earlier for standard loaders. Care should be taken to allow for two additional considerations:

1. When sizing up the receiving vessel for the loader, make clearance allowances for the protruding rotating level switch that is included as standard on positive discharge models (since the dump valve is pneumatically driven opened and closed, no magnetic reed switch, which acts upon the gravity motion of the standard dump valve, is included). The paddle for this extended switch is usually shipped loose with the loader.

2. The paddle for the rotating level switch must be installed onto the shaft of the switch motor, prior to operation. It is generally best to nearly complete your loader installation before installing the paddle onto its mating shaft, which extends from the loader's mounting flange. A simple cotter pin (included) is all that is required for installation of the paddle.

INSTALLATION

DIRECT FEED LOADER INSTALLATION

The DustBeater model loader (only) has the ability to be equipped with a "Direct Feed" mounting base to allow loading to be performed directly to an air-tight material destination, like the throat of an injection molding machine (See Figure 8). Usually the flat bottom plate of a Direct Feed Loader is blind, so that it may be drilled to fit the throat of the processing machine. The following installation guidelines should be strictly followed to assure successful operation of a Direct Feed Loader:

1. The surface that the loader is to be mounted upon must be completely flat and provide an airtight seal, to allow the loader to develop the vacuum required to load. Liquid coloring orifices, metering feeders, conventional drawer magnets, slide away drain ports, etc...may not be included since they are likely to leak air, preventing a good seal.

2. A gasket as included with the loader that is designed to seal the mating surfaces against air leakage. It must be custom punched to the hole pattern along with the loader base plate. Install the gasket carefully to avoid distortion or leakage.

3. If your installation requires the use of an adapter plate to mate the direct feed loader to the throat, be sure that another gasket is provided to further prevent air leaks.

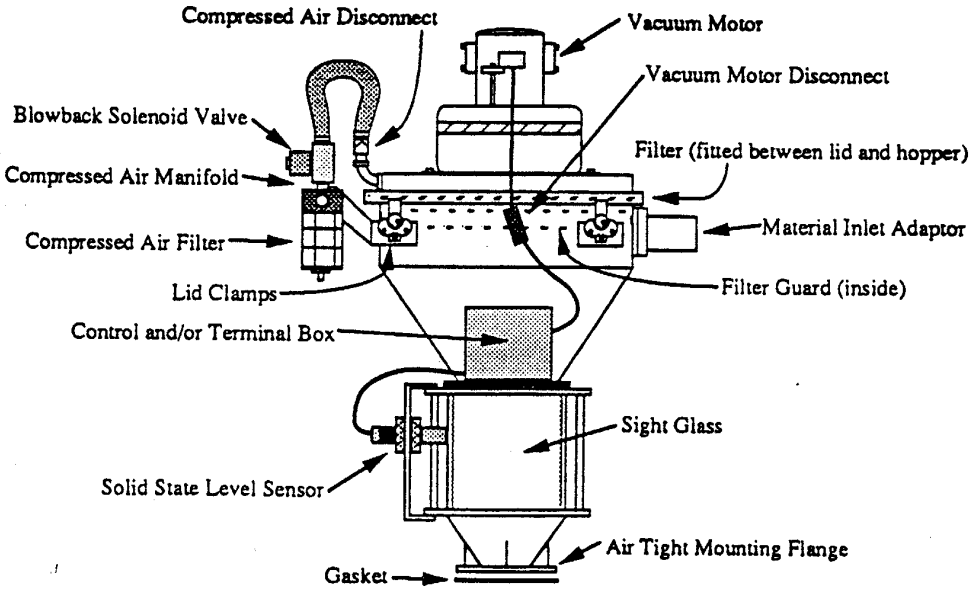


FIGURE 8

Direct Feed Loader

INSTALLATION

COMPRESSED AIR INSTALLATION

Once the loader is mounted, it must be supplied with compressed air. The compressed air line must be plumbed to the inlet of the compressed air filter, installed on the loader to trap contaminants and moisture. A 3/8" NPT pipe connection is recommended to allow maximum air flow and volume for filter cleaning.

An "Accumulator" may be included on the compressed air manifold to help the blowback function clean the filter. The accumulator further compresses the air supply so that when the solenoid opens to allow air to blast the filter clean, the air is supplemented with an additional accumulation of compressed air power. The accumulator may also be field installed on an existing loader as shown in Figure 9, if an accumulator retrofit kit is ordered.

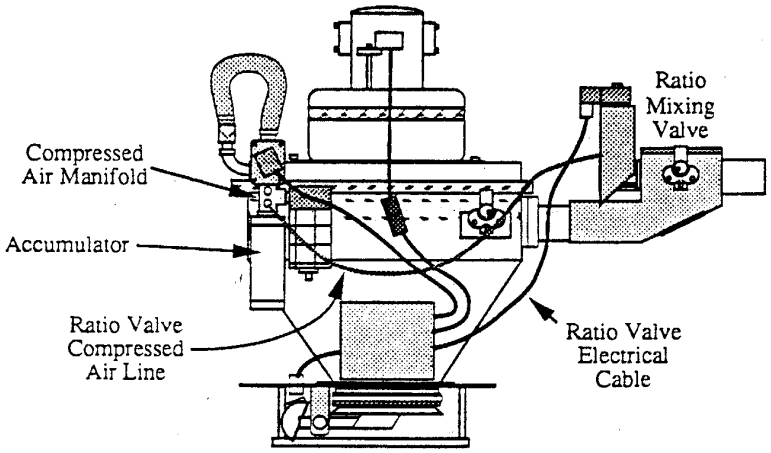


FIGURE 9

Loader with Blowback Accumulator

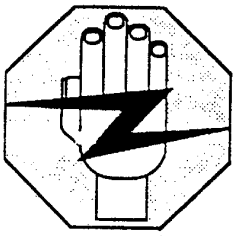
Two additional 1/8" NPT outlets are provided on the manifold tee/filter/solenoid assembly. These ports are used to supply air to a ratio valve or air discharge valve assembly. If not used, these ports are plugged.

SECTION

3

INSTALLATION

ELECTRICAL INSTALLATION



CAUTION!

When installing the electrical portion of your Modular Self-Contained Material Loader system, all wiring, connections, disconnects, and fusing should be installed in accordance with the National Electrical Code and all civil, industrial and local electrical codes applicable to your area.

115 VOLT LOADERS

115 Volt Loaders are equipped with power cords and plugs that may be simply plugged in for use. Lock Out Protection is provided on the power cord plug of 115 volt models so that the loader may be locked out against inadvertent energizing while under a maintenance or serviceman's care.

220 VOLT LOADERS

220 Volt loaders operate in a similar manner to 115 volt models, but are provided with a 220 volt vacuum motor and a 220 to 115 volt control transformer box that provides power for the entire loader. The control and power components of the loader may be shipped to you installed and pre-wired or loose. The following details the 220 volt loader assembly:

INSTALLATION

The loader power supply (See Figure 10) is installed on the loader flange with the included hardware, adjacent to the Universal Terminal Box. This box provides incoming power to the loader and should be used to turn the loader on and off for maintenance, repair, etc... Three connections are made at the power supply to allow it to control the loader:

1. The loader control (115 volts) is plugged into the grounded receptacle on the power supply. This provides power to the loader's control circuits.

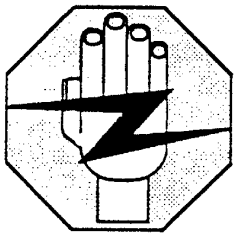
2. The vacuum motor of the loader (220 volts) is wired into the power supply through the hole labeled "Vacuum Motor". This connection supplies 220 volts to the motor upon a signal from the loader control.

3. A cable connects the loader's terminal box (115 volt "Vacuum On" signal) to the power supply through the hole labeled "LDR TERM BOX". This signal allows the load signal from the control system to trigger the 220 volt vacuum motor, through the power supply box.

Once installed as detailed above, a 220 volt loader will operate in exactly the same fashion as a 115 volt model, as described in this manual, with the following exceptions:

1. The power connection to a 220 volt model is supplied as a plugless cable. Responsibility for the input power connection belongs to the user and the user should use caution in selecting the appropriate plug, receptacle, or other power connection device. Use of a lock-out/tag-out device on the power connection is recommended and should be included for safety when servicing the loader.

2. The control circuits of the loader are 115 volts, but the vacuum motor itself is 220 volts. Refer to the proper parts description, wiring diagrams, etc.. when providing service to the loader.



3. All control functions of the loader may be performed through the loader control as described in this manual, but for power disconnection to the loader *including the motor*, **the power supply** must be disconnected to guard against harmful electrical shock.

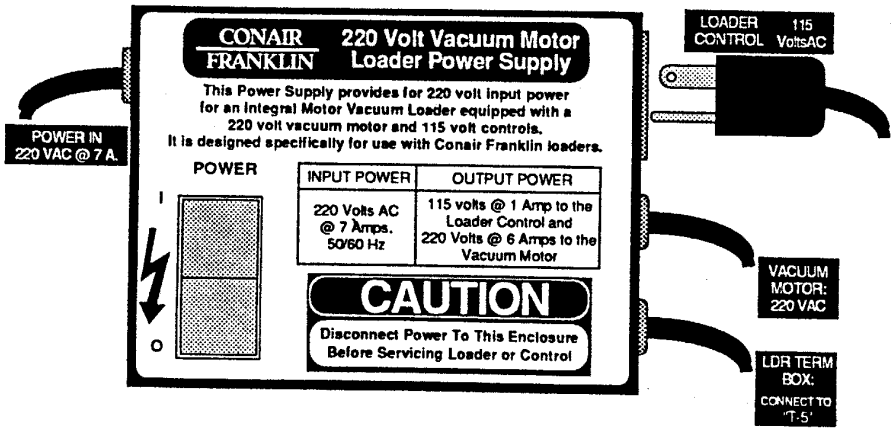


FIGURE 10

220 Volt Loader Power Supply

INSTALLATION

AMPERAGE REQUIREMENTS FOR LOADERS

The following amperage is required for each model:

MicroLine Loader:

MOTOR:	5/8 HP
@ 115 Volts	8 Amps
@ 220 Volts	4 Amps

DustBeater Loader:

MOTOR:	7/8 HP
@ 115 Volts	10 Amps
@ 220 Volts	5 Amps

THE UNIVERSAL TERMINAL BOX

Your Conair Loader is equipped with a "Universal Terminal Box" which extends the capabilities of your loader investment through compatibility with a wide variety of options. Figure 11 on the next page shows the internal layout of the "UTB" with its PC board and input/output connection points. Options that were ordered with the original loader will already be connected to the "UTB" and options that you may wish to add after initial purchase are easily connected according to the input/output labels included on the PC board.

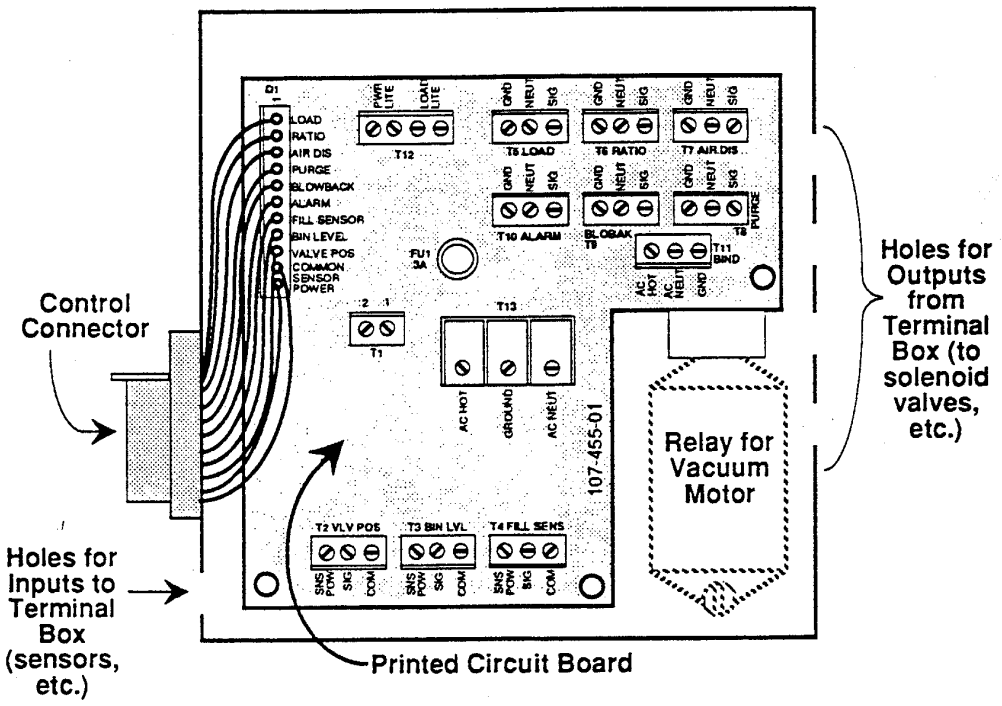


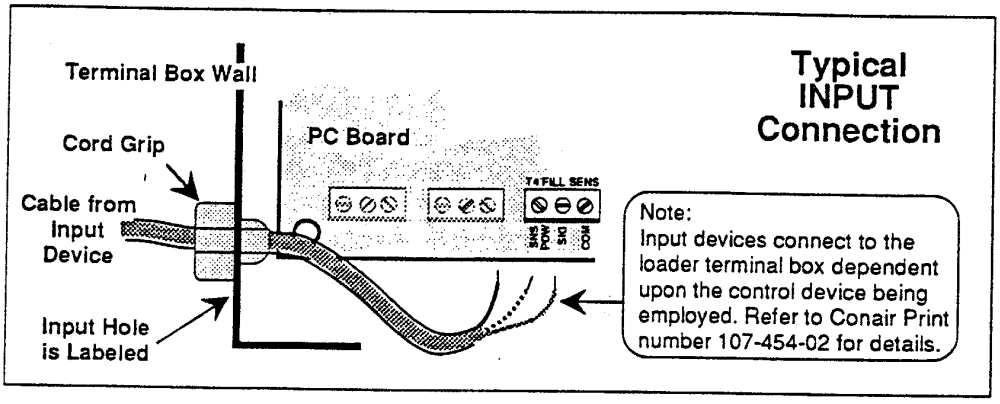
FIGURE 11

Universal Terminal Box (UTB)

CONNECTING OPTIONS TO THE UNIVERSAL TERMINAL BOX

Figure 12 details actual cable connections into the Universal Terminal Box through access ports that are clearly labeled on the outsides of the UTB. Input cables are connected to the left side and outputs are connected to the right. The holes are covered over by the label that identifies their function and the label may be cut with a knife to expose the hole. Take care not to cut any wires within the control as holes are being cut in the label. User proper strain relief connectors to hold the cables in place and terminate the cables into the appropriate terminal strip. Inputs may be terminated per the instructions listed on Conair Prints:
#107-454-02 and 107-454-02-01 for standard control
#107-454-02 and 107-454-02-02 for enhanced control
Input/output function by color code is shown on these prints. (Input configurations vary per the control package being employed and print #107-454-02 details these variations.) Outputs may be connected according to the function descriptions listed on the PC board within the UTB.

INSTALLATION



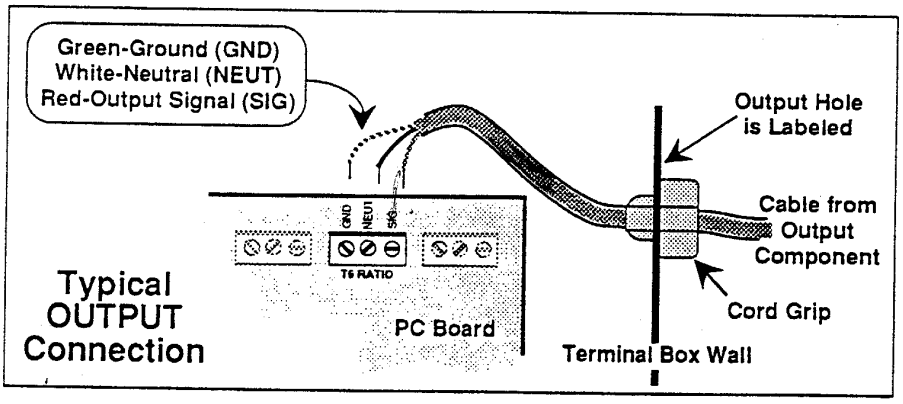


FIGURE 12

Input/Output Connections for the UTB

NOTE: The Universal Terminal Box allows for the connection of any standard option to any Conair loader, but the control being employed to operate that loader must be equipped with the appropriate input/output capability for that loader to operate properly. Check "Standard and Enhanced Controls", Page 29 for control capability details, or contact Conair Franklin for clarification prior to attempting to install an optional function onto the loader.

INSTALLATION

REMOTING THE CONTROL BOX

If your loader is equipped with a control panel mounted directly to the loader mounting flange (on the face of the terminal box), it may be remoted to more convenient location with the use of a Remote Control Cable. (See Figure 13).

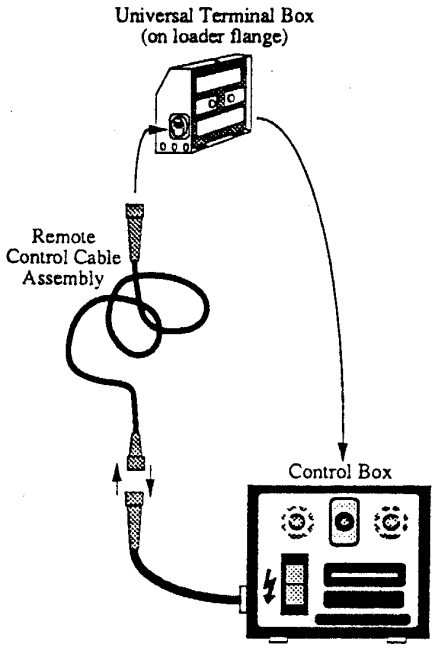


FIGURE 13

Remote Control Cable

The remote control cable (available in different lengths) provides an extension to the short cable between the control box and the Universal Terminal Box of your Conair loader.

To remote your control: Disconnect and lock-out power

1. Unplug the cable between the control and the terminal box.

2. Remove the outside small screw from the top of the terminal box that secures the control to the terminal box. Tilt the control box out from the top and lift the lower tabs out of the terminal box. The control is now free to be moved from the loader.

INSTALLATION

3. Loosen the four flat headed "positioning screws" on the back of the control box (See Figure 14) and slide each mounting outward so that the bottom tabs no longer protrude from the bottom of the control. As you slide the ears outward, they will provide mounting holes for fastening the control to a wall or other vertical surface. Tighten the positioning screws in their new position.

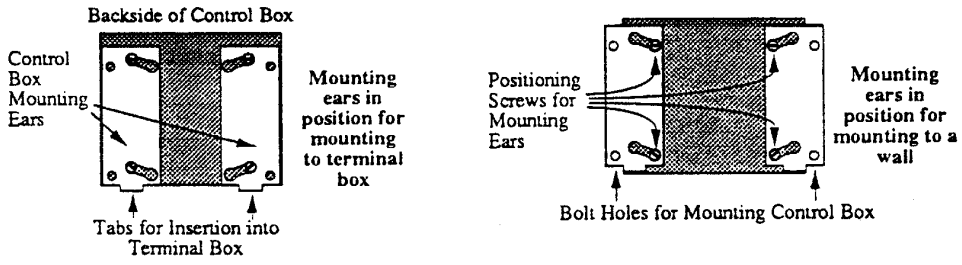


FIGURE 14

Control Mounting Ears

4. Locate the control on a vibration fee surface, within the length of the remote control cable and mount it using appropriate screws (1/4" diameter - maximum) installed through the holes in the mounting ears. Be sure that when your installation is complete, the cable between the control and the loader terminal box may be routed away from moving and/or hot surfaces that could damage the cable.

5. Connect the remote control cable between the control and the terminal box. Reconnect to power and test for full functionality.

NOTE: If it is desirable to relocate a remote control box to the flange of the loader, the above procedure may be reversed to mount the control on the terminal box and eliminate the use of the remote control cable.

INSTALLATION

MATERIAL LINE INSTALLATION

The Self-Contained Material Loader generates its own vacuum power to suck material into its vacuum hopper. The material is delivered to the vacuum hopper by flexible hose which is connected to a "Feed Tube" or "Wand". This feeding device is used to introduce material into the negative flow of air, "feed tube" or "wand".

Flexible material conveying hose is shipped with the loader to allow typical "Beside-the-Press" transfer of material from bins, bags or gaylords, to the loader, which may be mounted on an injection press, bin, or extruder (See Figure 2). The hose should be connected to the inlet of the loader, (or ratio mixing valve) and secured with a hose clamp (included with the hose). The hose should be cut to the appropriate length to allow a comfortable path between the loader and the material source and allow for typical movement. The material end of the hose should be clamped to the feed tube in a similar fashion (on the end with a series of holes) and the feed tube must be inserted deeply into the supply of material (See Figure 15).

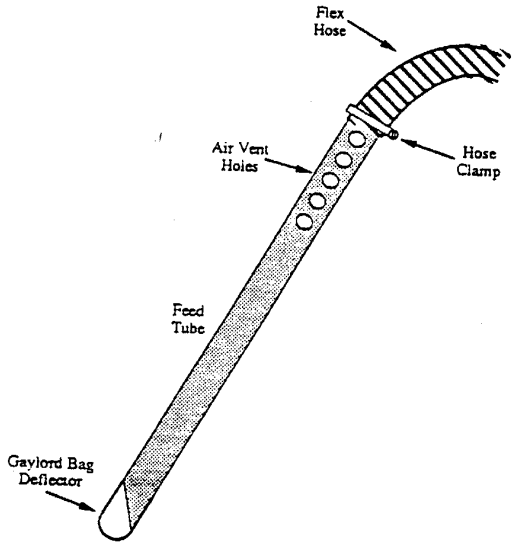


FIGURE 15

Vertical Feed Tube

SECTION

3

INSTALLATION

For Ratio Loaders, two material lines are required, one to each inlet of the ratio mixing valve. The valve is marked for Virgin and Regrind inlets with a "V" and "R". These inlets correspond to the loader control's output signals for proper proportioning of virgin and regrind materials. (See Figure 4).

In many cases, it may be desirable to substitute the "vertical" feed tube(s) included as standard with the loader, with an alternate model for pick-up from a granulator or a special device. In these cases, the flexible tubing may be clamped to the alternate device in a similar fashion. Be sure to make allowances for "Air-to-Material" adjustments to be accomplished when installing the tube, if these adjustments affect the installation of the tubing. Alternate material feed devices, like Distribution Boxes and horizontal bin tubes are available through the Conair Parts Department (Refer to inside back cover.)

PURGE VALVE INSTALLATION

For installations utilizing material line purging, the material tubing will be connected to a "Purge Valve" installed on the material pick-up tube. See "Material Line Purge Valve Operation" on page 30 for further details.

OPERATION

SETTING THE LOADER FOR OPERATION

The proper operation of an Self-Contained Material Loader depends upon proper settings by the user of the following parameters:

1. Optimum feed tube setting of the "Air-to-Material Ratio".

2. Optimum load time or "Vacuum-On" time setting.

3. Proper Regrind settings (Ratio Models Only)

4. Proper Unload, or "Vacuum-Off" time setting (if needed).

Some of these settings need to be made in concert with others, but they will be covered individually here.

1. FEED TUBE SETTING:

The vertical feed tube, or wand, delivered with your loader (see Figure 15) is equipped with multiple holes at the top to allow air to be mixed with the conveyed material. This air allows material to flow smoothly through the tubing, actually in a bed of air, created by the vacuum motor. However, too much air will not allow material to be picked up efficiently; and too little air will cause plugs of material to be conveyed, causing a "surging" in the tubing, or actually plugging the line with material.

The feed tube is designed to allow air-to-material adjustments to be made by slipping the flex hose, connected to the tube, down over any number of feed tube holes, to control the amount of air introduced as material is being drawn into the tube. The best way to find the optimum tubing position is by trial and error. Optimum flow is the maximum amount of material conveyed in the shortest amount of time, without surging at the beginning of loading and without material clogging the line at the end of the cycle.

If throughput demands are not high, more air is better, which will prevent the material line from clogging. Be cautious of vertical sections of tubing where material, enroute to the loader, will fall when vacuum is stopped, causing a blockage in the line.

Alternate feed tube models (like distribution boxes, horizontal bin tubes, granulator drawer tubes, etc) have similar air-to-material adjustments, dependent upon their style of construction. Take time to adjust them for optimum performance using the same general guidelines: optimum flow with minimal surging.

2. **LOAD TIME SETTING:**

The vacuum motor of the loader must be timed to provide a hopper full of conveyed material, without "packing" material into the loader or providing too little material which may not allow the dump valve of the loader to open.

"Time Fill" Operation uses a timer to operate the vacuum loader for a specified length of time. This setting, made with the "load time" dial on the control, is best made by trial and error. Start with the control at the "Nine O'clock" position, and listen to the vacuum motor and/or examine a transparent section of the conveying tubing to observe material flow. In typical use, the vacuum motor should shut off within a couple of seconds before the loader fills with material. A full loader can be determined by the flow of material in the conveying line stopping or a distinct change in the pitch of the vacuum motor. Once the motor's air flow is blocked by material in the hopper, the motor "free wheels", changing the pitch of the motor.

Make changes to the timer setting to provide the optimum vacuum-on time setting. An optimum setting will provide efficient loading with no unneeded wear to the vacuum motor.

OPERATION

"VOLUME FILL" OPERATION
(Enhanced Control Only)

On loaders equipped with "Fill Sensors", the sensor automatically terminates the operation of the vacuum motor as soon as the sensor is covered with the material being loaded. With volume fill sensor operation, the timer that controls the vacuum on-time, acts as an "alarm" timer, providing a maximum on-time if the fill sensor is not satisfied. The optimum alarm time setting will be the normal fill time of the loader, plus 5 seconds.

Volume Fill sensors require initial adjustment to sense your particular material before automatic loading can begin.. A small hole on the back of the sensor contains an adjustment screw that sets the sensitivity level of the sensor. Adjust the sensor to trip when covered with material, and to open when uncovered.

To adjust the sensor, set an excessively long load time on the loader control while positioning the loader so that access to the gravity dump valve can be made.

Start the loader and allow it to load material.

1. If the loader stops premature to full loading, the sensor is too sensitive.

2. If the loader runs past the point of filling, the sensor is not sensitive enough to be tripped by material.

While holding the dump valve of the loader shut with material in the loader, the sensor may be adjusted to sense the loaded material, and shut off the vacuum motor.

NOTE: the sensors are capable of sensing material dust, and as a result, should be re-adjusted after a period of operation to assure that the sensor reacts only to the presence of a solid "quantity" of material and "ignores" dust.

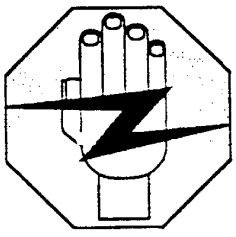
3. REGRIND PERCENTAGE SETTING:

Ratio loaders employ the same settings as single tube loaders, but include two material pick-up tubes plus the need for setting the ratio percentage. The ratio percentage setting determines the amount of virgin and regrind materials loaded in proportion to each other. The "Regrind Percentage" dial on the control face indicates the percentage of loading time that will be dedicated to the regrind inlet of the Ratio Mixing Valve.

NOTE: Both the load and regrind percentage settings indicate time settings and do not actually assure that material flows while the vacuum is directed to the virgin or regrind sides of the ratio mixing valve. Further, due to the inconsistent densities or virgin and regrind materials, it is almost assured that material will be delivered in inconsistent proportions, if proportions are set based solely on time.

It is recommended to make trial and error settings of the regrind percentage control and check the loaded material for the actual virgin/regrind percentage. Drastic changes in the regrind percentage setting may be necessary to compensate for different material flow rates, different material densities and different material tubing lengths.

In addition to the Regrind Percentage setting, an internal control governs the number of mixing cycles the ratio valve will make to introduce virgin and regrind materials to the loading hopper. The "cycles" control is located inside the control box, but does not usually require adjustment to achieve efficient loading performance.



CAUTION!

Changes made to the timers within the loader control box should be made **only** after disconnecting power to the control.

OPERATION

STANDARD AND ENHANCED CONTROLS

Conair Franklin Self-Contained Material Loaders may be equipped either of two different control boxes identified as the "Standard" or "Enhanced". These two control boxes look identical on the outside, but the capabilities of each is different and the location of user adjustable controls inside each box is different. Refer to Figures 5 and 6 for the detailed differences in the two models.

Both models can operate the loader functions of single material loading, ratio (two material) loading, and unloading with the use of a "Gravity" discharge valve. The enhanced model, however, has increased control logic and permits the operation of a loader with the following additional features:

1. "Positive" (Pneumatically operated) discharge valve (12" diameter DustBeater Only)

2. Fill Sensor (Volume Fill) operation

3. Solid state demand sensor (in place of the gravity discharge reed switch)

4. Material line purge operation

Operation of the positive discharge valve of the loader coincides directly with the timer control within the enhanced control labeled "Unload" (See Figure 6) and employs a rotating paddle switch in place of the magnetic reed switch used in gravity discharge models. In all other respects, the positive discharge model operates identical to the gravity model. When the unload sequence of the loader occurs, the positive discharge valve will open for the duration of the time setting on the unload timer. Set the unload timer according to the needs of your application and material.

SECTION

4

OPERATION

Fill sensor operation has been covered under the heading "Volume Fill Operation" on page 27. With a fill sensor, the vacuum on time setting of the control acts as a *maximum* load time, to stop the vacuum motor if the fill sensor is not satisfied in the time span set on the control.

MATERIAL LINE PURGE VALVE OPERATION

IMPORTANT NOTE!

If material line purging is not being employed on your loader, the "Purge" timer located within the control must be set to its full counter-clockwise position (minimum setting).

Material line purging actually cleans material out of the conveying line with each load cycle so that no residual material is left laying in the tubing. This is useful when dried material is being conveyed, or when there is a need for instantaneous material changing without the trouble of cleaning or replacing conveying tubing.

Line purging is accomplished through the use of a "Purge Valve" installed on the material line, at the material pickup point, which is usually a horizontal bin tube or distribution box. The valve is identical in appearance to a Ratio Mixing Valve (See Figure 4, Page 5). When properly installed on the material conveying line, the material source (feed tube) will be connected to the right inlet of the valve, marked with an "R". The left side (marked with a "V") is left open to draw in ambient air for purging, or may be equipped with an air inlet filter, or may be plumbed to a dry air source. The valve should be installed in a horizontal position so that the flat access lid is on top and the two inlet lines are horizontal. The singular outlet of the valve should be connected to the loader's inlet tube. The valve is connected electrically to the loader terminal box (terminal block T-8). Additional cable may be required to extend the included cable, or new cable may be installed from the plug on the valve solenoid. In addition, the valve must also be connected to a clean source of compressed air (60 psi minimum).

OPERATION

Material line purging takes place at the conclusion of the load cycle. Material will be vacuum conveyed for a duration of time as set on the load time control.

NOTE: It is not recommended to utilize a fill sensor in conjunction with material line purging.

At the conclusion of timed material conveying as set on the load timer, the purge cycle begins by first switching the purge valve to stop material flow and simultaneously open the adjacent purge valve inlet (air) line for a duration of time as set on the purge timer within the Enhanced control (See Figure 6). Clockwise rotation of the timer increases purge timing, counterclockwise rotation of the timer decreases purge time.

When employing material line purging on a ratio loader (loading both virgin and regrind materials) purging may take place only on the virgin inlet (left inlet) line of the loader. The ratio time adjustment on the front of the loader control provides the on-time adjustment for regrind material loading, which alternates with virgin material loading, as described under "Ratio Loading". At the conclusion of loading, purging will take place on the virgin inlet.

4. **UNLOAD TIME:**

The loader is designed to discontinue loading if the receiving hopper beneath the loader is full. When the loader continuously cycles however, (when it is initially filling an empty bin, for instance) the "unload timer" keeps the loader from restarting too soon for the loader to fully empty its load of material. Normally, the factory setting of this pot is satisfactory for all possible applications, and no further adjustment is required. But, if extremely slow moving materials are being loaded and the loader retains some material when it begins to load again (possibly blocking the sealing action of the discharge valve), the Unload time should be increased; Clockwise for increasing vacuum-off time; Counterclockwise for decreasing vacuum-off time.

DIRECT FEED LOADER OPERATION

Direct Feed Loaders (12" diameter, DustBeater models only) incorporating a sight glass and solid state level sensor (see Figure 8), operate in a similar fashion to standard Self-Contained Material Loaders with the following exceptions:

1. Demand sensing is done by the level sensor installed against the sight glass of the loader base. This sensor will need adjustment to assure accurate sensing of the material level in the sight glass. A small adjustment screw is present in the back of the sensor that allows the sensor to be made more or less sensitive the presence (or the absence) of material. Carefully adjust the sensor screw to turn off the loader when material is present in the sight glass and turn on the loader when the material level drops. Several trial and error adjustments are usually required to find the ideal sensitivity.

2. The sensor should be installed firmly against the sight glass to assure a consistent sensing range in operation. Dual adjustment nuts are provided to keep the sensor in position.

3. The level of material in the sight glass may be varied by moving the sensor up or down in its holder. If you are conveying moisture sensitive material or otherwise wish to minimize the material level at your machine throat, the level may be kept quite low by moving the sensor down on the glass. If larger shot sizes are required, you may need to move the sensor up to have more material available for the processing machine's consumption.

4. There is almost no mixing action included in the gravity material flow of a ratio direct feed loader from the loader hopper to the processing machine. Most gravity discharge loaders have some material tumbling as the material moves from one hopper to another, but with direct feed loader, material moves directly to the machine throat. As a result, it may be advisable to increase the number of ratio cycles (layers) to compensate for the lack of material tumbling.

SECTION

5

OPERATIONAL OPTIONS

BOLT-IN WEAR PLATES

Your vacuum loader may have to be equipped with a special abrasive wear prevention plate, installed opposite the material entry point. This plate provides a long life abrasion resistant surface for the plastic material being conveyed to impinge upon, preventing wear-through of the vacuum chamber. If your loader is not equipped with one of these plates, you may install it yourself.

The plate requires match-drilling holes in the vacuum chamber that allow the plate to be bolted into the loader according to Figure 16 on the next page. Once installed, the plate may be replaced, if ever necessary. The plate kit includes all hardware for initial installation or replacement.

To install a Bolt-In wear plate, first position the plate on the straight section of the loader interior, opposite of the material entry port, with the point or crown of the plate slipped firmly up into the filter guard. Mark through the holes of the plate onto the interior of the loader and drill the four marked holes with clearances for the included hardware. While installing the plate with the hardware, include a dab of silicone sealer on each bolt to prevent vacuum loss around each bolt. (Care should be taken to assure that the sealer is placed around the bolt shank and not the head where it could contaminate conveyed material). Tighten the lock nuts firmly on the outside of the loader.

To replace a Wear plate, remove the lock nuts from the outside of the loader and replace the plate and associated hardware according to the installation instructions above.

Wear plates are available in the following materials:

1. T-1 Carbon Steel
2. Stainless Steel
3. Carbon Steel with "Pneumatic Erosion Guard" coating (PEG)

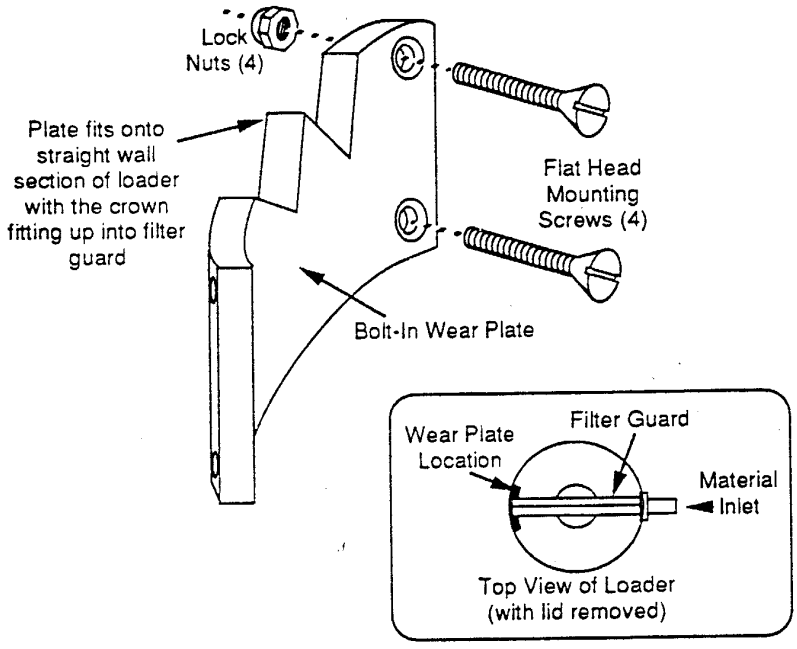


FIGURE 16

Bolt-In Wear Plate

OPERATIONAL OPTIONS

TUBE ADAPTER REPLACEMENT

The material inlet tube on your vacuum loader is designed in a modular fashion to allow easy adaptation to other sizes and to allow for replacement in the event of damage or material wear-through. Referring to Figure 17, note that the inlet tube is composed of three pieces, referred to as "A","B",and "C".

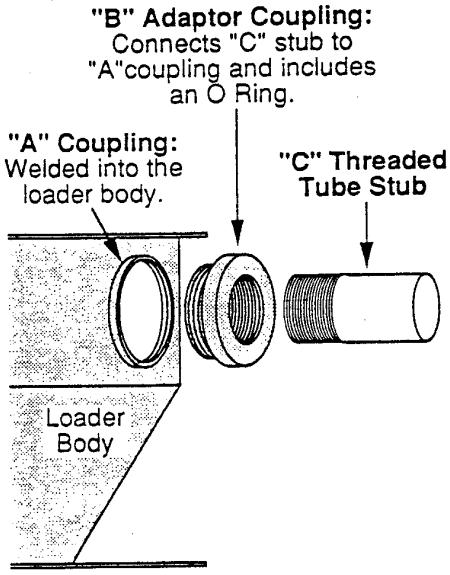


FIGURE 17

Inlet Tubing Adapter

If replacement is needed, both "B" and "C" pieces are available from Conair Franklin and may be screwed in and out of place as required. If they are difficult to remove, a strap wrench that applies friction around the perimeter of each component without crushing it, may be helpful. Avoid the use of pipe wrenches that could crush the thin walled tubing and/or create scuffs to the tubing exterior.

NOTE: Loctite #222 is used on fine threads of the "C" Piece ONLY. It may need to be heated to separate the pieces.

OPERATIONAL OPTIONS

CAUTION!

If you are making an adaptation to a different line size, be aware that adapting a loader to a different line size may result in undesirable loading characteristics like decreased throughput, plugged lines, etc.. The modular adapters on your loader are part of a family of connectors that are grouped according to accepted material conveying parameters per each loader size. consult Conair Franklin for acceptable guidelines.

Note that the "C" Threaded Tube Stubs comes in both aluminum and stainless steel materials. If you have experienced wear-through with an aluminum stub, you may wish to substitute stainless, to slow down further wear. "B" Adapter Couplings are aluminum as standard (they are not exposed to material flow). It is common to replace the "B" and "C" components together.

When installing "B" couplings, be sure to include the O'ring on the threaded side, and tighten the coupling enough to slightly compress the O'ring against the "A" coupling, for a good vacuum seal.

Replacement pieces are available in "C" piece only or a set of "B" and "C" piece pre-assembled and includes O'ring.

CHANGING DISCHARGE VALVES

The modular design of Conair loaders allow the discharge valve assembly of the loader to be changed to a different style, if required or desired. A selection of valves is available, including:

- Gravity: This model includes a discharge valve "pan" that opens freely from the weight of the material, after the loader has finished its vacuum cycle. It includes an integrated level switch that is triggered from the position of the valve "pan".

- Positive Discharge (Enhanced Control Only) : This is a powered open/powered close discharge valve that operates by a pneumatic cylinder upon signals from the control. Usually includes a rotating level switch for level detection.

- Viewing Chamber with Sensor (Enhanced Control Only) : This throat adapter has no actual discharge valve, since it is designed to bolt air-tight to the throat of a processing machine. It includes a see-through chamber that acts as a receiving hopper for the loaded material. A sensor is included for level detection.

OPERATIONAL OPTIONS

TO REMOVE A GRAVITY DISCHARGE VALVE (See Figure 1):

1. Remove the discharge seal of the loader by releasing the hose clamp that secures it to the loader throat.

2. Remove the level switch wires connecting the existing discharge valve to the loader terminal box (remove from the terminal box).

3. Remove the existing discharge valve assembly from the discharge mounting flange by unbolting the hex head bolts that secure the valve to the loader and slipping the valve off of the loader throat.

4. Install the new discharge valve or viewing chamber assembly employing the gasket that is included with the new kit.

TO INSTALL A POSITIVE DISCHARGE VALVE:

1. The new valve assembly will interface with the loader in a similar fashion to the valve that has been removed. Once bolted in position with a new gasket between the new valve flange and the flange of the loader, re-install the discharge valve seal with the original hose clamp and line it up to the new valve pan according to instructions listed on page 47.

2. Connect the pneumatic line of the positive discharge valve to the compressed air manifold of the loader. A plugged port on the manifold is provided. Remove the plug and plumb in the compressed air line from the valve assembly using thread tape (sparingly).

3. Connect the electrical line of the solenoid into the terminal box of the loader. A special hole is provided, labeled "DISCH". Use a cord grip and connect the cable into terminal strip numbered "T-7""AIR DIS". Use the parameters detailed on page 19 under "Connecting options to the Universal Terminal Box".

4. If a rotating level switch assembly is included in your installation, the electrical cable accompanying the level switch must be connected to the Universal Terminal Box according to the wiring diagram detailed on Conair print #107-454-02. The cable will enter the box through the hole labeled "VLV POS" and be connected to both AC power at T-11 "BIND" (to operate the motor of the switch) as well as, the set of input terminals marked "T-2".

TO INSTALL A GLASS VIEWING CHAMBER:

1. Bolt the chamber assembly to the bottom mounting flange of the loader with the included gasket.

2. Install the sensor cable of the viewing chamber into the UTB of the loader by inserting the cable into the "VLV POS" hole on the side of the UTB. Connect the sensor wire to terminal strip number "T-2" "VLV POS" according to print #107-454-02 (this print details the specific color and function coding required for most loader controls).

3. Install the loader on the processing machine according to the installation instructions on page 11, "Installing a "Direct Feed Loader".

RECEIVING HOPPER VENTING

In some loading applications, it is common for the vacuum loader to unload slowly (or not at all) due to the air-tightness of the receiving hopper beneath it. As material is dumped from the loader (See Figure 18), it displaces air from the receiving hopper and the air must be vented away to make room for the incoming material.

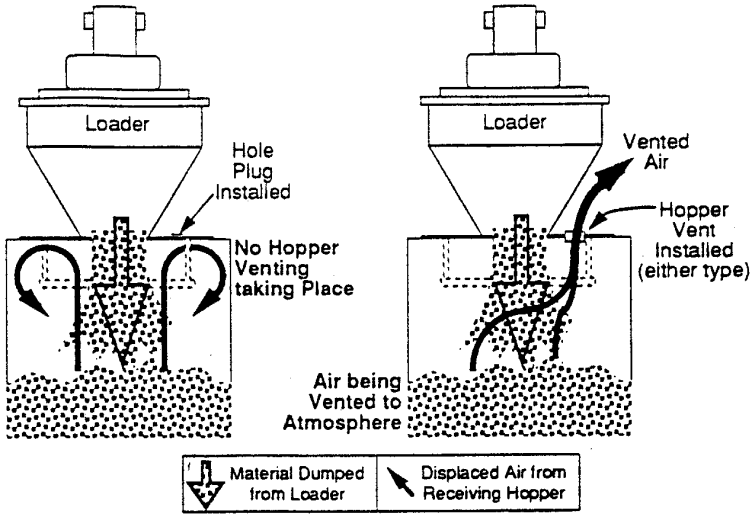


FIGURE 18

Venting a Receiving Hopper

Most often, there is enough ventilation of the receiving hopper to allow the displaced air to dissipate to atmosphere. If there is not, then receiving hopper venting must be included.

Referring to Figure 18, which explains hopper venting, note that a hole plug is most often supplied with each hopper loader. That hole plug may be removed and replaced with either of the optional vents shown in Figure 19.

OPERATIONAL OPTIONS

Note that the "Louvered" or "Open" vent allows full venting of the receiving hopper and air vented by this fashion may include material dust or fines (depending upon the nature of your material, how much airborne dust it generates, how much loading is being performed, etc....). The "Filtered" vent traps all fines and dust, yet allows the hopper to vent displaced air efficiently. Depending upon the amount of fines in your material, this vent will require periodic cleaning to assure optimum performance. The filter element may be vacuumed from the inside, or blown through with compressed air to clean it.

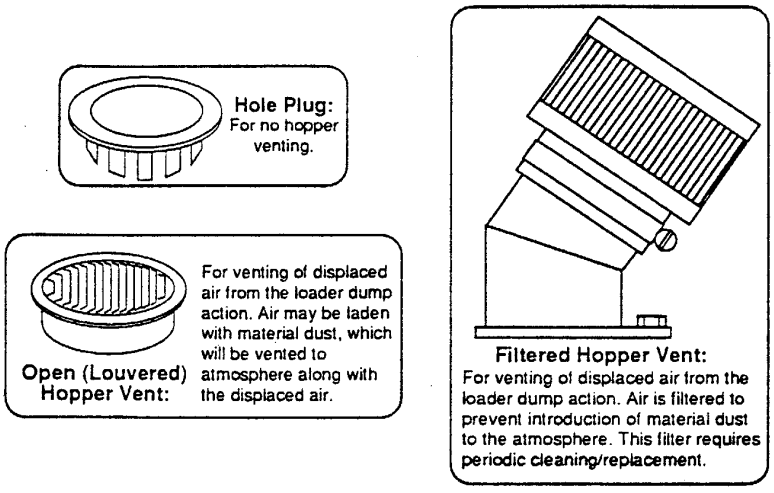


FIGURE 19

Receiving Hopper Vent Options

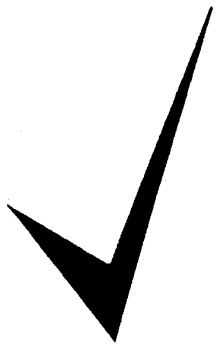
MAINTENANCE

CAUTION!

Hopper Loaders are often mounted on top of other pieces of auxiliary equipment such as hoppers, surge bins, or blenders which places the loader high above floor level.

Accessing a loader located in an elevated area in a safe manner is the responsibility of the user.

For maximum safety, an access platform equipped with toeboards, safety railing and non-skid walking surfaces is recommended. Since each installation is different, please observe and comply with the specific safety guidelines pertaining to your installation. Safe access to the loader should include firm footing with the ability to work on the loader with both hands.



MAINTENANCE

Maintenance of your Self-Contained Material Loader may be divided into the following categories:

1. Filter cleaning/replacement
2. Compressed air cleaning
3. Motor Brush checking/replacement
4. Discharge valve checking/adjustment/seal replacement
5. Ratio valve seal replacement

SECTION

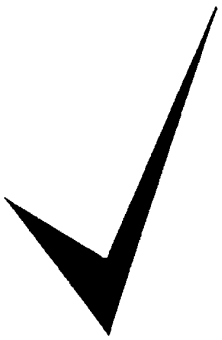
7

MAINTENANCE

1. FILTER CLEANING

The filter of your Self-Contained Material Loader is designed to protect the motor from damage by plastic pellets, regrinds, and fines that are drawn to the loader by the vacuum action of the motor. The filter, situated between the vacuum hopper and the lid of the loader, separates vacuum conveying air from the loaded material and usually becomes caked with material dust as material is loaded. The blowback function, which takes place at the conclusion of each loading cycle, does a good job of cleaning the filter, but occasionally the filter will need manual cleaning, or even replacement, to stay effective. The schedule of cleaning will depend upon how much material and how clean the material being conveyed is (dusty regrind causes rapid filter blinding).

To remove the filter, first disconnect power to the loader. The filter may be exposed by lifting the lid of the loader. Disconnect compressed air line from solenoid to lid, and vacuum motor power cord. The lid is released by the three twist clamps located around the perimeter of the lid. Once the lid is released, the filter may be removed. Clean the filter with either compressed air, blowing against the motor ("This Side Up") side, or with a vacuum cleaner sucking against the bottom, fabric side of the filter.



CAUTION!

Be sure to wear safety glasses to guard against air-borne material particles if compressed air cleaning is employed. Be sure that the compressed air being employed is completely dry and will not add moisture to the filter media. If moisture is added, the collected fines will probably solidify into clumps that will be very difficult to remove. If moisture is accidently introduced, set the filter aside and allow it to thoroughly air dry before vacuuming at a later time, or replace it with a new filter.

Be sure to discard and replace any filter that has developed a hole, or has become hopelessly clogged with material dust. Do not attempt to repair a damaged filter.

The filter in Conair Franklin Self-Contained Material Loaders performs double duty as an effective seal between the hopper body and the lid of the loader, so be sure to examine the integrity of the rubber perimeter to be sure that the loader will seal effectively when reinstalled into the loader.

The filter may be reinstalled by placing it carefully on top of the loader body's top flange, and positioning the lid down around it. The filter is labeled "This Side Up, indicating the course mesh side to be installed toward the vacuum motor lid. The cloth filter media should be installed down, where it will come in contact with the loaded material. Be sure to keep from crushing the filter or filter seal with the lid, in the event the filter is reinstalled off-center. The loader lid may be secured with the twist lock clamps. Reconnect compressed air hose from solenoid valve and vacuum motor power cord.

2. COMPRESSED AIR CLEANING

The compressed air connection of the loader is provided with a moisture trap to prevent troublesome moisture, possibly contained in the air supply, from entering the loader. The filter bowl of this moisture trap must be emptied regularly to drain the water from the air system. Follow the instructions listed on the filter bowl itself, which usually requires opening a port at the base of the bowl and letting the water in the bowl blow out in a stream of compressed air. A path for this blowout of moisture is usually a good idea, to prevent a stream of moisture laden air from contaminating machines, people, or you. It is also a good idea to inspect the bowl periodically with the compressed air supply turned off, to replace the filter element if need be and to remove contaminant accumulation, if it is present.

2. MOTOR BRUSH CHECKING/REPLACEMENT

The vacuum pumps employed on Self-Contained Material Loaders are powered by brush type, high RPM motors that require maintenance to the brushes on a regular basis. The brushes should be checked to prevent complete brush wear down, which could be damaging to the motor armature and the brushes should be replaced if they are extensively worn.

Access to the brush area differs on the two models of Self-Contained Material Loaders covered in this manual:

DustBeater (12" diameter) Loaders (4 brushes):
The brushes on the DustBeater are contained within two circular caps visible on each side of the uppermost section of the motor. Disconnect power and remove the acorn nuts that secure the circular caps to the motor body. Inside each cap are two spring mechanisms that secure the brushes, under tension, against the motor armature. The brushes may be removed by prying off the spring clips. Examine the brushes carefully to be sure that the brush is still intact and not disintegrated from use. The brush should be at least 1/2" long to be returned to service. If any brush is not, replace all four immediately.

MicroLine (8" diameter) Loaders (2 brushes):
The brushes of a MicroLine loader are located within a protective guard that covers the top of the motor. The guard may be removed by unscrewing four slot head screws located along the base of the cover and accessible with a long screwdriver down through holes in the top of the guard. Use caution when removing the guard since the motor's power cord runs through the guard and will still be connected to both the guard and motor when the guard is removed. Once the guard has been removed, the motor brushes will be visible on each side of the motor, held in place with two slot headed screws. The brushes and their holders may be freed by removing the screws. Examine the brushes carefully to be sure that the brush is still intact and not disintegrated from use.

The brush should be at least 1/4" long (as measured from the motor end to the brush holder) to be returned to service. If either brush is not, discard the brushes and holders and replace both immediately.

4. DISCHARGE VALVE CHECKING/ADJUSTMENT/SEAL REPLACEMENT

The Discharge Valves of Self-Contained Material Loaders provide a vacuum tight seal for the vacuum hopper while the loader is loading material, then allows easy discharge of the material by gravity when the loader's vacuum is turned off. In addition, the counterweight of the discharge valve is fitted with a magnet that comes in close proximity with a magnetic reed switch which is mounted down through the flange of the loader. The Reed Switch provides a "demand" signal for the loader to operate when the valve closes; indicating the absence of material. To achieve this design goal, the discharge valve needs to rotate easily on its shaft, seal tightly when sucked closed by vacuum and open easily by the weight of the material at the conclusion of the loading cycle.

Periodic checking of the Discharge Valve is recommended to assure that the valve operates smoothly and has not become distorted through rough handling (normal operation almost never causes failure of discharge valves). The valve is positioned at the base of the loader within a protective guard designed to protect the valve when handled during installation or service. If it is convenient, the guard may be removed by removing the three bolts that secure the guard to the loader's mounting flange. Figure 20 shows the components of the discharge valve. The following areas should be checked carefully to be sure that the valve is still in operating alignment:

1. Free movement of the valve on its bearing pivot point.

2. Accurate alignment of the valve with the circular opening in the base of the loading hopper.

3. Full, 360° contact sealing of the discharge valve "pan" with the seal of the loader body opening.

4. Proper signalling of the reed switch by the magnet as it rotates in proximity to the switch.

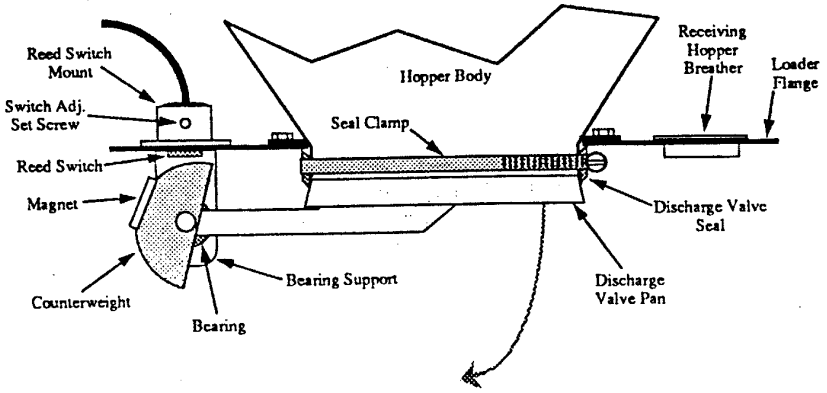


FIGURE 20

Gravity Discharge Components

If the bearing that pivots the discharge valve does not operate smoothly, clean out with compressed air. If operation is still not smooth, replace the bearing. All other critical points on the discharge valve are adjustable:

-- If alignment of the valve and loader opening is slightly off, carefully loosen the discharge valve bearing support (See Figure 1) with the two bolts on the loader flange, reposition the pan and firmly re-tighten the bolts.

-- The seal of the loader discharge may be released by loosening the large hose clamp that holds it in place. It may then be adjusted for proper alignment and full contact with the discharge pan.

NOTE: The "knife edge" of the seal (See Figure 21) should be pointed against the tapered edge of the discharge valve pan. The flat portion of the seal's taper should not lay flat upon the edge of the pan, even though they appear to match. The knife edge allows trapped pellets to be squeezed out of the intersection point of the seal and pan.

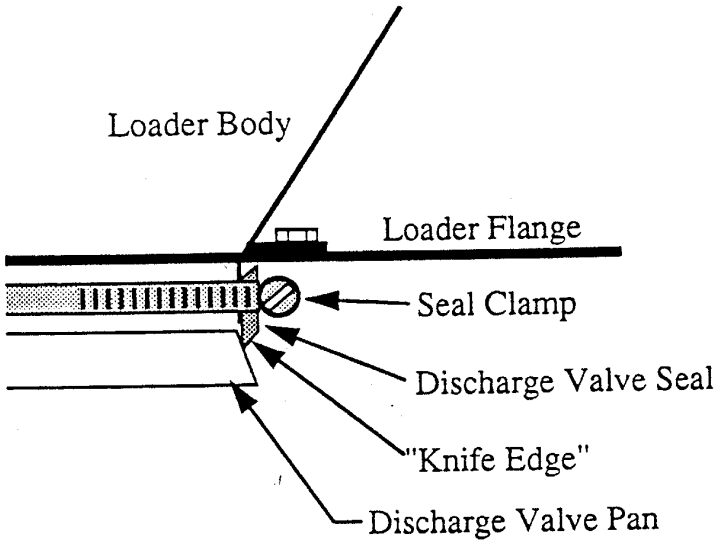


FIGURE 21

Discharge Valve Seal

-- The magnetic reed switch, mounted in an aluminum housing protruding up out of the loader's mounting flange, has been factory adjusted to provide proper clearance and response from the magnet connected to the counterweight of the discharge valve. The switch is normally pre-set to a bottoming shoulder located in the aluminum housing. The switch is secured with a set screw.

SECTION

7

MAINTENANCE

POSITIVE DISCHARGE VALVE MAINTENANCE

The maintenance of a Positive Discharge Valve is identical to that of the gravity valve, especially in the area of the discharge valve seal. Special attention should be given, however, to the pneumatic linkage of the valve, to assure continuous smooth motion. Note that the cylinder of the valve may be moved slightly through slotted mounting holes to allow for improved alignment with the discharge valve seal. If adjustment is made, be sure to firmly re-tighten all bolts.

NOTE: All bolts are sealed against vibration with Loctite 272.

RATIO VALVE SEAL REPLACEMENT

The seals of the ratio mixing valve that isolate the flow of the virgin and regrind material in coordination with the pneumatic plungers may become worn by the flow of the material and require replacement. Old seals may be carefully cut away with a knife to remove them. The inlet tube stubs should be thoroughly cleaned before replacing the new seals, removing old adhesive, accumulated material, etc... If the edges of the inlet stubs have been sharpened by the flow of abrasive material through the valve, then the whole valve assembly should be replaced.

Install the new seals on the inlet tubes so that they butt up against the inner wall of the mixing valve housing. Industrial adhesive (AD-E Bond brand) may be used to assure good adhesion to the stubs. Most important to the replacement is the careful installation of rugged tie straps around the perimeter of each seal. The straps should be installed behind the flare of the inlet stub, but not too close to the edge of the seal. When properly installed and tightened, the straps should neatly and evenly compress the rubber seals to hold them firmly in place when they are squeezed by each valve plunger. Maximum tension should be applied to each strap to assure a rugged grip on each stub.

We're Here to Help

Conair has made the largest investment in customer support in the plastics industry. Our service experts are available to help with any problem you might have installing and operating your equipment. Your Conair sales representative also can help analyze the nature of your problem, assuring that it did not result from misapplication or improper use.

How to Contact Customer Service

To contact Customer Service personnel, call:

From outside the United States, call: 814-437-6861

You can commission Conair service personnel to provide on-site service by contacting the Customer Service Department. Standard rates include an on-site hourly rate, with a one-day minimum plus expenses.

Before You Call ...

If you do have a problem, please complete the following checklist before calling Conair:

- ❒ Make sure you have all model, serial and parts list numbers for your particular equipment. Service personnel will need this information to assist you.
- ❒ Make sure power is supplied to the equipment.
- ❒ Make sure that all connectors and wires within and between loading control and related components have been installed correctly.
- ❒ Check the troubleshooting guide of this manual for a solution.
- ❒ Thoroughly examine the instruction manual(s) for associated equipment, especially controls. Each manual may have its own troubleshooting guide to help you.
- ❒ Check that the equipment has been operated as described in this manual.
- ❒ Check accompanying schematic drawings for information on special considerations.

Additional manuals and prints for your Conair equipment may be ordered through the Customer Service or Parts Departments for a nominal fee.

EQUIPMENT GUARANTEE

Conair guarantees the machinery and equipment on this order, for a period as defined in the quotation from date of shipment, against defects in material and workmanship under the normal use and service for which it was recommended (except for parts that are typically replaced after normal usage, such as filters, liner plates, etc.). Conair's guarantee is limited to replacing, at our option, the part or parts determined by us to be defective after examination. The customer assumes the cost of transportation of the part or parts to and from the factory.

PERFORMANCE WARRANTY

Conair warrants that this equipment will perform at or above the ratings stated in specific quotations covering the equipment or as detailed in engineering specifications, provided the equipment is applied, installed, operated and maintained in the recommended manner as outlined in our quotation or specifications.

Should performance not meet warranted levels, Conair at its discretion will exercise one of the following options:

- Inspect the equipment and perform alterations or adjustments to satisfy performance claims. (Charges for such inspections and corrections will be waived unless failure to meet warranty is due to misapplication, improper installation, poor maintenance practices or improper operation.)
- Replace the original equipment with other Conair equipment that will meet original performance claims at no extra cost to the customer.
- Refund the invoiced cost to the customer. Credit is subject to prior notice by the customer at which time a Return Goods Authorization Number (RGA) will be issued by Conair's Service Department. Returned equipment must be well crated and in proper operating condition, including all parts. Returns must be prepaid.

Purchaser must notify Conair in writing of any claim and provide a customer receipt and other evidence that a claim is being made.

WARRANTY LIMITATIONS

Except for the Equipment Guarantee and Performance Warranty stated above, Conair disclaims all other warranties with respect to the equipment, express or implied, arising by operation of law, course of dealing, usage of trade or otherwise, including but not limited to the implied warranties of merchantability and fitness for a particular purpose.