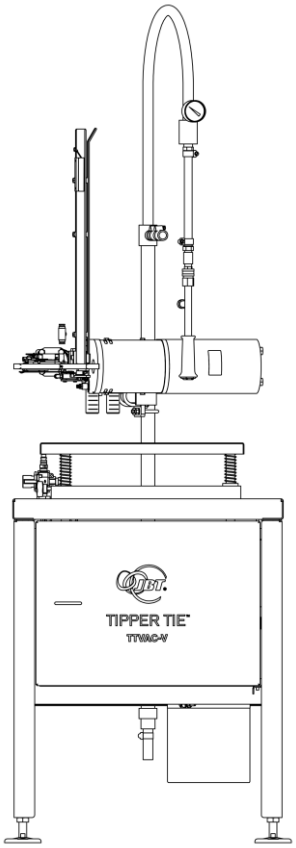
TIPPER TIE™



Model TTVac-V

Clipper Vac

User Manual

Manual Number 80-1485

Revision Number 03

August 2023

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Before operating this machine, you must read and understand this manual. Everyone who will operate or maintain this machine must be properly trained. Follow all operating instructions and exercise caution when operating or maintaining this machine (see Chapter 2: Safety Instructions).

Preventive Maintenance Requirements

IMPORTANT: For proper machine function and continued satisfaction with your finished product, it is **essential** that your machine be properly maintained (see Chapter 8: Maintenance Guide). This means that a preventive maintenance schedule should be established and followed. Attention shall be given at least **once a week** to observing wear of all moving parts, especially in the following areas:

- Die support channel and punch assembly
- Die and die pocket area of the die support
- Clip pusher assembly
- Knife assembly

Operating a machine without following an established preventative maintenance schedule constitutes neglect and may result in endangering the safety of the operator, degradation of machine function, or inferior product. Read and follow the Lubrication and Maintenance sections of this manual for further information.

Note About the Contents of the Manual

The photos and illustrations used throughout this manual are representative of parts installed on similar clippers and may differ slightly from the parts installed on your clipper.

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Publication History

The publication history summarizes major changes to this document. Each update of this manual is a new revision (Rev) in the first column (for example, Rev 02). An update that applies only to the drawings is listed on the Assembly Drawings PDF as a sub-revision (for example, Rev 02.01, Rev 02.02, etc.).

Revision	Description of changes	Issue date
00	Original draft.	January 25, 2023
01	Updated machine images. Updated operating instructions for Chapter 5.2. Added details to Troubleshooting (Chapter 9). Spare parts and assembly drawings lists updated. Minor corrections.	May 31, 2023
02	Added vacuum pump specification details to Chapter 6.2. Updated machine images. Added sound emission testing to Chapter 2.	June 22, 2023
03	Added residual risk section to Safety Instructions (Chapter 2).	August 15, 2023

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Chapter 1 – Machine Description and Specifications

1.1 Description

The TIPPER TIE (Clipper Vac) model TTVac-V is a vacuum packaging and clipping machine that accommodates a variety of product shapes, sizes, and weights. The machine is ideal for wet products and can be used to economically vacuum package poultry, whole birds, turkey breasts, cheese, corned beef, soups, sauces, cook/chill products or produce of all kinds. The TTVac-V is easy to use and requires only one operator to vacuum and clip the product. The operator lifts the product over the nozzle to draw a vacuum and moves the package into the clipper to securely close and trim the package.

The stainless steel TTVac-V uses an adjustable overhead gooseneck vacuum nozzle and is fitted with one of several TIPPER TIE horizontal clippers. The table height is adjustable, and easy adjustment of the overhead gooseneck nozzle allows for quick product changeover. All parts are readily accessible for ease of maintenance. The major components of the Model TTVac-V are shown in the following illustration.

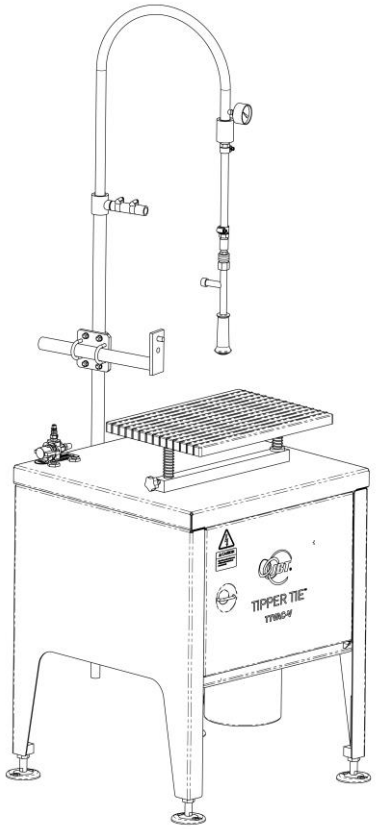

Figure 1: TTVac-V

1.2 Options

Optional nozzle configurations are available to maximize the machine's versatility and cost effectiveness. A gas flush option is available.

Clipper options include the SUSFT1100, SZ4135L, Z2105L, and SF486L to optimize package sealing requirements. The clippers work with TIPPER TIE Z200, Z400, 400G or 100T series clips.

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1.3 Name Plate and Specifications

The name plate shows important production data and specifications (see below). The name plate is affixed to the frame of the machine. There are two versions of the machine based on voltage:

A. Low Voltage (110-120 VAC)
B. High Voltage (220-240 VAC)

A. Low Voltage (110-120 VAC) Name Plate

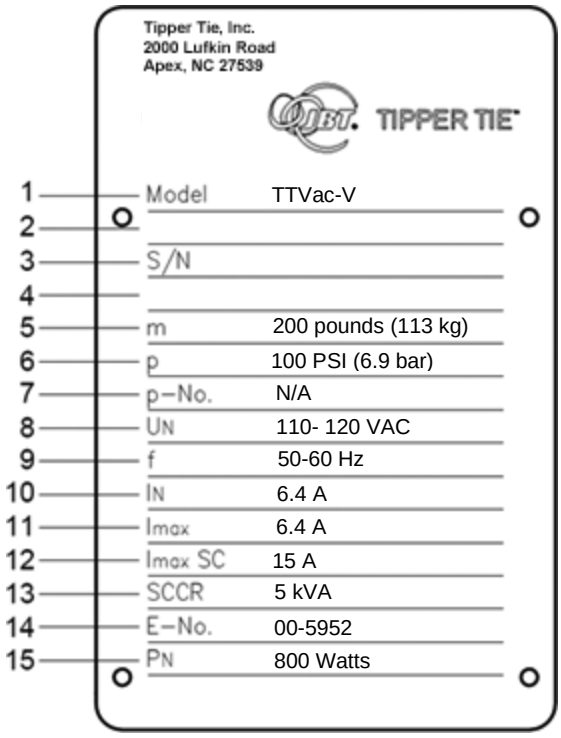

Figure 2: Low Voltage Name Plate

1	Model Name
2	Machine Designation
3	Serial Number
4	Year of Manufacture
5	Machine Weight
6	Max. Permissible Air Pressure
7	Diagram Number of Pneumatic System
8	Rated Voltage and Number of Phases
9	Permissible Grid Frequency
10	Rated Current of Electrical System
11	Current Consumption of Largest Motor
12	Max. Permissible Short-Circuit Current = Max. Permissible Short-Circuit Fuse Rating
13	SCCR: Short Circuit Current Rating
14	Electrical Wiring Diagram Number
15	Power Consumption of Machine (kVa or Watts)

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B. High Voltage (220-240 VAC) Name Plate

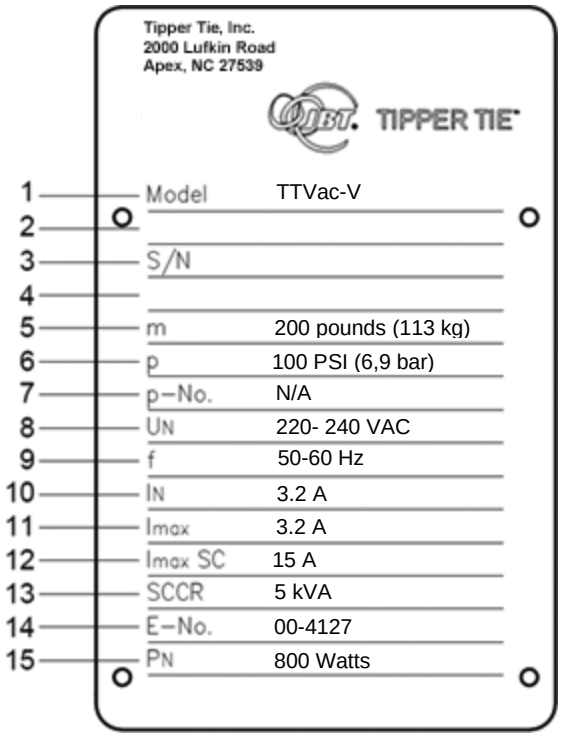

Figure 3: High Voltage Name Plate

1	Model Name
2	Machine Designation
3	Serial Number
4	Year of Manufacture
5	Machine Weight
6	Max. Permissible Air Pressure
7	Diagram Number of Pneumatic System
8	Rated Voltage and Number of Phases
9	Permissible Grid Frequency
10	Rated Current of Electrical System
11	Current Consumption of Largest Motor
12	Max. Permissible Short-Circuit Current = Max. Permissible Short-Circuit Fuse Rating
13	SCCR: Short Circuit Current Rating
14	Electrical Wiring Diagram Number
15	Power Consumption of Machine (kVa or Watts)

Additional Specifications:

- Air pressure: 8-14 CFM @ 80 PSI
- Vacuum pump: 26.5 HG maximum
- Vacuum: 8.0 CFM open flow
- Table dimensions: 14 x 20 inches (36 x 51 cm)
- Adjustable table height: 34-40 inches (86-102 cm)
- Clip type and size: TIPPER TIE Z200, Z400, 400G or 100T
- Machine weight: 265 pounds (120.2 kg)
- Shipping weight: 300 pounds (136 kg)

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1.4 Machine Layout

The layout of the TTVac-V is shown below.

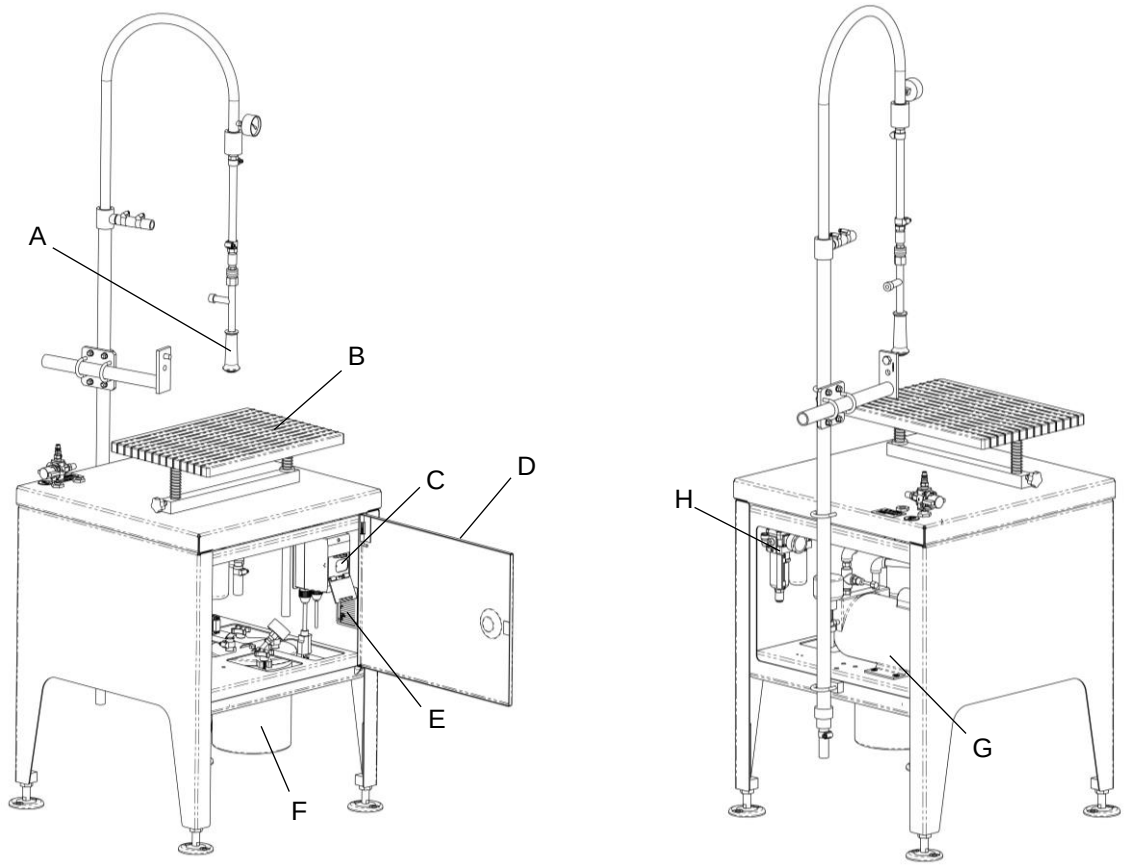

Figure 4: Machine Layout

A	Vacuum Nozzle
B	Adjustable Table
C	Vacuum Start/Stop
D	Cabinet Door
E	Nameplate
F	Waste Tank
G	Vacuum Pump
H	Filter/Regulator/Lubricator (FRL) Unit *Included with clipper

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1.5 Machine Dimensions

The dimensions of the TTVac-V are shown in the following illustrations.

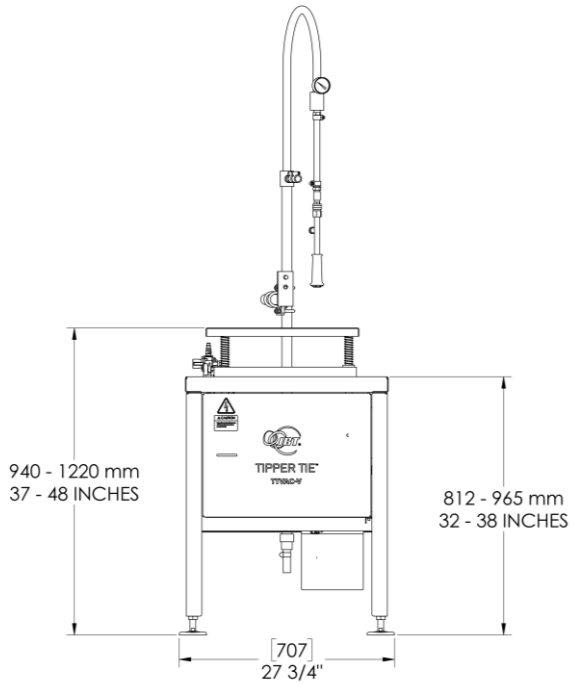

Figure 5: TTVac-V (Front View)

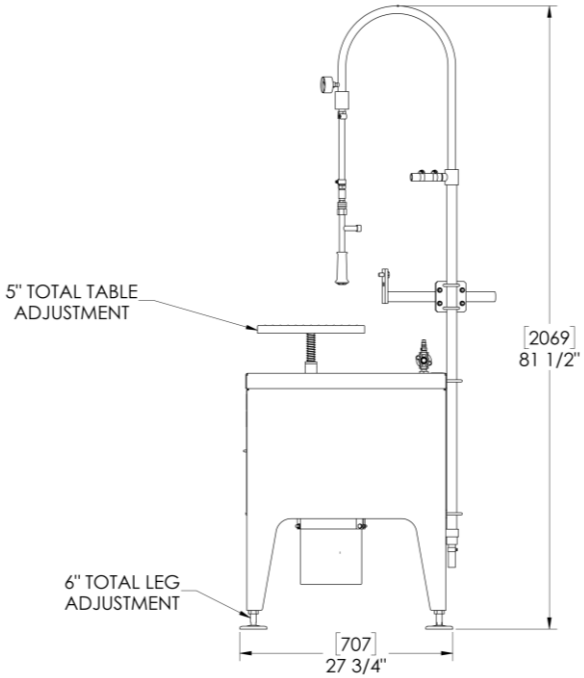

Figure 6: TTVac-V (Side View)

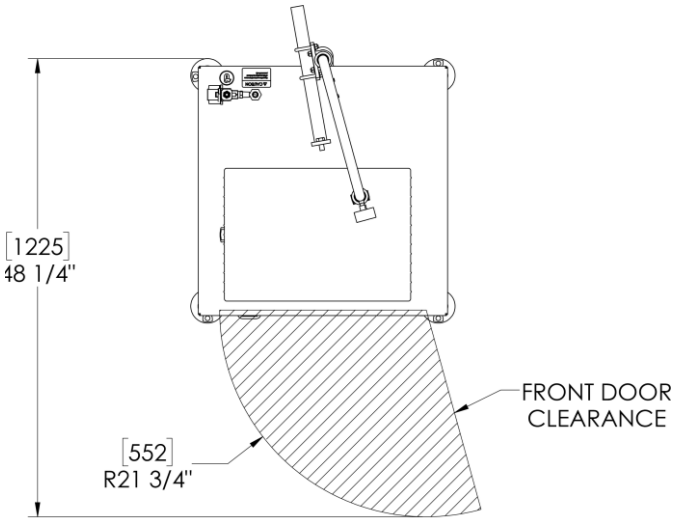

Figure 7: TTVac-V (Aerial View)

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Chapter 2 – Safety Instructions

The following sections outline safety instructions for the TTVac-V. Read and understand the contents of the manual before operating the machine. Only qualified personnel shall operate the machine (see Section 2.3: Qualified Personnel). Follow all instructions and use caution when operating or maintaining the machine.

2.1 Disclaimer of Liability

TIPPER TIE shall not be liable to any person for any defects or damages to persons or property resulting directly or indirectly from: (1) any neglect, misuse or abuse of the equipment, including, but not limited to, improper or inadequate maintenance of the equipment or improper modification or alteration thereto, or (2) any use of the equipment which contravenes any of the instructions set forth in this manual.

2.2 Safety Symbols

This handbook uses safety symbols to accompany safety instructions. Safety symbols make the reader aware when important safety instructions are provided. Both mandatory symbols and warning symbols are used. The purpose of each safety symbol is described below.

2.2.1 Mandatory Symbols

Mandatory signs indicate steps that are required before completing a task. Mandatory signs are circular with a blue background and white pictogram. This handbook uses four mandatory symbols as shown below.

Symbol	Designation
	Wear ear protection
	Wear eye protection
	Wear protective gloves
	Wear safety footwear

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2.2.2 Warning Symbols

Warning signs identify potential hazards that require caution. Warning signs are triangular with a yellow background and black pictogram. This handbook uses six warning symbols as shown below.

Symbol	Designation
	Warning of general danger or property damage
	Warning of electric shock
	Warning of injury from rotating parts
	Warning of injury from pinching
	Warning of injury from sharp objects
	Warning of injury from high air pressure

2.3 Qualified Personnel

Qualified personnel are persons who have been explicitly authorized to perform certain tasks with or on the machine. Operators, maintenance technicians, and cleaning personnel are examples of individuals that perform machine tasks. Qualified personnel must be able to identify potential risks and take necessary safety precautions.

Authorization must be based on qualification, training and experience, and knowledge of relevant safety and accident prevention regulations. Qualified personnel must be authorized by the person responsible for safety of the machine. The parties responsible for machine safety must ensure that all applicable directives, rules, and statutory regulations are strictly adhered to. Ensure that a copy of the operating manual is accessible to all personnel carrying out work on or with the machine.

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2.4 General Precautions

To prevent possible serious injury, it is extremely important that you understand and follow the safety precautions included in this manual. These safety precautions do not claim to be completely exhaustive. If you have any questions, please contact your TIPPER TIE representative. General precautions to follow are:

- Before installing and first operating the machine, this manual must be read and understood. Follow all operating and safety instructions and exercise extreme care.
- Understand the meaning of the safety symbols described in this chapter.
- This machine must be operated only by trained personnel. Training must be repeated at regular intervals.
- This machine must be mounted or installed on a stable, level surface prior to operation.
- Safety devices must be checked each day to ensure proper operation. Safety features should be examined once each year by experts.
- Locate and identify the Emergency Stop valve. Rotate the Emergency Stop valve to stop the machine. Correct and clear obstructions before restarting the machine. Immediately report all malfunctions to the person in charge.
- Do not modify, remove, discard, disable or bypass guards or safety circuits. Do not operate the machine unless the safety circuit is operating correctly. The safety circuit removes power from the air and electricity supplies immediately upon the opening of the guards.
- All guards, protective covers and shields must be in place before operating the machine. Operating this machine with guards, covers and shields removed could result in serious injury. Never operate this machine without its safety devices properly installed and functional.
- Keep hands and fingers clear of the clipper's gate, punch, die and knife areas. Never touch these areas while the machine is in operation or while being moved. Do not allow fingers, hands, jewelry or clothes around moving parts during operation of this machine.
- Before servicing, maintaining or moving the machine, disconnect the air and electrical supply lines. The main air supply line must be disconnected or locked out from the machine at the quick-disconnect before performing any service operation or maintenance.
- Be aware of the danger of electrical shock. Install "lockout devices" on the red electrical and pneumatic lock-out handles when maintenance or repair requires the removal of a guard. The machine's on/off switch is located inside the cabinet.
- When the machine is not in operation and prior to maintenance, disconnect the air supply at the "quick disconnect" on the machine. To prevent unauthorized or accidental operation, rotate the red emergency stop valve clockwise 1/4 turn. Attach a padlock through the holes.
- The maximum working pressure for this machine is 87 PSI (6 bar). Air pressure greater than this could cause an explosive rupture in any of the air lines or pneumatic components. Failure to adhere to this caution could result in personal injury or damage to the machine.
- Pay particular attention to the loud sound levels produced by this machine. If applicable, use ear protection.
- Use only original spare parts and accessories.
- If the machine is sold, the manual must be supplied to the new owner.

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2.5 Safety Illustrations

The following illustration shows the air pressure and vacuum nozzle danger areas of the TTVac-V.

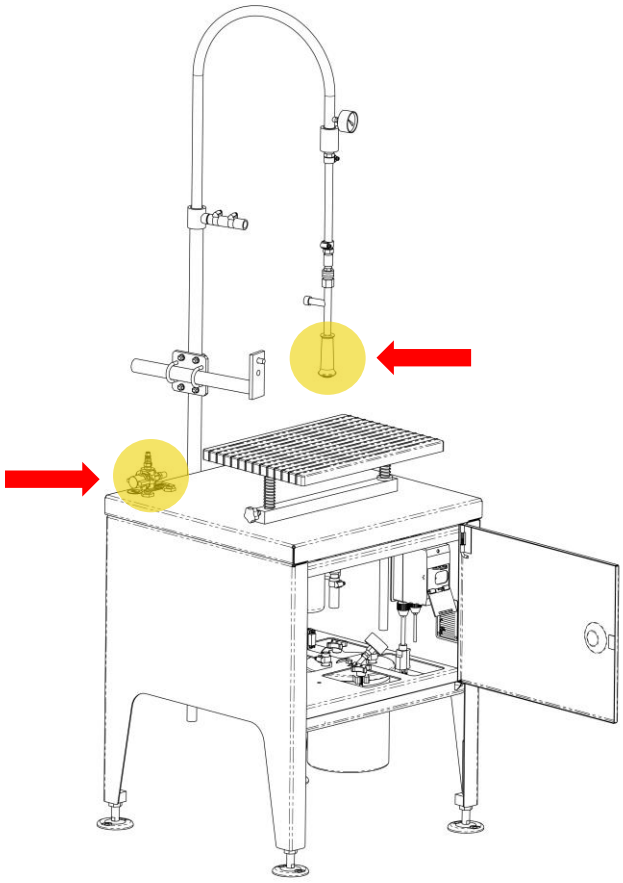

Figure 8: Air Pressure and Vacuum Nozzle Danger Areas

Warning: Keep hands, fingers, and clothing clear of the clipper's gate, die, punch, and knife.

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2.6 Residual Risk

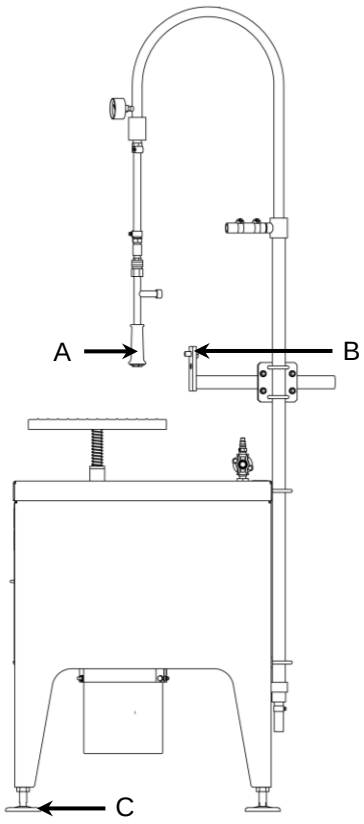
Even though the machine has been designed and manufactured according to the latest state of technology and relevant safety regulations, certain residual risk while operating the machine remains. These risks can be avoided with training and the practice of safely operating the machine.

Whenever there are parts in motion or that move against each other, there is a risk of being pinched or crushed by these parts.

Warning: Making machine adjustments may cause the machine and its components to become unstable. Use caution when performing height adjustments to the nozzle, clipper mount, and feet.

Warning:

Be aware of the potential of injury to hands and fingers when adjusting nozzle components or when loosening and tightening U-bolts on the clipper mount.



A	Vacuum Nozzle
B	Clipper Mount
C	Feet or Casters

Figure 9: Residual Risks

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2.7 Sound Emission

In compliance with EN ISO 11204:2010, a noise emission test was performed to document the levels of sound emission.

L_{pA} = 73 dB(A)

K_{2A} = 2.46 dB(A)

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Chapter 3 – Delivery and Setup

3.1 Delivery

Inspect the shipping container and equipment for damages due to shipping and handling.

If damage is found or suspected, contact the shipping agent immediately. The carrier must have an opportunity to inspect the damage to properly verify claims. Therefore, any loss or damage discovered after delivery should be reported to the shipper's agent as soon as possible or within 15 days after receipt of the goods.

In many instances, the original container is not opened and the contents not examined before reshipment to the final destination. Therefore, under current shipping regulations, nine months are allowed for filing claims for loss or damages. The shipping agent or carrier will help you process your claim.

Remember to report all suspected damages immediately. If additional assistance is required, TIPPER TIE will help in settling your claim. However, the first contact must be with the carrier or his agent.

Include the following materials with all correspondence:

- Original bill of lading or a copy
- Vendor invoice or certified copy when claim is based on weight or when valuation of shipment has been improperly described
- Catalog pages or product information
- Original packing slip or receiving reports or a copy of the electronic bill of lading manifest

3.2 Unpacking Equipment

For ease of shipping, some components may have been shipped disassembled. Check the shipping list and loose parts list to ensure that all items have been received. Do not discard packing materials until the machine is assembled and operational. Notify TIPPER TIE immediately if any component is missing or if additional assistance is required.

Read and review the manual before operating equipment. Add all required oils and fluids and make all machine adjustments as instructed before starting the clipper. Failure to do so may result in equipment damage or personal injury and will void the product warranty.

At time of delivery, record the following information and maintain with permanent records.

_____ **Machine serial number**

_____ **Clipper serial number**

For replacement parts, refer to Chapter 10, Spare Parts Lists and Chapter 11, Assembly Drawings.

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3.3 Setup

Warning: This machine must be plugged into a ground fault circuit interrupter (GFCI) receptacle. Failure to do so could cause serious injury or death and could severely damage the machine.

Before operating the machine, check all the air line connections as set at the factory. If lines have become disconnected, reassemble as shown in the appropriate assembly drawing (refer to Chapter 11, "Assembly Drawings").

Use Personal Protective Equipment (PPE) when operating the machine or performing machine tasks.

Assemble the factory air supply to the filter/regulator/lubricator (FRL) assembly by means of the quick-disconnect connector. The quick-disconnect provides a safe means of removing the air supply for maintenance and cleaning. The quick-disconnect must be attached with the check valve half (female) to the supply side of the air circuit.

Note: This machine must be mounted or installed on a stable, level surface prior to operation.

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Chapter 4 – Air Connections, Lubrication and Adjustments

4.1 Air Supply Connection

The air supply is connected to the model TTVac-V via the quick-disconnect connector. The recommended operating air pressure is 80-100 PSI (5,5-6,9 bar).

Warning: Do not set air pressure above 100 PSI (6,9 bar). Air pressure greater than this could cause an explosive rupture in any of the air lines or pneumatic components. Failure to adhere to this warning could result in injury or severe damage to the machine.

4.2 Filter/Regulator/Lubricator

A filter/regulator/lubricator (FRL) assembly is not standard equipment with the TTVac-V. The FRL is normally included with the clipper assembly if a clipper is purchased. If your machine has a clipper, refer to the clipper manual for additional information.

An example of an FRL is shown below with the quick disconnect on the right end of the assembly.

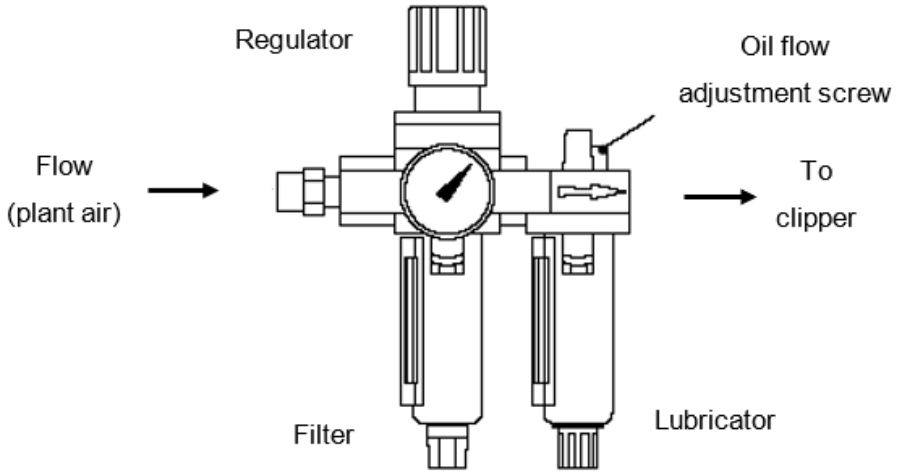

Figure 10: Filter/Regulator/Lubricator (FRL)

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Chapter 5 – Machine Operating Instructions

5.1 Vacuum Pump Setup

1. For ease of shipping, the vacuum pump may not be full and may require additional oil. After unpacking the machine, check the oil sight glass for the correct oil level and replenish as necessary (refer to Section 6.3, "Vacuum Pump Lubrication System").

5.2 Preparation

To prepare for machine operation:

2. Check all air connections.

   Note: If air connections have become disconnected, reassemble as shown in the pneumatic schematic (see Chapter 11, "Assembly Drawings").

3. Check the vacuum pump for proper oil level.
4. Adjust incoming air to the recommended pressure of 80 (5,5 bar).

   Note: Do not set air pressure above 100 PSI (6,9 bar).

5. Check for any air leakage.

   Note: If leakage is present, correct before continuing.

6. Load the clips.
7. Push clips down the rails.
8. Reset the clip pusher or place the clip weight on top of the clips (depends on the clipper model).
9. Check for proper clip feeding and for any obstructions at the punch, knife, and die areas on the clipper.

Danger: While operating the machine, never place fingers or hands near or through the slot in the clipping area or around the gate area.

5.3 Vacuum Nozzle Operation

To operate the vacuum nozzle:

1. Move the nozzle assembly downward into the package.
2. Secure the lip of the nozzle within the package envelope
3. Pull down on the nozzle assembly

   Note: This step opens the valve to draw a vacuum against the package.

4. After the vacuum is drawn proceed to the clipper.

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5.4 Clipper Operation

The clipping sequence is as follows:

1. Push product into the throat of the die support.
2. The punch trigger valve activates.
3. The punch assembly starts moving downward.
4. The punch takes a clip from the rail.
5. At the bottom of the stroke, the clip forms onto the product in the die.
6. At the end of the punch stroke, the cutoff knife extends.
7. The cutoff knife cuts the excess bag tail.
8. The trigger valve resets the system, and the knife and punch retract.
9. Remove the product from the clipper.
10. The machine is ready for another cycle.

Warning: If a clip or other obstruction jams in the die area, do not cycle the machine until the jam is cleared. Turn off and lock-out the air supply before removing the obstruction to avoid damaging the clipper.

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Chapter 6 – Vacuum Pump

6.1 Description

The Clipper Vac model TTVac-V uses a GAST 3/4 HP single-stage rotary vacuum pump. Electrical connections should be made by qualified electricians in accordance with local and national codes.

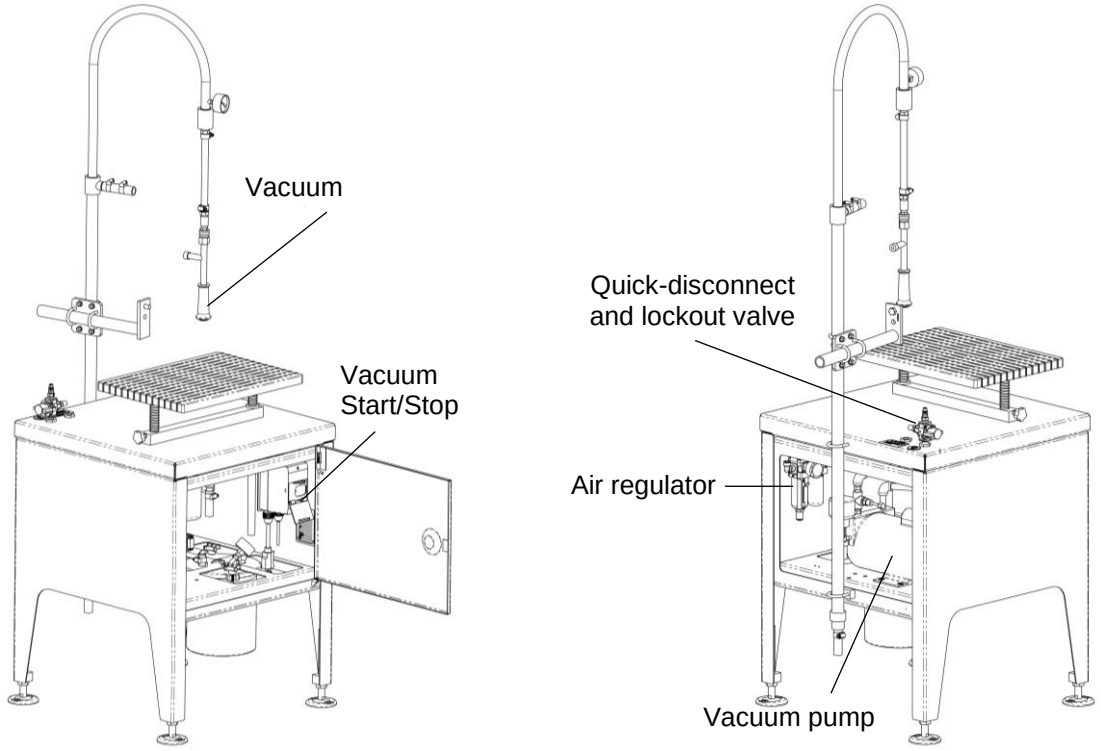

Figure 11: Vacuum Pump System

6.2 Vacuum Pump Electrical Specifications

The electrical specifications of the 3/4 HP GAST model 0823 vacuum pump are as follows:

Frequency: 60 Hz

	Low Voltage	***High Voltage***
Voltage	100-115 Vac	208-230 Vac
Current	9.05 A	4.6 A
Phase	1	
HP/Kw	.75/.37	
Speed	1725 RPM	

Frequency: 50 Hz

	Low Voltage	***High Voltage***
Voltage	100-110 Vac	220-240 Vac
Current	8.3 A	4.8 A
Phase	1	
HP/Kw	.75/.37	
Speed	1425 RPM	

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6.3 Vacuum Pump Lubrication System

The vacuum pump uses a constant level oiler. The lubrication rate is determined by the temperature, the vacuum or pressure at which the pump is operating, and the siphon jar oil level (determined by the vertical position of the tube in the jar).

Before operating the machine, check the vacuum pump for operating oils. To replenish:

1. Pull the reservoir upward out of the adjusting sleeve and turn it over.
2. Add oil through the tube.
3. When the upper reservoir is filled, replace it through the adjusting sleeve and firmly seat it against the top of the sleeve.
4. Fold the oil wick in half with the two ends submerged in the oil at the bottom of the jar.
5. Insert the folded center of the wick into the connector approximately 3/8” (9,5 mm) past the two breather holes in the connector.
   Note: The folded center of the wick should not touch the feed hold leading to the pump. Both the breather holes and the feed hole must be unrestricted.
6. For normal lubrication, adjust the lower end of the tube 1/4” (6,35 mm) from the bottom of the oil jar.
7. To reposition the tube, loosen the locknut.
8. Adjust the sleeve up or down.
9. Lock the new position with the locknut.
10. Upon starting the vacuum pump, check for vacuum leaks around hose connections.

Lubricator oil flow is adjusted by shifting the reservoir tube toward or away from the bottom of the oil jar.

- For faster lubrication, raise the reservoir tube away from the bottom of the oil jar.
- For slower lubrication, lower the reservoir tube toward the bottom of the oil jar.

Note: Refer to the GAST Operation and Maintenance technical manual for additional information and a troubleshooting guide.

6.4 Oil Type

The recommended oil type is GAST AD220 SAE #10 oil (see Chapter 10, “Spare Parts List”). A 10-weight high detergent automotive engine oil can also be used as an equivalent. In high ambient temperature locations, a 20-weight oil may also be used.

6.5 Motor

If the motor fails to start or slows down under load:

1. Shut off and unplug the motor.
2. Check that the supply voltage agrees with the motor post termination and the motor data nameplate.
3. Examine the plug and the switch.
4. If the motor is extremely cold, bring it to room temperature before starting.

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6.6 Flushing

Most pump troubles can be corrected by flushing rather than disassembling the pump. A noisy or inefficient pump is frequently caused by a vane that is stuck in the rotor slot due to excessive oiling or foreign material in the unit.

Wear eye protection when flushing the vacuum pump. Flush the unit in a well-ventilated area. Keep your face away from the exhaust port.

Follow these steps to flush the pump:

1. Remove inlet and outlet accessories.
2. Slowly add several teaspoons of solvent at the intake while the unit is running.
   Note: The recommended solvent is GAST flushing solvent part number AH255.
3. Place the unit on its side with the outlet facing downward so the solvent will work its way out of the pump.
4. After the solvent is removed, place the pump upright.
5. Add a few drops of oil at the intake and attach the accessories.

Warning: Do not use gasoline, kerosene or any other type of flammable liquid for flushing. Personal injury and equipment damage will result.

6.7 Disassembly

If flushing the vacuum pump does not resolve the issue, disassembling the pump should eliminate the foreign material.

Caution: Do not remove the rotor or loosen any of the electric motor through-bolts.

Follow these steps to disassemble the pump:

1. Remove the end plate and the four vanes.
2. Wash the vanes, end plate and pump chamber with the recommended solvent.
3. Dry the unit and re-lubricate lightly.

If the pump fails to produce the proper vacuum or pressure, the top clearance between the rotor body may have increased. A metallic clanging could mean the rotor and the body are touching.

To resolve:

1. Remove the end plate, loosen the body bolts, and set the top clearance at .004 inch.
   Note: This can be done by tapping *lightly* with a miniature hammer on the pump body (either on the top or the bottom, depending on whether the clearance is too large or too small).

The rotor should be turning as you are setting the clearance so that all points on the circumference of the rotor will clear the body. For the end clearance, the total for both sides of the rotor may vary from .0025 to .0035 inch.

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Chapter 7 – Cleaning Procedures

7.1 Cleaning Overview

After the machine has been used or serviced, it must be cleaned to remove all food or other residue from the food contact zone – the tabletop, the vacuum nozzle, the clipper's punch, die, gate, and knife, and all other contact surfaces. Check machine surfaces and surrounding workstations for contamination. All surfaces must be cleaned using current recommended materials and procedures.

Warning: Before cleaning the machine, disconnect the vacuum pump power, depressurize the vacuum pump, and disconnect and lockout the air supply.

7.2 Cleaning Precautions

Follow these precautions when cleaning the machine.

The clipper's cutoff knife is very sharp. Before servicing the knife, disconnect the incoming air from the machine. Be very careful when working with the knife assembly. Protective gloves must be worn.

Disconnect electrical supply lines prior to cleaning the machine. Always protect electrical connections, motors and air lines from water and cleaning fluids.

Note: Using caustic sanitizer solutions may adversely affect the finish of many machine components.

7.3 Cleaning Procedures

Follow these procedures to clean the machine.

1. Turn off the factory air.
2. Use the quick-disconnect to purge air pressure from the machine.
3. Remove guards and protective covers to expose all surfaces for cleaning.
4. Clean all surfaces according to current food safety rules.
5. Inspect for worn or damaged components that may need to be replaced.
6. Apply a light food-grade mineral oil to all food contact surfaces.

   Note: The FRL assembly lubricates the machine's internal moving parts.
7. Check the guards and protective covers for safe operation.
8. Inspect all safety components.
9. Check for and tighten all loose connections, bolts, nuts, and screws before returning the machine to operation.
10. Check for and remove burrs around the die pockets of the clipper assembly.

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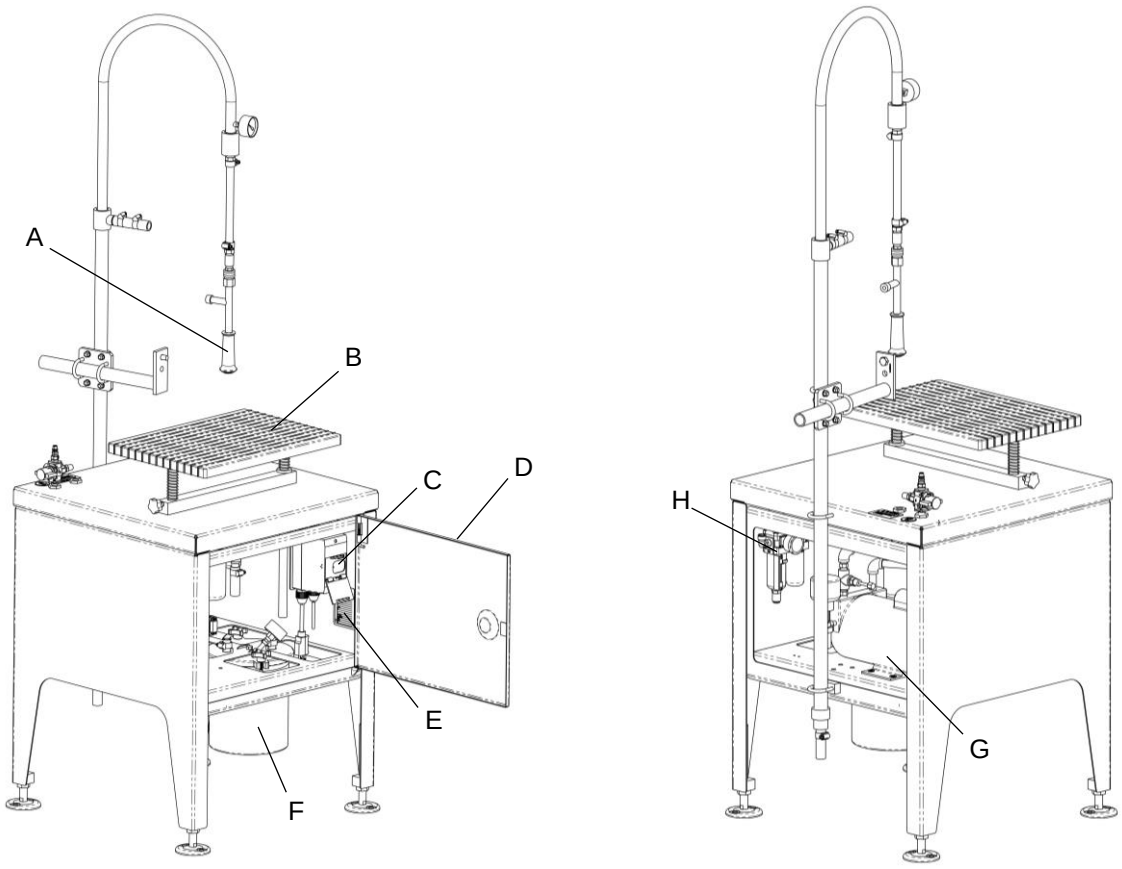
7.4 Cleaning Vacuum Lines and Waste Storage Tank

The vacuum system, like the outer surfaces of the machine, should be cleaned and purged daily. The vacuum system and waste storage tank must be cleaned using USDA-approved cleaning solutions.



Follow these procedures to properly clean the system:

1. Turn the vacuum system on (**C**).
2. Move the vacuum nozzle (**A**) forward until vacuum is applied.
3. Place a plastic bag containing approved cleaning solution on the vacuum nozzle (**A**).
4. Flush out the vacuum system with clear potable water to remove all cleaning solution residues.
   Note: Observe the cautions and procedures in Chapter 6, "Vacuum Pump".

Before attempting to remove the waste tank, ensure the vacuum is completely depressurized:

1. Disconnect the air supply to the machine.
2. Turn off power to the vacuum pump (**G**).
3. Push the vacuum nozzle (**A**) to the maximum forward position.
4. Check the air gauge to ensure it reads zero vacuum.

Continue with the cleaning procedure after the vacuum is depressurized.

1. Remove the waste tank (**F**).
2. Drain and clean the waste tank (**F**) by flushing with clear potable water.
3. Allow the waste tank and vacuum system to air dry.
4. Leave the waste tank unattached until the machine is ready to be used again.

Note: When reattaching the waste storage tank and before using machine, always check the gasket seal, vacuum lines, and vacuum nozzle for leakage.

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Chapter 8 – Maintenance Guide

8.1 Preventive Maintenance Guidelines

For proper machine function and continued satisfaction with your finished product, it is **essential** that your machine be properly maintained. This means that a preventive maintenance schedule should be established and followed. Attention shall be given at least **once a week** to observing wear of all moving parts, especially in the following areas:

- Die support channel and punch assembly
- Die and die pocket area of the die support
- Clip pusher assembly
- Knife assembly

Warning: Operating a machine without following an established PM schedule constitutes neglect and may result in endangering the safety of the operator, degradation of machine function, and inferior product.

To help you track scheduled periodic maintenance as well as unscheduled service, a maintenance log has been included in Chapter 12, “Appendix”.

Note: Make copies of the sample (or design your own form) and use the log to record all service and maintenance activities. In addition to fulfilling the PM requirement, the log will help you to identify and isolate adverse maintenance trends.

For replacement parts, refer to Chapter 10, “Spare Parts Lists“ and Chapter 11, “Assembly Drawings”.

8.2 Maintenance Precautions

After performing any service or maintenance, before you return the machine to operation, always check for and tighten any loose screws, bolts and nuts, connectors, and hoses. Inspect the machine’s safety components. Closely follow all safety warnings and notes to avoid serious injury and potential damage to the machine.

Warning: If a clip or other obstruction jams in the die area, do not cycle the machine until the jam is cleared. Turn off and lock-out the air supply and then remove the obstruction to avoid damaging the clipper.

Warning: Do not attempt to add oil to the FRL lubricator while the machine is under pressure. Disconnect the air supply at the quick disconnect, which will purge the air pressure from the system. Lock-out the air supply.

Caution: Carefully and frequently inspect the clipper for worn parts. Always replace worn parts as necessary. Protective gloves should be worn.

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8.3 Daily Maintenance Checklist

Prior to any maintenance or repair, use the following lock-out and tag-out procedures:

Disconnect the main power and electrical supplies. Attach power and electrical lockout devices.

Tag-out the machine before beginning any maintenance work.

Attempt to cycle the machine to ensure it is properly disabled. Follow all safety precautions in this manual.

Check the following items each day before operating the machine:

___ Check for loose screws.

___ Check the oil level in the lubricator.

___ Check the air filter.

___ Check the knife for signs of chipping

___ Check the end of the punch for burrs.

___ Check guards for safe function.

___ Check for and tighten all loose connections and screws before returning machine to operation.

___ Check for and remove any burrs around die pockets.

___ Inspect for worn or damaged components that may need to be replaced.

After any maintenance has been performed, before you return the machine to operation:

- Check for and tighten all loose connections and screws
- Check for and remove any burrs around die pockets and voider gates, and
- Inspect all safety components for proper operation

For replacement parts, refer to Chapter 10, “Spare Parts Lists“ and Chapter 11, “Assembly Drawings”.

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Chapter 9 – Troubleshooting Guide

If you are having trouble with your machine, before you call for assistance, try to resolve the problem through the following troubleshooting steps. Find your problem from the list of symptoms in the left column, then try each of the solutions in the right column until the problem is resolved.

Note: The first things to check in the event of a major machine outage are the electrical and air supplies. From that point the following table can be used to isolate and correct the problem.

Symptom	Solution
Clipper has no power	1. Air connection may be loose. Check all air connections.
	2. Regulator may be turned off. Check the regulator unit.
	3. Water may be in the system. Drain and change the filter.
Machine is slow	1. Water may be in the system. Drain water and change the filter.
	2. Muffler may be clogged. Replace the muffler.
	3. Pressure to the clipper is low. Check the pressure setting and increase if necessary.
	4. Air lines are pinched. Replace the air lines.
	5. Cylinder is stuck. First check for pinched air line and check the air pressure. If cylinder is still stuck, disconnect air line and check for broken or worn parts. Replace bad parts or air cylinder.
Punch does not retract	1. Punch extend valve may fail to reset. Replace the punch valve.
	2. Punch movement restricted by debris in clip channel or clip window. Remove debris and confirm that punch is free to move in clip channel.

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Symptom	Solution
Knife does not cut	1. Check knife for nicks. Sharpen or replace as needed.
Malformed clips	1. Punch or die may be damaged. Replace as necessary.
	2. Air pressure may be too low or too high. Check air pressure and adjust if necessary.
Clips are loose and seal poorly	1. Check crimp control and adjust if needed.
	2. Air pressure too low. Check air pressure and adjust if necessary.
	3. Punch and die may be worn. Check for wear on punch and die and replace if needed.

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Chapter 10 – Spare Parts List

When ordering replacement or spare parts, always include the following information:

- Machine model number and date of purchase
- Identifying part number that is stamped on the part
- Part number from spare parts list or from assembly drawing

Listed items can be ordered individually. Recommended quantities are provided below.

Recommended Spare Parts:

Part number	Description	Quantity
21-0377	Valve	1
21-0490	1/2” Ball Valve SST S3F	1
21-0259	Mechanical Sport Metal Seal PB	1
21-0375	3 Way Airtec Valve	1
21-0223	3 Port 2 POS 1/4” Ports Air Pilot	1
24-0045	Filter element kit	1

Loose Parts List:

Part number	Description	Quantity
24-9933	GAST AD220 SAE #10 Oil	1
80-1485	TTVac-V User Manual	1

To obtain part numbers, refer to the parts listed on the assembly drawings listed in Chapter 11: Assembly Drawings.

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Chapter 11 – Assembly Drawings

Machine Assembly

TTVac-V	TTVac-V Assembly
00-5810	TTVac Waste Tank Assembly
00-6059	TTVac Frame Assembly
00-0805	Shut-Off Valve Assembly
00-0813	Goose Neck Pipe Assembly
43-1368	Intake Filter Assembly
43-1369	Exhaust Muffler Assembly
00-4136	Pump - Vacuum 3/4 HP Parts List
00-4153	Waste Tank Sub-Assembly
00-4527	Lubrication Assembly
00-8065	Shurvac Nozzle

For SZ4135 and SZ2105 Clippers

00-5321	Pipe Adapter Assembly

For Clippers Other Than SZ4135 and SZ2105

00-5399	Pipe Adapter Assembly

Options

Caster Option

00-7596	TTVac Caster Kit

Vacuum Nozzle Options

00-0424	Spit Nozzle Assembly
00-8066	Vacuum Nozzle Assembly

100V Class Vacuum Pump Option

00-7782	3/4 HP 100V Class Vacuum Pump Assembly
00-3506	On/Off Switch Assembly, Eaton 8-12 A

200V Class Vacuum Pump Option

00-7783	3/4 HP 200V Class Vacuum Pump Assembly
00-3505	On/Off Switch Assembly, Eaton 4-6.3 A

Gas Flush Options

00-5325	Vacuum Nozzle Assembly
00-5359	Gas Flush Valve Assembly
00-5363	Waste Tank Cover Assembly
00-5364	CV-E Gas Flush Conversion Kit

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Chapter 12 – Appendix

Maintenance Log

Make copies of this maintenance log (or design your own) and use the log to record all preventive maintenance and unscheduled service activities. Use the log to identify and isolate adverse trends.

Date	Technician	Maintenance Performed

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Chapter 13 – Index of Figures

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