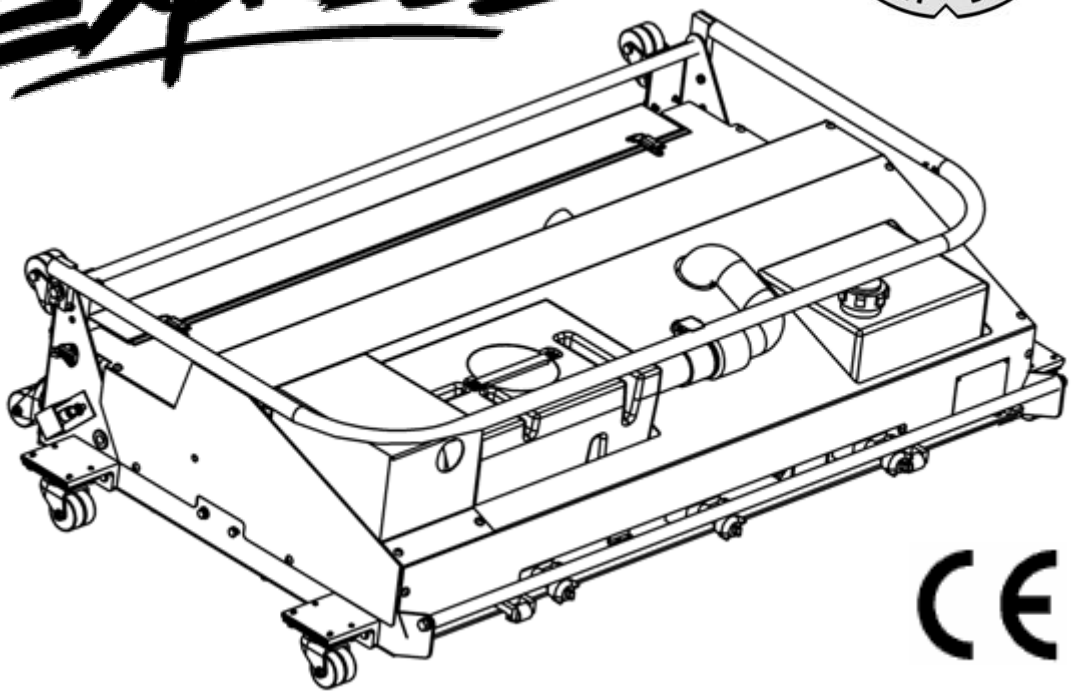
EXPRESS



Combination Lane Machine

Operation, Maintenance, and Parts Manual

400-294-005 Rev. A: 04/04

Caution: Read this instruction manual before using the lane machine

ALL RIGHTS RESERVED

TRADEMARK NOTICES

DOCUMENT UPDATES

In the interest of continual product and services improvement, AMF Bowling Products, Inc. reserves the right to revise or update this manual at any time without obligation to notify any person or entity of such revision. The document number and revision date below indicate the edition and printing date of this manual.

Document Part No. 400-294-005

Rev. A Revision Date: 04/16/2004

AMF BOWLING PRODUCTS, INC.
Performance Equipment Division
8100 AMF Drive
Mechanicsville, Virginia 23111

EXPRESS
COMBINATION LANE MACHINE
Operation, Maintenance, and Parts Manual

Part Number 400-294-005

Summary of Changes

Change No.	ECR No.
Original	

List of Effective Pages

Page	Change No.	Effective Date
All	Original	04/16/2004

CONTENTS

4.0 MAINTENANCE, continued

7.0 PARTS, continued

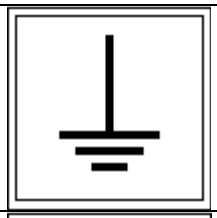
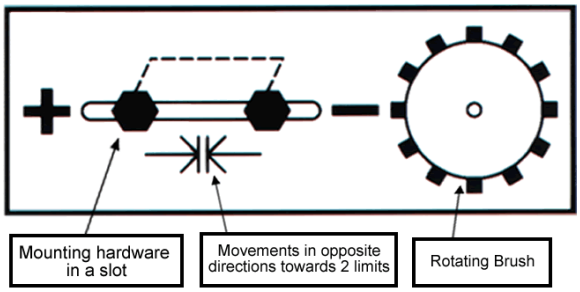
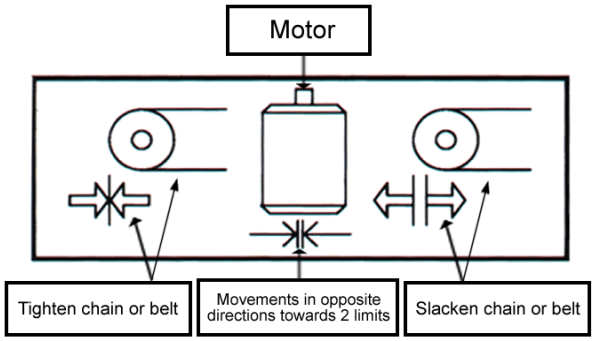
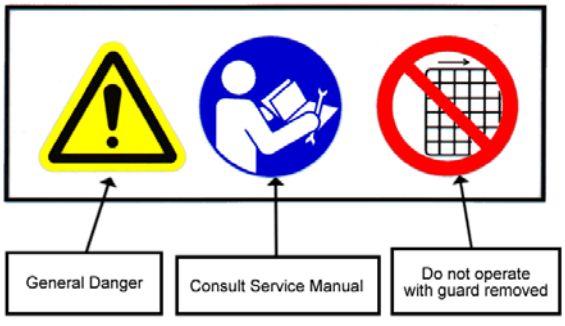
Section 1

SAFETY INFORMATION

1.1 OVERVIEW OF LABEL SYMBOLS

This Guide contains information needed to properly operate and maintain the ***Express Combination Lane Machine***. If any terms, concepts, or operations contained in this Guide are not clear to you, consult an experienced professional or AMF Technical Support at 1-800-342-5263 between the hours of 8:00 a.m. and 5:00 p.m. Eastern Time. After 5:00 p.m., you can leave a message on the voice mail system. The 24-hour fax line is 1-804-730-4390. Address all faxes to: AMF Products Technical Support. Below you will find the different safety labels that indicate potential hazards associated with various machine components as well as a brief description of the hazard. This section also contains a number of safety precautions that should be observed when operating and servicing the machine.

SINGLE ICON LABELS	DESCRIPTION
	**Electric Shock Hazard/Electrocution** **AMF Part Number 294-115-236**
	**Heat, Hot Surface, Burn Hazard** **AMF Part Number 294-115-238**
	**Hand Crush/Force From Side** **AMF Part Number 294-115-237**
	**Hand Entanglement Hazard (chain drive)** **AMF Part Number 294-115-245**
	**Hand Entanglement Hazard (notched belt drive)** **AMF Part Number 294-115-246**

	**Earth (Ground)** **AMF Part Number 294-115-256**
	**Protected Earth (Ground, Main)** **AMF Part Number A-1058**
MULTIPLE ICON LABELS	
	**Buffer Adjustment** **AMF Part Number 294-001-019**
	**Buffer or Drive Motor Belt Adjustment** **AMF Part Number 294-001-018**
	**Danger, Read Tech Manual** **AMF Part Number 294-009-005**

IMPORTANT SAFETY INFORMATION

WARNING! The following basic safety-related items must be followed in order to ensure the safe operation of your lane machine. Failure to follow these precautions could result in serious personal injury, damage to the lane machine, or both.

- Read this instruction manual before using this appliance.
- Ensure the pinspotters are turned off for the lanes you are conditioning.
- This lane machine is very heavy. Obtain the assistance of a second person when transferring the machine between the operating and storage positions. Exercise care to prevent the machine from tipping when moving the machine while it is in the upright position.
- ALWAYS operate the lane machine on a dedicated and grounded electrical circuit of the proper voltage.
- Inspect the power cord prior to each use.
- DO NOT allow the lane machine to run over the power cord.
- Unplug and inspect the power cord for damage if the machine runs over the power cord. Should the power cord become entangled in the machine, unplug the power cord from the bowling center's electrical receptacle before attempting to clear the power cord from the machine.
- DO NOT operate this machine with a damaged power cord or plug.
- DO NOT use any other extension cord in place of, or in addition to, the one provided.
- Disconnect the power cord when cleaning, replacing parts, or performing maintenance.
- DO NOT operate the lane machine on a lane when someone is working on the lane or in the vicinity of the pinspotter.
- DO NOT operate the lane machine with a hood assembly open or removed except when required to make adjustments.
- DO NOT use flammable or toxic materials in the lane machine. Use only cleaners and conditioners specifically formulated for use by the bowling industry.

IMPORTANT SAFETY INFORMATION, cont.

- Avoid splashing liquid when filling the cleaner tank and oil tanks. Follow all instructions and precautions on the product label. In case of eye contact, flush with water for 15 minutes.
- DO NOT fill the oil tanks on or near the approach. Conditioner spilled on the approach presents a hazard to the bowler.
- Turn off the machine if foam or liquid issues from the vacuum exhaust.
- Be aware of the possibility of the machine continuing onto the approach when it returns to the foul line. Stay out of the path of machine travel when the machine is approaching the foul line.
- DO NOT wear loose personal items such as neckties, necklaces, bolos, or long hair around rotating machinery.
- Keep hands away from solenoid linkages, gears, chains, and belts. These components can pose a severe pinching hazard.
- Exercise caution whenever the hoods are open or when making adjustments. Some components may become hot during use.
- DO NOT modify the machine's wiring except as specified in AMF Bowling-supplied publications.
- DO NOT use, clean, or store the machine outdoors and/or in wet conditions.
- Use only brushes supplied with this appliance or those supplied by the manufacturer for use in this machine.
- Ensure all of the machine's doors are closed and latched before placing the machine in the storage position.
- The possibility exists of a slipping hazard on any wet surface which could come about by operating, moving, or storing the lane machine.
- DO NOT modify any safety apparatus, shield, or electrical components except by a qualified technician for the sole purpose of adjusting and/or repair testing the machine. In completing this function all safety aspects must be restored prior to regular operation.

NOTE: Never use the Express Combination Lane Machine for any purpose except to clean and oil (condition) the surface of bowling lanes.

Section 2

INTRODUCTION

The Express Lane Machine, shown in Figure 2-1, is a versatile, total lane care machine that performs three operations: cleaning, conditioning, and standalone buffing. The cleaning operation removes dirt and oil from the lane. It can be performed alone or in combination with conditioning. The conditioning operation buffs an oil pattern on the lane. The buffing operation buffs oil that is already on the buffer brush onto the lane and redistributes the oil already on the lane. The buffing operation is automatically activated with the oiling operation, but it can be performed alone.

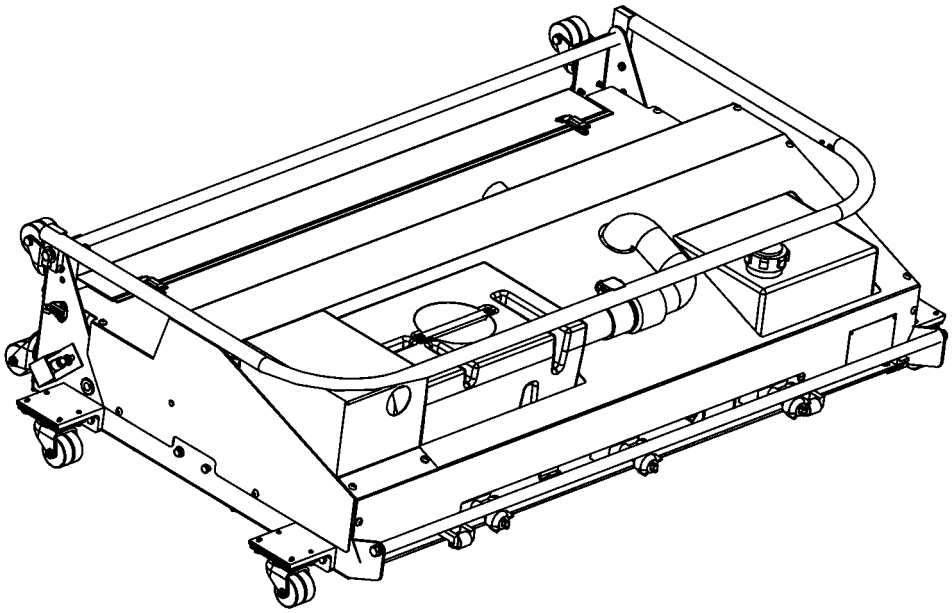


Figure 2-1

The cleaning operation wets the lane by spraying a cleaning solution through three spray heads. The factory-set flow rate and spraying pattern give gutter-to-gutter coverage without getting overspray into the gutters. To boost the effectiveness of the cleaning solution, it is applied more heavily down the middle of the lane, where the oil is usually heaviest, and it is mixed into the oil by an agitator foam. The residue is then picked up by the Express Lane Machine's floating vacuum head. The floating action allows the vacuum head to conform to changes in the lane surface. The cleaning operation is performed only as the machine travels from the approach to the pin deck.

The conditioning operation (also known as lane conditioning, oiling, or dressing) applies oil by buffing it onto the lane. If you select the oiling operation before selecting the buffing operation, the Express automatically selects the buffing operation for you. When conditioning your lanes using the Express as set at the factory, the oil pattern is medium-low output along the outer 11 inches of each side of the lane and high output down the middle 20 inches of the lane. The oil is applied for the first 24 feet of the lane and brushed out another 15 feet. The specific oil output produced by your Express across the lane at eight feet from the approach was shipped with your machine. The oil output (the pattern across the width of the lane) and the application pattern (the oiled area and buffing taper) can be changed by using different densities of wicking foams and different oiling and buffing distances. Lengths of the other densities of the wicking foams that can be used with the Express were shipped with the machine. For more information about oil output and patterns, refer to Section 6.0 - *Determining Your Oiling Pattern*.

Buffing can be performed with or without applying new oil. When used alone, the buffing operation applies the oil already on the brush and redistributes the oil already on the lane. Since very little new oil is being applied to the lane during this operation, the resulting oil pattern will not match the oil pattern you achieve when you condition the lane; it will only be an approximation of that pattern.

2.1 SPECIFICATIONS, DIMENSIONS, AND CAPACITIES

The following table provides electrical use, machine weight and dimensions, and tank capacities of the Express Lane Machine.

Electrical	Single phase, 50/60 Hertz, 3360 watts 110 V (US) 208 – 250V, 14 amps (Other)
Main Power Circuit Breaker	30 amp protection (US), 14 amps protection (Other)
Overcurrent Protection	Each motor and solenoid is individually protected against an overcurrent condition either by a thermal overload protection device or board-mounted mini-fuses. The Machine must be operated on a dedicated and grounded electrical circuit.
Weight (empty)	250 pounds (113.4 kg)
Machine Dimensions	13.5 inches (34.3 cm) H x 34 inches (86.4 cm) L x 56.25 inches (142.9 cm) W
Vacuum Head Dimension	42 inches (106.7 cm) W
Power Cord	3-conductor, 110 V (US) 12 gauge, 230V (Other), harmonized, 125 feet (38.1 m) L

Cleaner Tank Capacity	1.75 gallons (6.623 liters), enough to clean 12 lanes from the pre-approach start position. **Use only cleaners specifically manufactured for use on bowling lanes.**
Waste Tank Capacity	Holds waste for 12+ lanes when a defoamer is used.
Oil Tank Capacity	40 ounces (1.183 liters), enough to condition 24 lanes. **Use only oil products specifically manufactured for use on bowling lanes.**
Foams: Standard Alternates	 Outside - 3-1/4 inches (8.255cm) H x 11 inches (27.94 cm) L Middle - 3-1/4 inches (8.255cm) H x 20 inches (50.8 cm) L 3-1/4 inches (8.255cm) H x 48 inches (121.9 cm) L

2.2 UNPACKING THE EXPRESS LANE MACHINE

Before your first use of the Express Lane Machine, you should ensure all the components were shipped and that they arrived in good condition. We also strongly suggest you familiarize yourself with how to operate the machine.

IMPORTANT
The oil transfer roller is tied in place to prevent damage during shipment. You must complete the steps below before using the machine or you will damage the machine.

1. Open the clasps on the back of the machine and open the oil tank compartment door.
2. Cut the plastic wire tie and remove the red tag and wire tie.
3. If the silver roller (oil transfer roller) does not drop down against the buffer brush, gently push it down to rest against the buffer brush. Do not force it.
4. Close the oil tank compartment and refasten the clasps.
5. It is also recommended by the manufacturer that you remove the vent plug from the drive motor gearbox. It is labeled to be removed before use but only needs to be once the cover is taken off for the first time.

The following table lists the contents of the Express Lane Machine package.

Item	Part Number
Express Lane Machine	294-115-200 (110V) or 294-115-220 (230V)
Power Cord	294-002-359 (110V) or 294-115-269 (230V)
Large Red Funnel (for cleaning solution)	RP-115
Small Red Funnel (for oil)	RP-42
Quick Start Information	400-294-003
Buffer Pressure Adjusting Tool	RP-43
Oil Pattern Printout	Not Applicable
Starter Pack • ACC Cleaner, qty 1 - 2.5 Gallon (9.46 liter) container • Reactor Oil, qty 1 - 2.5 Gallon (9.46 liter) container • Defoamer, 1 Gallon (3.78 liter)	 • 294-006-047 • 294-006-049 • 294-115-161
Yellow Envelope for 110V Express • Warranty Card • 4A Relay Board Fuse • 10A Relay Board Fuse • 6.3A Relay Board Fuse • 8A Relay Board Fuse • 2A Relay Board Fuse • 5x20 Slow Blow, 500mA Fuse Pack	 • 294-115-166 • 294-115-373 • 294-115-374 • 294-115-375 • 294-115-366 • 294-002-246
Yellow Envelope for 230V Express • 4A Relay Board Fuse • 1A Relay Board Fuse • 2A Relay Board Fuse • 5A Relay Board Fuse • 5x20 Slow Blow, 500mA Fuse Pack	 • 294-115-166 • 294-115-365 • 294-115-366 • 294-115-367 • 294-002-246

Standard Foams (in the machine) • Medium-Low Output (2) orange, 3-1/4 inches (8.255cm) H x 11 inches (27.94 cm) L • High Output (1) blue, 3-1/4 inches (8.255cm) H x 20 inches (50.8 cm) L	 • 294-115-181 • 294-115-182
Alternate Foams, 3-1/4 inches (8.255cm) H x 48 inch (121.9 cm) L • Super-High Output (black) • High Output (blue) • Medium-High Output (red) • Medium-Low Output (orange) • Low Output (natural)	 • 294-115-177 • 294-115-178 • 294-115-179 • 294-115-180 • 294-115-176

IMPORTANT

If you find damage caused in shipping, immediately contact the shipper and file a damage claim; AMF is not responsible for damage that occurs during shipment.

This page intentionally left blank.

Section 3

OPERATION

Operating the Express Lane Machine is very straightforward and easy to do. The basic steps are:

1. Fill the tanks,
2. Plug in the machine,
3. Select the operation,
4. Set it on the lane, and
5. Press the Start button.

But giving you only that bare information is like telling a new driver how to operate a car by telling them to turn the key in the ignition and press the accelerator. In both examples, there are many things each operator needs to know about preparing the machine for use, how the machine functions, and how to use the machine to perform the functions for which it was designed. This section contains the detailed information you need to know in order to use the Express Lane Machine safely, effectively, and efficiently.

3.1 OVERVIEW OF HOW THE EXPRESS LANE MACHINE OPERATES

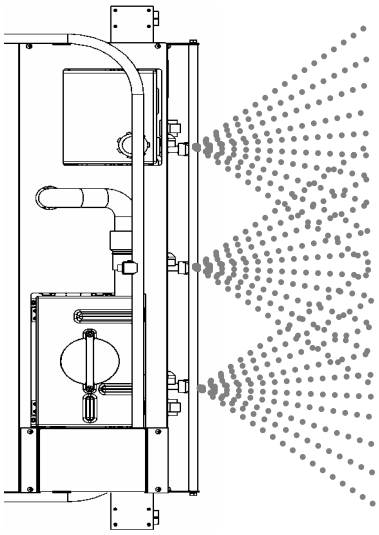
The Express Lane Machine is separated into the cleaning section and the conditioning section. The cleaning section is powered by the vacuum motor. The conditioning section is powered by the oil transfer roller motor and the buffer motor. The machine is propelled along the lane by the drive motor.

The machine is equipped with front and rear optical sensors and guide rollers to keep it correctly placed on the lane. The Express also has an internal distance counter so it "knows" its position on the lane. The Express continually compares its internal counter to the distance you enter for an operation so it knows where on the lane to start and stop an operation.

The cleaning section is made up of:

• The cleaner tank	• The vacuum head
• The cleaner spray pump	• The vacuum motor
• The spray heads	• The waste tank

The vacuum head contains the agitator foam and the squeegees. When cleaning, the Express performs the following actions:



1. The spray heads dispense the cleaner over the lane, as shown in Figure 3-1.
2. The agitator foam mixes the cleaner into the oil on the lane.
3. The front squeegee directs the residue into the vacuum chamber that is created by the front and back squeegees.
4. The residue in the chamber is vacuumed into the waste tank.

The cleaning operation can be performed separately or with the conditioning operation.

Figure 3-1

The conditioning section is made up of the following components:

• Oil tank	• Wicking foams	• Oil transfer roller motor
• Oil transfer roller	• Buffer brush motor	• Buffer brush

The Express Lane Machine uses wicking foams to transport the oil from the oil tank to the transfer roller. The width, type, and density of the wicking foams control the amount of oil moved to the transfer roller. The Express comes installed with three foams in two densities. The two outside foams are medium-low output foams and apply oil to the outside 11 inches of the lane. The middle foam is a high-output foam that applies oil to the middle 20 inches of the lane. These foams create the most often used oiling pattern.

A printout of the oil output produced by your Express Lane Machine across the lane at eight feet from the approach was included in the materials shipped with the machine. The oil output can be changed by replacing the installed foams with the alternate wicking foams that were also shipped with your machine. For information about changing the oil output, refer to Section 6.0 - *Determining Your Oiling Pattern*.

When conditioning the lanes, the transfer roller turns to continuously pick up oil from the wicking foams and move it for pickup by the buffer brush. The buffer brush picks up the oil from the transfer roller and applies it to the lane. When the buffing-only operation is performed, the transfer roller does not turn, so the buffer brush does not pick up any oil; it only redistributes the oil that is already on the brush and on the lane.

The Express is propelled by the drive motor. When cleaning the lanes, the drive motor propels the machine until the end of the lane is reached, then it reverses direction and propels the machine back to the approach. When only conditioning the lanes (no cleaning) or only buffing the lanes, the drive motor propels the machine until the buffing distance is reached, then it reverses direction and propels the machine back to the approach.

3.2 THE EXPRESS LANE MACHINE CONTROLS

You control the operations of the Express Lane Machine by selecting options and specifying information on the control dashboard, shown in Figure 3-2. This section describes the control dashboard and how to use it.

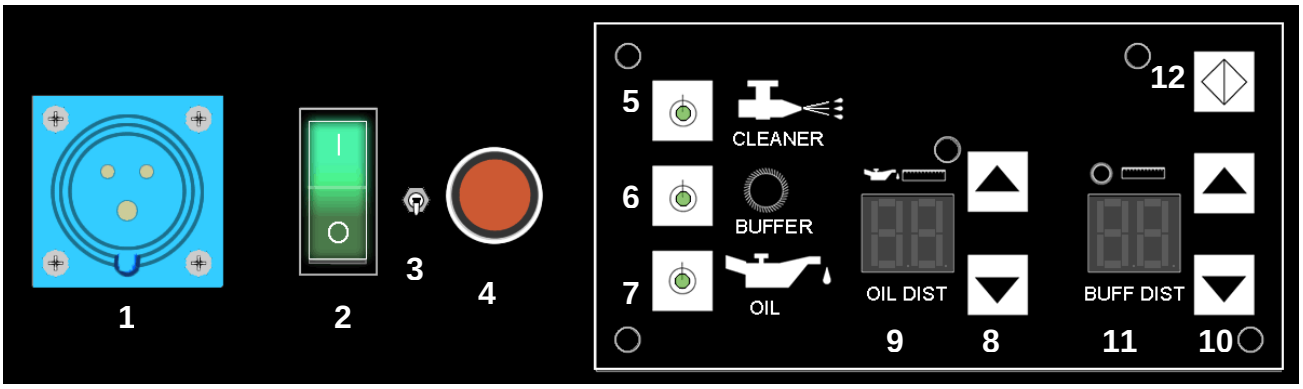


Figure 3-2

The controls and information displays on the control dashboard are described below. The recommended start-up sequence is given in the *Cleaning and Conditioning the Lanes* instructions on page 3-21.

ID	Control or Display	Description
1	Power Inlet	This blue inlet is where you connect the power cord. To ensure you properly and safely connect the power cord, the large, blue plug is designed to fit into the inlet in only one way. The machine must be plugged only into a grounded, 110-volt (US) (230 volt other) outlet. Have your center manager show you the outlet(s) to use.
2	POWER Switch	This rocker switch is the circuit breaker for the Express. It turns power on and off to the machine and provides overcurrent (30 amp) protection (14 amp on 230V machine). **This switch does not start any of the operations.**

ID	Control or Display	Description
3	Drive Motor Kill Switch	This switch will stop the drive motor only. This is useful when making certain machine adjustments.
4	STOP Button	This large, red button stops all machine operations. **It does not power off the machine.** After you press the STOP button, you must use the POWER rocker switch to power off, then power on the machine to restart it.
5	CLEANER	This touch-sensitive button selects and deselects the cleaning operation. The Express automatically selects this operation when you turn on the machine. The CLEANER button glows green when the cleaning operation is selected.
6	BUFFER	This touch-sensitive button selects and deselects the buffing operation. The Express automatically selects this operation when you turn on the machine. If you select the oiling operation without selecting the buffing operation, the machine automatically selects the buffing operation. The BUFFER button glows green when the buffing operation is selected.
7	OIL	This touch-sensitive button selects and deselects the oiling operation. The Express automatically selects this operation when you turn on the machine. The OIL button glows green when the oiling operation is selected.

ID	Control or Display	Description
8	OIL DIST ⬆ Up Arrow ⬇ Down Arrow	These touch sensitive buttons are used to scroll up and down through numbers to specify where the machine is to stop and resume oiling. When the machine is moving toward the pin deck, the setting is the number of feet from the approach at which the machine is to **stop** oiling. When the machine is moving toward the approach, the setting is the number of feet from the approach at which the machine is to **resume** oiling. The numbers are displayed in the Oil Dist window. The Express remembers the distance used in the last lane conditioning session and assumes that distance when you next start up the machine.
9	Oil Dist	This window displays the distance, in feet from the approach, that will be oiled.
10	BUFF DIST ⬆ Up Arrow ⬇ Down Arrow	These touch sensitive buttons are used to scroll up and down through numbers to specify where the machine is to stop and resume buffing. **This setting must be equal to or larger than the OIL DIST setting.** When the machine is moving toward the pin deck, the setting is the number of feet from the approach at which the machine is to **stop** buffing. When the machine is moving toward the approach, the setting is the number of feet from the approach at which the machine is to **resume** buffing. The numbers are displayed in the Buff Dist window. The Express remembers the distance used in the last lane conditioning session and assumes that distance when you next start up the machine.
11	Buff Dist	This window displays the distance in feet from the approach that will be buffed.

ID	Control or Display	Description
12	START You can also use the START button on the handle.	This touch-sensitive button starts up the components for the operation(s) you have selected then starts the machine down the lane. NOTES You must press the START button twice. For your safety, the START button has a time-out feature. If your second touch of the START button is more than five seconds after your first touch, the start-up sequence halts and you have to begin again. When you have selected the cleaning operation, the first touch turns on the spray pump so cleaner starts spraying on the lane, starts the vacuum motor, and lowers the vacuum head onto the lane. The second touch turns on the drive motor to propel the machine down the lane. When you select either the conditioning or buffing-only operation, nothing happens on the first touch of the START button. The second touch starts the oil transfer roller motor (if conditioning), the buffer motor to rotate the buffer brush, and turns on the drive motor to propel the machine down the lane.

3.3 PUTTING THE EXPRESS LANE MACHINE INTO POSITION

The Express Lane Machine has two positions, operating and storage. The machine must be in the operating position, shown in Figure 3-3, to perform any of its operations.

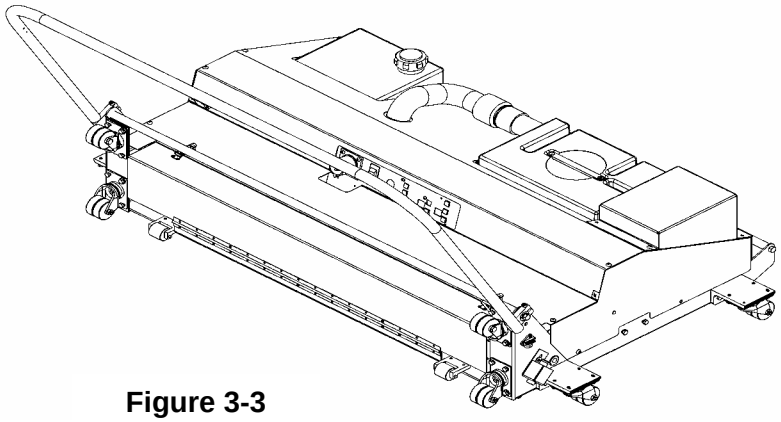


Figure 3-3

Though you can move and store the machine in the operating position, we recommend that you tip it into the storage position, as shown in Figure 3-4.

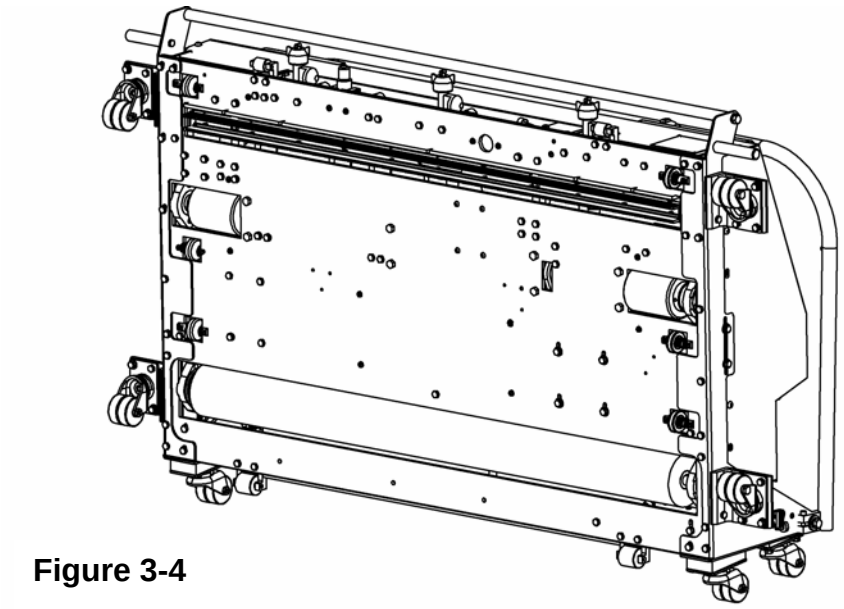


Figure 3-4

To put the Express into the operating position from the storage position, stand facing the bottom of the machine and grab the lifting handle, as shown in Figure 3-5, with both hands. Slowly lower the machine onto its wheels. Do not release the lifting bar until all four caster wheels are on the approach.

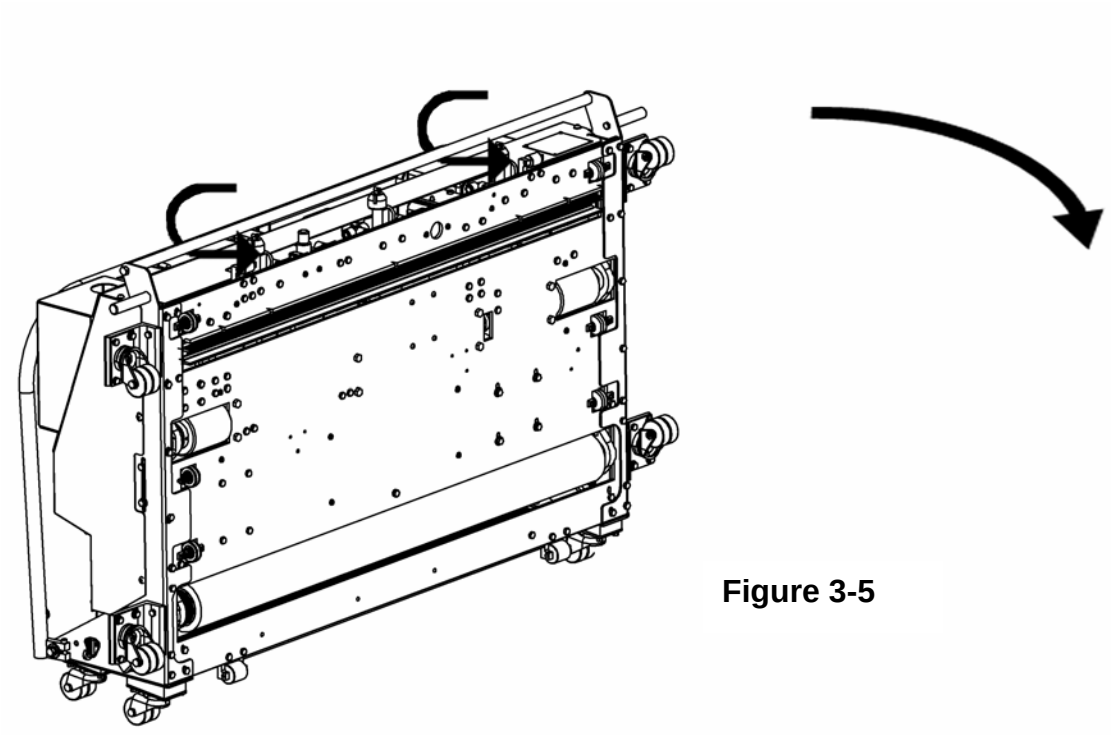


Figure 3-5

To put the Express into the storage position from the operating position, fold the handle across the machine then stand in front of the machine (the side with the spray heads) and grab the lifting bar with both hands. Slowly tip up the machine onto its wheels. Do not release the lifting bar until all four wheels are on the approach.

NOTE

Most of the machine's weight is located at the back/bottom of the machine. This helps keep the machine balanced while you place it into position. However, the machine weighs 250 pounds, and while it is not necessary to lift its entire weight, take the appropriate lifting precautions when moving it from one position to another.

3.4 THE HANDLE

The handle, shown in Figures 3-6a and 3-6b, can be placed in any position -- from flat against the Express housing to parallel to the floor. This allows you to put the handle in whatever position is comfortable for you when operating, moving, or storing the Express.

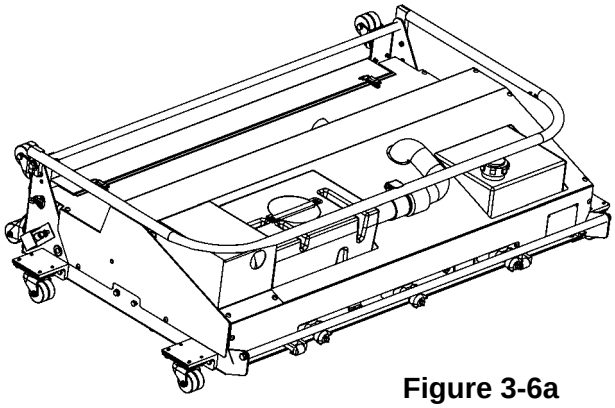


Figure 3-6a

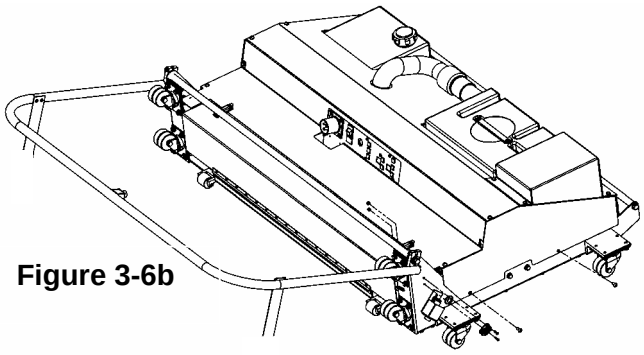


Figure 3-6b

SUGGESTION

Before releasing the handle when the Express starts to move down the lane, we strongly recommend that you lower the handle either over the machine or toward the lane as you release it. This ensures the handle will not scrape the underside of your lane masks.

The handle has a START button and hook and loop straps, as shown in Figure 3-7.

The START button works just like the one on the control dashboard. It is placed on the handle so you don't have to reach across to the machine to start an operation.

The hook and loop straps hold the power cord up and away from the moving parts of the machine and help prevent it from dragging on the lane as the machine moves down and up the lane. It also relieves stress on the power cord as it is pulled when the machine moves.

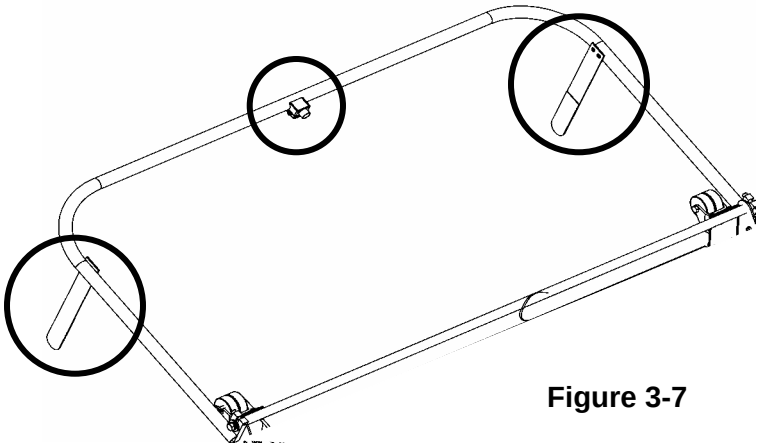


Figure 3-7

The recommended power cord path is:

- Bring the power cord under the handle.
- Wrap the power cord around the left side of the handle and secure it with the hook and loop strap.
- Clip it into the eye hook located on the left side of the Express frame.
- Plug it in.

This path keeps the cord away from the back sensor so that it doesn't inadvertently set off the sensor.

3.5 OPTICAL SENSORS

The front and rear optical sensors determine whether the Express Lane Machine has reached the back of the pin deck or the approach.

The front sensor is located on the underside of the Express, as shown in Figure 3-8. It is positioned so it "looks" down on the lane. Information from this sensor is used only when the machine is traveling from the approach to the pin deck (down the lane). The sensor is continually testing for a change in height where the lane drops off. When the sensor detects the drop off, it sends a signal to the machine that it has reached the end of the pin deck.

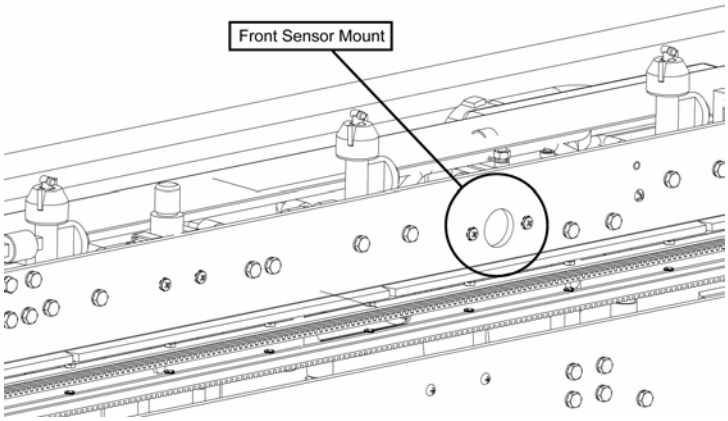


Figure 3-8

The rear sensor is located on the back wheel bracket, as shown in Figure 3-9. It is positioned so it “looks” behind and slightly to the right of the machine. Information from this sensor is used only when the machine is traveling from the pin deck to the approach. The sensor is continually testing for changes in height such as caused by the gutter ramps or where the gutter abuts the approach. When the sensor detects the change, it signals the machine that it has reached the approach.

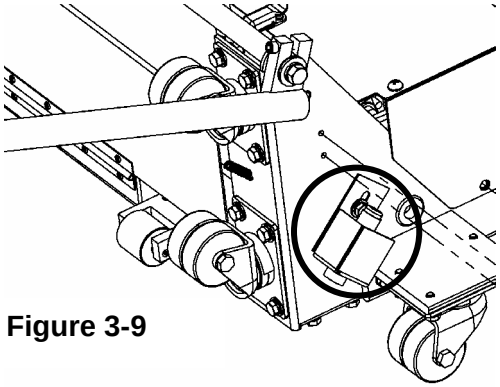


Figure 3-9

NOTES

- When the rear sensor detects something in the gutter, it will assume it is “seeing” where the gutter abuts the approach. Therefore you should remove items from the gutters before starting the Express down the lane.
- To ensure the power cord does not affect the sensors, we recommend you route the cord as described earlier in this section.
- If the machine turns off in the middle of an operation, you can resume the operation from where the machine stopped. For information about restarting the machine, refer to the Troubleshooting section.
- Brightly colored gutter ramps may not register with the sensor as quickly as darkly colored ramps. If you have brightly colored ramps and the machine does not stop at the approach, refer to the Troubleshooting section for information about adjusting the sensor position.

3.6 CLEANING OPERATION COMPONENTS

The components used in the cleaning operation are shown in Figures 3-10 and 3-11, and described below.

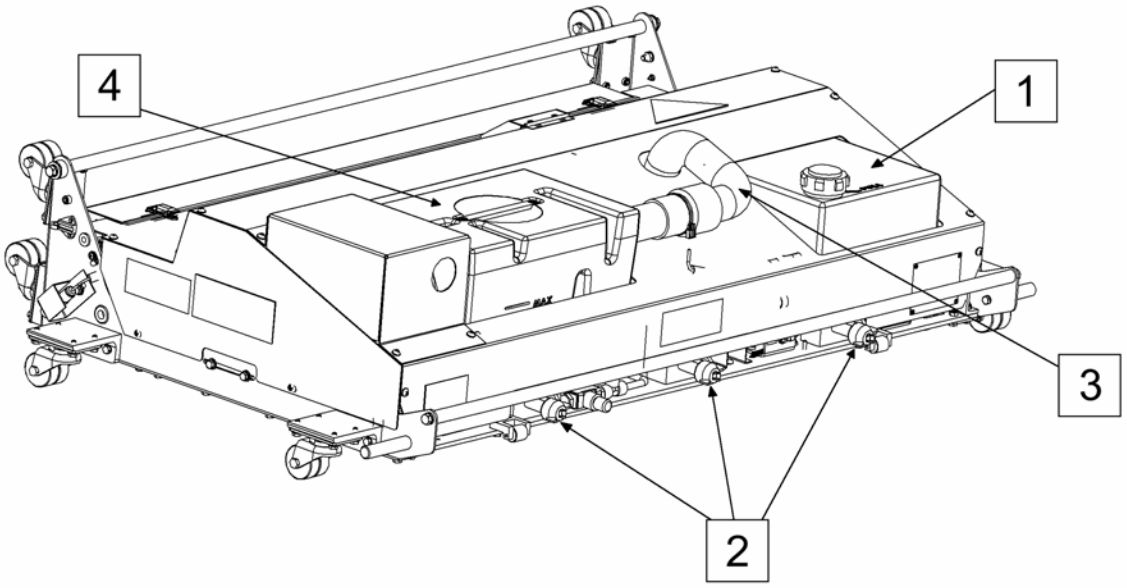


Figure 3-10

ID	Component	Description
1	Cleaner Tank *(Figure 3-10)*	This tank holds the cleaner. It holds enough cleaner to clean a minimum of 12 lanes. Because the tank is designed to not drip when the machine is tipped into its the storage position, you can leave cleaner in the tank.
2	Spray Heads *(Figure 3-10)*	The three spray heads distribute the cleaner on the lane. The spray head pattern is set to overlap and to distribute more cleaner in the areas where the oil pattern is thicker. The spray head positions cannot be adjusted. Refer to the Troubleshooting section for information about how to clear clogs and how to change the amount of cleaner dispensed from the spray heads.
3	Vacuum Hose *(Figure 3-10)*	This flexible tube is used to transport the residue from the vacuum head to the waste tank. The hose slips onto the waste tank inlet tube. This slip fitting makes it easy for you to take off the hose when you remove the waste tank.

ID	Component	Description
4	Waste Tank *(Figure 3-10)*	This tank is large enough to hold the cleaner, dirt, and oil from the cleaning of a minimum of 12 lanes. To keep suds from being sucked into the vacuum motor, pour one to two ounces of defoamer into the waste tank before every lane cleaning session. You should empty the waste tank every time you fill the cleaner tank during a lane cleaning session and before you store the machine. The waste tank also has a line marked “MAX” and it should be emptied once the level of the waste reaches that line. Though a full waste tank will not leak when the machine is in the storage position, we recommend that you empty and clean the waste tank before storing the Express.

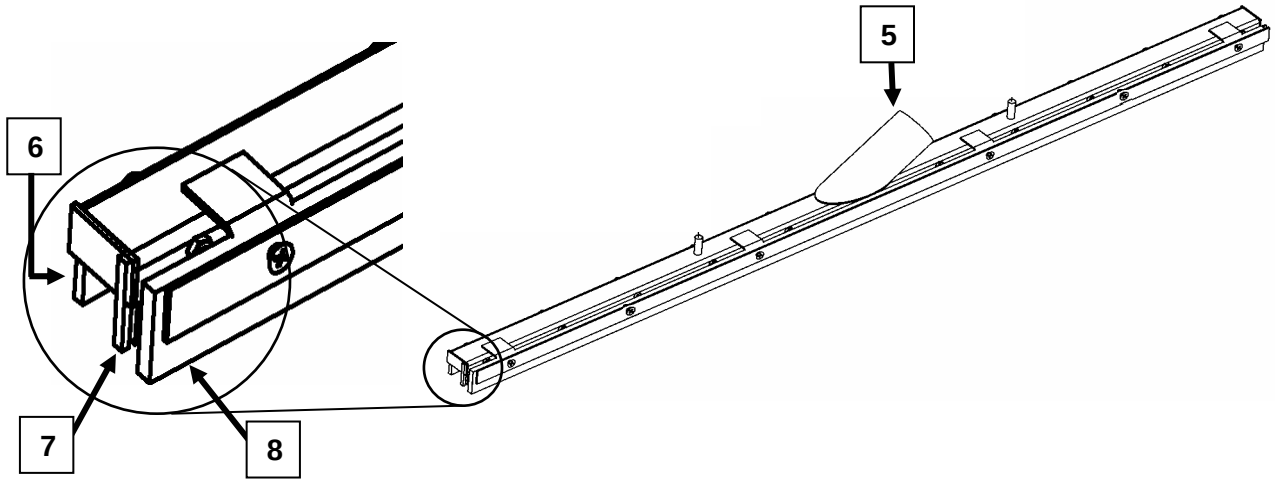


Figure 3-11

ID	Component	Description
5	Vacuum head *(Figure 3-11)*	The metal tube on the top is the external part of the vacuum system to which the vacuum hose is connected. The agitator foam and squeegees are attached to the bottom of the component.
6	Squeegee 2 *(Figure 3-11)*	This squeegee seals against the lane to create the vacuum chamber. It also ensures the residue is kept in the vacuum chamber until it is vacuumed from the lane.

ID	Component	Description
7	Squeegee 1 *(Figure 3-11)*	The front squeegee wipes the lane and directs the residue into the vacuum area.
8	Agitator Foam *(Figure 3-11)*	This foam strip mixes the cleaner into the oil on the lane.

3.7 LANE CONDITIONING COMPONENTS

The lane conditioning components are shown in Figures 3-12 through 3-14 and described below.

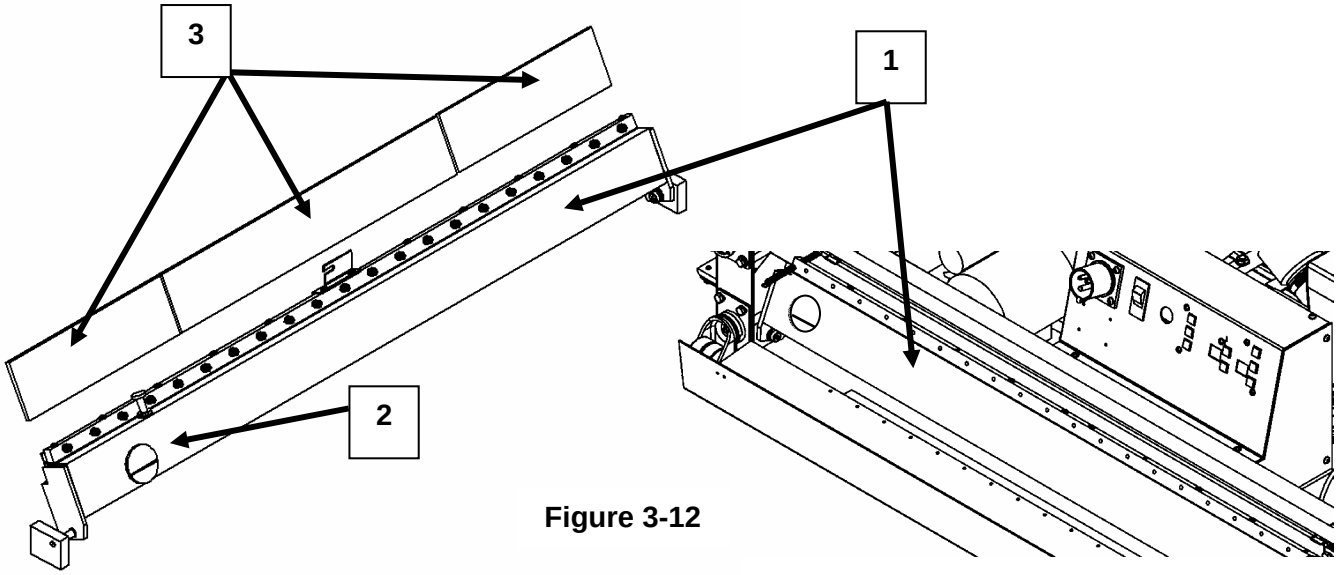


Figure 3-12

ID	Component	Description
1	Oil Tank *(Figure 3-12)*	The tank holds enough oil to condition 24 lanes. You should “top off” the oil tank before each conditioning session to ensure a consistent amount of oil is kept in the wicking foams. The level of oil in the tank is indicated in the oil tank level indicator (item 2).

ID	Component	Description
2	Oil Tank Level Indicator *(Figure 3-12)*	This indicator shows the level of oil in the oil tank. Add oil to the tank before the oil level drops below the bottom of the sight glass and before every lane conditioning session. This will help keep the oil pattern consistent.

IMPORTANT

ALWAYS fill the oil tank **slowly** to allow the oil level in the indicator to adjust to the level in the tank.

NEVER fill the oil tank above the mark on the oil tank level indicator or oil will overflow into the machine and onto the lane.

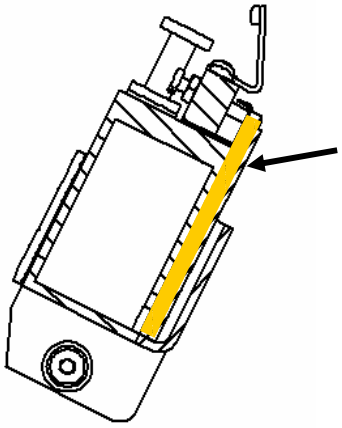


Figure 3-13

3	Foams *(Figure 3-12 and Figure 3-13)*	The bottoms of the wicking foam pieces rest in the oil tank where they constantly absorb oil. Their capillary action causes the oil to move to the top of the wicking foam where it is picked up by the transfer roller. The different sizes, types, and densities of foam determine the pattern in which the oil is distributed onto the transfer roller. The oiling pattern produced by your machine was included in the shipping package. For different oil patterns, refer to Section 6.0 - *Determining Your Oiling Pattern*.
	Oil Transfer Roller *(Not shown - under the hood))*	The oil transfer roller picks up oil from the wicking foams and “holds” it for pickup by the buffer brush.

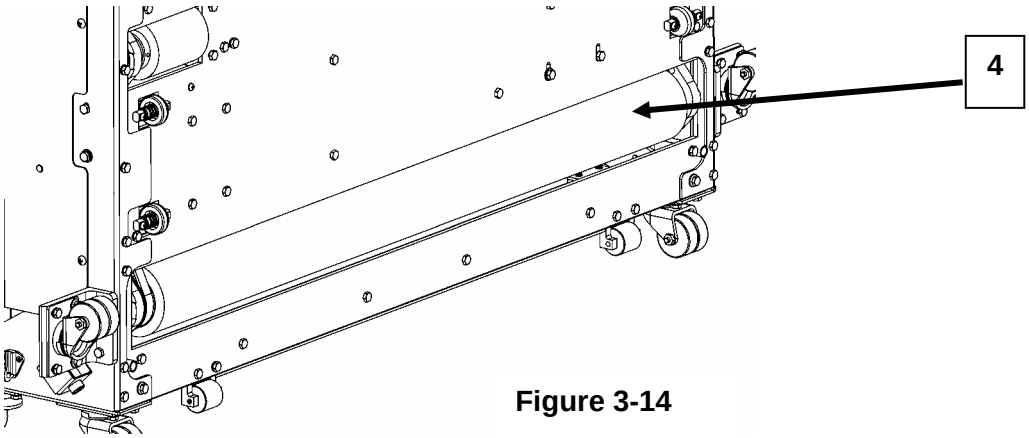


Figure 3-14

ID	Component	Description
4	Buffer Brush *(Figure 3-14)*	The brush picks up oil from the transfer roller and applies it to the lane.

3.8 PREPARING FOR USE

Before every lane conditioning session you should perform the following steps to prepare the Express Lane Machine for use.

- Move the handle through its full range of motion to ensure it moves easily and is not damaged.
- Check the fluid levels and fill the cleaner and oil tanks if necessary.
- Check the vacuum connections and add defoamer to the waste tank.
- Check the wicking foams, agitator foam, squeegees, and buffer brush for wear.

This section describes how to perform these tasks.

3.8.1 Filling and Preparing the Tanks

The tanks have been designed to allow you to clean, condition, and store the vacuumed residue for at least 12 lanes. We recommend you fill the cleaner and oil tanks away from the lane. However if you do fill them on the lanes, position the machine at least 2 feet down the lane from the foul line to ensure you do not get cleaner or oil on the approach.

Complete the steps below to fill the cleaner and oil tanks and to prepare the waste tank.

3.8.1.1 Adding Cleaner

You cannot use just any cleaner in the Express Lane Machine or on your lanes. Listed below are the things you need to keep in mind when filling the cleaner tank.

- Use only cleaners that are manufactured for use on bowling lanes.
- Follow the manufacturer's directions to properly dilute the cleaner.
- DO NOT put undiluted cleaner in the cleaner tank.
- Do not overfill the tank.

Avoid splashing the cleaner. Follow all instructions and precautions on the product label. In case of eye contact, flush with water for 15 minutes.

Follow the steps below to fill the cleaning tank.

1. Remove the cap from the cleaner tank and set it aside.
2. Insert the **large** red funnel into the tank opening. Leave a small gap to allow air to exit from the tank as you fill it.
3. Pour **diluted** ACC Cleaning Solution (or equivalent) into the tank until it is about an inch below the tank inlet.
4. Remove the funnel.
5. Replace the cap.
6. Wipe up any drips or spills that may have occurred.

Note: The large red funnel must have a screen in place. Replace funnel if the screen is missing or damaged.

3.8.1.2 Adding Oil

As with the cleaner, there are things you must keep in mind when filling the oil tank.

- Use only oil or lane dressing that is manufactured for use on bowling lanes.
- Do not overfill the tank.

Pour in the oil slowly.

CAUTION

Because bowlers can slip and fall on oil spilled on the approach, do not fill the oil tank on the approach. Fill it 2 to 3 feet down the lane or in an area away from the lanes, such as the service area by the pinspotters.

Avoid splashing the oil. Follow all instructions and precautions on the product label.

Follow the steps below to fill the oil tank.

1. Unhinge the clasps holding the oil tank cover to the hood, as shown in figure 3-15 and open the oil tank compartment door to access the oil tank.
2. Remove the plug from the oil tank and set it aside.
3. Insert the **small** red funnel (it has a filter) into the opening. Leave a small gap to allow air to exit from the tank as you fill it.
4. SLOWLY pour Reactor Oil (or equivalent) into the tank until the oil level in the oil level indicator, as shown in Figure 3-16, is at the mark.
5. Remove the funnel.
6. Replace the plug.
7. Wipe up any drips or spills that may have occurred.
8. Close the oil tank cover and redo the clasps.

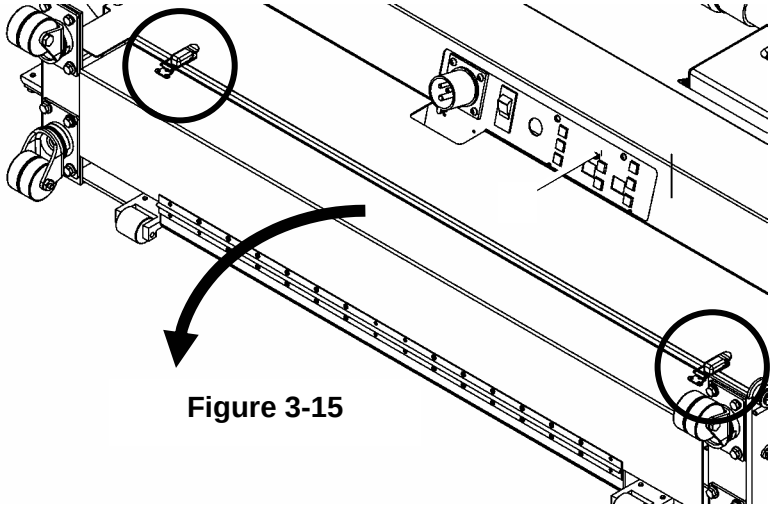


Figure 3-15

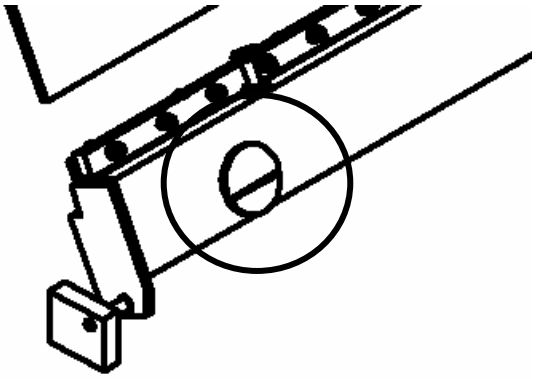


Figure 3-16

3.8.2 Defoaming the Waste Tank and Checking the Hose Connections

As the emulsion of cleaner and oil is vacuumed, air is forced into it. This action produces suds that can get sucked into the vacuum motor. To alleviate this problem, pour one to two ounces of defoamer into the waste tank before starting a cleaning session. The defoamer should remain effective for your entire cleaning session, even after you empty the waste tank. However, if you notice suds accumulating, pour one to two ounces of defoamer into the waste tank again.

The defoamer, a silicon-based liquid, can damage lane surfaces. Therefore perform this process away from the lane and approach, and pour the defoamer directly into the waste tank.

The vacuum hose connections must be tight and the waste tank must be properly seated against the vacuum motor seal to ensure the proper vacuum seal. If the seal between the parts leaks, the Express will not be able to pick up the residue from the lane. Perform the steps below to check the connections and tank placement.

1. Gently tug on the vacuum hose where it is clamped to the vacuum head. You should not be able to feel the hose move.
2. Firmly push the other end of the vacuum hose onto the waste tank inlet port.

NOTE

Whenever you place the waste tank in the machine, be sure not to fold, wrinkle, roll, or abrade the vacuum motor seal.

3.9 POSITIONING THE EXPRESS LANE MACHINE ON THE LANE

There are two ways you can place the Express Lane Machine on the lane as its starting position. The first is to place only the front caster wheels in the gutters. The second is to place all four caster wheels in the gutters. Placing only the two front caster wheels in the gutters allows you to use the Express to clean the lane head. Placing all four caster wheels in the gutters, positions the Express to start cleaning about 30 inches down the lane from the foul line and to start conditioning at the foul line.

IMPORTANT

Cleaning is the **only** operation you should perform with the Express positioned with only the front caster wheels in the gutters**. If you select any other operation, oil will be applied to the approach.**

3.10 CLEANING AND CONDITIONING

The Express Lane Machine was designed to start up with the settings from the last time you used the machine. This feature means you can repeat your lane cleaning and conditioning settings without having to re-enter them every time you use the machine.

NOTE

We strongly suggest you dust the lanes before cleaning them. Dusting the lanes will prolong the life of the foams and squeegees, and ensure quality results.

IMPORTANT

Ensure the pinspotters are turned off for the lanes you are conditioning.

When you first use the Express, the cleaning, oiling, and buffing operations will be turned on, the oiling distance will be 24 feet, and the buffing distance will be 39 feet. These distances are an average of the most common oiling and buffing distances. You can use these settings and distances or you can enter your own.

- To only clean the lanes, turn **off** the oiling and buffing operations.
- To only buff the lanes, turn **off** the oiling and cleaning operations.
- To enter oiling and buffing distances, press the up or down arrow buttons for each operation until the window displays the distance you want. The distance you are setting is the number of feet from the approach.

BUFFING NOTES

The redistributed oil will only approximate the oil pattern that is put down when oil is applied to the lanes.

Because you are using the existing oil on the lane, **do not clean the lanes** before performing this operation.

OILING NOTE

The machine is sent with wicking foams that provide the optimal lane conditioning for most centers. This factory-set pattern can be altered by many factors, such as wicking foam output, oiling and buffing distances, and type of oil being used. For information about changing the oil pattern, refer to Section 6.0 - *Determining Your Oiling Pattern*.

3.10.1 Cleaning the Lane Head

When you place only the front wheels in the gutter, the machine cleans and conditions the lane starting at the foul line. This allows you to clean the head of the lane with the machine instead of having to do it manually.

IMPORTANT

Cleaning is the **only** operation you should perform with the Express positioned with only the front wheels in the gutter. If you select any other operation, **oil will be applied to the approach.**

To clean the lane head, complete the following steps.

1. Position the machine on the lane with only the front caster wheels in the gutters.
2. Press the POWER switch to ON.
3. Press the START button **once**. The Express starts spraying the cleaning solution and starts the vacuum motor.
4. Push the Express forward until all four caster wheels are in the gutters and wait for the time-out feature to turn off the cleaning operation.

When the Express times out, it is properly positioned in the gutters for you to clean the rest of the lane or clean and condition the lane.

3.10.2 Cleaning and Conditioning the Lanes

The following table lists all the steps you perform to clean, oil, and buff a lane. Skip any steps that do not apply to the operation(s) you are performing.

The left-hand column shows **C** - for cleaning, **O** - for oiling and **B** - for buffing, to indicate what operation the step is performed for.

C O	Check the cleaner and oil tank levels. Add cleaner and oil as needed.
C	Pour defoamer into the waste tank.
C O B	Place the machine into the starting position.
C O B	Plug the power cord into a 110-volt US (230-volt other) outlet.
C O B	Insert the large, blue plug into the power inlet on the machine and secure the cord to the handle.
C O B	Press the POWER rocker switch to ON. *The internal distance counter resets to zero.*
C	Check that the Cleaner indicator is green. If it is not, press the CLEAN button.
B (**O**)	Check that the Buff indicator is green. If it is not, press the BUFF button. *Because the buffing operation affects the oiling operation, you should set your buffing specifications first.*
B (**O**)	Verify that the buffing distance is correct. If it is not, set the distance you want. *The buffing distance number must be equal to or higher than the oiling distance number.*
O	Check that the Oil indicator is green. If it is not, press the OIL button.
O	Verify that the oiling distance is correct. If it is not, set the distance you want. *The buffing distance number must be equal to or higher than the number you select here. The Express will not allow you to set an oiling distance number that is higher than the buffing distance number.*
C O B	Press the START button (on the control dashboard) or the START button (on the handle) **once**.

When you press the START button the first time, the Express performs the following actions:

- If CLEANER is selected, the spray heads begin spraying solution onto the lane, the vacuum head drops to the lane, and the vacuum motor starts.

- If OIL and BUFFER are selected without CLEANER, no actions are performed.

C O B	Press the START button (on control dashboard or handle) **a second time**. The drive motor starts and the machine begins to move down the lane. You must press the START button the second time within five seconds of pressing the START button the first time or the Express will shut down.

When you press the START button the second time, the Express performs the following actions:

- If CLEANER is selected, the drive motor starts and propels the Express down the lane.
- If OIL is selected, the oil transfer roller motor starts and turns the oil transfer roller, the buffer motor starts and turns the buffer brush, and the drive motor starts and propels the Express down the lane.
- If BUFFER is selected without Oil, the buffer motor starts and turns the buffer brush, and the driver motor starts and propels the Express down the lane.

C O B	Push the handle down (either across the machine or toward the lane then release it to allow the machine to travel down the lane.

As the Express makes its circuit down and up the lane to complete the operations you selected, it performs the actions shown in the table below. The table separates each action by operation, but the Express performs the actions simultaneously when multiple operations are selected.

CLEANER OPERATION	OIL OPERATION	BUFF OPERATION
▸ Sprays cleaner. ▸ Turns on the drive motor. ▸ Turns on the vacuum motor.	▸ Turns on the oil transfer roller motor. ▸ Turns on the buffer brush motor. ▸ Turns on the drive motor.	▸ Turns on the buffer brush motor. ▸ Turns on the drive motor.

CLEANER OPERATION	OIL OPERATION	BUFF OPERATION
▸ Sprays cleaner continuously until the counter reaches 30 feet from the approach then sprays cleaner intermittently until it reaches the front of the pin deck, where it sprays one last time. ▸ Vacuums the entire length of the lane.	Brushes oil onto the lane until the counter reaches the specified number of feet from the approach and then disengages the oiling part of the machine.	Brushes the oil already on the brush and on the lane until the counter reaches the specified number of feet from the approach.
▸ When the sensor detects the end of the lane (back of the pin deck), it performs the following end-of-lane actions: • Positions the agitator foam and squeegees past the end of the lane, then stops. • Raises then quickly drops the vacuum head twice to shake off excess cleaner and residue from the foam and squeegees, • Reverses the direction of the drive motor and begins to travel toward the approach. ▸ Runs the vacuum motor for 10 feet toward the approach.	When the counter reaches the number of feet specified for BUFFER, the drive motor stops, then reverses and the machine returns to the approach.	When the counter reaches the number of feet specified, the drive motor reverses and the machine returns to the approach.
	Brushes oil onto the lane when the counter reaches the specified number of feet from the approach.	Brushes the oil already on the brush and on the lane when the counter reaches the specified number of feet from the approach.

CLEANER OPERATION	OIL OPERATION	BUFF OPERATION
Travels to the approach until the sensor detects the gutter transition block.	Applies oil until the sensor detects the gutter transition block.	Brushes the existing oil until the sensor detects the gutter transition block.
Turns off the drive motor.	▸ Turns off the oil transfer roller motor. ▸ Turns off the buffer motor. ▸ Turns off the drive motor.	▸ Turns off the buffer motor. ▸ Turns off the drive motor.

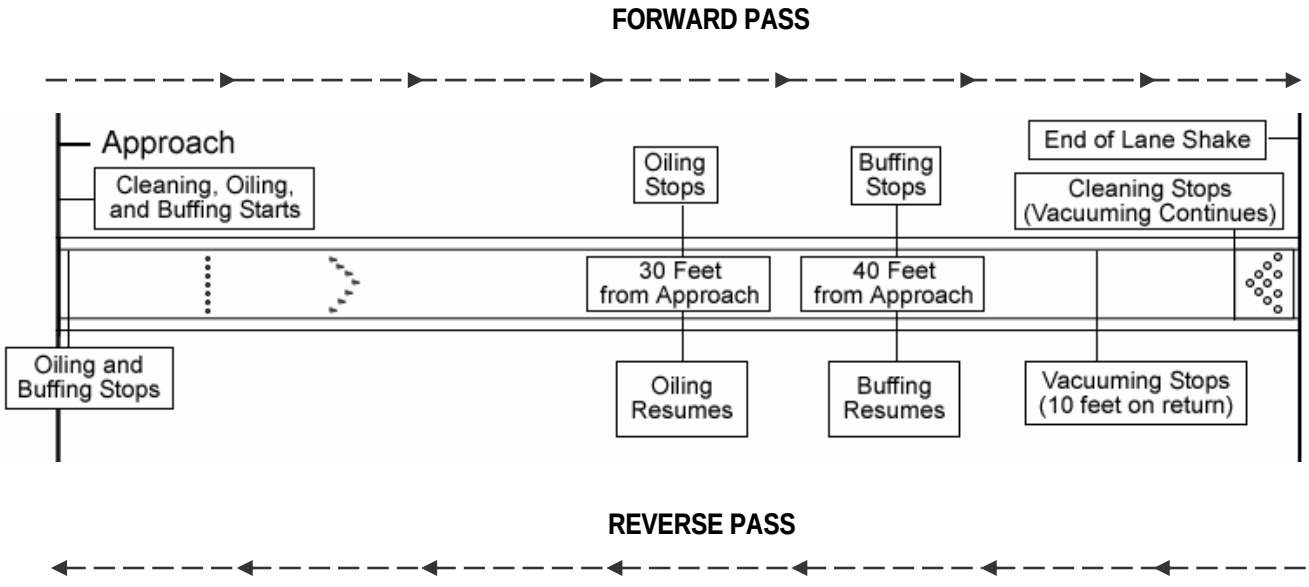
NOTE

Though the vacuum, buffer, and drive motors are turned off, the Express is still powered on.

Once the Express has returned to the approach and turned off the motors for the operation(s) you selected, you can move it to the next lane or press the POWER rocker switch to OFF to turn off the machine. For information about storing the Express, refer to the Maintenance section.

3.10.3 Illustration

The following drawing illustrates where the Express performs actions when you select Cleaning, Oiling for 30 feet, and Buffing for 40 feet.



Section 4

MAINTENANCE

The design of the Express Lane Machine makes it as easy to care for as it is to use. The cleaner, oil, and waste tanks are all sealed, so you do not need to empty them between uses; the agitator foam and squeegees are vacuumed of excess moisture through normal use of the machine, and the oil transfer components do not require special maintenance. By performing the simple, periodic maintenance procedures given in this section, you will keep the Express Lane Machine in good working order to ensure high quality lane conditioning.

In addition to the periodic maintenance procedures, this section also contains information about how to test the machine's performance and how to replace the parts that wear out from normal use.

Always ensure the Express Lane Machine is disconnected from any power source before starting any maintenance, replacement, or repair task.

4.1 PERFORMING AFTER-USE MAINTENANCE

After you have completed a conditioning session, you should clean the Express Lane Machine and perform the maintenance tasks listed below. By performing these tasks, you keep the Express in good operating condition and have the machine ready for your next conditioning session.

NOTES

We recommend that you perform the tasks in the order they are listed, but you can perform them in any order.

When cleaning the machine, it is important that you don't get oil into the cleaning components of the machine and that you don't get cleaning solution into the oiling components of the machine.

Perform the following tasks with the machine in the **operating** position:

Oiling Area

- Check the oil level and add oil if needed.
- Ensure the cap is in place and securely tightened.
- Check the wicking foams for nicks, cracks, and missing pieces along the edge.
- With a clean cloth, gently wipe the edges of the wicking foams then wipe the oil tank and surrounding area.

Cleaning Area

- Check the amount of cleaning solution in the cleaner tank and add cleaning solution if needed.
- Ensure the cap is in place and securely tightened.

Waste

Though you can leave the waste residue in the waste tank, we recommend you empty and rinse the waste tank after each cleaning/conditioning session is complete.

- Empty the waste tank. Rinse the waste tank under running water until the water runs clear.
- Replace the waste tank being careful that you do not bend or abrade the vacuum motor to waste tank seal.

Power Cord

- Unplug the power cord from the power inlet on the control panel.
- Unplug the power cord from the outlet.
- Coil the power cord around the base of the handle.

Frame and Exterior Components

- Wipe the optical sensors lens with a clean, soft cloth.
- Wipe the nozzles.
- Wipe the frame.

Perform the following tasks with the machine in the **storage** position:

Cleaning Area

- With a clean cloth, wipe the agitator foam and squeegees.
- Check the agitator foam and squeegees for nicks, cracks, gaps in their edges.
- Check the squeegees to see if the edges have become hard and for places where the edges have warped out of shape.

Oiling Area

- With a clean, dry cloth, wipe the bristles on the buffer brush. Turn the brush and wipe each exposed section of bristles until you have wiped all of the bristles.
- Check the buffer brush for numerous broken bristles and uneven wear patterns that could indicate the buffer brush pressure is uneven or that the buffer brush pressure is too high.

Do not use any kind of heating apparatus to dry the brush as it may damage the bristles.

Frame and Exterior Components
To clean these areas, use the cloth you used to wipe the cleaning area or use a clean cloth.

- Wipe the nozzles.
- Wipe the casters and wheels.
- Wipe the top and sides of the machine.
- Wipe the base plate - starting at the cleaning area and finishing with the oiling/buffing area.

NOTE
The optical sensors should only be cleaned with a dry or damp clean cloth and it should have no cleaner on it.

4.2 PERFORMING WEEKLY MAINTENANCE

In addition to the maintenance procedures you perform after each lane conditioning session, you should also perform the following tasks each week. The steps to perform these tasks are given in the following sections.

- Test the machine's performance.
- Clean the cleaner tank and cleaner tank area.
- Check the waste tank seal.
- Clean the waste tank and waste tank area, the in-line filter, the oil tank area, and the buffer brush.

4.2.1 Testing the Express Lane Machine's Performance

The Express Lane Machine has been designed and manufactured to give you years of worry-free lane conditioning. However, you should check the cleaning and conditioning operations to ensure the components are set correctly and that the Express is performing as you expect.

4.2.1.1 Checking the Cleaning Function

If you always clean and condition your lanes (cleaning, oiling, and buffing), you can't tell how well the Express is cleaning the lanes. To ensure the Express is removing the cleaning residue from the lanes, pick two or three lanes in your center and perform only the cleaning operation on them. After the Express has cleaned the lanes, examine them for residue.

If the Express leaves residue on the lanes, check the condition of the squeegees and the vacuum seal as described in the *Performing After-Use Maintenance*. Also refer to the *Troubleshooting* section for other possible causes and solutions.

4.2.1.2 Measuring the Buffer Brush Pressure

The pressure put on the lane by the buffer brush must be consistent across the width of the brush to ensure the oil is applied in a consistent amount across the lane. When the Express Lane Machine leaves the factory, the buffer brush pressure is set to give you optimal lane conditioning and is tested to ensure the pressure is the same across the brush.

Unless you found you needed a higher setting when you determined your oiling pattern, the best setting for the buffer brush pressure is between B and C on the Pressure Adjusting Tool, shown in Figure 4-1. As the bristles on the buffer brush break off through normal wear and tear, the pressure will lessen. Though the best practice is to replace the buffer brush when the buffer pressure falls below B, you can extend the life of the buffer brush by adjusting the buffer brush pressure setting. For information about changing the buffer brush pressure, refer to the *Adjusting the Buffer Brush Pressure* information later in this section.

NOTE

It is possible for the pressure on one side of the brush to be different from the other side. Both sides need to be adjusted to the same pressure to ensure the oil pattern is consistent across the width of the brush.

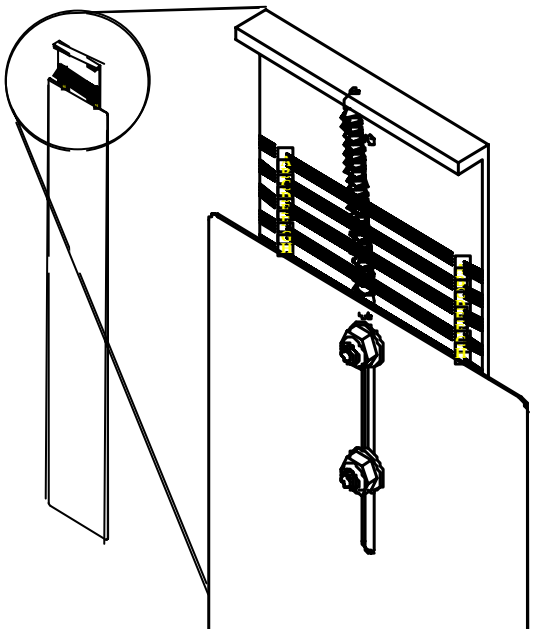


Figure 4-1

To measure the buffer brush pressure, perform the following steps. Perform these steps with the machine in the **operating** position.

Tools Needed:	• Pressure Adjustment Tool

1. Position the Express on a lane, about 2 feet down the lane from the foul line.
2. Turn off the drive motor kill switch.
3. Plug the Express into a power source.
4. Press the POWER toggle switch to ON.
5. If it is not already set to OFF, set CLEANER to OFF.
6. If it is not already set to OFF, set OIL to OFF.
7. If it is not already set to ON, set BUFF to ON.
8. Press the START key twice.
9. From the rear of the machine, position the vinyl strip of the Pressure Adjusting Tool under the middle of the buffer brush, with at least 3 inches of the vinyl strip extending from the other side of the buffer brush. (You will feel it engage under the buffer brush.)
10. While observing the scale, hold the aluminum plate just off the surface of the lane, and slowly pull the tool away from the machine until you eventually pull it out from under the machine.
    - Pull the tool away from the brush in a straight path without lifting the aluminum plate away from the lane.
    - Take the reading while you are pulling the tool, not as the vinyl strip releases from the buffer brush.
11. Repeat the test at the left and right sides of the buffer brush.
12. Turn off the machine.
13. If all the readings are not between B and C, you need to reposition the buffer brush until the buffer brush pressure is the same at each test point across the width of the brush. For instructions about how to perform this task, refer to the *Adjusting the Buffer Brush Pressure* information on page 4-9.

    If the readings are between B and C for all of the areas you tested, unplug the Express from a power source.
14. Turn the drive motor kill switch back on.

4.2.2 Cleaning the Cleaner Tank Area

To clean the cleaner tank area, wipe the outside of the tank with a cloth dampened with the same, diluted cleaning solution you use on the lanes.

4.2.3 Cleaning the In-Line Filter

To keep particles out of the cleaner solution delivery system, the Express has an in-line filter. To check and clean the in-line filter, complete the steps below. Perform these steps with the machine in the **operating** position.

Always ensure the Express Lane Machine is disconnected from any power source before starting any maintenance, replacement, or repair task.

Tools Needed:	Phillips screw driver

1. Remove the two screws, shown in Figure 4-2, from both sides of the hood and lift the hood from the frame. Set aside the screws.

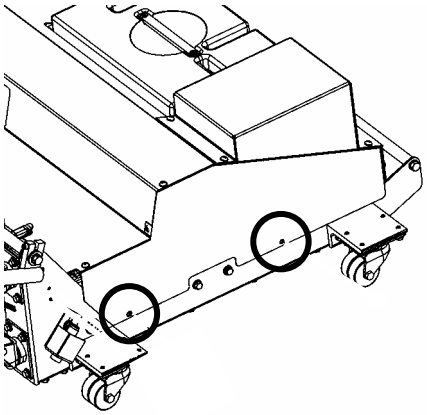


Figure 4-2

2. Locate the filter, shown in Figure 4-3. You should remove the waste tank guard assembly to access the filter easily. It is located under the waste tank bracket.

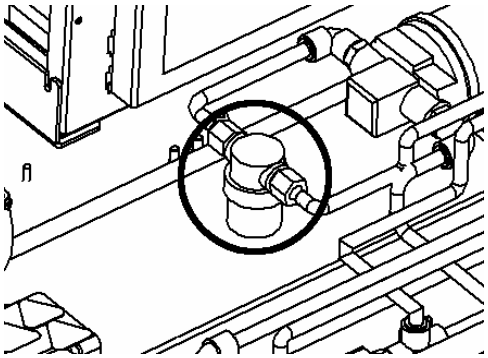


Figure 4-3

3. Remove tubing to allow the filter bowl to slide out.
4. Pinch or plug up the tubing from both sides of the filter bowl when you remove it. Some cleaner will probably drain when you take off the tubing. Stopping the flow of cleaner is important so unnecessary spills will not be present.
5. Remove the bowl and screen by unscrewing the bottom of the piece and clean.
6. Reassemble the screen and bowl.
7. Reconnect the tubing.
8. Wipe up any spills.
9. Replace the hood on the frame and secure it in place with the two screws on each side.

4.2.4 Checking the Waste Tank Seal

To ensure the proper vacuum is achieved, the waste tank seal must function correctly. Therefore, each week you should closely inspect the waste tank seal to ensure it doesn't have nicks or cuts, isn't rolled or bent, doesn't have excessively frayed or abraded areas, and is securely attached to the vacuum motor.

4.2.5 Cleaning the Waste Tank

In addition to rinsing the waste tank after each use, you should also clean it weekly by completing the steps below. Perform these steps with the machine in the **operating** position.

1. Disconnect the vacuum hose and remove the waste tank from the Express.
2. Pour a few drops of cleaner into the waste tank and add water until the waste tank is about half full.
3. Carefully swish around the solution in the waste tank. Be sure to get the upper corners and around the intake opening.
4. Empty the cleaning solution from the waste tank.
5. Rinse the waste tank under running water until the water runs clear.
6. Reinstall the waste tank in the Express and reconnect the vacuum hose.

4.2.6 Cleaning the Oil Tank Area

Oil will accumulate on the sides of the oil tank and in the wicking foams area. To clean this area, complete the steps below. Perform these steps with the machine in the **operating** position.

Tools Needed:	None

1. Unfasten the clasps of the oil tank compartment cover at the back of the Express and open the compartment.
2. Slide the oil tank latch sideways out of the slot in the retaining bracket to release the oil tank.
3. Tip the oil tank away from the oil transfer roller to expose the oil transfer roller and wicking foams.
4. Wipe the oil transfer roller, wicking foams area, oil tank, and oil tank area with a clean, dry cloth. DO NOT WIPE THE WICKING FOAMS.
5. Return the oil tank into position and wipe the outside of the oil tank.
6. Relatch the oil tank, close the oil tank compartment cover, and refasten the clasps.

4.2.7 Cleaning the Buffer Brush

The buffer brush bristles can get tangled and they can pick up lint or other things too large to be removed from the lane by the vacuum head. The buffer brush cannot apply the oil correctly if it has tangles and debris in the bristles. To clean the buffer brush, complete the steps below. Perform these steps with the machine in the **storage** position.

Tools Needed:	Coarse-toothed comb or stiff-bristled brush (optional)

1. Wipe the buffer brush with a clean, dry cloth.
2. Turn the buffer brush to expose another section.
3. Turn and wipe the buffer brush until the entire brush has been cleaned.

TIPS

If the bristles have become tangled or matted, use a coarse-toothed comb or stiff-bristled brush to comb through the bristles.

If the buffer brush bristles are in good condition but there is dirt in the brush, refer to the information about how to replace the buffer brush and follow those instructions to remove and reinstall the buffer brush from the machine. With the brush removed from the machine, use a coarse-toothed comb or stiff-bristled brush to comb out the dirt.

4.3 PERFORMING OCCASIONAL MAINTENANCE

At some time you will need to replace parts as they wear out from use. This section describes how to replace those parts that undergo the most wear and tear, and contains information about some of the repairs you might have to perform.

Refer also to the Troubleshooting section of this manual. If you encounter a problem that is not described here or in the Troubleshooting section, contact Technical Support.

4.3.1 Adjusting the Buffer Brush Pressure

For a consistent application of oil across the lane, the buffer brush pressure must be the same across the width of the buffer brush. The best setting for the buffer brush pressure is between B and C on the Buffer Pressure Adjusting Tool. If the buffer brush pressure readings are not the same on both sides or no longer show the buffer brush pressure between B and C, complete the steps below to reposition the buffer brush.

Though increasing the buffer brush pressure can eliminate low spots on the lane where oil is not being applied, the pressure increase will shorten the life of the buffer brush and put undue strain on the buffer motor. Also, a slight reduction in oil on the lane will occur. Weigh the benefits against the detriments before setting the pressure higher than recommended.

NOTES

Any adjustment you make to one side will affect the other side. Adjust both sides to the same reading on the Pressure Adjustment Tool. (Too much pressure on one side can cause the machine to drive at an angle on the lane.

If adjusting the buffer brush still does not give you the oiling pattern you want, refer to Section 6 - *Determining Your Oiling Pattern*.

To change the buffer brush position, follow the steps below. Perform these steps with the machine in the **operating** position.

WARNING

Always ensure the Express Lane Machine is disconnected from any power source before starting any maintenance, replacement, or repair task.

Tools Needed:	Ratchet and 7/16” socket or 7/16” wrench

1. Remove the two screws, shown in Figure 4-4, from both sides of the hood and lift the hood from the frame. Set aside the screws.

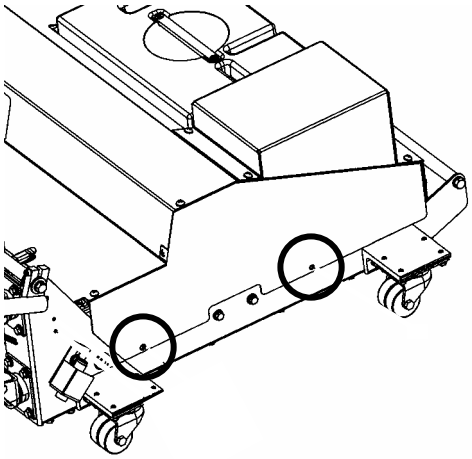


Figure 4-4

2. On each side of the machine frame, locate the buffer brush pressure screws. Figure 4-5 shows the screws on the side near the waste tank.
3. **Loosen** the screws just enough to allow you to move the buffer brush linkage. **Do not** remove the screws.

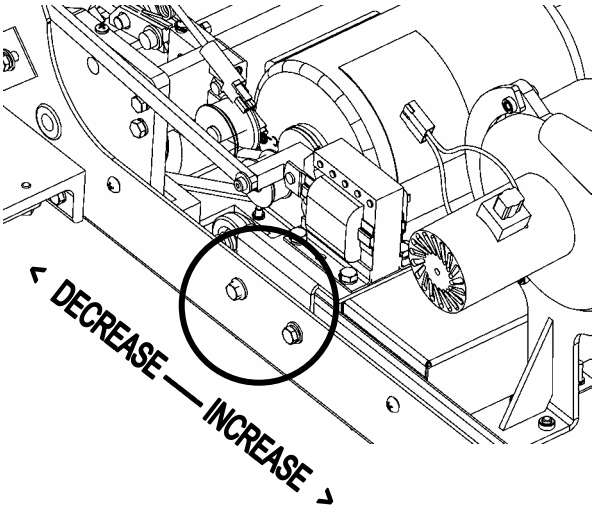


Figure 4-5

4. Position the buffer brush linkage as follows (Use the decal as a guide if needed):
    - To increase the buffer brush pressure, move the buffer brush linkage toward the vacuum head.
    - To decrease the buffer brush pressure, move the buffer brush linkage toward the oil tank.
5. Tighten the screws.
6. Check the buffer pressure and repeat adjusting the screw positions as needed.
7. Reinstall the hood.

TIP

Make small, incremental adjustments to the buffer brush position and repeat the pressure tests after each adjustment until you get the pressure set where you want it.

4.3.2 Rotating the Wicking Foams

Whenever the Express starts leaving a wavy oil pattern, you need to replace the wicking foam surface. This can be done by replacing the foams or by rotating the wicking foam so a new surface is applying oil to the oil transfer roller. For information about replacing the wicking foams, refer to the instructions later in this section. Follow the steps below to rotate the wicking foams.

NOTES

The Express cannot be used for approximately 15 minutes after you rotate the wicking foams. This waiting period is required to allow the oil to completely saturate the wicking foam after being removed from the oil tank tray.

When you use the Express after rotating the wicking foams, clean, oil, and buff the first lane twice to ensure the proper amount of oil is applied.

To rotate the wicking foams, perform the steps below. Perform these steps with the machine in the **operating** position.

Tools Needed:	None

1. Unfasten the clasps of the oil tank compartment and open the compartment.
2. Slide the oil tank latch sideways out of the slot in the retaining bracket to release the oil tank.
3. Tip the oil tank away from the oil transfer roller to expose the oil transfer roller and wicking foams area.
4. Spread clean, dry cloths over all the components, leaving only the wicking foams and oil tank tray exposed.

5. Working from one side to the other, remove an outside wicking foam from the oil tank tray.
6. Turn the wicking foam side to side. The result will be that the front face becomes the back face with the top remaining at the top and the bottom remaining at the bottom, as shown in Figure 4-6. If needed, clean the wicks before reinserting into the tank. Put the turned wicking foam back into the oil tank tray. Repeat this step for the other wicking foams. Ensure the wicking foams line up evenly cross the top, with 1-3/8 inches of wicking foam showing above the tray edge, and that they are firmly seated in the oil tray.

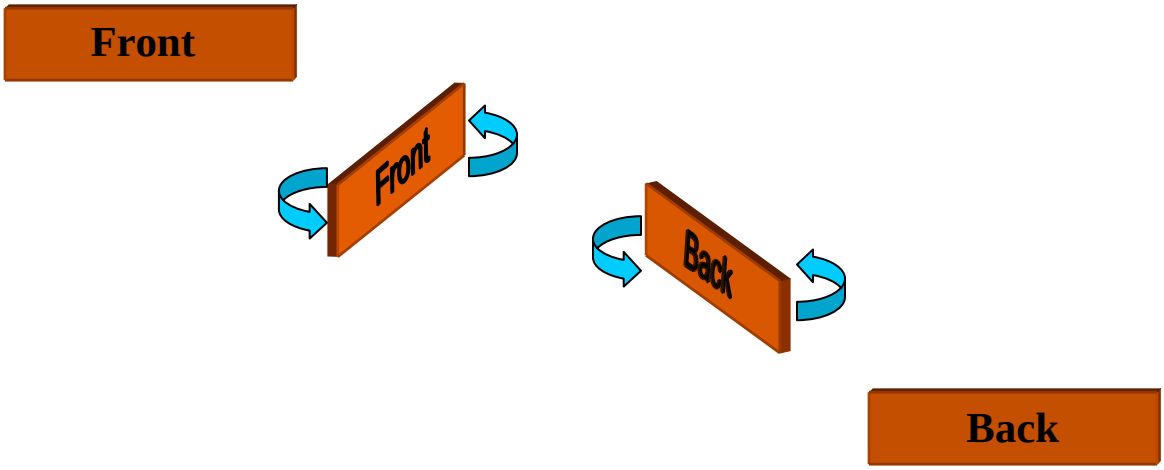


Figure 4-6

7. Wipe up any spills immediately with a clean, dry cloth.
8. Tip the oil tank back against the oil transfer roller, latch the oil tank in place, close the compartment door and refasten the clasps.

4.3.3 Lubricating the Chains

Approximately every three months you should lubricate the drive chain and sprocket and the oil transfer roller motor chain and sprocket with a good quality 80- to 90-weight gear oil. DO NOT USE GREASE. Be sure to wipe off any excess oil.

4.3.3.1 Drive Chain

Depending on how often you condition your lanes, you may need to lubricate the chain more frequently than every three months. Perform the steps below with the machine in the **storage** position.

Tools Needed:	Oil can with nozzle dispenser **or** Small, long-handled, stiff-bristled brush

1. Locate the drive chain opening on the base plate, as shown in Figure 4-7.

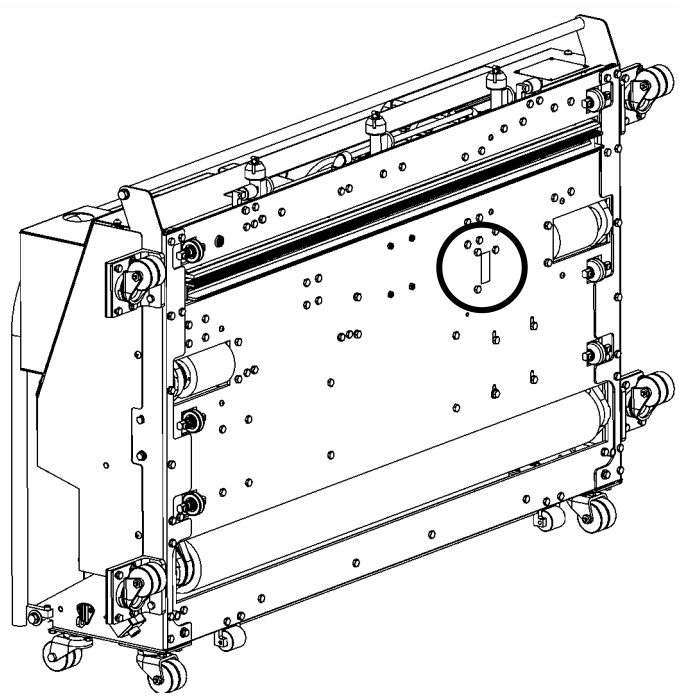


Figure 4-7

2. Apply a small amount of oil to the chain links and wipe off any excess.

4.3.3.2 Oil Transfer Roller Chain

Depending on how often you condition your lanes, you may need to lubricate the oil transfer roller chain more frequently than every three months. Perform the steps below with the machine in the **storage** position.

Always ensure the Express Lane Machine is disconnected from any power source before starting any maintenance, replacement, or repair task.

Tools Needed:	Oil can with nozzle dispenser or Small, long-handled, stiff-bristled brush

1. Remove the screws on each side of the hood, as shown in Figure 4-8, and lift the hood off the frame. Set aside the screws.
2. Locate the oil transfer roller chain at the left rear of the machine, as shown in Figure 4-9.

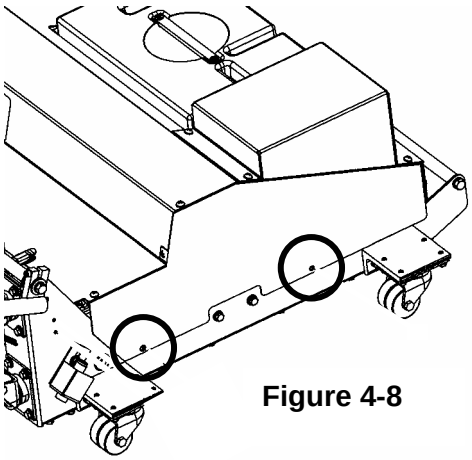


Figure 4-8

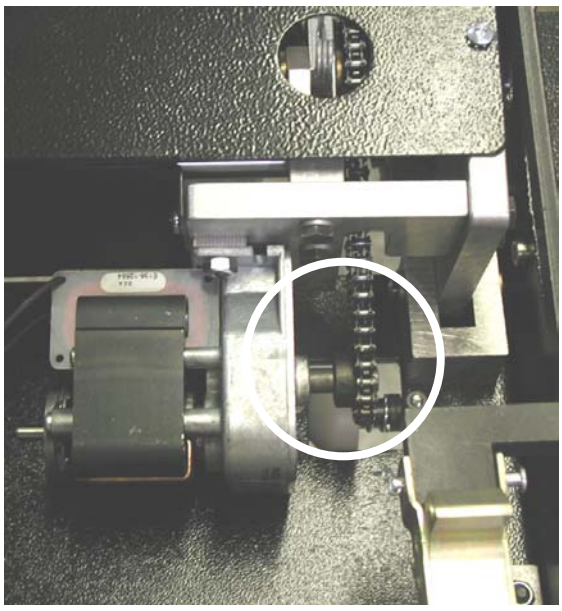


Figure 4-9

3. Apply a small amount of oil to the chain links.
4. With your hand, move the chain and apply oil until all the links have been lubricated.
5. Wipe off any excess oil.
6. Reinstall the hood.

4.3.4 Clearing Clogged Nozzles

The nozzles are designed to be clog free and the in-line filter should keep out particles that could clog the nozzles, but a clog may still occur. To clear a clogged spray head, follow the steps below. Perform these steps with the machine in either the **operating** or the **storage** position.

Tools Needed:	None

1. Turn the spray head 1/4 turn to the **left** to release it from the connector. The spray head, nozzle, and washer will be released.
2. Soak the spray head in warm water for several minutes then blow air through it from the tip end.
3. Reassemble the washer, nozzle, and spray head.
4. Position the assembled parts against the connector and turn the spray head 1/4 turn to the **right** to secure them in place.

4.4 REPLACING PARTS

The agitator foam, squeegees, buffer brush, and waste tank seal all wear with use so they will eventually need to be replaced. This section tells you how to replace these parts.

4.4.1 Replacing the Agitator Foam

Since the agitator foam is the first component to contact the oil and dirt on the lanes, it takes a lot of wear and tear and should be replaced at least every three months. Depending on how often you clean your lanes, you may need to replace the agitator foam more frequently. To replace the agitator foam, complete the steps below. Perform these steps with the machine in the **operating** position to start.

TIP

After you have removed the vacuum head from the machine, position it upside down on blocks that are high enough to allow the output port to hang down without touching the work surface. This keeps the vacuum head level and positions the components for easy access.

Always ensure the Express Lane Machine is disconnected from any power source before starting any maintenance, replacement, or repair task.

Tools Needed:	• Medium flat blade screwdriver • Ratchet and 1/2” socket or 1/2” wrench

1. Remove the two screws, shown in Figure 4-10, from both sides of the hood and lift the hood from the frame. Set aside the screws.
2. Loosen the screw on the vacuum hose clamp and remove the vacuum hose from the vacuum head. Stand the machine up in the **storage** position.
3. Remove the two 5/16 nuts to release the vacuum head from the machine, as shown in Figure 4-11, and remove the vacuum head from the **bottom** of the machine.

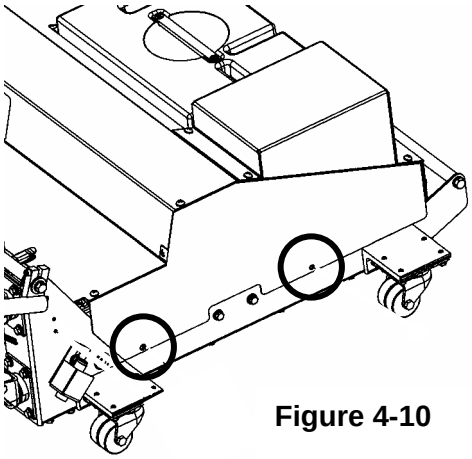


Figure 4-10

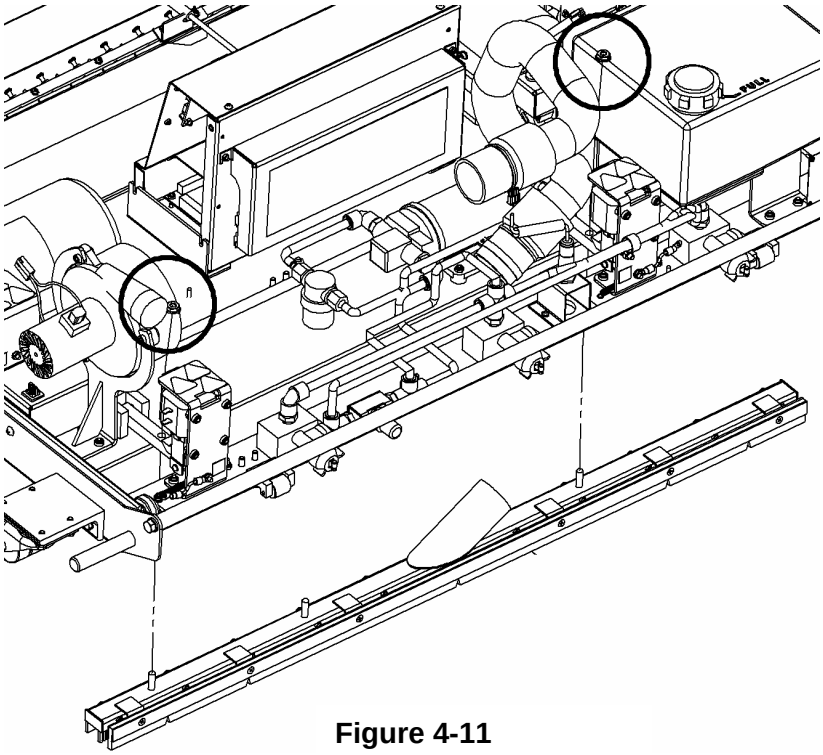


Figure 4-11

4. Remove the six #10 screws from the vacuum head to release the agitator foam and clamps, and set them aside.
5. Place one of the foam clamps over the new agitator foam. Align the top of the foam to the top of the clamp and center it on the clamp.

6. Position the new agitator foam between the two foam clamps and secure the assembly to the vacuum head with the six #10 screws.
7. Reinstall the vacuum head in the machine and secure it in place with the two 5/16 nuts and put machine back into **operating** position.
8. Attach the vacuum hose to the vacuum head and tighten the screw on the vacuum hose clamp.
9. Replace and secure the hood to the frame.

4.4.2 Replacing the Squeegees

The squeegees should be replaced at least every 12 months and whenever they show wear and tear, or become stiff or brittle.

IMPORTANT

When reattaching the back squeegee (squeegee 2), tighten the hex nuts only until the edge of the stud shows; to do otherwise will cause the squeegee to deform which will allow residue to remain on the lane.

NOTE

You should replace both squeegees during the repair. However, remove and replace one squeegee at a time to avoid mixing up the stud bars which are not interchangeable.

Perform these steps with the machine in the **operating** position to start.

TIP

After you remove the vacuum head from the machine, position it upside down on blocks that are high enough to allow the output port to hang down without touching the work surface. This keeps the vacuum head level and positions the components for easy access.

Always ensure the Express Lane Machine is disconnected from any power source before starting any maintenance, replacement, or repair task.

Tools Needed:	• Medium flat blade screwdriver • Ratchet and 1/2” socket or 1/2” wrench • Ratchet and 9/16” socket or 9/16” wrench

1. Remove the two screws, shown in Figure 4-12, from both sides of the hood and lift the hood from the frame. Set aside the screws.

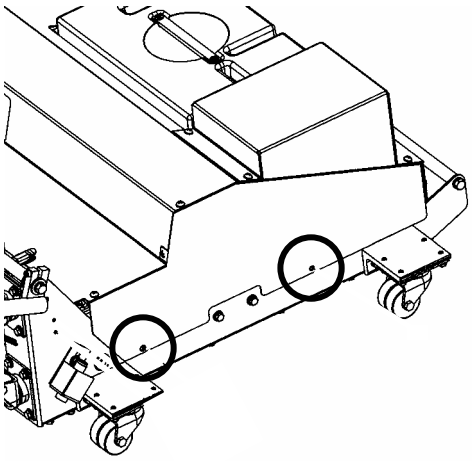


Figure 4-12

2. Loosen the screw on the vacuum hose clamp and remove the vacuum hose from the vacuum head.
3. Remove the two 5/16 nuts to release the vacuum head from the machine, as shown in Figure 4-13, and remove the vacuum head from the **bottom** of the machine. Stand the machine up in the **storage** position.

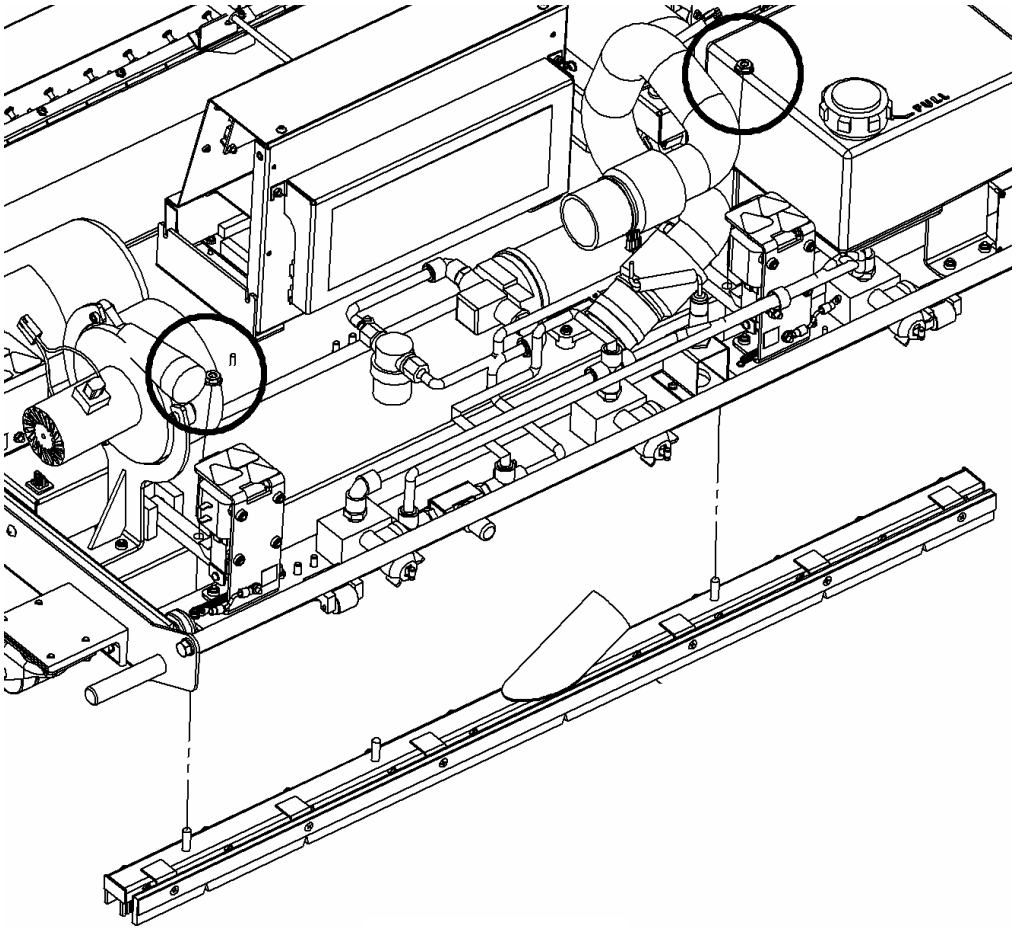


Figure 4-13

4. Remove the 14 #6 nuts that hold the stud bar in the vacuum head and set them aside.
5. Remove the stud bar and squeegee from the vacuum head.
6. Pull the old squeegee from the stud bar.
7. Attach the new squeegee to the stud bar with the **smooth** side against the stud bar.
8. Reinstall the squeegee and stud bar into the vacuum head.
9. Reinstall the 14 #6 nuts to attach the stud bar to the vacuum head. Reinstall the nuts in the following pattern: one end, other end, middle, then all remaining nuts.

IMPORTANT

When replacing the back squeegee, DO NOT OVERTIGHTEN THE NUTS. Tighten them until the nuts are just flush with the studs. Also, front squeegee mounting bar is different than the back. Do not mix them up.

10. Replace the other squeegee.
11. Reinstall the vacuum head in the machine.
12. Secure the vacuum head in the machine with the two 5/16 hex head nuts and put machine back into **operating** position.
13. Attach the vacuum hose to the vacuum head and tighten the screw on the vacuum hose clamp.
14. Reinstall the hood and secure it to the frame.

4.4.3 Replacing the Wicking Foams

Depending on conditions such as how many lanes you have and how often you clean and condition them, the wicking foams should last between four to six months. However, whenever the Express starts leaving a wavy oil pattern or the oil output has decreased and rotating the wicking foams does not alleviate the problem, you need to replace the wicking foams.

NOTES

The Express cannot be used for approximately two hours after you have replaced the wicking foams. This waiting period is required to allow the oil to be wicked to the top of the foam. To verify the oil has wicked to the top of the foam, check the color of the wicking foam. Because the wicking foam darkens as it wicks oil, you can easily identify the lighter (no oil) area of the wicking foam. When the wicking foam is all the same color, it is ready for use.

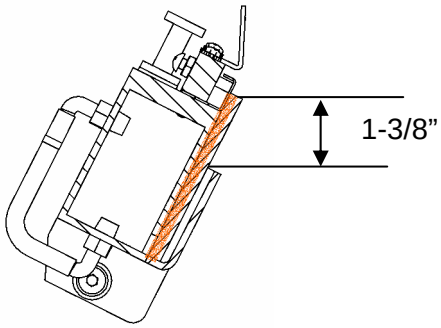
When you use the Express after replacing the wicking foams, clean, oil, and buff the first lane twice to ensure the proper amount of oil is applied.

To replace the wicking foams, perform the steps below. Perform these steps with the machine in the **operating** position.

Tools Needed:	None

1. Unfasten the clasps over the oiling components at the back of the Express and open the compartment.
2. Slide the oil tank latch sideways out of the slot in the retaining bracket to release the oil tank.
3. Tip the oil tank away from the oil transfer roller to expose the wicking foams.
4. Pull out the wicking foams out from the oil tank slot and put them in a container to catch the oil.
5. Wipe up any spills immediately with a clean, dry cloth.
6. Insert the new wicking foams so they rest on the ledge of the oil tank slot, as shown in Figure 4-14a. There should be 1-3/8 inches of foam showing above the edge of the oil tank slot.

If you are using the standard wicking foams, replace them with the short wicking foams on the outsides and the long wicking foam in the middle, as shown in Figure 4-14b. If you are using alternate wicking foams, replace the foams according to your pattern.



Side View

Figure 4-14a

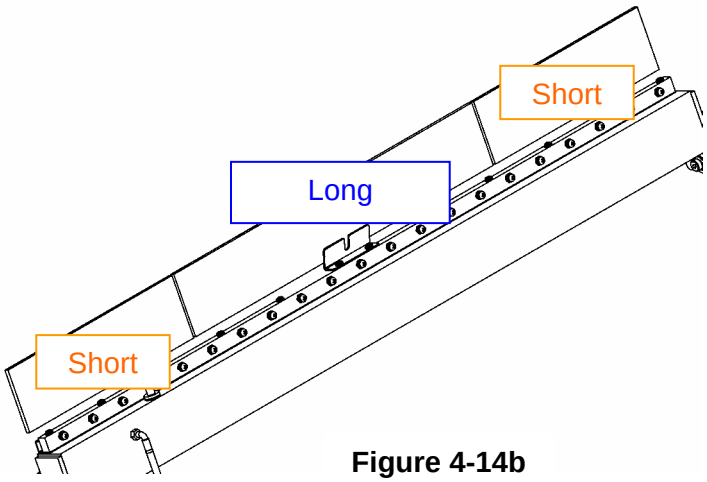


Figure 4-14b

IMPORTANT

Ensure the wicking foam edges firmly abut each other with no gaps at the top and that the tops of the wicking foams are even.

7. Tip the oil tank back against the oil transfer roller, relatch the oil tank, close the compartment door, and refasten the clasps.

4.4.4 Replacing the Buffer Brush

As the bristles wear and break off the buffer brush and it becomes dirty through use, it can no longer apply the oil properly. When the oil pattern looks like a washboard and all other possible reasons have been eliminated, you need to replace the buffer brush.

NOTE

You can sometimes extend the life of the buffer brush by increasing the buffer brush pressure. Refer to the information about changing the buffer brush pressure earlier in this section.

Tools Needed:	None

Perform the steps below to replace the buffer brush. Complete these steps with the machine in the **storage** position.

1. Face the base plate.
2. Grasp the left end of the buffer brush.
3. Gently slide the buffer brush to the right while slightly pulling the left end towards you (out of the opening). Pull out the left end until it is just clear of the slot in the base plate, as shown in Figure 4-15.

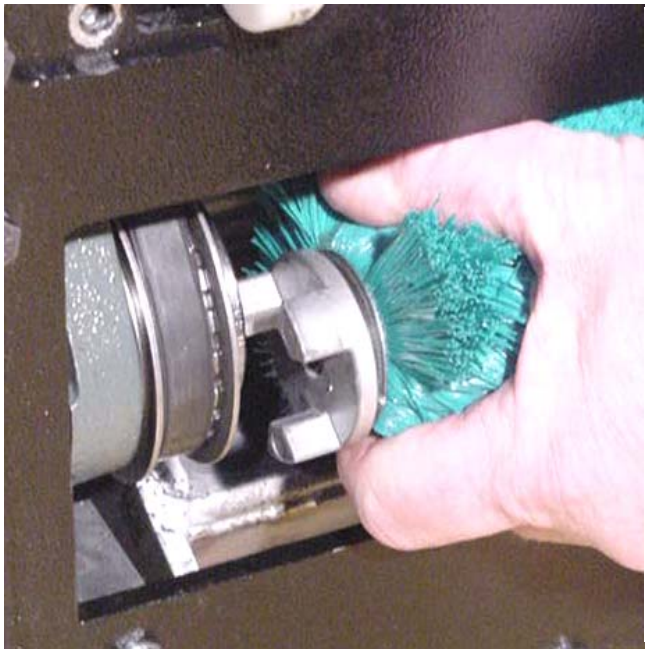


Figure 4-15

4. Pull the buffer brush towards the left to release its right side from the machine.
5. Pull the entire buffer brush out from the machine.
6. Lightly oil the spring-loaded end of the right side of the new buffer brush. Use the same 80- to 90- weight gear oil you use to lubricate the chains.
7. Insert the right end of the buffer brush into the sprocket on the right side of the opening.
8. Grasp the left end of the buffer brush and push it gently towards the right while positioning it into its sprocket on the left side.
9. Release the left side of the buffer brush into its sprocket.

4.4.5 Replacing the Waste Tank Seal

The waste tank seal should be smooth and flat. A waste tank seal that is wrinkled, warped, buckled, or has started to pull away from the vacuum motor, can't provide the seal needed to create the vacuum to remove the cleaning residue from the lane and must be replaced.

Perform the steps below to replace the waste tank seal. Perform these steps with the machine in the **operating** position.

Tools Needed:	• Scraper • Solvent

1. Remove the vacuum hose from the waste tank inlet port.
2. Remove the waste tank from the machine to expose the Waste Tank Seal, as shown in Figure 4-16.

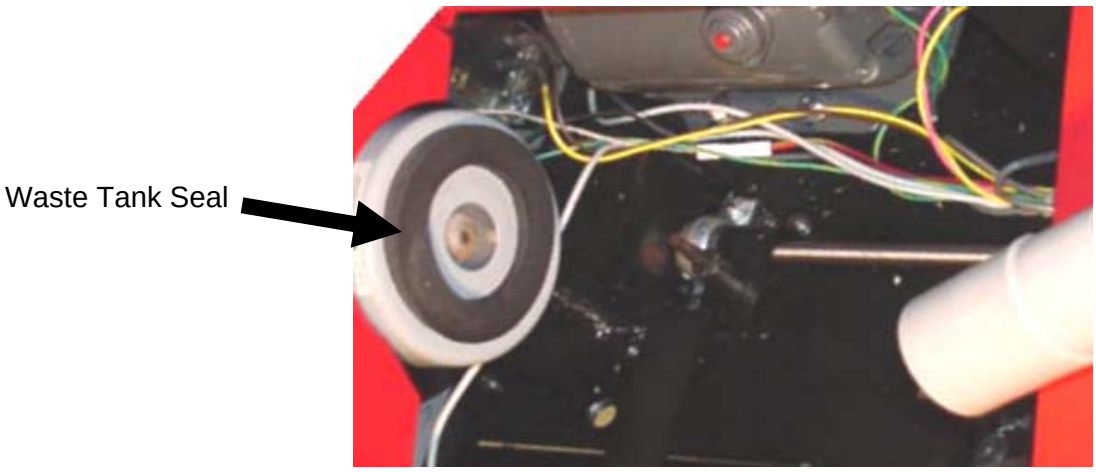


Figure 4-16

3. Carefully pull off the waste tank seal.
4. Scrape off any remaining pieces of the seal and any adhesive.
5. Wipe the waste tank seal area with a solvent to remove any remaining residue.
6. Remove the plastic backing from the new waste tank seal.
7. Center the new seal over the vacuum motor inlet and press firmly.

NOTE

Allow the adhesive 15 to 20 minutes to set before installing the waste tank.

4.4.6 Replacing the Fuses

There are seven fuses in the Express, the main power board and six for the pump, motors, and solenoids. They are all located on the back side of the control box with the exception of the control board fuse. It is a 5x20 Slow Blow, 500ma. To replace the fuses, perform the steps on the next page with the machine in the **operating** position.

Tools Needed:	• Phillips screwdriver • Medium flat screwdriver

WARNING

Always ensure the Express Lane Machine is disconnected from any power source before starting any maintenance, replacement, or repair task.

Note: To replace any fuse except the one on the main power board, follow step 1 below. Remove the electrical cover from the back of the control box. Then take off the appropriate fuse cover by twisting it in a counter-clockwise direction.

To remove the fuse, pull it straight out and away from the circuit board.

To insert the fuse, line up the fuse contact wires with the holes in the board and push the fuse in straight. Be careful not to bend the fuse contact wires.

Replace the fuse cover on the fuse with a clockwise twist.

The following instructions will assist you in replacing the control board fuse:

1. Remove the two screws on each side of the hood, as shown in Figure 4-17, and lift the hood off the frame. Set aside the screws.
2. Remove the top and front screws of the top panel of the control enclosure, as shown in Figure 4-18 (arrows). Set aside the screws.
3. It is not nessecary to take off the side panels of the box to access the fuse. Carefully lift the top off the control enclosure

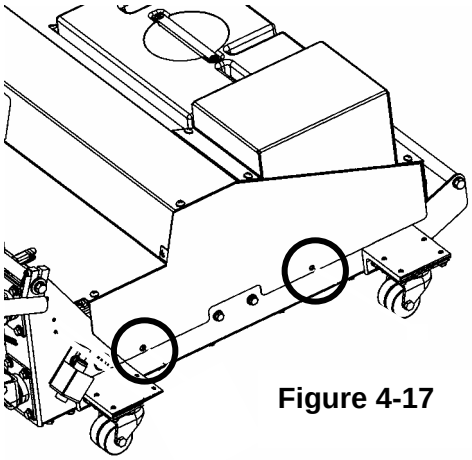


Figure 4-17

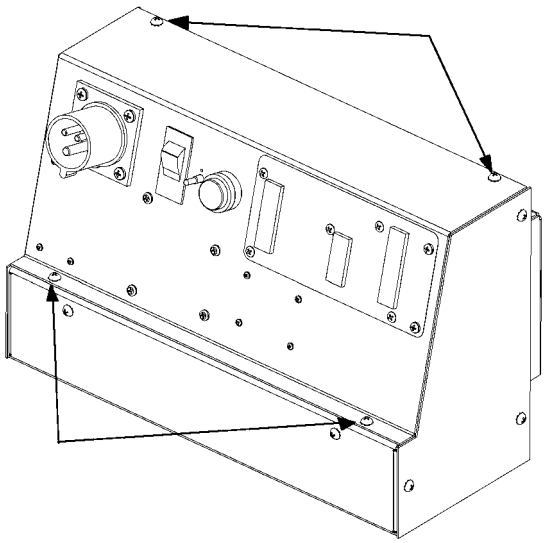


Figure 4-18

The control board fuse is located on the left side of the control board, as shown in Figure 4-19.

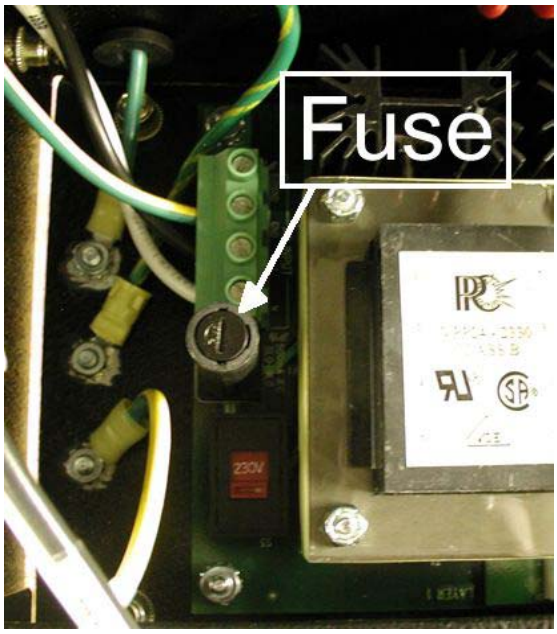


Figure 4-19

1. To remove the fuse, insert the blade of the screwdriver into the slot, push down slightly, and turn the screwdriver 1/4 turn counterclockwise to unlock the fuse housing. The fuse housing will spring up.
2. Remove the fuse from the fuse housing and insert a new fuse.
3. Insert the fuse housing into the opening. Put the screwdriver in the slot, push down slightly, and turn the screwdriver 1/4 turn clockwise to lock it into place.
4. Reinstall the top cover. Fasten the four screws on the top and front of the control box enclosure.
5. Reinstall the hood on the frame and secure it in place with the two screws on each side.

4.4.7 Repositioning and Replacing Optical Sensors

The optical sensors control where the Express stops. If they are not functioning properly, the Express may stop before it reaches the approach or may not stop at all. The information below tells you how to reposition the rear sensor and how to replace the front and rear sensors.

4.4.7.1 Repositioning the Rear (Approach) Sensor

If you have brightly colored gutters or a structure near the gutter area, the rear sensor may turn off the Express before it reaches the foul line. To correct this, you can reposition the sensor.

Complete the steps below to adjust the position of the rear sensor. Perform these steps with the machine in the **operating** position.

Tools Needed:	• Phillips screwdriver (magnetic tip recommended but not required) • 7/16" wrench

1. Locate the sensor on the bracket over the back, right caster wheel, as shown in Figure 4-20.
2. Loosen the bolt just until you can move the bracket. DO NOT REMOVE THE BOLT. The sensor bracket rotates and moves up and down in the slot on the bracket, as shown in Figure 4-21.

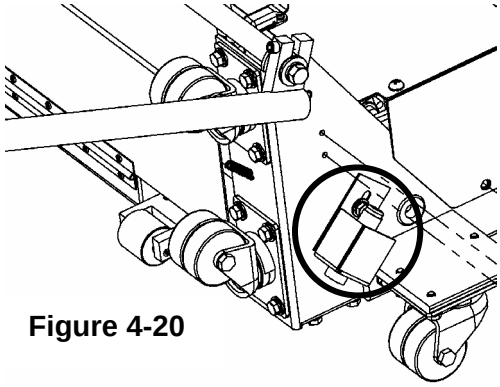


Figure 4-20

3. Make the position changes in small increments.
   - To position the sensor so the distance it "looks" down the gutter is shorter, move the bracket lower down on the side of the machine.
   - To position the sensor so the distance it "looks" down the gutter is longer, move the bracket higher up the side of the machine.
   - To position the sensor so the angle at which it looks into the gutter is steeper, rotate the front of the bracket down.
   - To position the sensor so the angle at which it looks into the gutter is broader, rotate the front of the bracket toward the top of the machine.

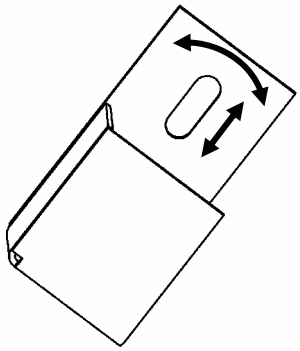


Figure 4-21

4. Tighten the bolt just enough to hold the sensor in place then run the Express to test the positioning.

5. If the machine comes up the lane and turns off only at the approach, fully tighten the bolt to secure the rear sensor in place. If the Express stops before it reaches the approach, repeat these steps until the sensor is correctly positioned.

4.4.7.2 Replacing the Front (Pin Deck) Sensor

To replace the front sensor, complete the steps below. Perform these steps with the machine in the **operating** position.

WARNING

Always ensure the Express Lane Machine is disconnected from any power source before starting any maintenance, replacement, or repair task.

Tools Needed:	• Phillips screwdriver • Wire cutters • Socket set or equivalent • 15/16” wrench

1. Remove the screws on each side of the hood, as shown in Figure 4-22, and lift the hood off the frame. Set aside the screws.

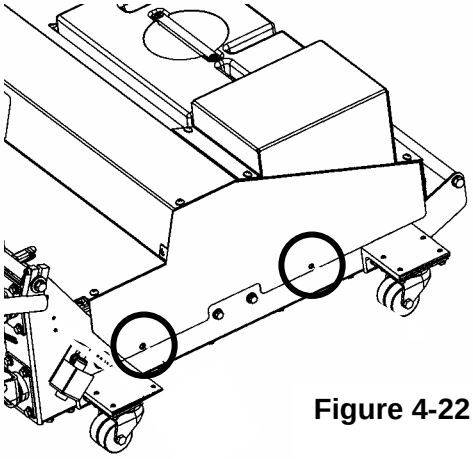


Figure 4-22

2. From within the machine, locate the sensor on the front of the base plate near the center spray nozzle.
3. From under the sensor bracket, unscrew the jam nut on the sensor. (This might be easiest done using a socket and ratchet.) Pull the sensor out of the hole. Set aside the jam nut.
4. Unscrew the other jam nut off the sensor and set it aside.
5. Follow the path of the sensor wire through the wire harness to the connector at the back of the control enclosure. The connector is attached to the slot on the right in the bottom row, as shown in Figure 4-23.

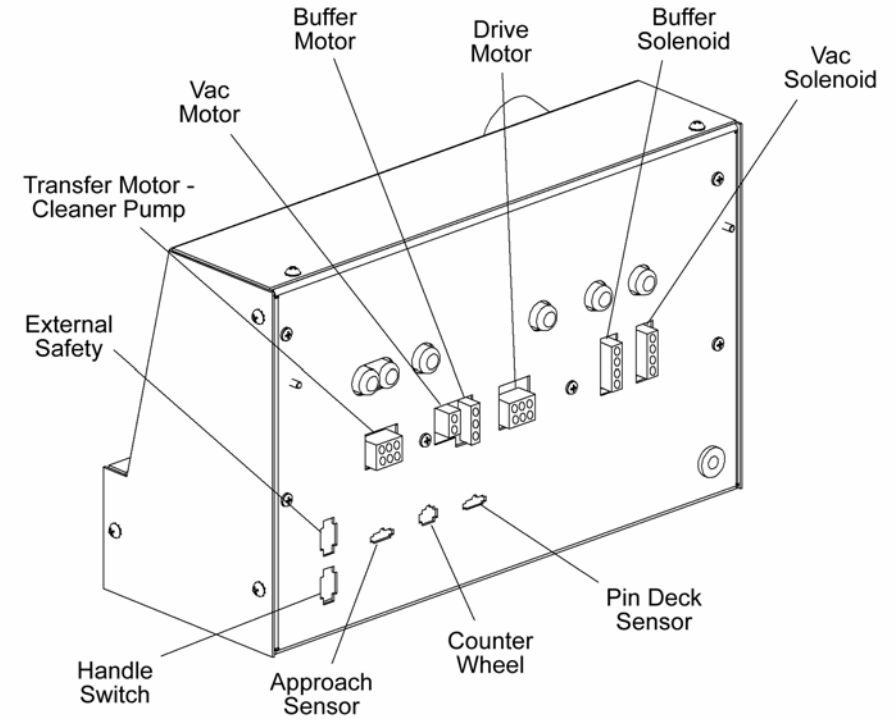


Figure 4-23

NOTE

To release the sensor wire from the wire bundle, you can either cut the tie around the bundle or cut the connector off the end of the sensor wire and pull the sensor wire out of the bundle.

6. Gently squeeze the outer tabs of the connector and pull it from the housing on the control enclosure.
7. Insert the new sensor connector into the housing on the control enclosure and route the wire to the hole in the sensor bracket.
8. Thread a jam nut onto the sensor and insert the sensor through the hole in the sensor bracket.
9. From under the sensor bracket, thread the other jam nut onto sensor so the base plate is sandwiched between the two jam nuts.
10. Tighten the jam nuts (finger tighten only) until the sensor is securely positioned.

4.4.7.3 Replacing the Rear (Approach) Sensor

To replace the rear sensor, complete the steps below. Perform these steps with the machine in the **operating** position.

WARNING

Always ensure the Express Lane Machine is disconnected from any power source before starting any maintenance, replacement, or repair task.

Tools Needed:	• Phillips screwdriver • Ratchet and 15/16” wrench • Wire cutters

1. Remove the screws on each side of the hood, as shown in Figure 4-24, and lift the hood off the frame. Set aside the screws.
2. Locate the sensor on the bracket over the back, right caster wheel, as shown in Figure 4-25.
3. While holding the sensor, unscrew the bottom jam nut (under the bracket) and remove it from the sensor. Pull the sensor up from the bracket. Set aside the jam nut.
4. Unscrew the top jam nut and set it aside.
5. Follow the sensor wire through the hole in the side of the machine, to the wire harness, and to the connector at the back of the control enclosure. The connector is the one on the bottom row that is two to the left of the pin deck sensor, as shown in Figure 4-23.

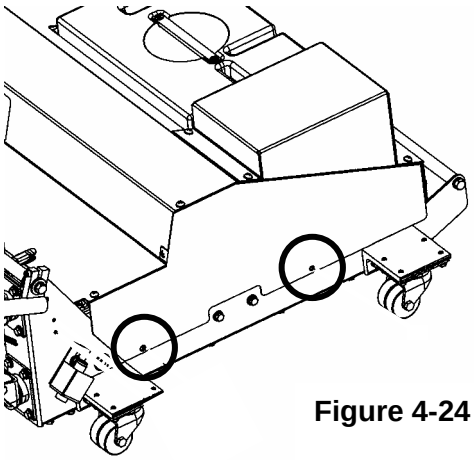


Figure 4-24

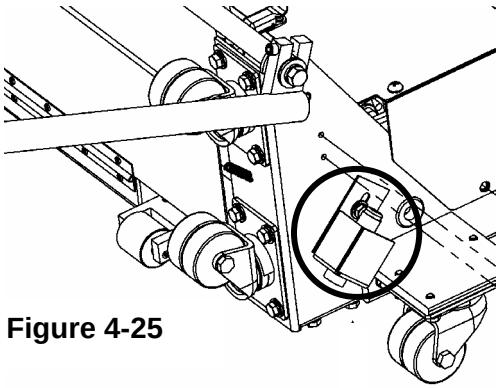


Figure 4-25

NOTE

Since the sensor will not fit through the hole in the side of the machine, disconnect the wire from the control enclosure and pull it through the hole.

6. Gently squeeze the outer tabs of the connecter and pull it from the housing on the control enclosure.

NOTE

To release the sensor wire from the wire bundle, you can either cut the tie around the bundle or cut the connector off the end of the sensor wire and pull the sensor wire out of the bundle.

7. Thread one of the jam nuts onto the new sensor then place the sensor into the hole in the bracket.
8. From under the bracket, thread the other jam nut onto the end of the sensor so the bottom of the bracket is sandwiched between the two jam nuts. Tighten the jam nuts (finger tighten only) until the sensor is secured in the position you want.
9. Route the wire from the sensor through the hole in the side of the machine to the connector at the back of the control enclosure.
10. Insert the connector into the housing on the control enclosure.
11. Be sure to secure the sensor wire to the wire bundle again with wire ties.
12. Reinstall the hood.

Section 5

TROUBLESHOOTING

This section contains a list of some of the problems you might encounter while using the Express Lane Machine and some possible solutions to those problems. Also included in this section are the procedures to follow when the Express stops in the middle of an operation.

NOTE

The information in this section assumes the problem has occurred after you have established your oiling output pattern.

5.1 OPERATIONAL PROBLEMS AND SOLUTIONS

The problems are grouped into three categories:

General Operation	Problems with the machine that are not related to a specific operation.
Cleaning Operation	Problems specific to the cleaning operation.
Conditioning Operation	Problems specific to the oiling and buffing operations.

If you cannot resolve a problem with the possible solutions that are listed here or in section 5.3, contact the AMF Technical Support Center. Their number and hours of operation are given below.

1 (800) DIAL AMF or 1 (804) 730-4000
Monday through Friday from 8:30 a.m. to 5:00 p.m. Eastern Time

SUGGESTION

The solutions given in this section should be performed only by persons who are accustomed to working with machines, electrical components, and parts drawings. Do not attempt to repair the Express Lane Machine if you do not understand any of the steps given for a possible solution.

5.1.1 General Operation

PROBLEM	SOLUTION
The machine doesn't turn on. The control dashboard doesn't light up.	1. Ensure that the power cord is firmly plugged into the outlet and into the power inlet on the machine. 2. Ensure that the power cord is plugged into a 110 volt US (230 volt other) outlet. 3. Ensure the POWER rocker switch is set to ON. 4. Ensure that the front cover is closed. 5. Ensure that wire contacts are still attached to the front cover switch.
The machine travels down the lane but the distance indicator does not change and the operations do not stop or start as the machine travels on the lane.	The encoder is not functioning. This could be caused by the encoder getting misaligned or by dirt and oil accumulating on it. 1. Remove the two screws on each side of the hood and lift the hood off the frame. 2. Locate the encoder next to the drive motor. Refer to the drawings located in the Parts section. 3. Ensure the encoder and counter wheel are correctly aligned. If not, loosen the #10 screw on the drive motor socket, realign the parts, and tighten the screw. 4. Wipe the parts with a clean, dry cloth to remove any oil or dirt. 5. Replace the hood.
The machine does not stop at the end of the lane (runs into the pit).	Ensure that the front sensor is not dirty or blocked.

5.1.1 General Operation, continued

PROBLEM	SOLUTION
The drive motor continues to run after the machine returns to the approach.	• Ensure that the rear sensor is not dirty or blocked. **NOTE** If you have brightly colored gutters, the rear (approach) sensor may not be detecting the gutter ramp. Refer to the *Maintenance* section page 4-26 for instructions about how to reposition the rear sensor to accommodate brightly colored gutters.
The machine stops on the return trip.	This indicates the rear sensor is detecting something in or near the gutter. • Remove everything from the gutter. • If there are permanent fixtures near the gutter that are setting off the sensor, refer to the *Maintenance* section page 4-26 for instructions about how to reposition the sensor so the fixture does not trigger it.
The machine turns on but doesn't do anything when the Start button is pressed (first or second time).	This occurs when the EMERGENCY STOP button has been used to turn off the power to the operations, the front cover is not closed, or the front cover switch is not working correctly. To reset the machine, press the toggle switch to the OFF position, wait 10 to 15 seconds, then press the toggle switch to the ON position. Also, check that the access door is closed so that the interlock switch doesn't trigger the machine to stop. If this does not correct the problem, check the fuses. Refer to the Maintenance section page 4-23 for instructions about how to access the fuses.

5.1.1 General Operation, continued

PROBLEM	SOLUTION
The machine buzzes.	 **Use extreme care when servicing solenoids. The surfaces can be very hot and a severe pinching hazard exists under the solenoid cover.** One or more of the solenoids that operate the vacuum head, buffer brush, and oil transfer roller may not be fully engaged. You may be able to locate the buzzing solenoid by feeling **NEAR** the solenoids; a solenoid that is not engaging will feel hot. Solenoids that do not fully engage are usually out of alignment. If you find a misaligned solenoid, loosen the adjustment screws, realign the solenoid, and tighten the screws. It is also possible that oil or debris has gotten on the solenoid shaft and it is preventing the solenoid from engaging. Wipe the solenoid shaft with a clean, dry cloth.

5.1.2 Cleaning Operation

PROBLEM	SOLUTION
None of the nozzles are spraying cleaner.	1. Make sure the cleaning operation is selected. 2. Ensure there is cleaner in the cleaner tank. 3. Clean the in-line filter. Refer to the *Maintenance* section page 4-6 for instructions about how to clean the in-line filter. 4. Adjust the cleaner flow at the flow control bypass valve to dispense more cleaner by turning it **clockwise** in small increments until cleaner begins spraying. Refer to the drawing located in the *Parts* section to locate the flow control bypass valve.

5.1.2 Cleaning Operation, continued

PROBLEM	SOLUTION
A nozzle is erratically spraying cleaner. A nozzle is not spraying any cleaner.	The nozzle head is clogged. Refer to the *Maintenance* section page 4-15 for information about how to unclog the nozzle heads.
Foam is coming out the exhaust port of the vacuum motor.	This is caused by either of the problems. • The waste tank needs to be emptied. • The action between the cleaner, oil, and agitator foam creates suds that float on top of the debris in the waste tank. This foam is sometimes sucked through the motor. To reduce the amount of suds, pour one to two ounces of defoamer into the waste tank before you begin your lane cleaning session.
Residue is left on the lane after the Express passes over it.	Any damaged or worn edges on any of the parts listed below will weaken the suction needed to draw the debris into the waste tank. • Check that the waste tank is seated correctly against the waste tank seal and vacuum motor.

5.1.3 Conditioning Operation

PROBLEM	SOLUTION
Oil is not being applied to the lane.	1. Check the wicking foams. Rotate or replace them if needed. 2. Make sure there is oil in the oil tank and that the oil level is above the bottom of the bullseye. 3. Check the buffer pressure with the Buffer Pressure Adjustment Tool and adjust as needed. 4. Check to ensure that the transfer roller motor is operating.
Parts of the oil pattern looks like a “washboard.”	Increase the buffer pressure. Refer to the *Maintenance* section page 4-9 for instructions about how to do this.

5.1.3 Conditioning Operation, continued

PROBLEM	SOLUTION
The amount of oil being applied is less than it used to be.	1. Ensure the oiling and buffing distances have not been changed. 2. Ensure the oil level is above the bottom mark on the oil level indicator. 3. Rotate or replace the wicking foams. Refer to the *Maintenance* section pages 4-11 and 4-19 for information about how to rotate the wicking foams or install new wicking foams, and refer to the *Parts* section for part numbers.
The machine hums or drones when it is buffing.	The buffer brush pressure is too high. Reposition the buffer brush to reduce the pressure. Refer to the *Maintenance* section page 4-9 for information about adjusting the buffer brush.
The buffer brush doesn't lift off the lane when it has reached the distance at which it should stop buffing.	Check the buffer return springs. To access the buffer return springs, release the clasps on the oil tank compartment and open the compartment door. The spring should be connected to the bolts that attach the storage-position casters to the frame. • If the springs are not connected, thread the loop at the end of the spring onto the bolt and secure it in place with a 1/4-20 Flexloc nut. Refer to the drawing located in the Parts section.

5.2 RECOVERING WHEN THE EXPRESS STOPS ON THE LANE

There are only five reasons the Express would stop on the lane:

- The machine came unplugged.
- The rear sensor had been tripped by something in the gutter.
- The EMERGENCY STOP button was pressed.
- The guide rollers were too tight against the lane.
- Some component within the Express stopped working.

When the machine stops on the lane, complete the steps below to turn off all the operations and return it to the approach.

1. Press the POWER rocker button to OFF.
2. Press the POWER rocker button to ON.

The machine will turn on with all the operations selected.

3. Turn off the Cleaner, Oil, and Buffer operations.
4. Press the START key on the control dashboard or the START button on the handle **twice**.

Because you have turned off all the operations, only the drive motor starts when you press START the second time. Regardless of what the machine was doing when it stopped, the machine will travel to the end of the lane then return to the foul line.

Once the Express has returned to the foul line, restart the machine to have it perform the same operation(s) it was performing when it stopped.

5.3 TROUBLESHOOTING BY SERVICING

When all adjustments have been made on the machine but your problem remains, you might be in need of part fixing or replacement. The problems are grouped the same way as in section 5.1.

General Operation	Problems with the machine that are not related to a specific operation.
Cleaning Operation	Problems specific to the cleaning operation.
Conditioning Operation	Problems specific to the oiling and buffing operations.

SUGGESTION

The solutions given in this section should be performed only by persons who are accustomed to working with machines, electrical components, and parts drawings. Do not attempt to repair the Express Lane Machine if you do not understand any of the steps given for a possible solution.

5.3.1 General Operation

PROBLEM	SOLUTION
The machine doesn't turn on. The control dashboard doesn't light up.	Check the control board fuse. Refer to the *Maintenance* section page 4-23 for information about replacing fuses and to the appropriate drawings located in the *Parts* section.

5.3.1 General Operation, continued

PROBLEM	SOLUTION
The machine travels down the lane but the distance indicator does not change and the operations do not stop or start as the machine travels on the lane.	If the problem continues even though all steps in section 5.1.1 have been completed, replace the encoder. Refer to the *Parts* section for part numbers.
The machine does not stop at the end of the lane (runs into the pit).	Test that the sensor is working by tilting up the machine high enough to change the sensor state. If the indicator light on the sensor doesn't blink as the machine is lifted, replace the sensor. Refer to the *Maintenance* section page 4-26 for information about replacing the sensor and refer to the *Parts* section for part numbers.
The drive motor continues to run after the machine returns to the approach.	Test that the sensor is working by passing your hand back and forth across the sensor path about three inches away from the sensor. If the indicator light on the sensor doesn't blink as it sees/doesn't see your hand, replace the sensor. Refer to the Maintenance section page 4-26 for information about replacing the sensor and refer to the Parts section for part numbers. **NOTE** If you have brightly colored gutters, the rear (approach) sensor may not be detecting the gutter ramp. Refer to the Maintenance section page 4-26 for instructions about how to reposition the rear sensor to accommodate brightly colored gutters.

5.3.1 General Operation, continued

PROBLEM	SOLUTION
The machine hesitates or stops while traveling down the lane.	The guide rollers are set at the factory to fit against wood lanes and AMF synthetic lanes. Depending on your lanes, the guide rollers can become too tight and stop the machine. Complete the steps below FOR ALL SIX GUIDE ROLLERS to remove the spacer in the guide roller assembly. 1. With the machine in the **storage** position, remove the Phillips screw on each end of the guide roller shaft to release the guide roller assembly. Refer to the drawing located in the *Parts* section. The guide roller assembly configuration is: a spacer, a spring, and a guide roller. 2. Remove the spacer. 3. Reassemble the guide roller assembly and secure it in place with the two Phillips screws.
The machine does not tightly fit against the sides of the lane.	The guide rollers are set at the factory to fit wood lanes and AMF synthetic lanes. Depending on your lanes, the guide rollers may need to more tightly hug the sides of the lane. To tighten the fit against the lanes, complete the steps below FOR ALL SIX GUIDE ROLLERS to add a spacer in the guide roller assembly. 1. With the machine in the storage position, remove the Phillips screw on each end of the guide roller shaft to release the guide roller assembly. Refer to the drawing located in the Parts section. The guide roller assembly configuration is: a spacer, a spring, and a guide roller. 2. Insert a spacer next to the other spacer. 3. Reassemble the guide roller assembly and secure it in place with the two Phillips screws.

5.3.1 General Operation, continued

PROBLEM	SOLUTION
The machine buzzes.	 **Use extreme care when servicing solenoids. The surfaces can be very hot and a severe pinching hazard exists under the solenoid cover.** If the solenoid continues to buzz or feel hot, replace it. Refer to the *Parts* section for part numbers.

5.3.2 Cleaning Operation

PROBLEM	SOLUTION
Residue is left on the lane after the Express passes over it.	Any damaged or worn edges on any of the parts listed below will weaken the suction needed to draw the debris into the waste tank. • Check the squeegee edges to ensure they are not worn, hard, or warped. If they are, replace them. Refer to the *Maintenance* section page 4-17 for information about how to install the squeegees and refer to the *Parts* section for part numbers. • Ensure the squeegees are making full contact with the lane surface. If they are not, replace them. Refer to the *Maintenance* section page 4-17 for information about how to install the squeegees and refer to the *Parts* section for part numbers. • Check that the waste tank seal is not bent, wrinkled, rolled, or worn. If it is, replace it. Refer to the *Maintenance* section page 4-22 for information about how to install the seal and refer to the *Parts* section for part numbers.

5.3.3 Conditioning Operation

PROBLEM	SOLUTION
Oil is not being applied to the lane.	1. Check the wicking foams. Rotate or replace them if needed. 2. Check that the buffer solenoids are working. (Listen for them to engage.) If they are not working, trace the wiring back to the Control Enclosure to ensure the wiring is intact and the connections have not worked loose. Check the fuse. Refer to the *Maintenance* section page 4-23 for information about accessing and replacing the fuses. If the solenoids are still not working, replace them. Refer to the *Parts* section for part numbers.
Parts of the oil pattern looks like a “washboard.”	If changing the buffer pressure does not eliminate the problem, replace the buffer brush. Refer to the *Maintenance* section page 4-21 for information about how to replace the brush and refer to the *Parts* section for part numbers.
The amount of oil being applied is less than it used to be.	Rotate or replace the wicking foams. Refer to the *Maintenance* section pages 4-11and 4-19 for information about how to rotate the wicking foams or install new wicking foams, and refer to the *Parts* section for part numbers.
The buffer brush doesn’t lift off the lane when it has reached the distance at which it should stop buffing.	Check the buffer return springs. To access the buffer return springs, release the clasps on the oil tank compartment and open the compartment door. The spring should be connected to the bolts that attach the storage-position casters to the frame. If the springs no longer have tension, replace them. Refer to the Parts section for part numbers.

This page intentionally left blank.

Section 6

DETERMINING YOUR OILING PATTERN

The lane experts agree that knowing how much oil to put on a lane and just where to put it is as much an art as a science. The amount of oil you need on your lanes is determined by numerous factors, such as

- The type and viscosity of oil
- The type of lanes
- The condition of the wood or synthetic surface
- The temperature and humidity of the oil, the lane, and the bowling center
- The bowling skill level of your bowlers
- The types of balls your bowlers use

Of all the factors affecting oil patterns, there are only four you can control: the amount of oil you apply, the distance you apply it and buff it out, the pressure with which you apply it, and the viscosity. Of these four factors, the Express allows you change the amount of oil it applies, the oiling and buffing distances, and the buffer brush pressure.

This section describes how the Express applies oil, how to check if the factory settings will work for your center, what factors to adjust for different conditioning problems, and the various wicking foams that can be used in the Express.

NOTE

The information in this section cannot address every oiling and buffing situation, nor is it intended as a full discussion of how to condition lanes. Only by experimenting with the wicking foams, oiling and buffing distances, buffer brush pressure, and oil viscosity will you be able to find the perfect mix of factors for your center.

SUGGESTION

When changing the settings, work with only one factor at a time.

6.1 HOW THE EXPRESS APPLIES OIL

The Express uses wicking foams to transport the oil from the oil tank onto a roller. The roller then "holds" the oil for pick up by the buffer brush. The buffer brush then brushes the oil onto the lane surface. Because the roller only holds the oil and the buffer brush only applies what it picks up from the roller, the majority of the oiling pattern is determined by the amount and placement of oil put on the roller by the wicking foams.

The wicking foams use capillary action[1] to move the oil. Capillary action virtually "sucks up" the oil from the bottom of the foam to the top of the foam, moving the oil through the channels created by the holes in the foam. The density - the number of holes per square inch - determines how much oil is moved in a given amount of time and space. Less dense foams hold less oil but the oil moves quickly because the channels created by the holes are large and relatively straight. Denser foams hold more oil but the oil moves slowly because the channels created by the holes are small and winding.

6.2 TESTING YOUR CURRENT DISTANCES

After you have unpacked the Express and familiarized yourself with it, run the machine on your lanes to see how well the Express machine conditions your lanes with your current distances. For the oiling and buffing distances, enter the oiling and buffing distances you currently use, fill the tanks, then clean and condition each lane **twice**. After cleaning and conditioning the lanes, perform the checks listed on the next pages for each lane to determine if you need to change any of the settings. Remember: Your goal is to find the best pattern for <u>all</u> your lanes.

[1] Capillary action is caused by adhesion, cohesion, and surface tension. Adhesion is the attraction of molecules of different materials - in this case, foam and oil. Cohesion is the attraction of molecules of the same material - in this case, oil. Surface tension is the "skin" that keeps the molecule from breaking apart. In the foams, the oil is attracted to a foam molecule at the bottom edge of the foam. Because the surface tension of the oil keeps the molecule together, the molecule has no place to go but up. And as it goes up, it finds the edge of another foam molecule to which it becomes attracted. Because of cohesion, as that first oil molecule crawls from one foam molecule to the next, another oil molecule comes with it. And a third comes with the second, and so on. As each additional oil molecule joins the chain, the higher and higher the first oil molecule gets supported as it crawls up until it no longer has new foam molecules to get attracted to - in this case, the top edge of the foam.

The table below lists the checks you should perform to ensure the Express is applying the amount of oil you want in the pattern you want. For each check, the table also lists where to get information for changing the Express to the settings for your lanes. If you find none of the problems listed below, you don't need to make any adjustments to the factory settings.

Dry spots in the oiled area (from depressions, undulating lane surfaces, etc.)	If there are some dry spots **but** the rest of the lane has the amount of oil you want, you can increase the buffer brush pressure. This will not affect the amount of oil applied in the oiled area only how hard the brush presses against the lane surface. Keep in mind that increasing the buffer brush pressure shortens the life of the buffer brush and puts undue strain on the buffer motor. For information about checking and changing the buffer brush pressure refer to the Maintenance section. If there are some dry spots **and** the rest of the lane does not have the amount of oil you want, you may need to change the wicking foams to one with higher output. For information about this, refer to the Creating Oil Output Patterns in this section. If changing the wicking foams does not eliminate the problem, you can increase the buffer brush pressure but, as explained in the paragraph above, it will affect the life of the buffer brush, and the buffer motor. For information about checking and testing the buffer brush, refer to the Maintenance section.
Washboard Pattern In The Oiled Area	This indicates one of three things: the buffer brush pressure is not consistent across the lane, the oil output is too low, or the buffer brush pressure needs to be increased. Test the buffer brush pressure across the entire width of the brush. The pressure should be at the same point between B and C on the Buffer Pressure Adjustment Tool at each place you test on the buffer brush. If they are not, adjust the buffer brush pressure until the pressure is the same across the width of the brush. For information about measuring the pressure and adjusting the buffer brush pressure, refer to the Maintenance section. Condition the lane after making the adjustments to see if the adjustments eliminate the problem. If the pressure is the same across the width of the brush and the washboard pattern occurs, check the amount of oil applied to the lane. If you want more oil, change the wicking foams to a higher output. For information about this, refer to the

	Creating Oil Output Patterns later in this section. Condition the lane after changing the wicking foams to see if their oil output eliminates the problem. If the problem still remains, you may need to change to an even higher output foam or you may need to increase the buffer brush pressure. For information about increasing the buffer brush pressure, refer to the Maintenance section.
Washboard Pattern In The Buffed Area	If the washboard pattern occurs in both the oiled area and the buffed area, correct the condition in the oiled area first. That correction may automatically correct the condition in the buffed area. If the washboard pattern occurs only in the buffed area, it is caused by too little oil in the brush after applying oil in the oiled area. To correct the condition, increase the buffer brush pressure. For information about increasing the buffer brush pressure, refer to the Maintenance section.

6.3 CREATING OIL OUTPUT PATTERNS

To create an oil output pattern across the lane, you have to change the wicking foams that deliver the oil to the oil transfer roller. The Express is shipped with two medium low output foams for the outside 11 inches of both sides of the lane and a high output foam for the middle 20 inches of the lane. This creates the pattern used by most bowling centers: less oil along the edges and more down the center, as shown in Figure 6-1.

Figure 6-1

By using wicking foams of various densities along the 42 inch width of the oil tank, the Express can apply numerous oiling patterns. For example, if you use the same output wicking foam across the entire oil tank, the pattern will be similar to the one shown in Figure 6-2. Because of the numerous factors that affect lane conditioning (some of which were listed at the beginning of this section), your pattern may not exactly match the one shown below.

Figure 6-2

Conversely, if you use the following wicking foam pattern:

Left Outside	10 inches of high output wicking foam
Left Middle	5 inches of super high output wicking foam
Middle	12 inches of low output wicking foam
Right Middle	5 inches of super high output wicking foam
Right Outside	10 inches of high output wicking foam

The resulting oil pattern will be similar to the one shown in Figure 6-3.

Figure 6-3

Though you would probably never want to use this pattern, it does show that you can mix and match wicking foams to achieve the pattern you want.

6.3.1 Wicking Foam Densities

The wicking foams shipped in the Express are two medium low output foams along the sides and one high output wicking foam in the middle. Listed below are the five color-coded wicking foams available for use in the Express:

Super High Output (Black)	High Output (Blue)	Medium High Output (Red)	Medium Low Output (Orange)	Low Output (Natural)

The wicking foams come in 48 inch lengths so you can cut them to whatever size you need. For the wicking foam part numbers, refer to the Introduction or Parts sections.

NOTE

The medium low output wicking foams (orange) and the high output wicking foams (blue) are available in both standard and 48-inch lengths. The standard length for the medium low output wicking foam (orange) is 11 inches. The standard length for the high output wicking foam (blue) is 20 inches. For these two wicking foams, be sure you use the part number that matches the length you want.

6.3.2 Preparing Custom-Sized Wicking Foams

The wicking foams come in lengths of 48 inches. That means you will have to cut them to fit the 42-inch width of the oil tank and to create the oiling output pattern you want. The cut edges must be not be ragged; they must meet without gaps and the tops must be even across the oil transfer roller. To get the clean cuts needed, we recommend you use a straight edge and sharp cutting tool, such as a box cutter, to cut the wicking foams.

Before putting the wicking foams into the machine, line them up on a flat surface to ensure the edges and top meet, and that they total 42 inches across.

When putting the wicking foams in the oil tank tray, start at one side and insert the wicking foams across to the other side.

6.4 CHANGING THE AMOUNT OF OIL APPLIED TO THE LANE

After completing the two passes with the Express, check to see if the amount of oil the Express has applied in the oiled area is the amount of oil you want. If you have a lane reading machine, run a tape at your usual distance and compare your previous results with the readings you get after running the Express. If you do not have a lane reading machine, use whatever method you have developed for testing the oil amount in the oiled area and compare your previous results with the oil amount applied by the Express.

If the amount is more or less than you normally apply, you can change the oiling distance and the wicking foams.

- If you normally oil more than 24 feet and you tested the oil amount beyond the 24-foot oiled area, change the oiling distance to your normal distance, recondition the lane, and test the oil amount again.

- If you tested within the 24-foot oiled area and there is too much or not enough oil, you can change the wicking foams to ones with lower or higher output, as needed. For information about the wicking foam oil outputs, refer to the Creating Oil Output Patterns information in this section. For information about changing the wicking foams, refer to the Maintenance section.

If the amount of oil in the buffed area is different from what you want, there are four things you can change: the buffing distance, the oiling distance, the amount of oil applied in the oiled area, and the buffer brush pressure.

- If you normally buff more or less than 15 feet (starting at 24 feet and ending at 39 feet), adjust the buffing distance to your normal distance and check the oil amount again.

- If changing the buffing distance to your normal distance does not give you the oil application you want at your test spot, experiment with other buffing distances.

- If changing the buffing distance does not result in the amount of oil you want applied in the test spot in the buffed area, consider changing the oiling distance. A shorter oiling distance will result in less total oil being applied to the buffed area; a longer oiling distance will result in more oil total being applied in the buffed area. Refer to the Oil Taper information of this section for information about how the oil is applied in the buffed area.

- If changing the oiling distance is not an option or does not result in the amount of oil you want applied to your test spot in the buffed area, consider changing the wicking foams to change the amount of oil applied in the oiled area. A lower amount of oil applied in the oiled area will result in less oil being applied to the buffed area; a higher amount of oil will result in more oil being applied in the buffed area.

- If changing the amount of oil applied in the oiled area is not an option or does not result in the amount of oil you want at your test spot in the buffed area, change the buffer brush pressure. Changing the buffer brush pressure will not affect the amount of oil applied in the oiled area, but it will change the amount applied in the buffed area. Keep in mind, though, that increasing the buffer brush pressure will shorten the life of the buffer brush and put undue strain on the buffer motor. For information about checking and changing the buffer brush pressure, refer to the Maintenance section.

If the amount of oil in the oiled and buffed areas is different from the amount you want. There are three things you can change: the distances, the wicking foams, and the buffer brush pressure.

- If the oiling and buffing distances are not what you normally use, change the distances to those you normally oil and buff.

- If using your normal distances does not create the oil output you want, experiment with other distances for both oiling and buffing. For information about how the distances affect the oil output pattern, refer to the Oil Taper information in this section.

- If changing the distances does not create the oil output you want, change the wicking foams to ones with higher or lower output, as needed. For information about the wicking foam output, refer to the Creating Oil Output Patterns information in this section. For information about changing the wicking foams, refer to the Maintenance section.

- If changing the wicking foams does not give you the amount of oil you want applied, increase or decrease the buffer brush pressure within the B - C range on the Buffer Pressure Adjusting Tool.

NOTE

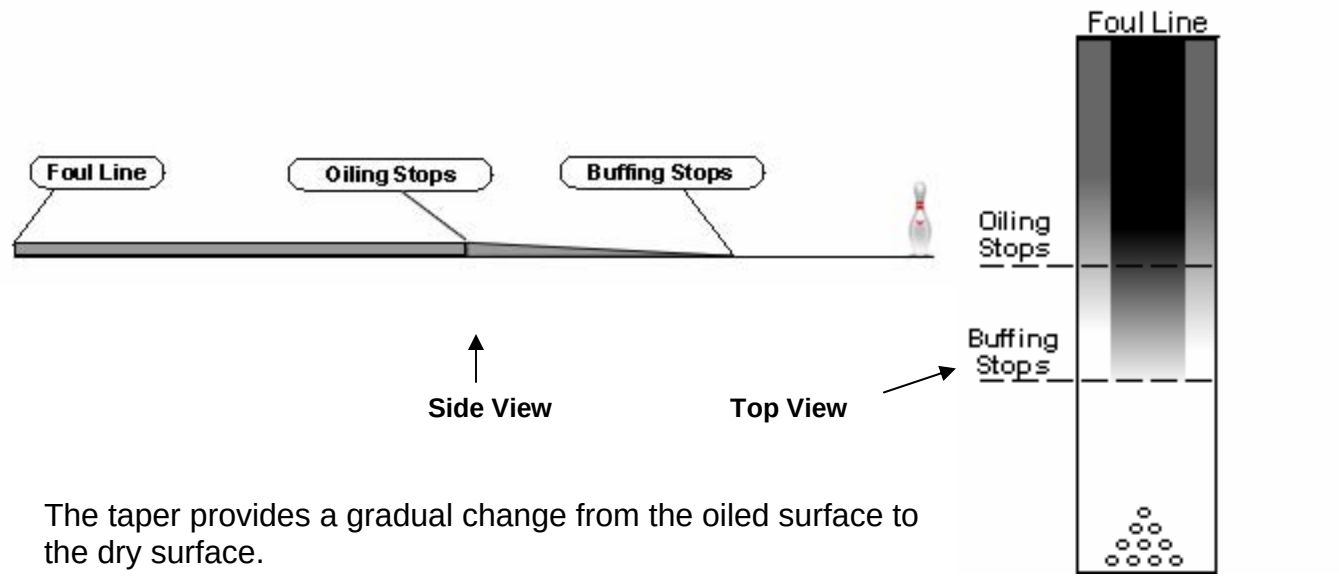
It is better for you to use a wicking foam that applies slightly more oil than you want. This allows you to fine-tune the oil application by **decreasing** the buffer brush pressure. Unlike increasing the pressure to get more oil, decreasing the buffer brush pressure will apply less oil, not affect the life of the buffer brush, and will not strain the buffer brush motor.

The viscosity of the oil also affects the amount of oil applied to the oiled and buffed areas. If you choose to use a higher or lower oil viscosity than the type shipped with your Express, you will need to experiment with the oil and other factors to find the correct combination of factors for your lanes.

6.5 OIL TAPER

When you select the oiling operation, oiling begins at the foul line and ends at the distance you specify. Buffing is always done with the oiling operation since the brush applies the oil. You can either stop the buffer brush where you stop oiling or you can have the buffer brush continue to buff after the oiling distance has been reached. If you do not buff after the oiling distance is reached, you create a sharp break between the oiled and dry surfaces. If you continue to buff, the Express applies the oil that remains in the brush from the oiling operation. It will continue towards the pindeck in a taper on the lane until the buffer brush runs dry or reaches the end of the buffing area (distance set for the buffing operation).

The amount of oil tapers off in both thickness and lane width as the brush buffs down the lane. If you are using the standard oiling pattern (more oil down the middle and less oil down the sides), the tapers look like the ones illustrated on the next page.



The taper provides a gradual change from the oiled surface to the dry surface.

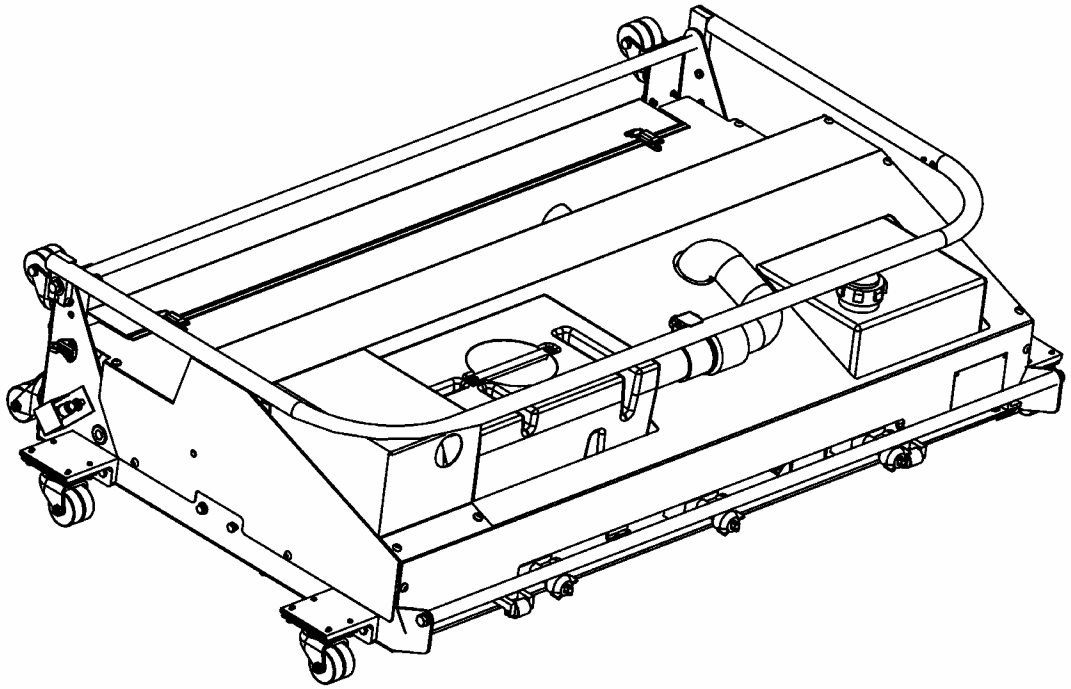
The amount of oil the Express applies to the buffed area of the lane is determined by the oil output on the oiled area, the oiling distance, and the buffing distance. Generally, the higher the amount of oil and the longer the oiling distance, the more oil that remains in the buffer brush from the oiling operation and therefore the more oil that is applied in the buffed area. This results in a higher volume of oil over the entire lane. For example, if you have a high amount of oil applied in the oil area, the oiling distance is 28 feet, and the buffing distance is 40 feet, the buffed area will start out with that high amount of oil at 29 feet and taper off to a low amount of oil at 40 feet. Conversely, if you have that same amount of oil applied to the oil area, the oiling distance is 24 feet, and buffing distance is 50 feet, the buffed area will start out with that high amount of oil at 25 feet and taper off to little or no oil at 50 feet.

The difference between the two amounts of oil in the buffing area is caused by the difference in the amount of time the buffer brush is in contact with the oil; the longer the brush is in contact with oil, the higher the amount of oil that gets into the brush, thus a higher amount of oil that can be applied to the remainder of the lane. Think of it like a paint brush. If you just dip the tips of the bristles into the can of paint, you don't get much of the wall covered before you have to get more paint. But if you plunge in the brush midway up the bristles and leave it in the paint for a few seconds, you can cover a lot more of the wall before you have to get more paint.

Since the amount of oil applied to the buffed area is directly related to the combination of the amount of oil applied in the oiled area and the distance of the oiled area, the only ways to change the amount of oil in the buffed area — without changing the amount of oil applied to the oiled area — is to change the distance of the oiled area or the buffer brush pressure. Unfortunately, because every lane differs in how it accepts oil, there is no formula for determining how long to set the oiling distance to get a given amount of oil taper in the buffed area. Nor is there a formula for determining what buffer brush pressure is required for a taper. You will have to experiment with different oiling distances and buffer brush pressures to find the right setting for your lanes.

This page intentionally left blank.

PARTS



This section contains drawings of the Express Lane Machine parts and the wiring diagram. The drawings are shown within functional groupings, as listed on the next page.

Use the part numbers in this section to order parts.

If you have a part number and want to find the drawing on which it is shown, use the Parts Index at the back of this manual.

MISCELLANEOUS

- Power Cord Assembly
- Buffer Brush Adjusting Tool
- Wiring Diagram

FRAME and BODY

- Base Plate Assembly
- Cleaner Pump Assembly
- Buffer Side Plates: Buffer Side and Drive Side
- Caster Assembly
- E - Stop Assembly
- Control Box Enclosure Assembly
- Express Control Box Fuses
- Drive Motor Assembly
- Drive Shaft Assembly
- Drive Wheel Cover Assembly
- Express Assembly
- Frame Assembly
- Handle Assembly
- Hood Assembly
- Access Door Hood Assembly
- Door Interlock Switch Assembly
- Optical Sensors: Approach and Pin Deck

VACHEAD and CLEANING

- Vac Solenoid & Bracket Assembly - RH
- Vac Solenoid & Bracket Assembly - LH
- Cleaner Tank Assembly
- Flow Valve Assembly
- Nozzle Assembly
- Pivot Bracket Assembly
- Vacuum Hose Assembly
- VacHead Assembly
- Vacuum Motor Assembly
- Vacuum Pivot: Block and Arm Assemblies
- Waste Tank Assembly
- Waste Tank Guard Assembly

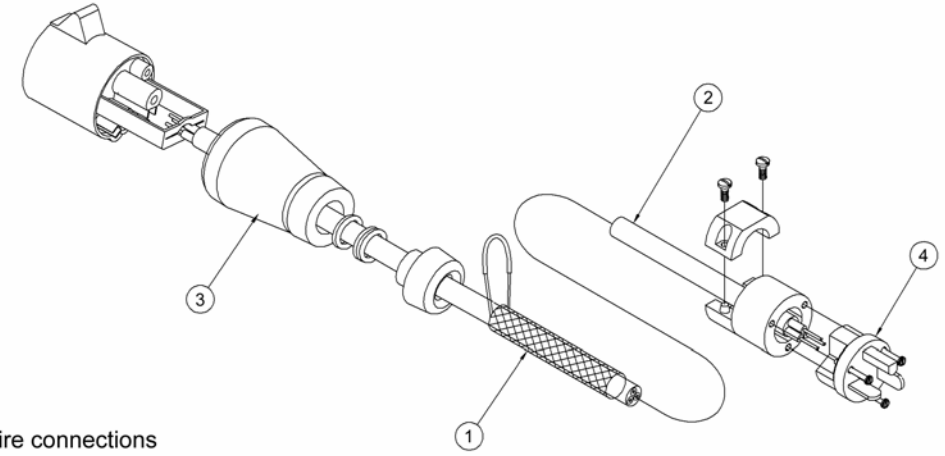
OILING and BUFFING

- Buffer Solenoid & Bracket Assembly - RH
- Buffer Solenoid & Bracket Assembly - LH
- Belt Tensioner
- Buffer Motor Assembly
- Oil Tank Assembly
- Oil Tank Lift Assembly
- Oil Transfer / Buffer Mount Assembly
- Transfer Roller Motor Assembly

MISCELLANEOUS

294-002-359 110V Power Cord Assembly

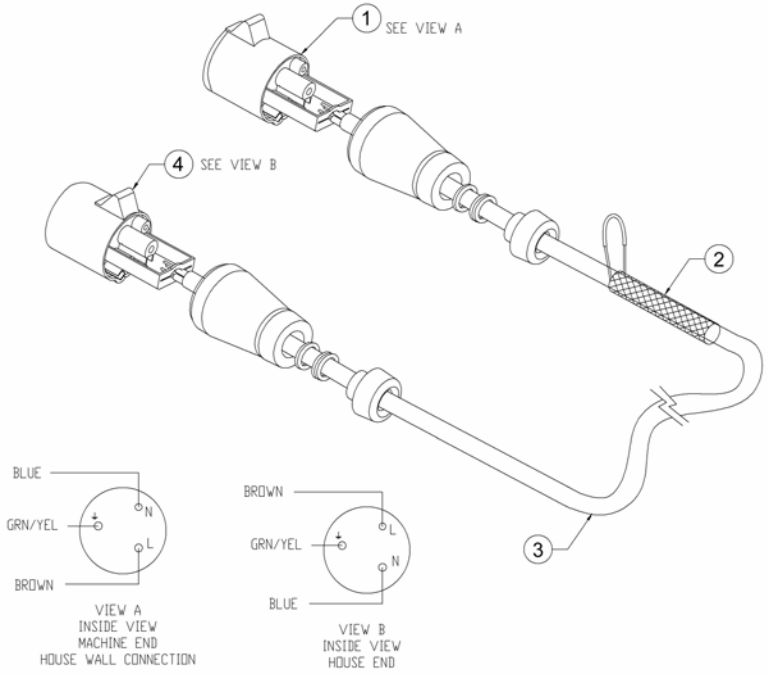
	NUMBER	DESCRIPTION
1	04-443	Support Grip, Single Eye, Single Weave
2	02-238	Wire, 12/3, Type SJTO
3	294-002-219	Connector Body
4	02-397	125V, 20A, Male Plug



Detail for wire connections

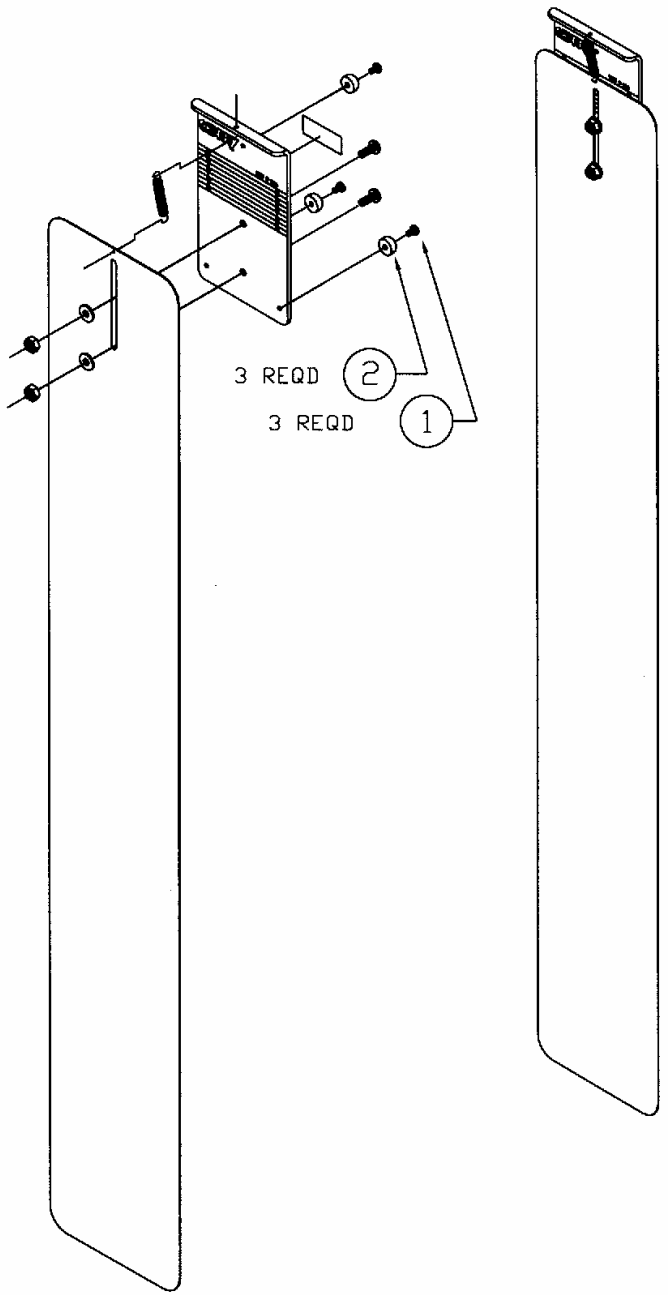
294-115-269 240V Power Cord Assembly

	NUMBER	DESCRIPTION
1	294-002-219	Connector Body
2	04-443	Support Grip, Single Eye, Single Weave
3	294-002-249	Harmonized Power Cord
4	294-115-344	Plug Body

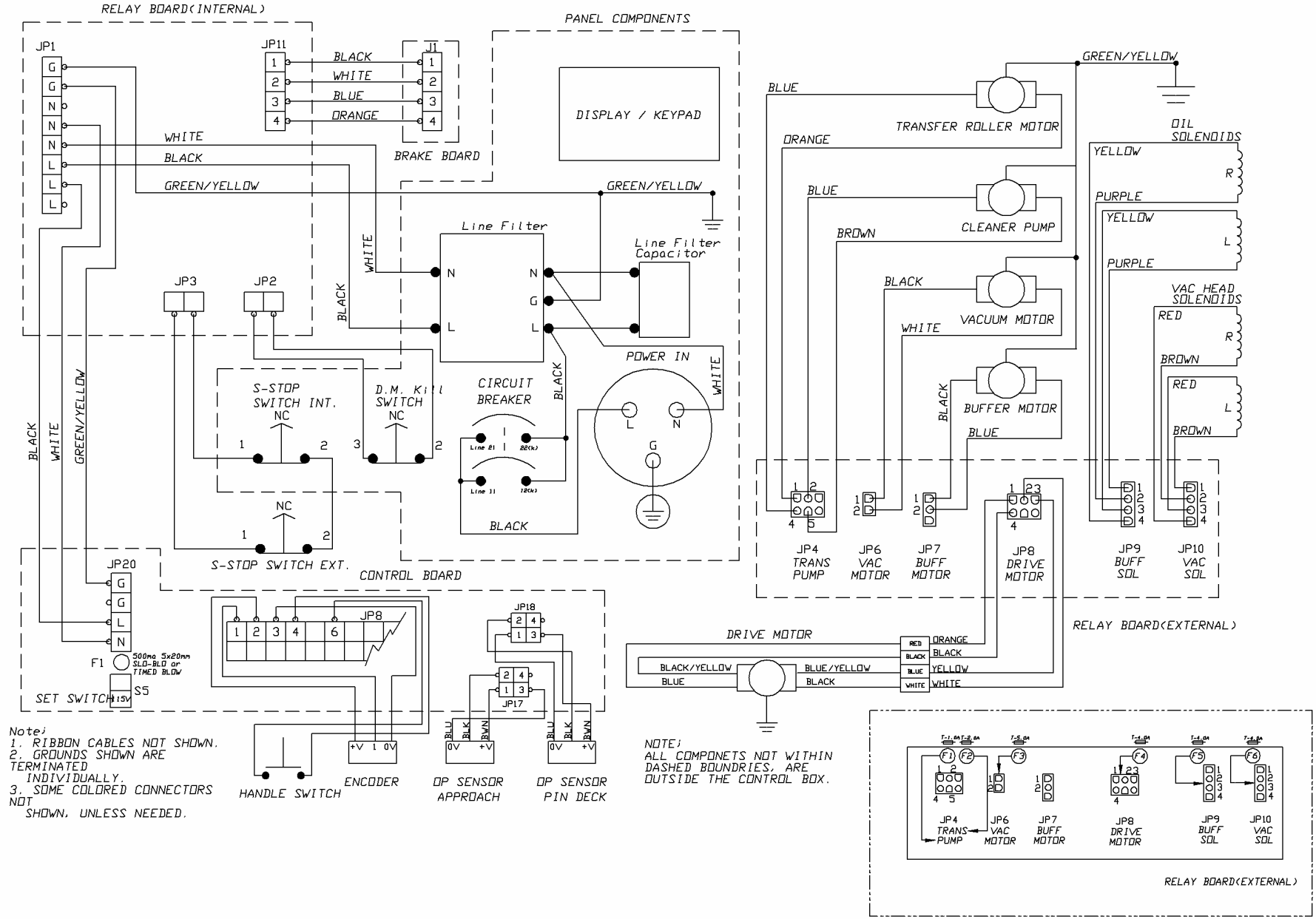


RP-43 Buffer Pressure Adjusting Tool

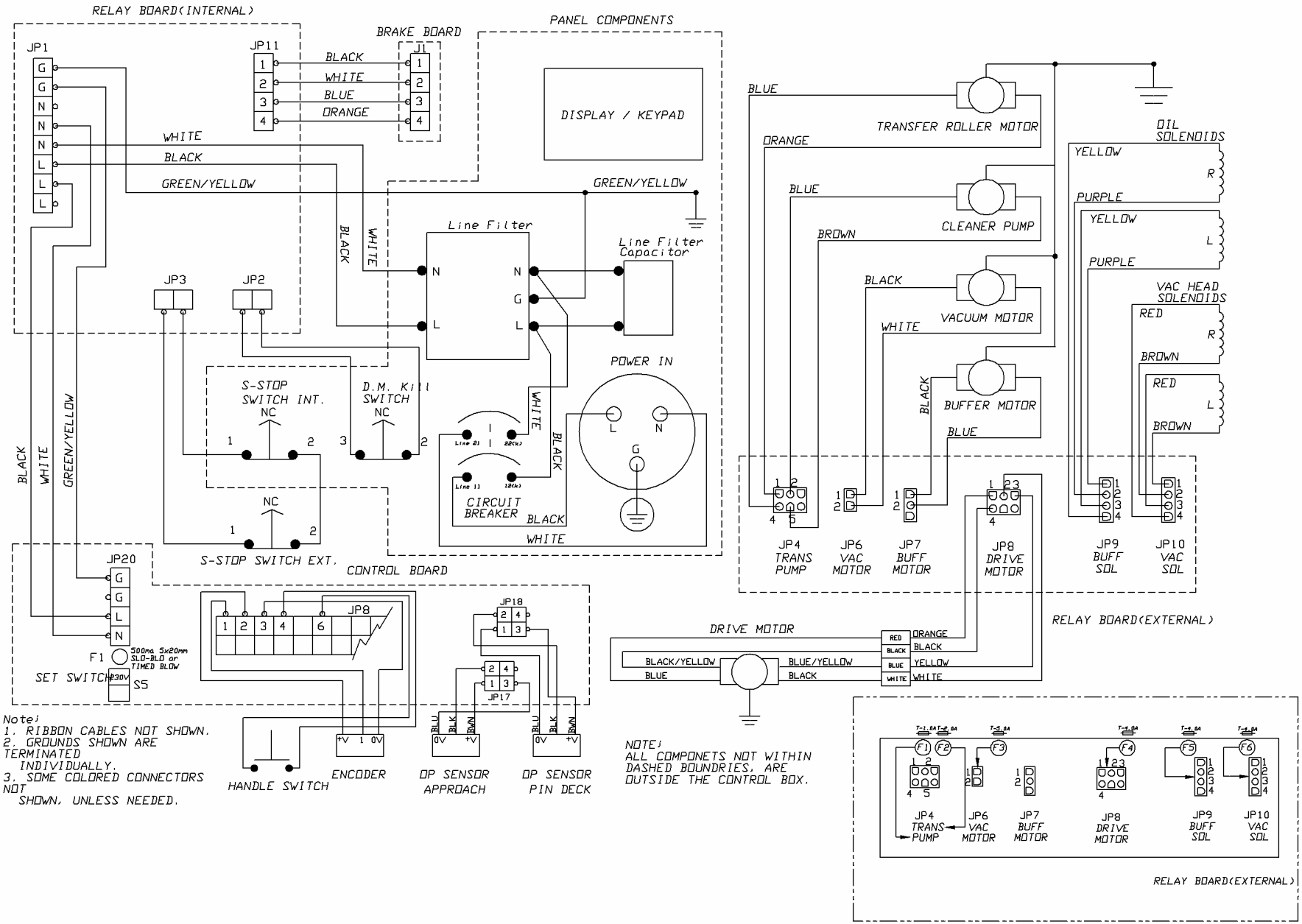
	NUMBER	DESCRIPTION
1	01-108	Screw, 6-32 X 1/4 Pan Head
2	04-403	Recessed Bumper



294-115-351 Wiring Diagram 110V Express Lane Machine



294-115-350 Wiring Diagram 240V Express Lane Machine



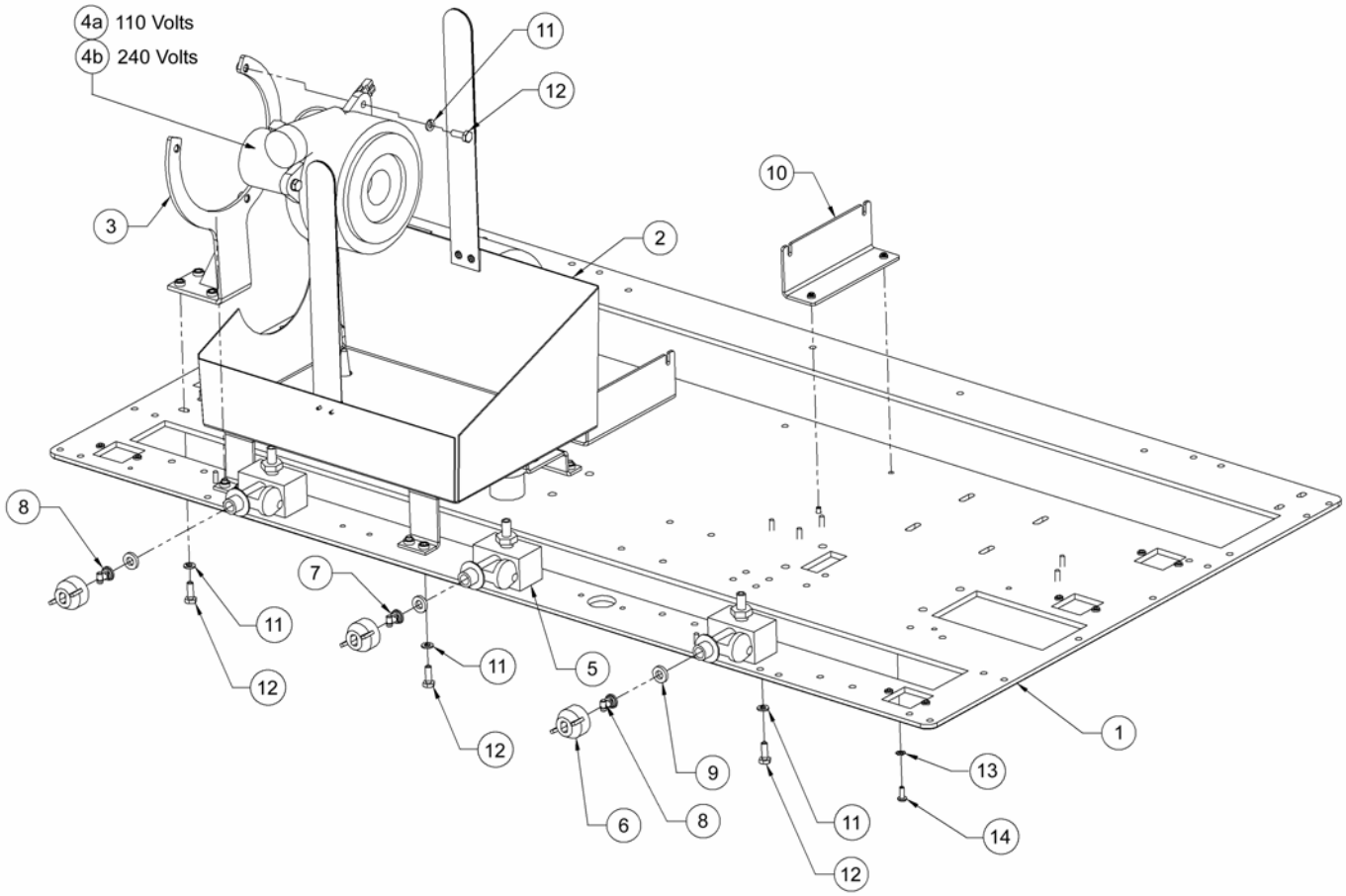
This page intentionally left blank.

FRAME and BODY

Base Plate Assembly (Page 1 of 4)

	NUMBER	DESCRIPTION
1	294-115-031	Base Plate - Express
2	294-115-233	Waste Tank Guard Assembly
3	294-115-041	Vac Motor Bracket Weldment
4a	294-115-042	110V Vac Motor Assembly
4b	294-115-343	240V Vac Motor Assembly
5	294-115-065	Nozzle Mount Assembly
6	294-115-067	Nozzle Head
7	294-115-069	Nozzle Tip - Green

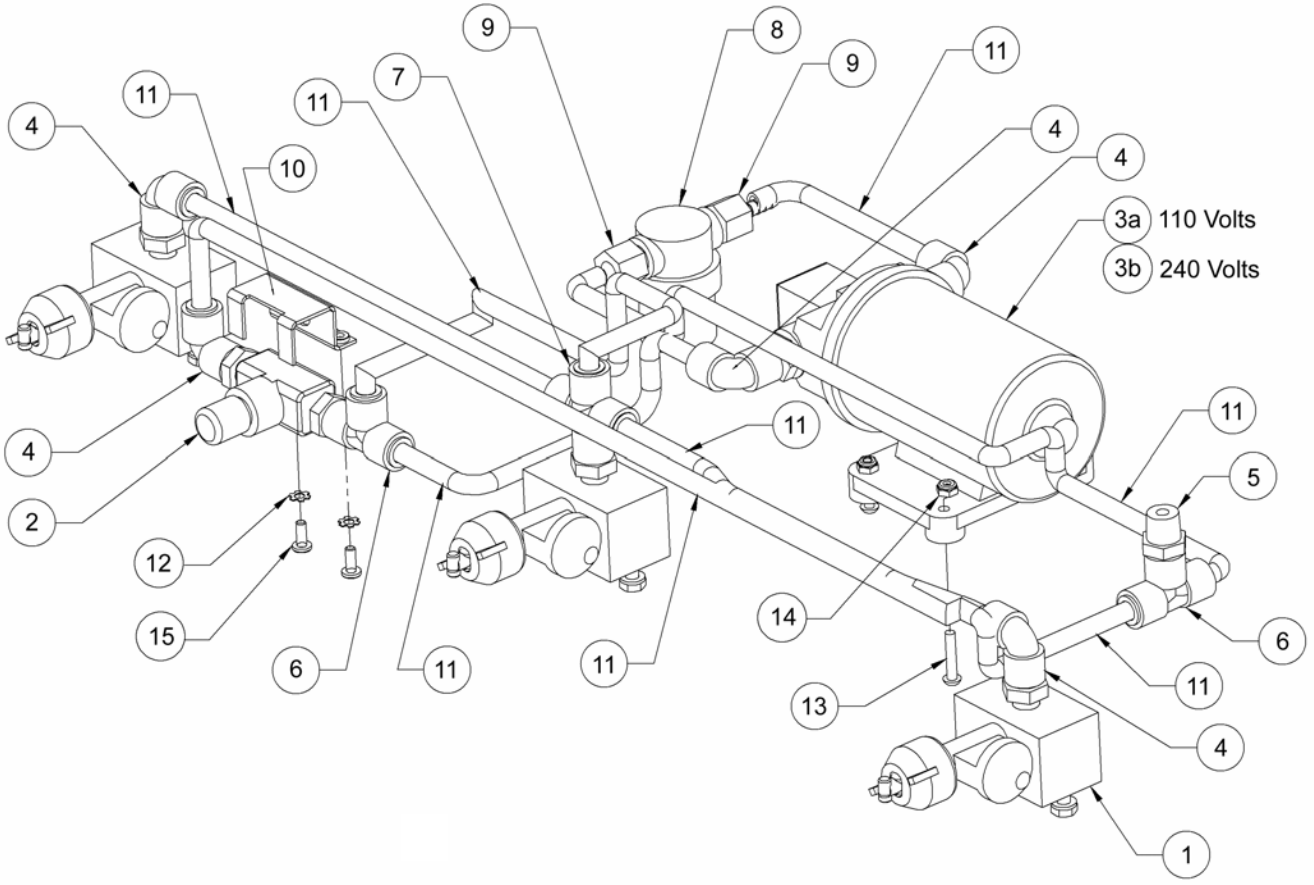
	NUMBER	DESCRIPTION
8	294-115-068	Nozzle Tip - Orange
9	294-115-070	Viton Washer
10	294-115-260	Control Box Mount Assembly
11	01-054	Washer, 1/4, Split, Zinc
12	809-849-125	Screw, 1/4-20 X 3/4, Hex Head, Black
13	01-033	Washer, #10, External Tooth Lock, Zinc
14	01-021	Screw, #10-32 X 1/2, Phillips, Pan Head



Base Plate Assembly (Page 2 of 4)

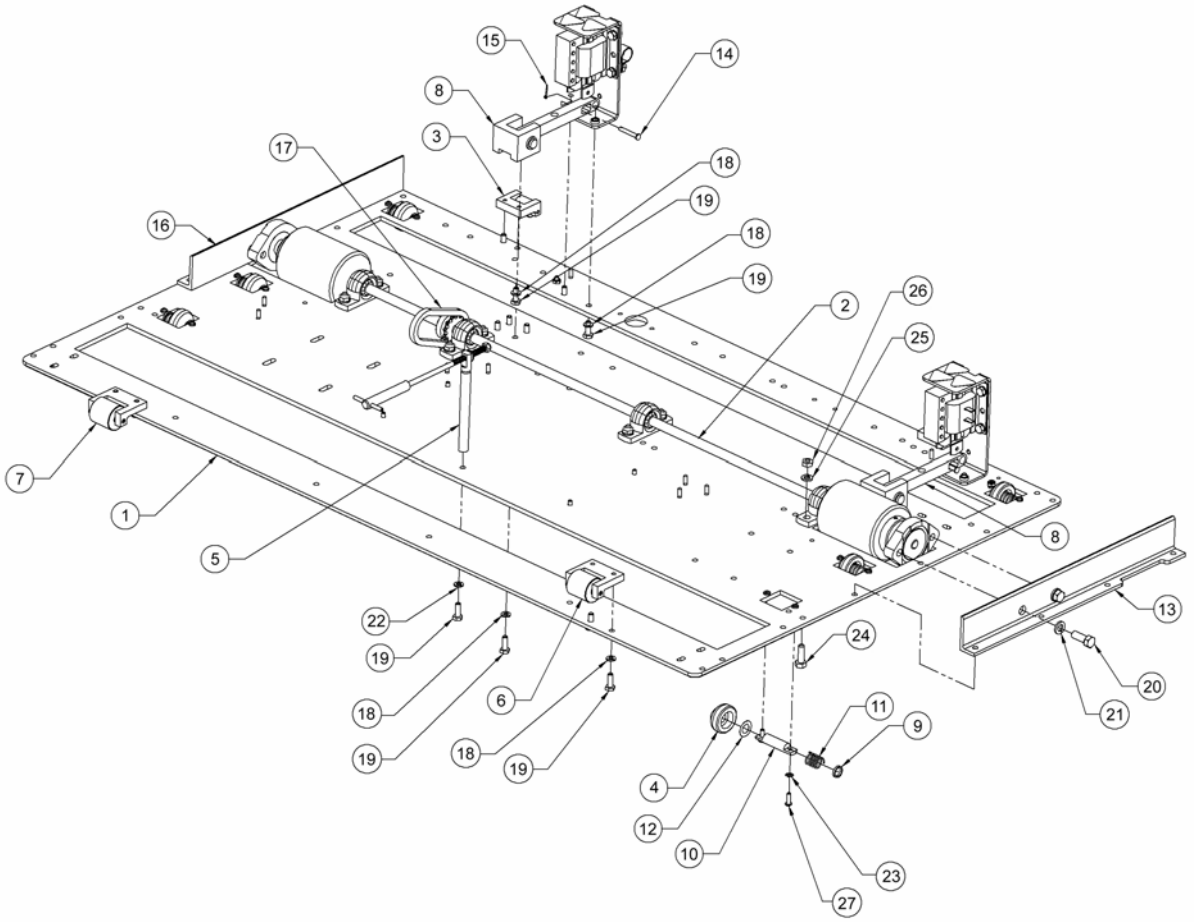
	NUMBER	DESCRIPTION
1	294-115-065	Nozzle Mount Assembly
2	294-115-075	Flow Valve Assembly
3a	02-206	Cleaner Pump, 110V, 60 PSI
3b	294-115-287	Cleaner Pump, 240V
4	294-115-073	Union Elbow - 3/8 X 3/8
5	294-115-072	Stem Adapter, 3/8mpt X 3/8
6	294-115-074	Union Tee - 3/8 X 3/8,
7	294-115-076	Union Cross (4x) 3/8, Quick Connect

	NUMBER	DESCRIPTION
8	04-322	Filter Bowl
9	04-398	Fitting
10	294-115-289	Cleaner Valve Bracket Assembly
11	04-128	Tubing, Tygothane, 3/8 OD X 1/4 ID (specify length in feet)
12	01-033	Washer, #10, External Tooth Lock, Zinc
13	01-024	Screw, #10-32 X 1, Phillips, Round Head, Zinc
14	840-040-002	Nut, #10-32, Flexloc, Zinc
15	01-021	Screw, #10-32 X 1/2, Phillips, Pan Head



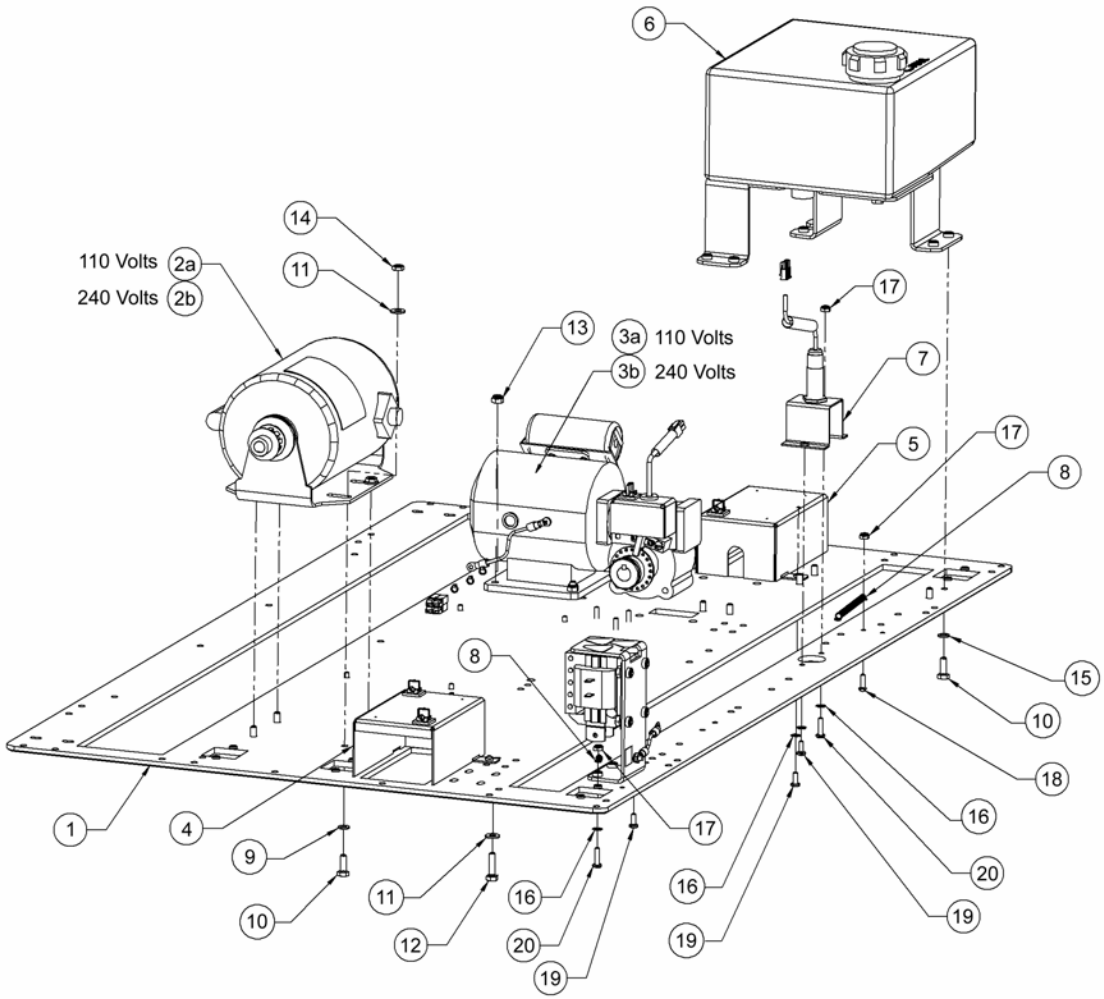
Base Plate Assembly (Page 3 of 4)

	NUMBER	DESCRIPTION
1	294-115-031	Base Plate - Express
2	294-115-024	Drive Shaft Assembly
3	SA-3012	Duster End Plate Roller Assembly
4	SA-0244	Guide Wheel Assembly
5	294-115-162	Oil Tank Lift Assembly
6	294-115-079	Idler Wheel Assembly - Buffer Side
7	294-115-078	Idler Wheel Assembly - Drive Side
8	294-115-223	Vac Pivot Block & Arm Assembly
9	A-0025	Guide Roller Washer
10	294-115-058	Guide Roller Axle
11	A-0024	Guider Roller Spring
12	01-161	Phenolic Washer
13	294-115-059	Stiffener Bracket
14	01-495	Pin, 3/16 X 1 1/4, Clevis
15	01-080	Pin, 1/16 X 1/2, Cotter, Zinc
16	294-115-063	Stiffener Bracket-Drive Side
17	294-115-080	Drive Chain
18	01-054	Washer, 1/4, Split, Zinc
19	809-849-125	Screw, 1/4-20 X 3/4, Hex Head, Black
20	809-865-165	Screw, 3/8-16 X 1, Hex Head, Black
21	951-164-002	Washer, 3/8, Split, Black
22	951-148-008	Washer, 1/4, Split, Black
23	01-033	Washer, #10, External Tooth, Zinc
24	809-857-165	Screw, 5/16-18 X 1 Hex Head
25	01-063	Washer, Lock, 5/16 Split
26	01-062	Hex Nut, 5/16-18
27	01-022	Screw, #10-32 X 5/8 Phillips Head



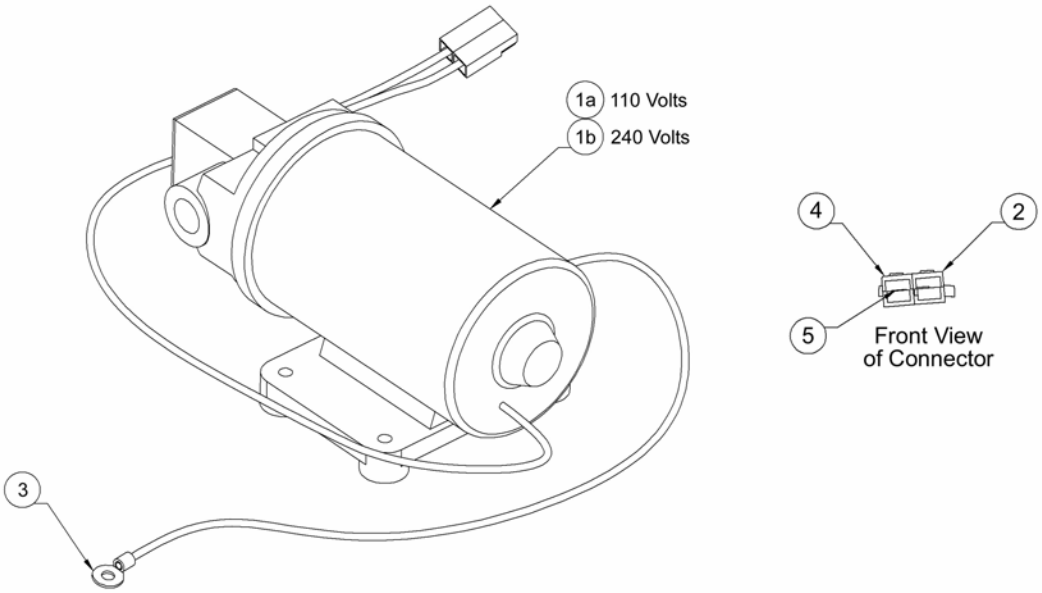
Base Plate Assembly (Page 4 of 4)

	NUMBER	DESCRIPTION
1	294-115-031	Base Plate - Express
2a	294-115-038	110V Buffer Motor Assembly
2b	294-002-270	240V Buffer Motor Assembly
3a	294-115-039	110V Drive Motor Assembly
3b	294-115-326	240V Drive Motor Assembly
4	294-115-321	Drive Wheel Cover Assembly - Rh
5	294-115-322	Drive Wheel Cover Assembly - Lh
6	294-115-165	Cleaner Tank Assembly
7	294-115-219	Sensor And Mount Assembly
8	A-0409	Buffer Return Spring
9	01-054	Washer, 1/4, Split, Zinc
10	809-849-125	Screw, 1/4-20 X 3/4, Hex Head, Black
11	948-753-102	Washer, 1/4, A - N, Flat, Black
12	809-849-165	Screw, 1/4-20 X 1, Hex Head, Gr 8, Black
13	01-051	Nut, 1/4-20, Flexloc, Zinc
14	01-340	Nut, 1/4-20, Jam
15	951-148-008	Washer, 1/4, Split, Black
16	01-033	Washer, #10, External Tooth Lock, Zinc
17	840-040-002	Nut, #10-32, Flexloc, Zinc
18	01-022	Screw, #10-32 X 5/8 Phillips Head
19	01-021	Screw, #10-32 X 1/2, Phillips, Pan Head
20	01-023	Screw, #10-32 X 3/4, Phillips, Pan Head, Zinc



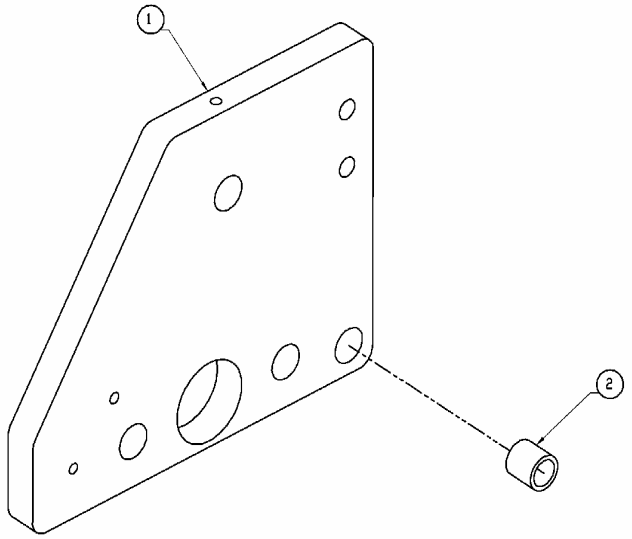
Cleaner Pump Assembly

	NUMBER	DESCRIPTION
1a	02-206	Cleaner Pump, 110V
1b	294-115-287	Cleaner Pump, 240V
2	294-115-304	Housing, Black
3	02-243	Ring Terminal
4	294-115-306	Housing, Blue
5	02-793	Terminal



294-115-014 Buffer Side Plate (Buffer Side)
294-115-019 Buffer Side Plate (Drive Side)

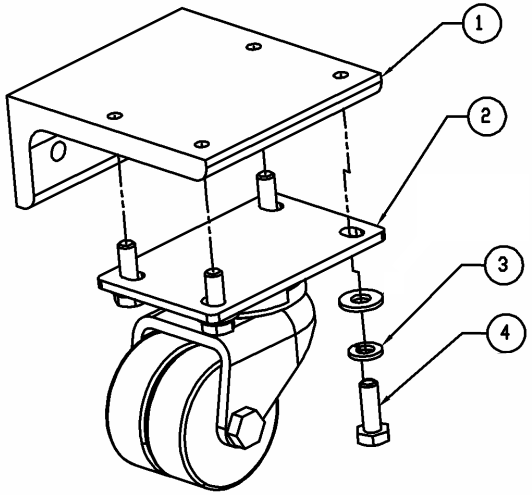
	NUMBER	DESCRIPTION
1	294-115-010	Buffer Brush Side Plate
2	294-115-015	Bushing: .5 OD X .3/3 ID X .5



NOTE: Both the Buffer side and the driver side plates are made with the same components.

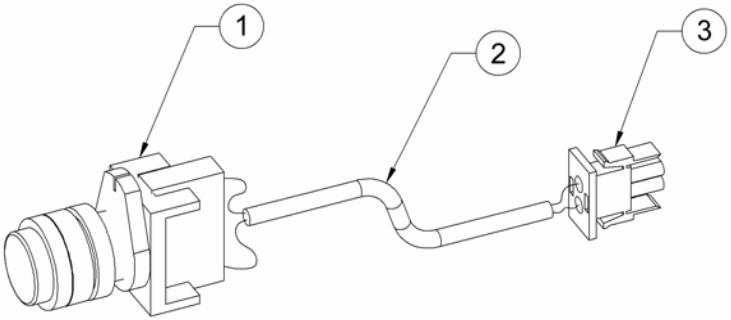
294-115-167 Caster Assembly

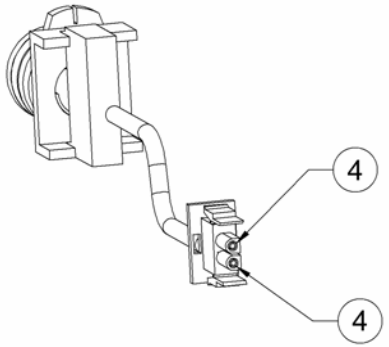
	NUMBER	DESCRIPTION
1	294-115-056	Caster Bracket
2	294-115-057	Lane Caster
3	951-148-008	Washer: 1/4, Split, Lock
4	809-849-125	Screw: 1/4-20 X 3/4, Hex Head



294-115-135 E - Stop Assembly

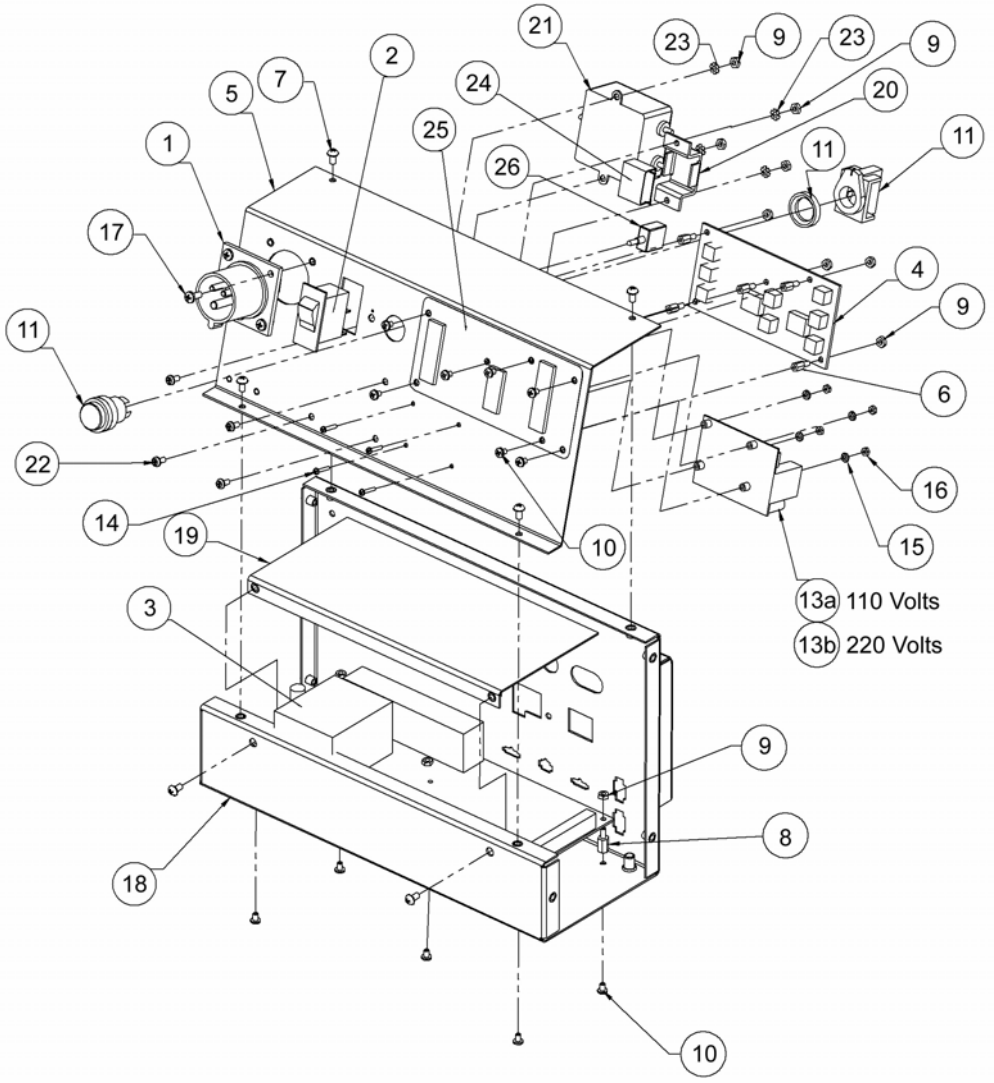
	NUMBER	DESCRIPTION
1	294-115-197	E - Stop Switch Assembly
2	02-307	Wire: 2 - Conductor, Shielded, 22 AWG
3	294-115-136	Connector: 2 - Position
4	02-299	Female Terminal: 18-24 AWG





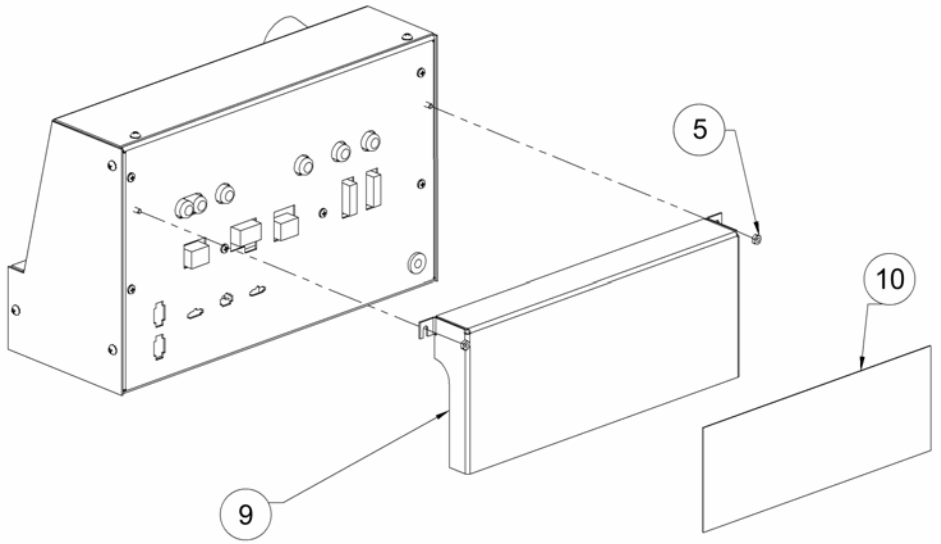
294-115-263 Control Box Enclosure Assembly (110V) (Page 1 of 2)
294-115-253 Control Box Enclosure Assembly (240V)

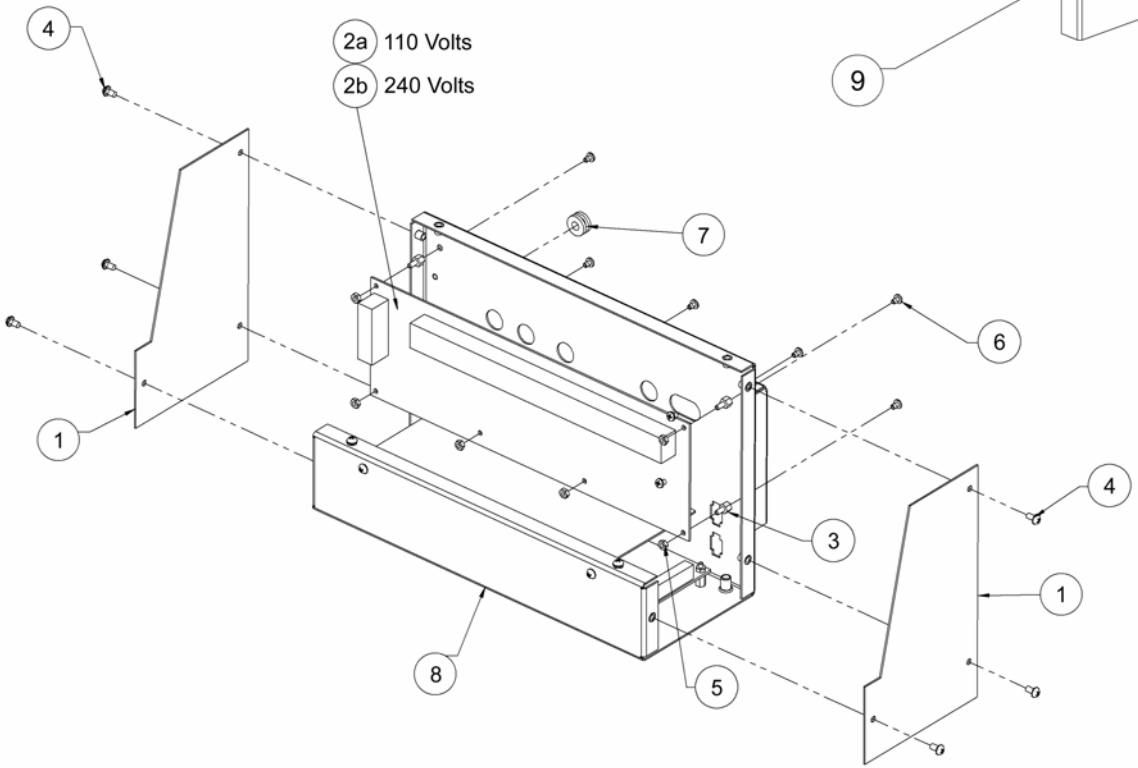
	NUMBER	DESCRIPTION
1	294-002-218	Panel Mount, Power Inlet
2	294-002-323	Circuit Breaker, 30 A
3	294-115-155	Control Board
4	294-115-026	Interface Board Assembly
5	294-115-262	Control Box - Face Plate Assembly
6	294-115-291	Standoff, #8-32 X 3/8 Long, Male - Female
7	818-240-062	Screw, 10-32 X .375, Phillips, Pan Head, Sems
8	294-115-142	Standoff, #8-32 X .500 Male/Female
9	843-133-002	Nut, #8-32 Keps, Zinc
10	01-008	Screw, #8-32 X 1/4, Phillips, Pan Head
11	294-115-197	E - Stop Assembly, Normally Closed
12	04-078	Rubber Grommet - Handle
13a	SA-1199	Brake Board, 110V
13b	SA-1200	Brake Board, 220V
14	01-339	Screw, #4-40 X 5/8, Phillips, Pan Head, Zinc
15	01-005	Washer, #6, Ext Tooth Lock, Zinc
16	01-107	Nut, #4-40, Hex, Zinc
17	01-021	Screw, #10-32 X 1/2, Phillips, Pan Head
18	294-115-254	Control Box, Base
19	294-115-258	Control Box, Divider Assembly
20	294-002-150	Capacitor Bracket
21	02-040	K - Series Rfi Power Line Filter
22	01-009-1	Screw, #8-32 X 3/8 Pan Head
23	951-632-060	Washer, #8, Ext Tooth Lock, Zinc
24	02-038	Capacitor 1.0mf, 250V
25	294-115-228	Membrane Cover - Control Box Express
26	294-115-311	Drive Motor Kill Switch



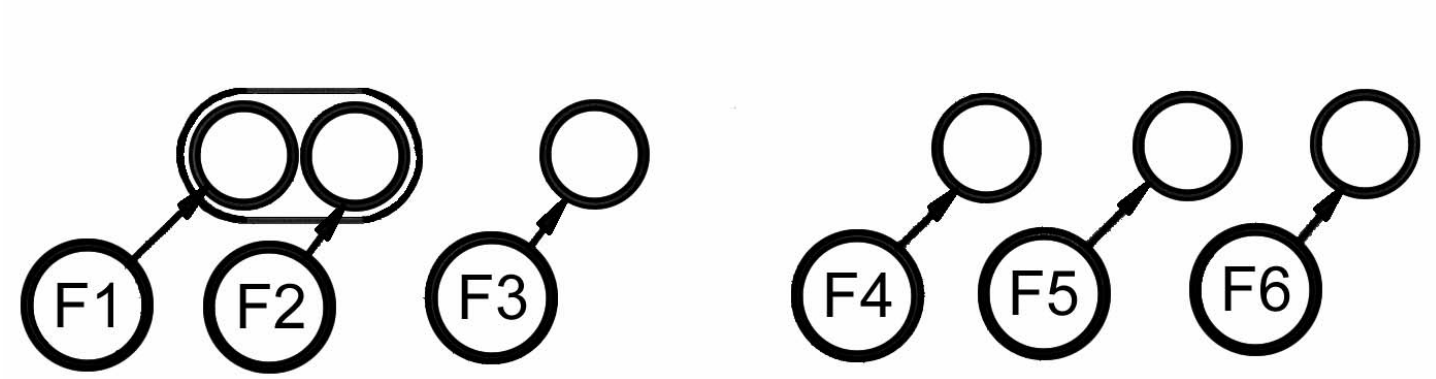
294-115-263 Control Box Enclosure Assembly (110V) (Page 2 of 2)
294-115-253 Control Box Enclosure Assembly (240V)

	NUMBER	DESCRIPTION
1	294-115-255	Control Box, Side
2a	294-115-271	Relay Board, Express 110V
2b	294-115-202	Relay Board, Express 240V
3	294-115-141	Standoff, #8-32 X .25 Male/Female
4	818-240-062	Screw, 10-32 X .375, Phillips, Pan Head, Sems
5	843-133-002	Nut, #8-32 Keps, Zinc
6	01-008	Screw, #8-32 X 1/4, Phillips, Pan Head
7	04-078	Rubber Grommet - Handle
8	294-115-254	Control Box, Base
9	294-115-231	Back Control Box Cover
10	294-115-266	Decal - Control Box Wiring





Express Control Box Fuses



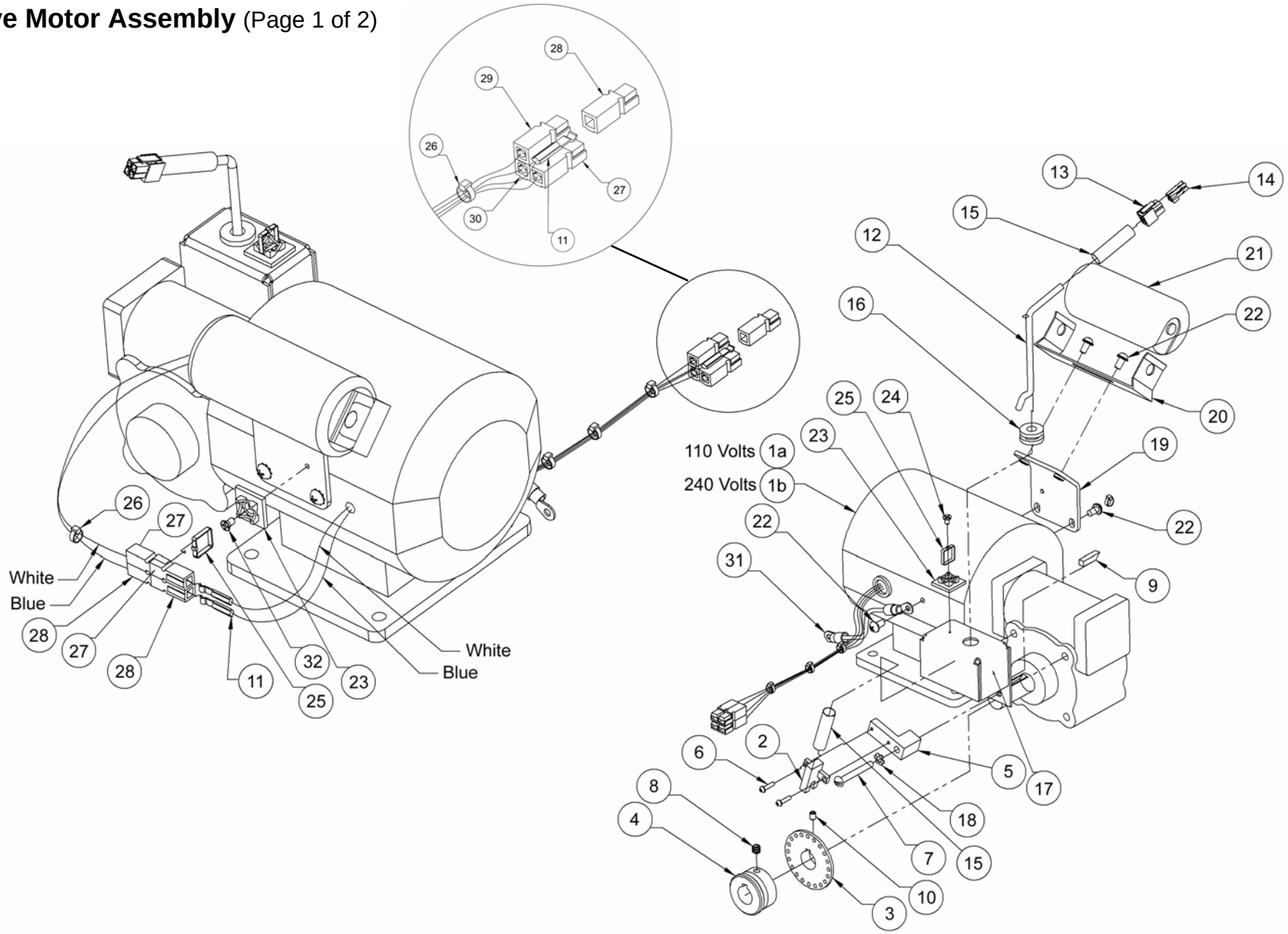
115 Volt Fuses

	NUMBER	DESCRIPTION
F1 Cleaner Pump	294-115-366	2A Fuse
F2 Oil Transfer Roller Motor	294-115-166	4A Fuse
F3 Vacuum Motor	294-115-373	10A Fuse
F4 Drive Motor	294-115-374	6.25A Fuse
F5 Buffer Solenoids	294-115-375	8A Fuse
F6 Vac Head Solenoids	294-115-375	8A Fuse

230 Volt Fuses

	NUMBER	DESCRIPTION
F1 Cleaner Pump	294-115-365	1A Fuse
F2 Oil Transfer Roller Motor	294-115-366	2A Fuse
F3 Vacuum Motor	294-115-367	5A Fuse
F4 Drive Motor	294-115-166	4A Fuse
F5 Buffer Solenoids	294-115-166	4A Fuse
F6 Vac Head Solenoids	294-115-166	4A Fuse

Drive Motor Assembly (Page 1 of 2)

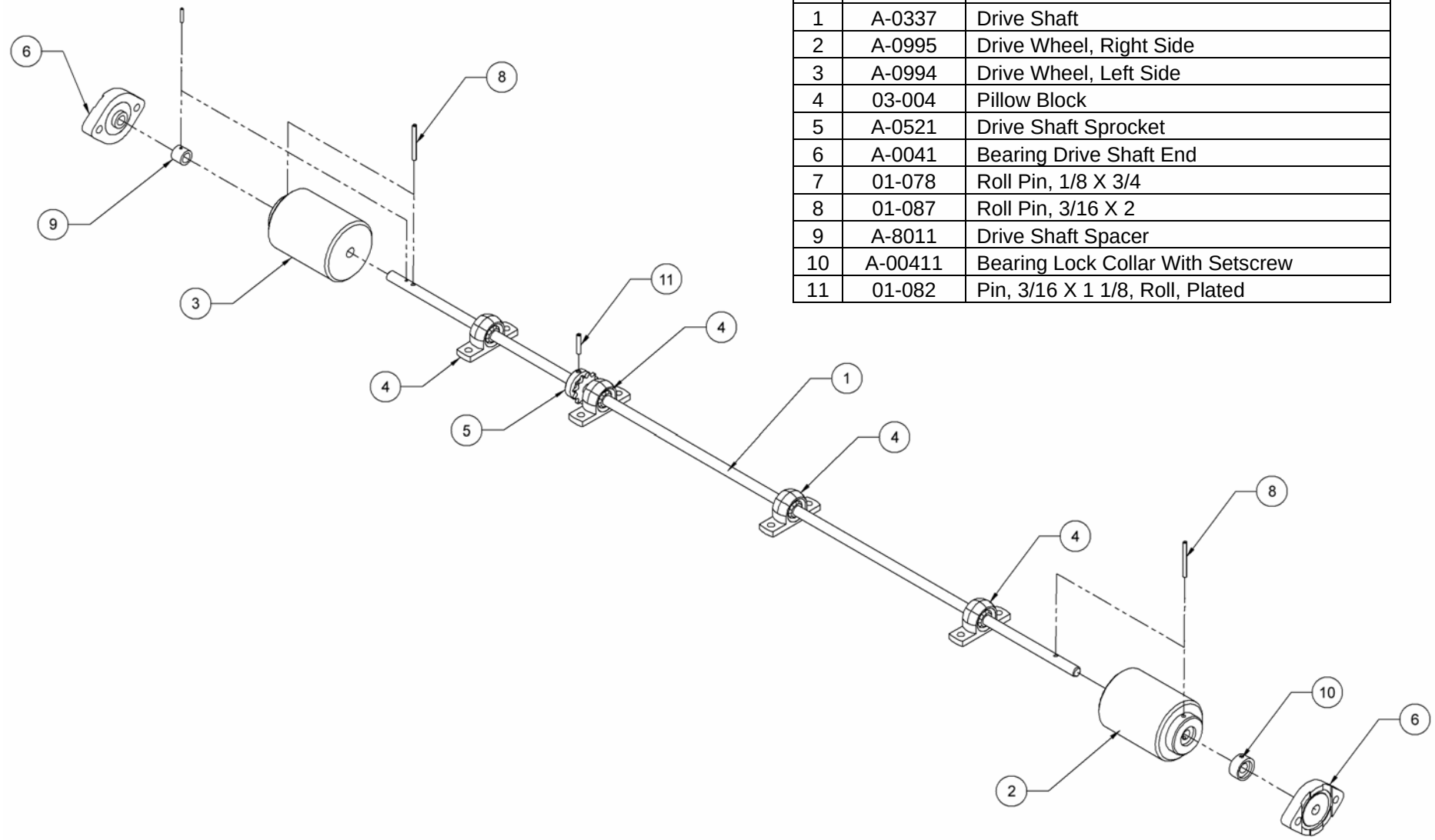


Drive Motor Assembly (Page 2 of 2)

	NUMBER	DESCRIPTION
1a	02-525	Drive Motor: 110V
1b	294-115-325	Drive Motor: 240V
2	294-115-046	Encoder
3	294-115-045	Counter Wheel
4	03-032	Sprocket, Drive Motor
5	294-115-047	Encoder Mounting Bracket
6	817-921-060	Screw: 1/4-40 X 1/2, Phillips, Pan Head, SEMS
7	01-028	Screw: #10-32 X 1.5, Phillips, Round Head, SEMS
8	04-041	Screw: 1/4-20 X 1/4, Set, Socket Head, Cup Point
9	A-0537	Drive Sprocket Key
10	01-097	Screw: #10-32 X 1/4, Set, Socket Head, Cup Point
11	02-793	Contact, 15 AMP, 16-20 AWG Wire
12	02-308	Wire, Shielded, 4 Conductor, 22 AWG, Alpha 2404C, 19” long
13	294-115-127	Connector Receptacle, 4 Position, Mini Fit Jr
14	02-299	Female Terminal, 18-24 AWG
15	02-087	Heat Shrink, 3/8 ID X 1-1/2
16	04-078	Rubber Grommet-Handle
17	294-115-133	Encoder Guard
18	01-033	Washer, #10, External Tooth Lock, Zinc
19	294-115-296	Drive Motor Capacitor Mount Assembly
20	02-525-2	Capacitor Bracket (Supplied With Motor)
21	02-525-1	Capacitor (Supplied With Motor)
22	818-240-062	Screw, 10-32 X 3/8, Phillips, Pan Head, SEMS
23	02-539	Flat Tie Holder W/Adhesive & #6 Hole
24	01-355	Screw, #6 X 1/4, Phillips, Flat head, Zinc
25	04-065	Plastic Wire Tie
26	04-065	Plastic Wire Tie
27	294-115-306	Housing, Powerpole 15/45, Blue
28	294-115-305	Housing, Powerpole 15/45, White
29	294-115-304	Housing, Powerpole 15/45, Black
30	294-115-303	Housing, Powerpole 15/45, Red
31	294-115-308	Ground Wire Assembly
32	01-114	Screw, #6-32 X 1/4, Phillips, Flat Head, Zinc

294-115-024 Drive Shaft Assembly

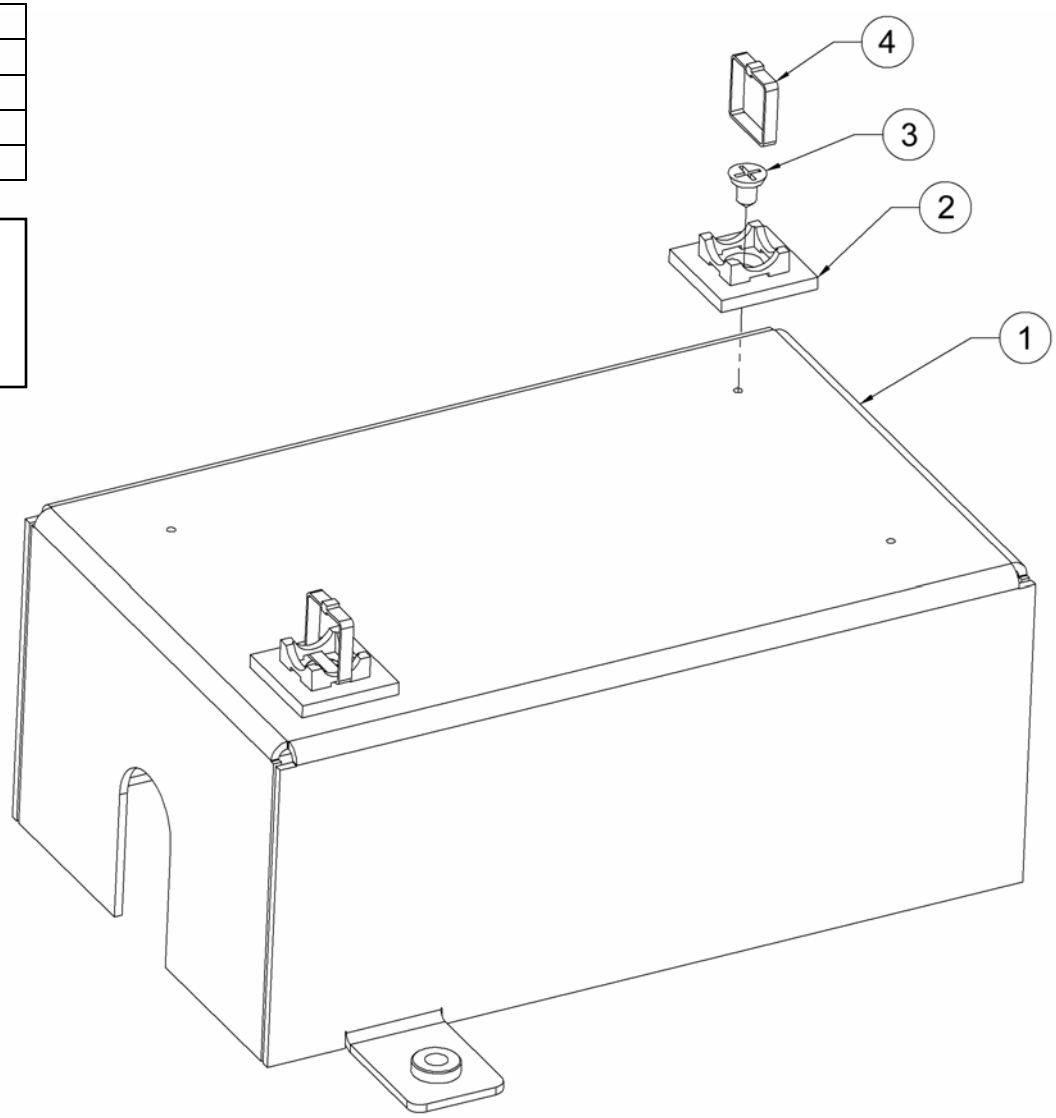
	NUMBER	DESCRIPTION
1	A-0337	Drive Shaft
2	A-0995	Drive Wheel, Right Side
3	A-0994	Drive Wheel, Left Side
4	03-004	Pillow Block
5	A-0521	Drive Shaft Sprocket
6	A-0041	Bearing Drive Shaft End
7	01-078	Roll Pin, 1/8 X 3/4
8	01-087	Roll Pin, 3/16 X 2
9	A-8011	Drive Shaft Spacer
10	A-00411	Bearing Lock Collar With Setscrew
11	01-082	Pin, 3/16 X 1 1/8, Roll, Plated



Drive Wheel Cover Assembly

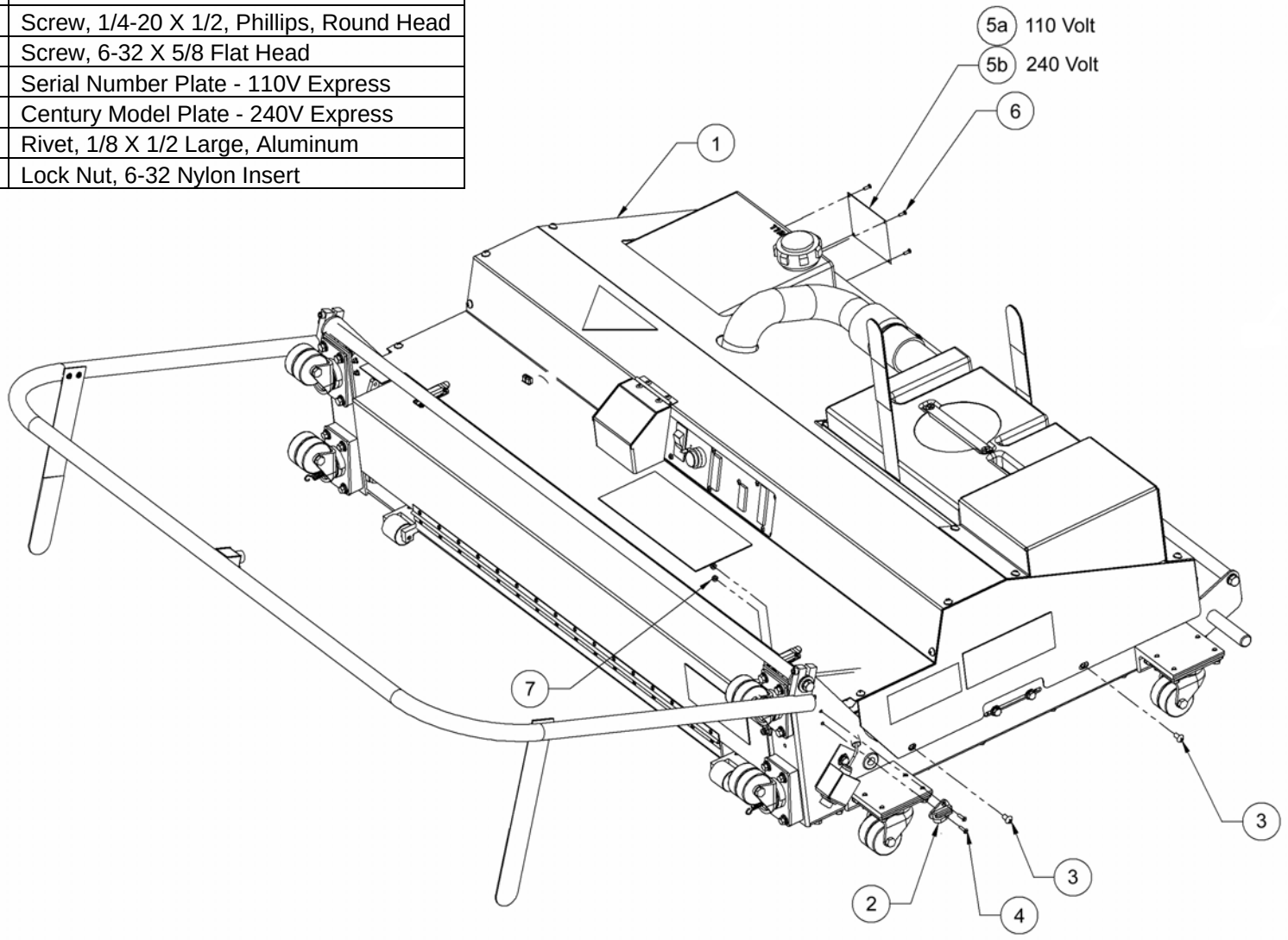
	NUMBER	DESCRIPTION
1	294-115-111	Drive Wheel Cover
2	02-539	Flat Tie Holder W/Adhesive & #6 Hole
3	01-355	Screw, #6 x 1/4, Phillips, Flat Head, Zinc
4	04-065	Plastic Wire Tie

Note: The left hand and right hand assemblies are both made up of the same components. The position of the wire tie holders on top of the drive wheel cover dictate whether it is a left or right hand assembly.



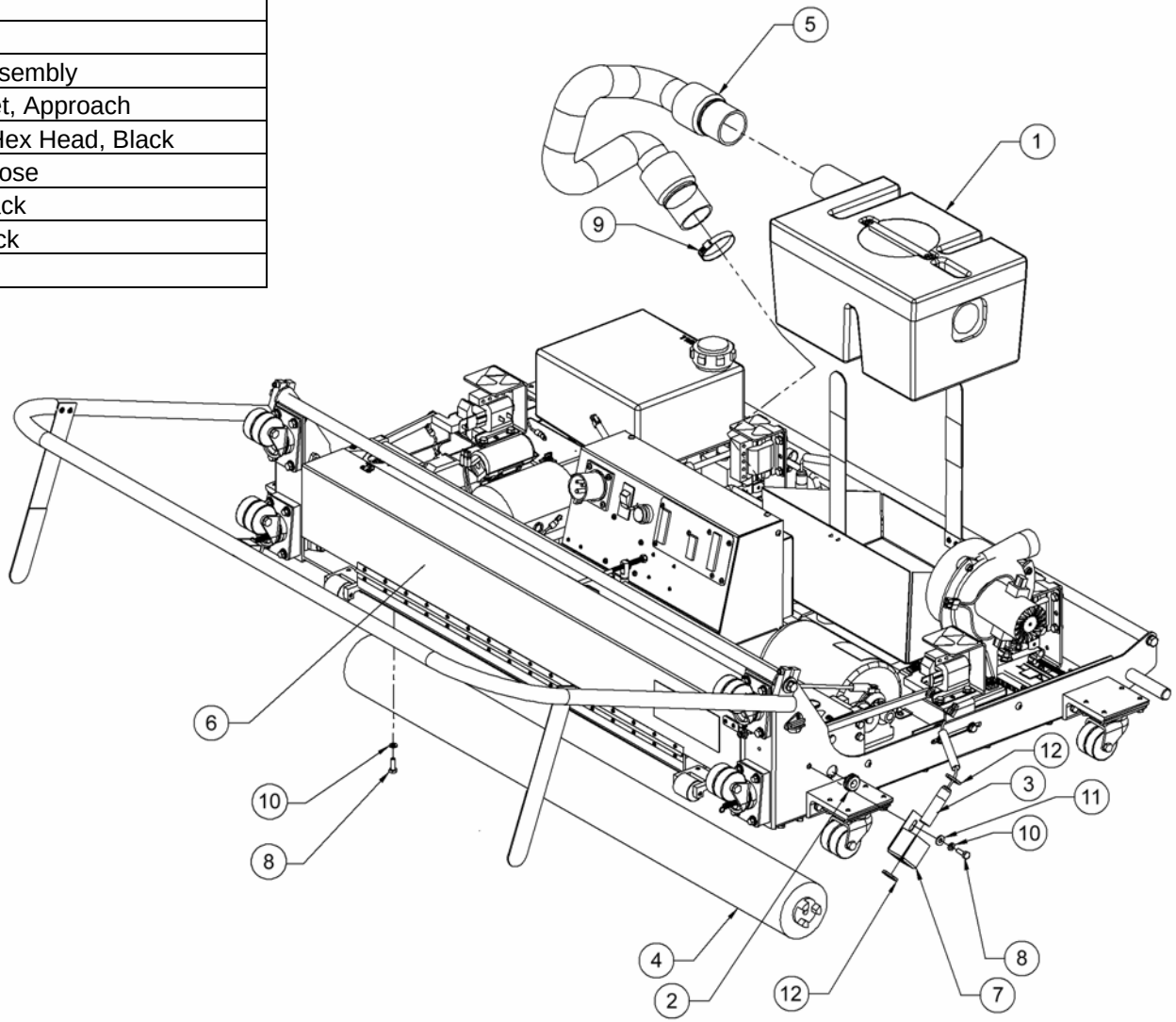
Express Assembly (Page 1 of 3)

	NUMBER	DESCRIPTION
1	294-115-094	Hood Assembly
2	A-2037	Power Cable Hook
3	01-027	Screw, 1/4-20 X 1/2, Phillips, Round Head
4	812-027-100	Screw, 6-32 X 5/8 Flat Head
5a	A-0580	Serial Number Plate - 110V Express
5b	294-002-278	Century Model Plate - 240V Express
6	01-130	Rivet, 1/8 X 1/2 Large, Aluminum
7	01-416	Lock Nut, 6-32 Nylon Insert



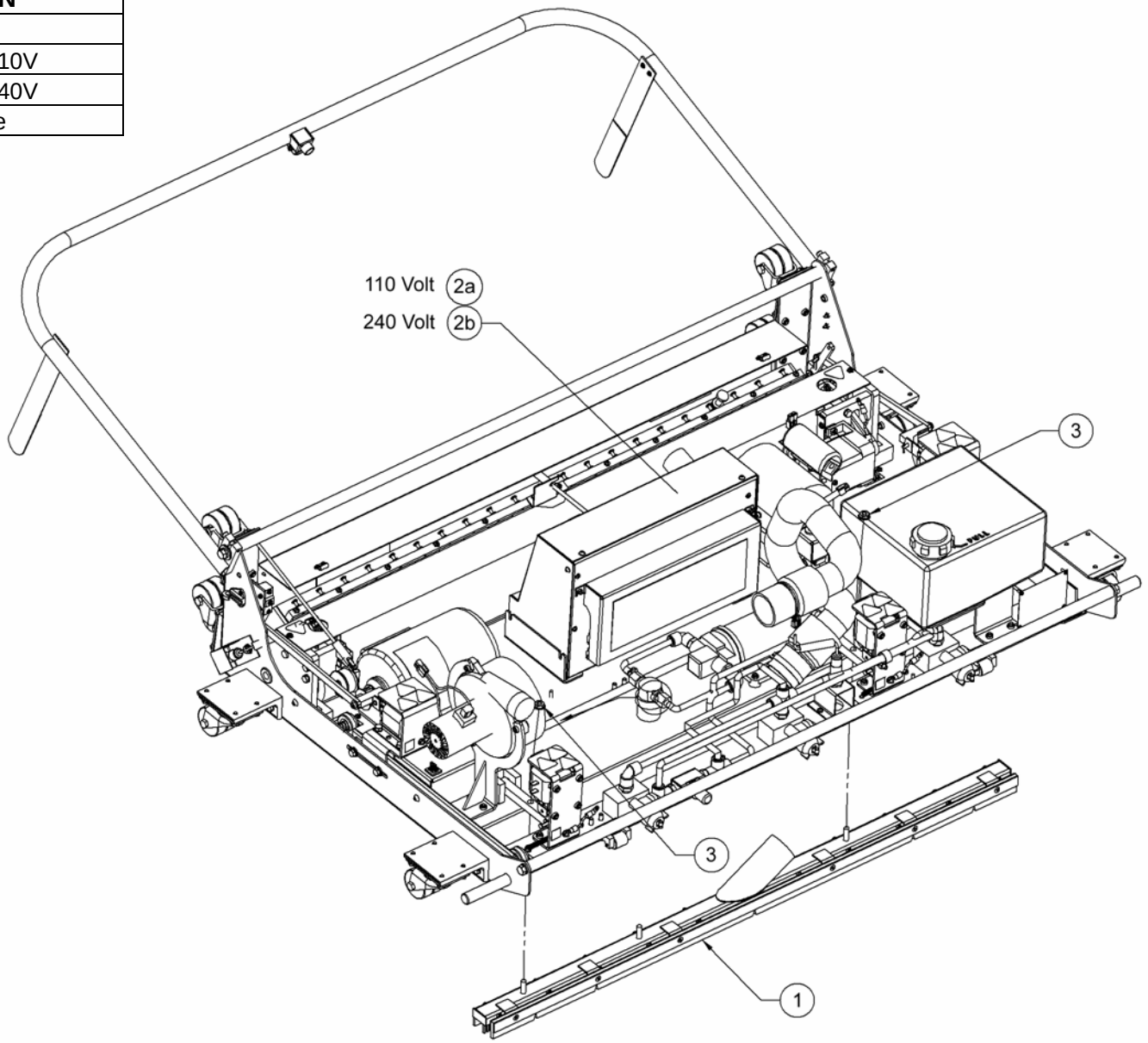
Express Assembly (Page 2 of 3)

	NUMBER	DESCRIPTION
1	SA-1129	Waste Tank Assembly
2	04-077	Rubber Grommet, 1/8" Groove
3	294-115-299	Optical Sensor Assembly - Approach
4	SA-1182	Buffer Tube Assembly
5	294-115-113	Vac Hose Assembly
6	294-115-252	Access Door Hood Assembly
7	294-115-104	Optical Sensor Bracket, Approach
8	809-849-125	Screw, 1/4-20 X 3/4, Hex Head, Black
9	04-120	Clamp, Waste Tank Hose
10	951-148-008	Washer, 1/4, Split, Black
11	948-753-102	Washer, 1/4, Flat, Black
12	294-115-201	Nut, 18mm, Thin Jam



Express Assembly (Page 3 of 3)

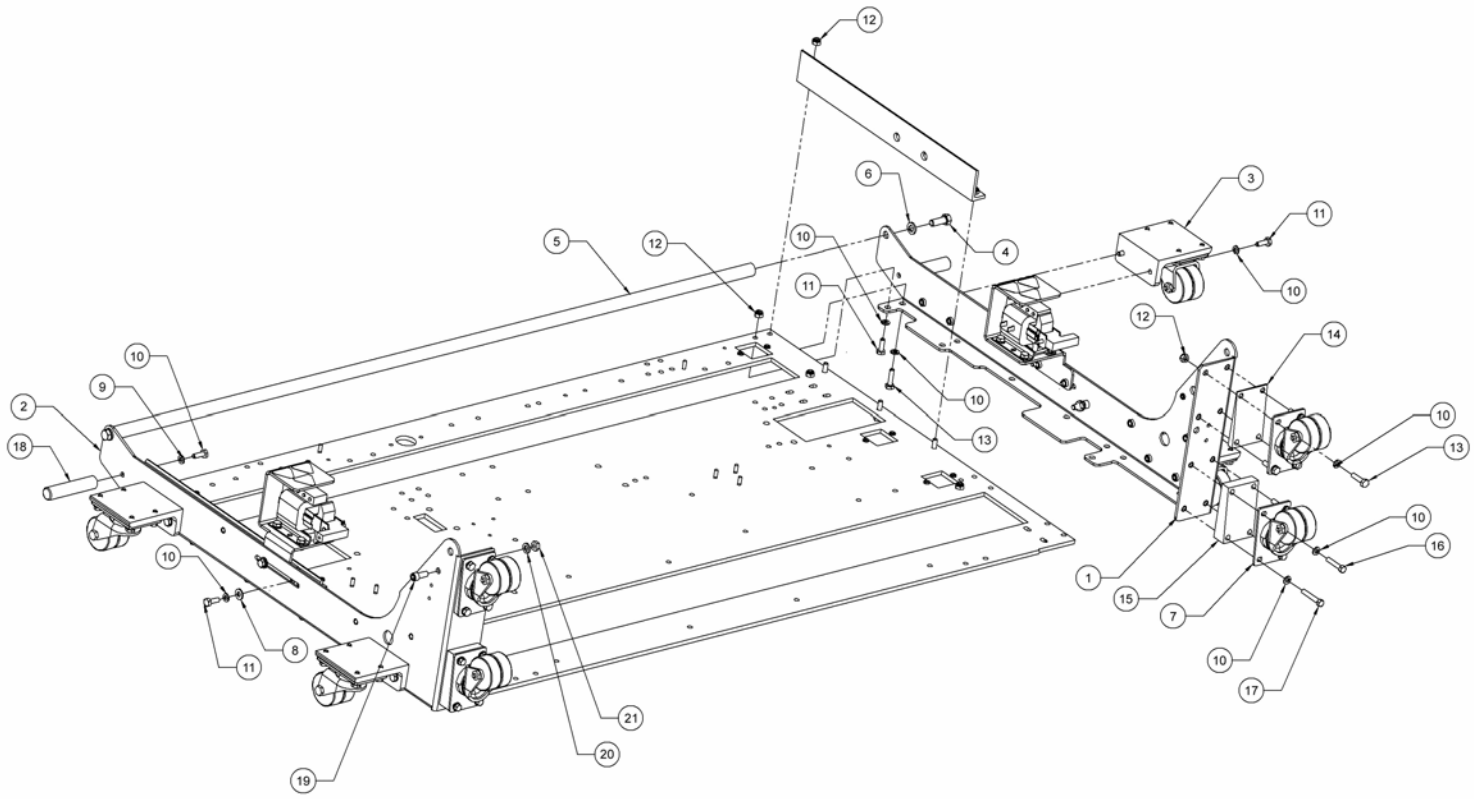
	NUMBER	DESCRIPTION
1	294-115-095	Vac Head Assembly
2a	294-115-263	Control Box Enclosure 110V
2b	294-115-253	Control Box Enclosure 240V
3	01-519	Nut, 5/16-18, Hex Flange



Frame Assembly (Page 1 of 3)

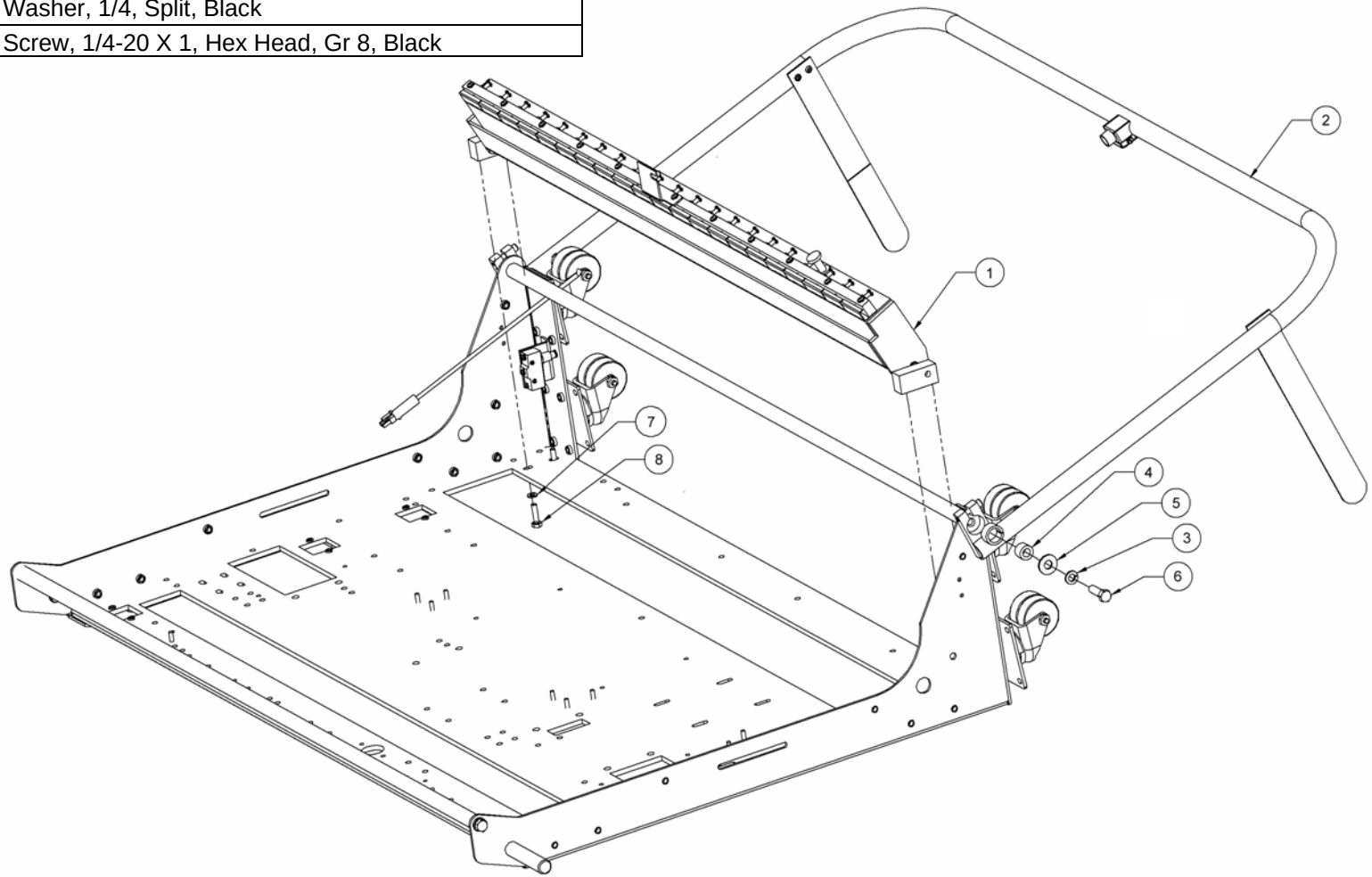
	NUMBER	DESCRIPTION
1	294-115-054	Side Plate, Buffer Side
2	294-115-055	Side Plate, Drive Side
3	294-115-167	Caster Assembly
4	809-865-165	Screw, 3/8-16 X 1, Hex Head, Black Finish
5	294-115-081	Handle Tube
6	951-164-002	Washer, 3/8, Split, Black
7	294-115-057	Caster
8	948-753-102	Washer, 1/4, A - N, Flat, Black
9	809-865-205	Screw, 3/8-16 X 1 1/4, Hex Head, Gr8, Black Finish
10	951-148-008	Washer, 1/4, Split, Black
11	809-849-125	Screw, 1/4-20 X 3/4, Hex Head, Black

	NUMBER	DESCRIPTION
12	01-051	Nut, 1/4-20, Flexloc, Zinc
13	809-849-165	Screw, 1/4-20 X 1, Hex Head, Gr 8, Black
14	294-115-191	Top Caster Bracket Wedge
15	294-115-192	Bottom Caster Bracket Wedge
16	809-849-205	Screw, 1/4-20 X 1 1/4, Hex Head, Gr 8, Black
17	809-849-245	Screw, 1/4-20 X 1 1/2, Hex Head, Gr 8, Black
18	294-115-259	Express Machine Handle
19	810-257-120	Screw, 5/16-18 X 3/4, Socket Head, Black Finish
20	01-063	Washer, 5/16, Split, Zinc
21	01-062	Nut, 5/16-18, Hex, Zinc



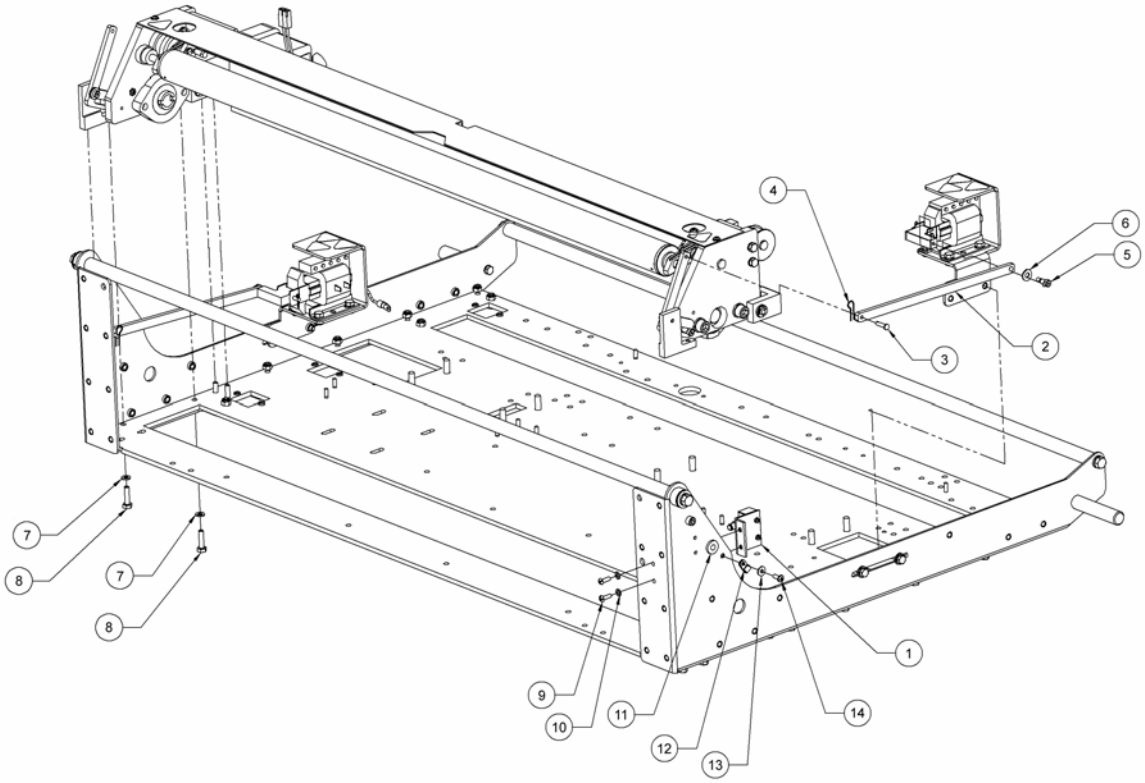
Frame Assembly (Page 2 of 3)

	NUMBER	DESCRIPTION
1	294-115-085	Oil Tank Assembly
2	294-115-098	Handle Assembly - Express
3	951-164-002	Washer, 3/8, Split, Black
4	294-115-082	Handle Pivot Boss
5	947-367-141	Washer, 3/8, Flat, Black
6	809-865-205	Screw, 3/8-16 X 1 1/4, Hex Head, Gr 8, Black Finish
7	951-148-008	Washer, 1/4, Split, Black
8	809-849-165	Screw, 1/4-20 X 1, Hex Head, Gr 8, Black



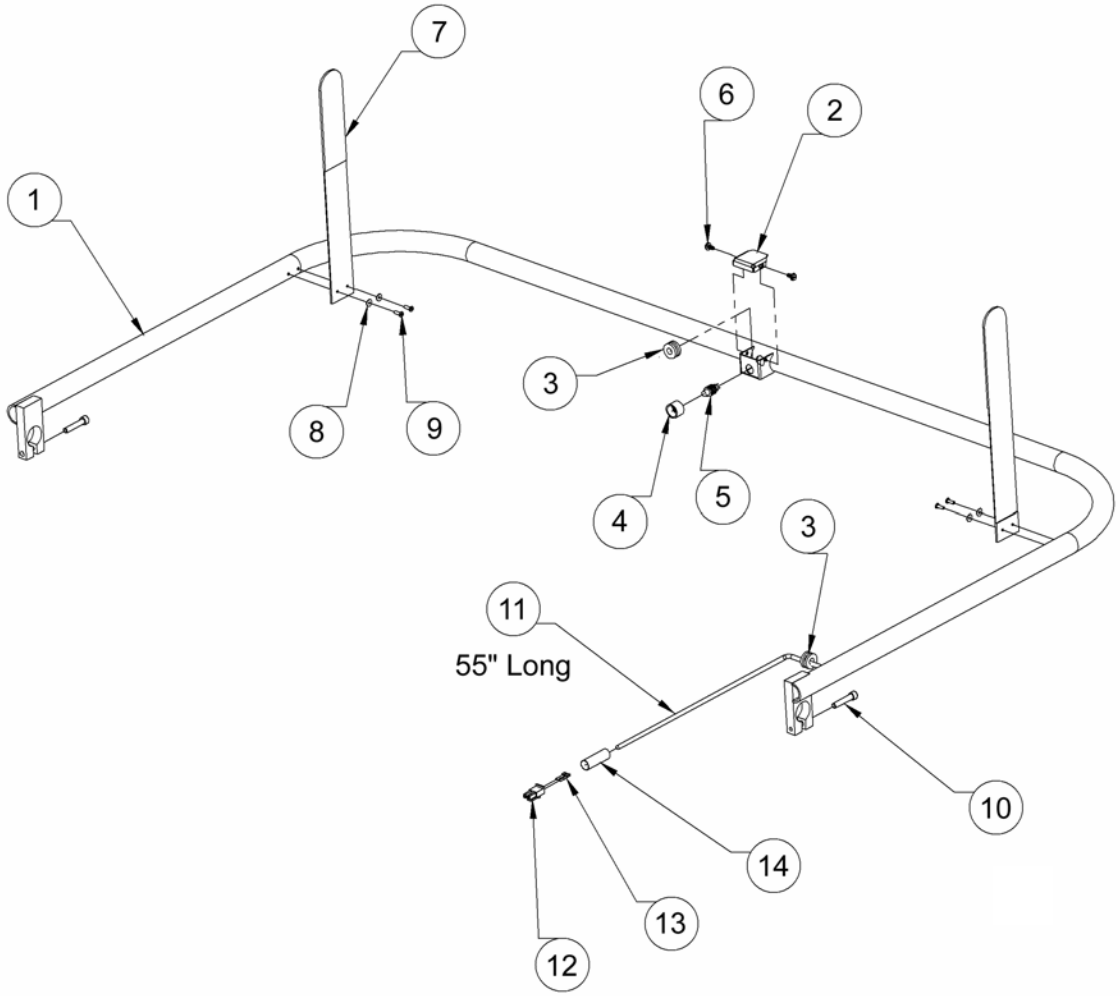
Frame Assembly (Page 3 of 3)

	NUMBER	DESCRIPTION
1	294-115-356	Door Interlock Switch Assembly
2	294-115-089	Straight Link, Buffer Engagement
3	01-215	Pin, 3/16 X .75, Clevis
4	01-040	Pin, 3/64 X 9/16, Hair Clip, Zinc
5	01-349	Bolt, 1/4 X 3/8, Shoulder, Black
6	948-753-102	Washer, 1/4, A - N, Flat, Black
7	951-148-008	Washer, 1/4, Split, Black
8	809-849-165	Screw, 1/4-20 X 1, Hex Head, Gr 8, Black
9	01-022	Screw, #10-32 X 5/8 Phillips Head
10	01-033	Washer, #10, External Tooth Lock, Zinc
11	04-078	Rubber Grommet - Handle
12	02-008	Plastic Wire Tie, 3/16
13	01-030	Washer, #10, Flat, Zinc
14	01-021	Screw, #10-32 x 1/2, Phillips, Pan Head, Zinc



294-115-098 Handle Assembly

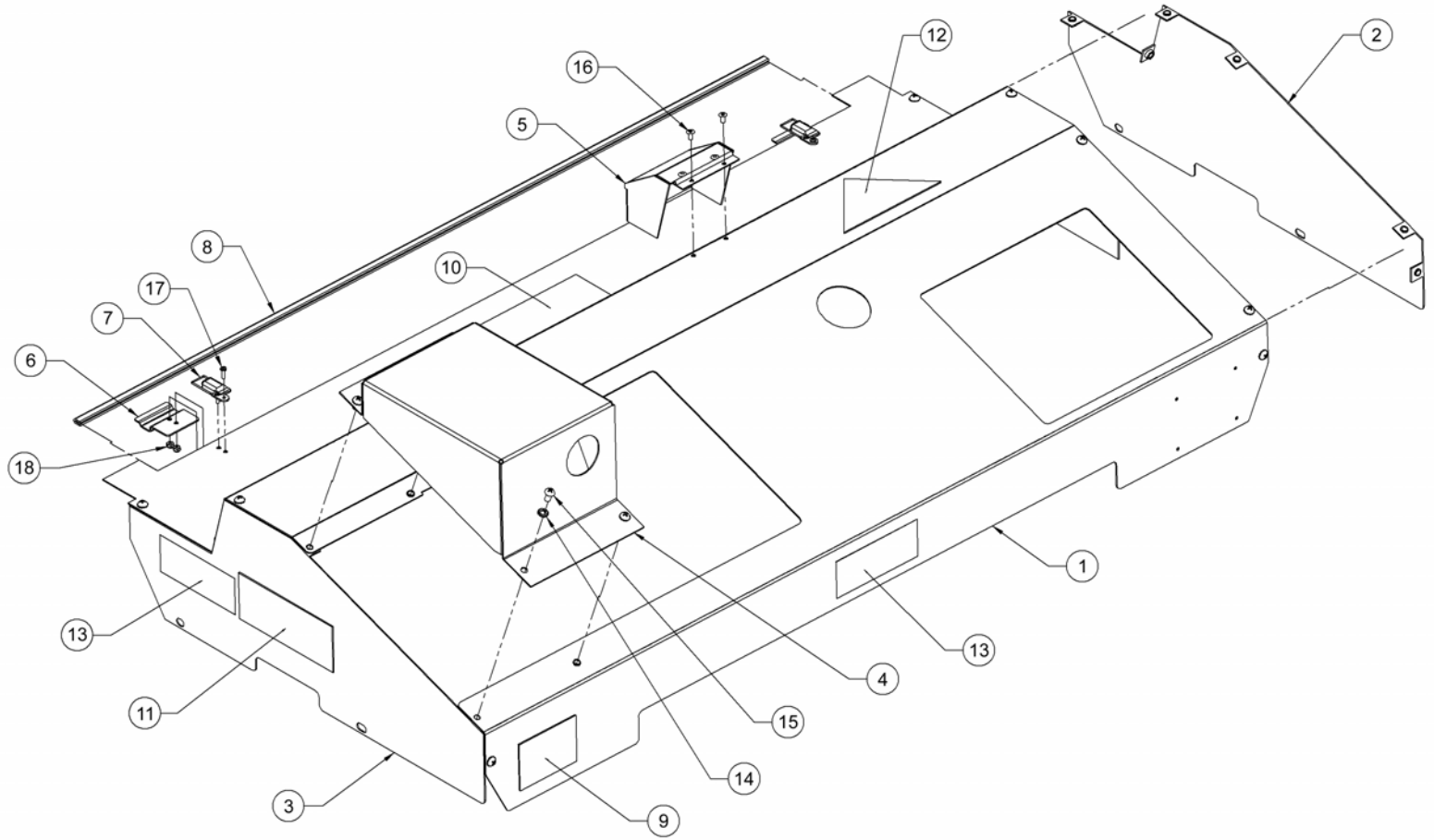
	NUMBER	DESCRIPTION
1	294-115-030	Handle Weldment
2	A-0448	Handle Switch Box Cover
3	04-078	Rubber Grommet - Handle
4	A-1028	Start Switch Cover
5	02-335	Switch, Handle
6	01-058	Screw, #8 X 3/8, Hex Head
7	04-397	Cord Strap, Handle
8	01-303	Washer
9	01-130	Rivet, 1/8 X 1/2 Large, Aluminum
10	810-349-200	Screw, 1/4-20 X 1 1/4, Socket Head
11	02-307	Wire, 2 Conductor, Shielded, 22 Awg
12	02-336	Receptacle
13	02-299	Female Terminal, 18-24 Awg
14	02-208	Heat Shrink Tube, 1/2" ID, Black



294-115-094 Hood Assembly

	NUMBER	DESCRIPTION
1	294-115-033	Top Hood Assembly
2	294-115-034	Hood - Side Plate - Drive Side
3	294-115-035	Hood - Side Plate - Buffer Motor Side
4	294-115-037	Hood - Fan Cover
5	294-115-286	Inlet Power Cover Assembly
6	294-115-187	Guard Stop
7	04-073	Draw Pull Catch, Corbin
8	04-069	Edge Trim
9	A-5574	Decal, USA Flag

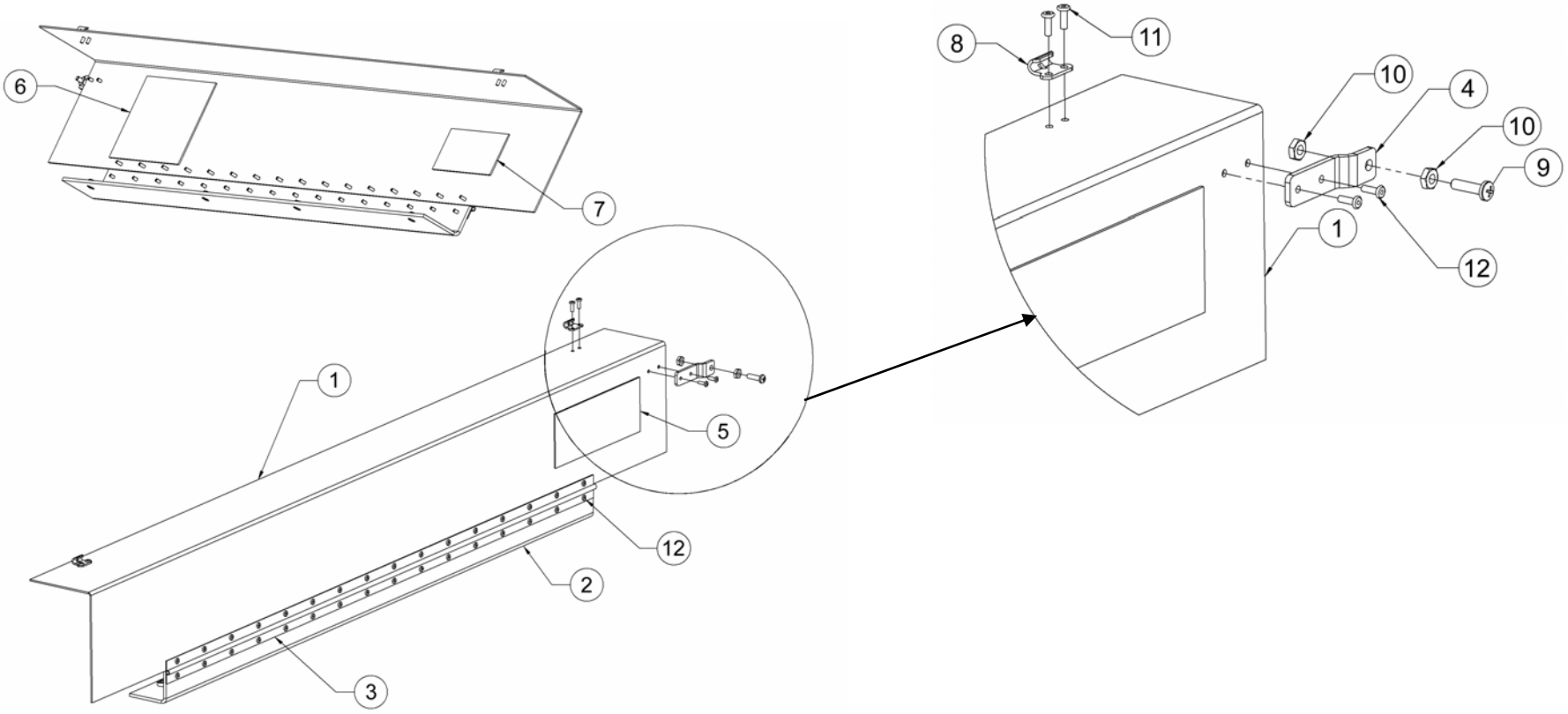
	NUMBER	DESCRIPTION
10	294-115-144	Express Logo, Large
11	294-115-145	Express Decal, Small
12	294-115-174	AMF Triangle Logo
13	294-009-005	Danger, Read Tech Manual Label
14	01-053	Washer, 1/4, Tooth
15	01-027	Screw, 1/4-20 X 1/2, Phillips, Round Head
16	294-115-324	Rivet, 3/16 X 3/8, Steel, Zinc, Black, Pop Rivet # Sd43bs
17	01-002	Screw, #6-32 X 1/2, Phillips, Pan Head, Zinc
18	01-229	Nut, #6-32, Nylon Lock, Zinc



294-115-252 Access Door Hood Assembly

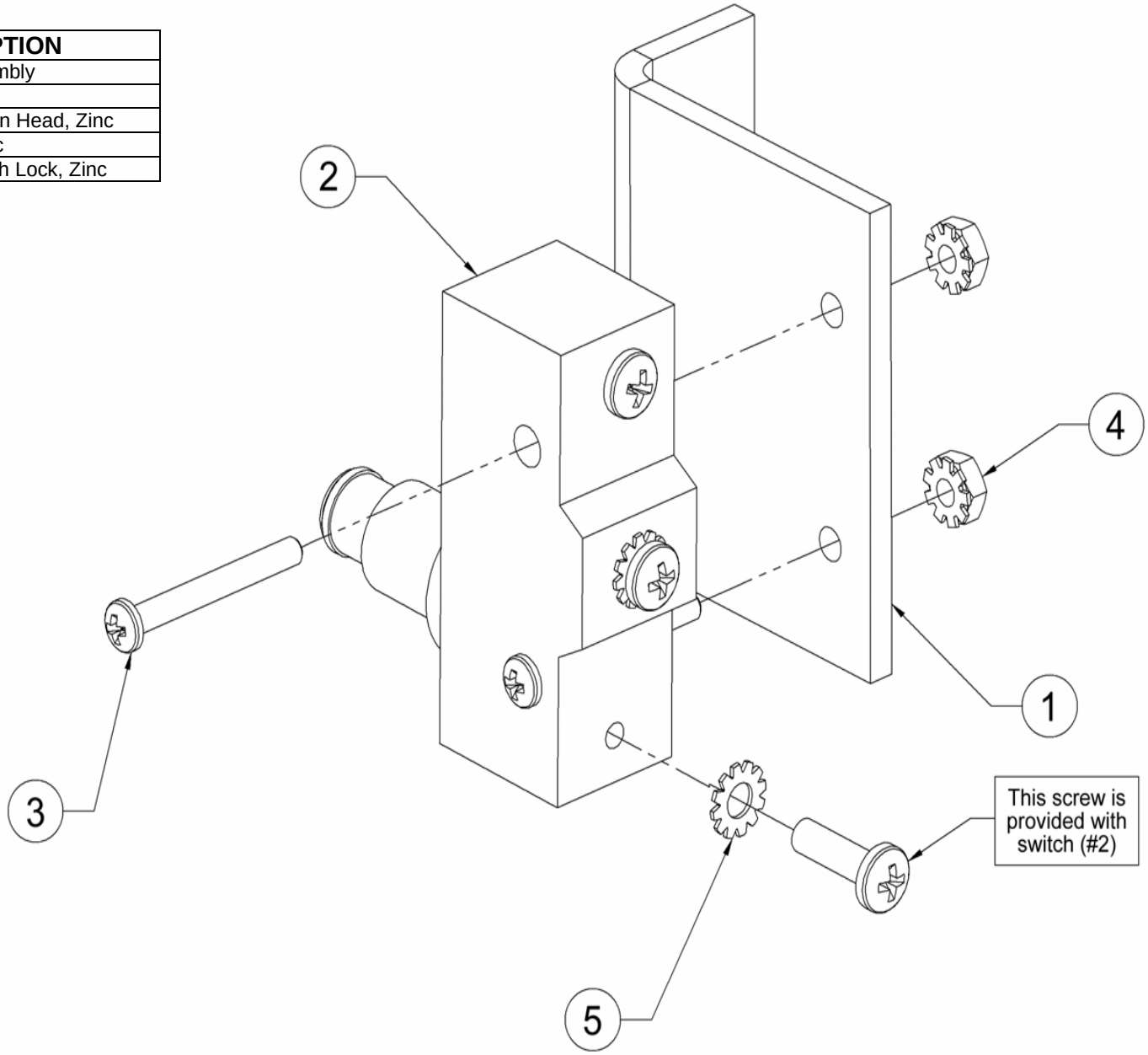
	NUMBER	DESCRIPTION
1	294-115-036	Hood - Access Door
2	294-115-093	Buffer Lip Stiffener
3	294-115-143	Hinge Mod, Express
4	294-115-251	Door Interlock Switch Plate
5	294-115-145	Express Decal, Small
6	294-115-183	Foam Selection Decal

	NUMBER	DESCRIPTION
7	A-5575	Decal, Replacement Parts
8	A-0458	Hook, Draw Latch
9	01-023	Screw, #10-32 X 3/4, Phillips, Pan Head, Zinc
10	01-032	Nut, #10-32, Hex, Zinc
11	01-130	Rivet, 1/8 X 1/2 Lg, Aluminum
12	01-191	Rivet, 3/16 X 1/4, Steel



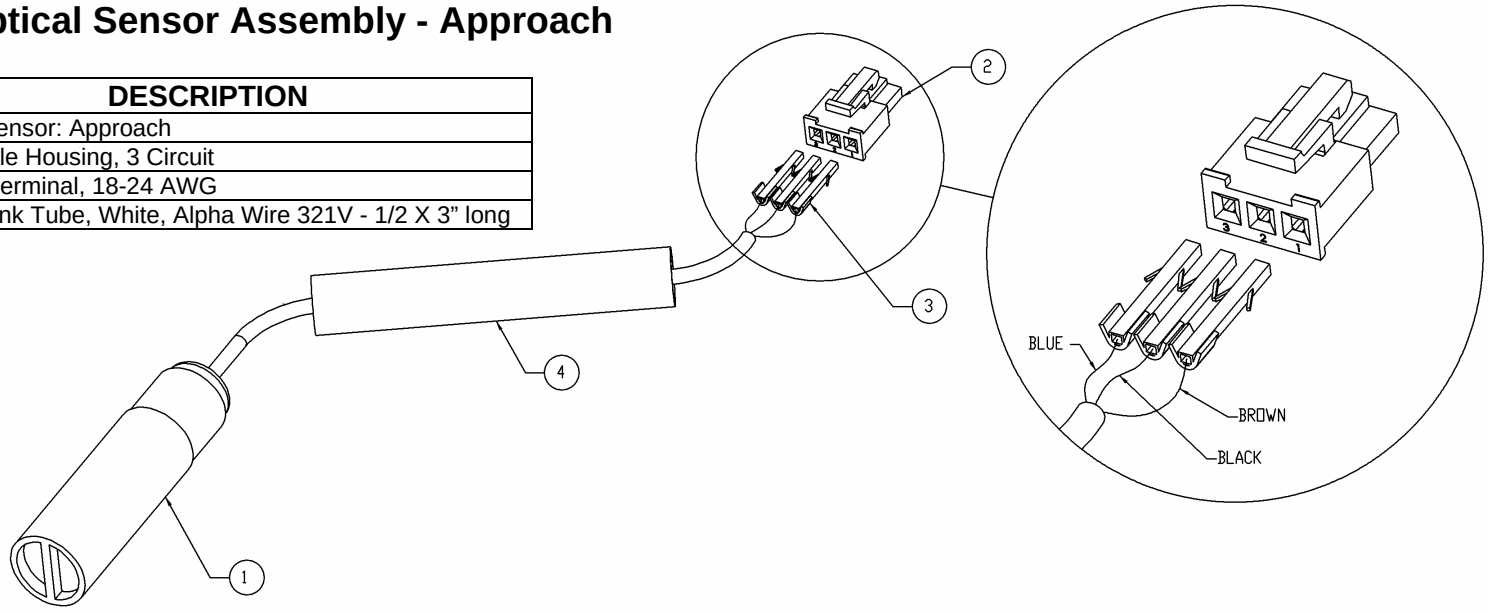
294-115-356 Door Interlock Switch Assembly

	NUMBER	DESCRIPTION
1	294-115-355	Switch Bracket Assembly
2	294-115-358	Switch
3	813-221-162	Screw, #4-40 X 1, Pan Head, Zinc
4	843-121-002	Nut #4-40, Keps, Zinc
5	01-005	Washer, #6, Ext Tooth Lock, Zinc



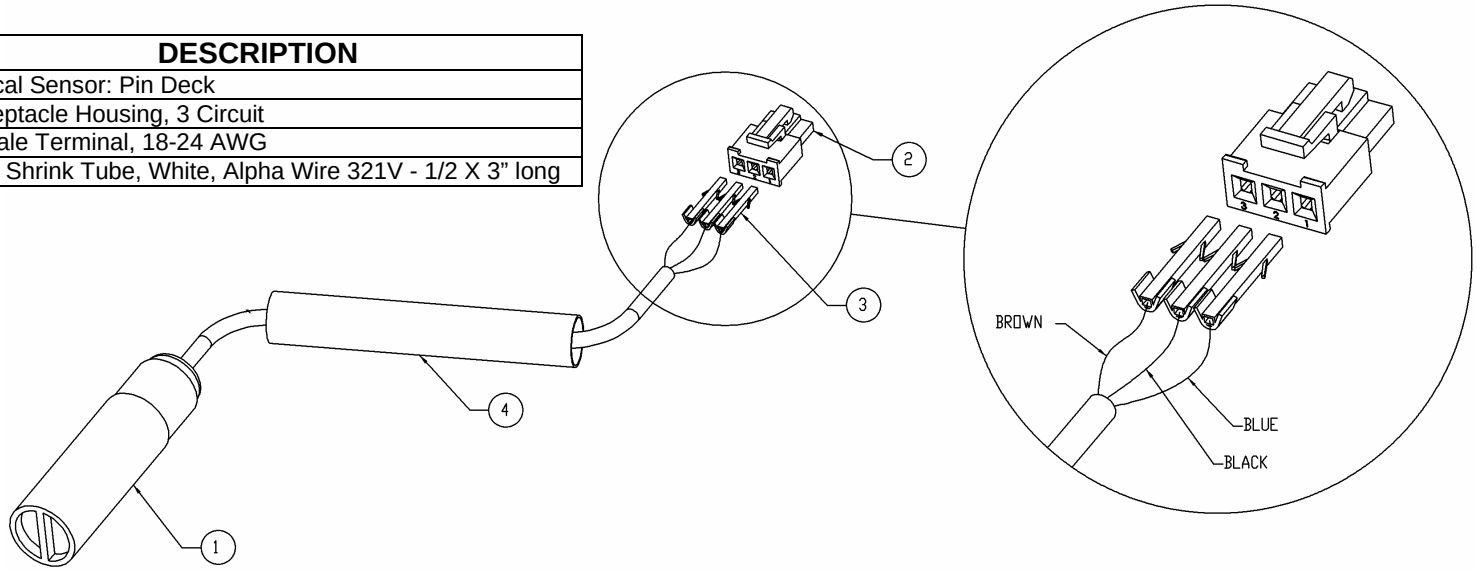
294-115-299 Optical Sensor Assembly - Approach

	NUMBER	DESCRIPTION
1	294-115-297	Optical Sensor: Approach
2	294-115-128	Receptacle Housing, 3 Circuit
3	294-115-310	Female Terminal, 18-24 AWG
4	294-115-352	Heat Shrink Tube, White, Alpha Wire 321V - 1/2 X 3” long



294-115-300 Optical Sensor Assembly - Pin Deck

	NUMBER	DESCRIPTION
1	294-115-298	Optical Sensor: Pin Deck
2	294-115-128	Receptacle Housing, 3 Circuit
3	294-115-310	Female Terminal, 18-24 AWG
4	294-115-352	Heat Shrink Tube, White, Alpha Wire 321V - 1/2 X 3” long

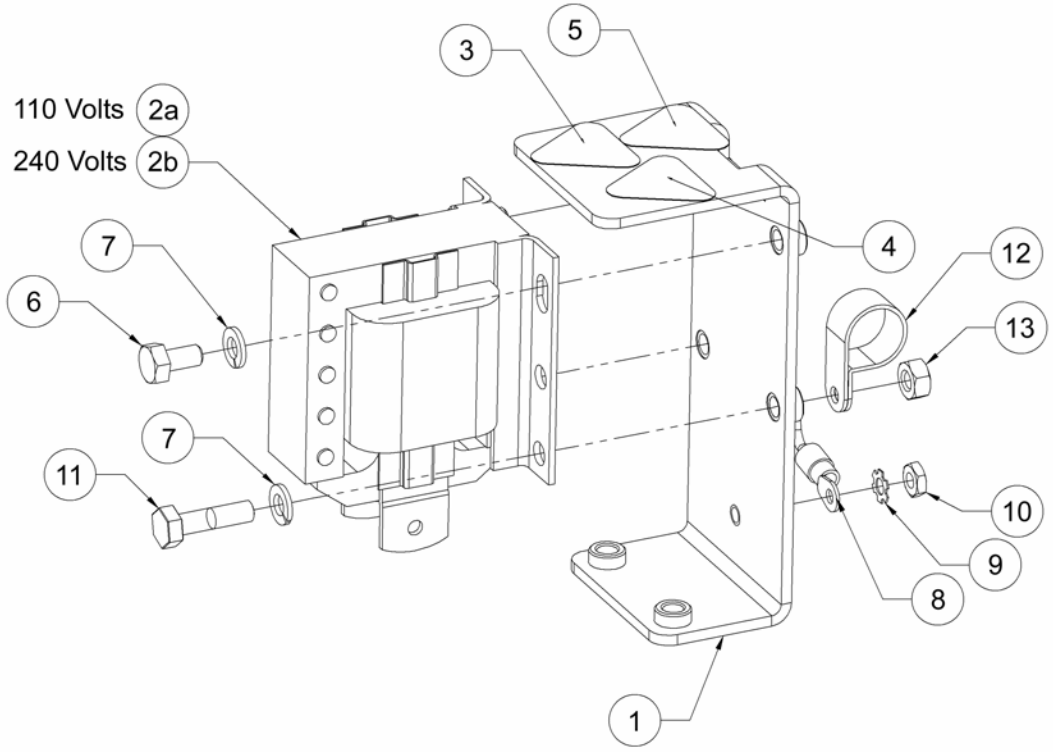


This page intentionally left blank.

VACHEAD and CLEANING

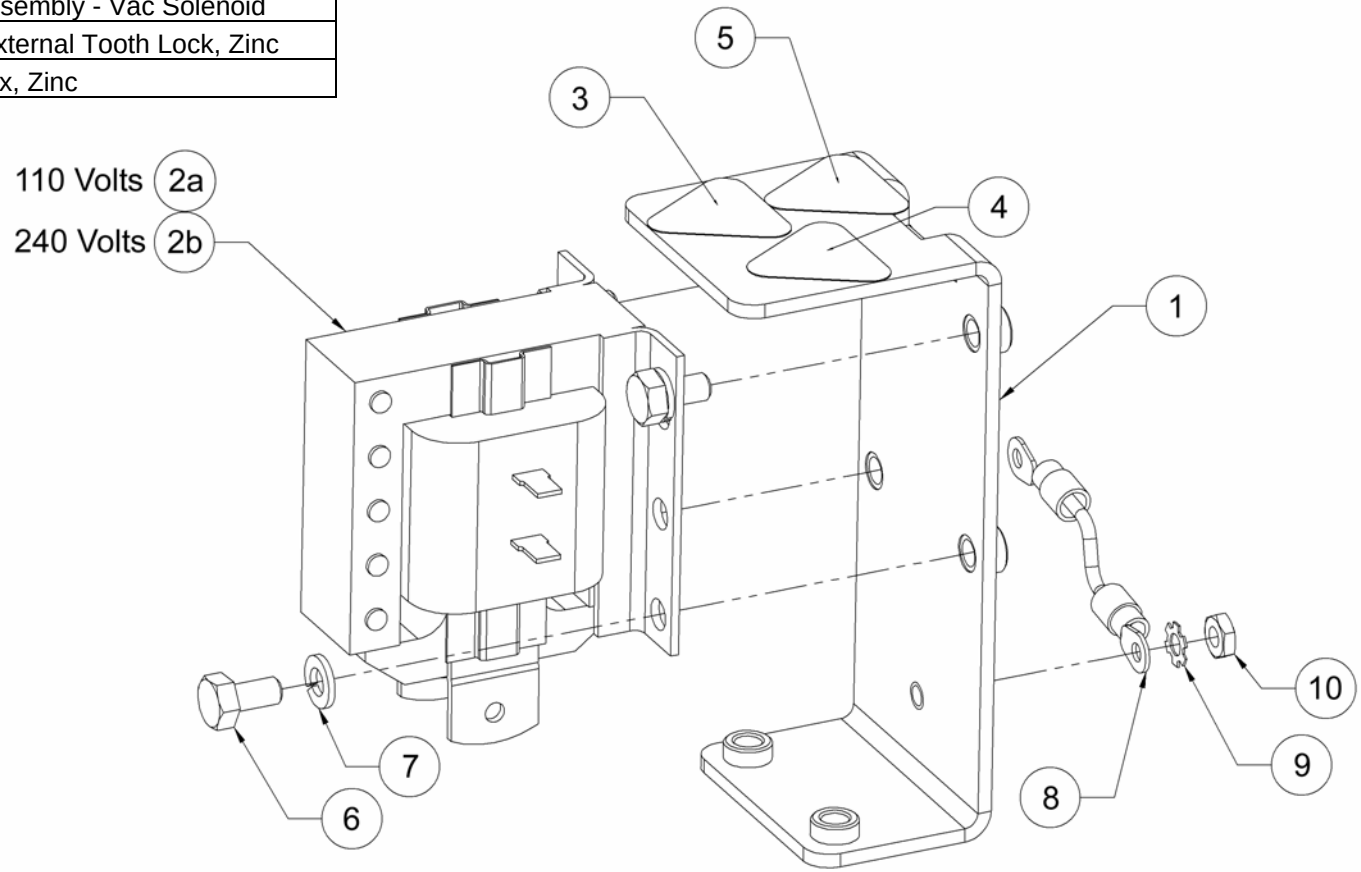
Vac Solenoid & Bracket Assembly - RH

	NUMBER	DESCRIPTION
1	294-115-235	Vac Solenoid Bracket Assembly
2a	294-002-033	Solenoid, 110V
2b	294-002-275	Solenoid, 240V
3	294-115-236	Electric Shock Hazard/Electrocution Sticker
4	294-115-237	Hand Crush/Force From Side Sticker
5	294-115-238	Heat, Hot Surface, Burn Hazard Sticker
6	809-849-085	Screw, 1/4-20 X 1/2, Hex Head, Gr 8, Black
7	01-054	Washer, 1/4 Split, Zinc
8	294-115-309	Ground Wire Assembly - Vac Solenoid
9	01-033	Washer, #10, External Tooth Lock, Zinc
10	835-540-002	Nut, #10-32, Hex, Zinc
11	809-849-165	Screw, 1/4-20 X 1, Hex Head, Gr 8, Black
12	02-086	Plastic Wire Tie, 3/4”
13	01-052	Nut, 1/4-20, Hex, Zinc



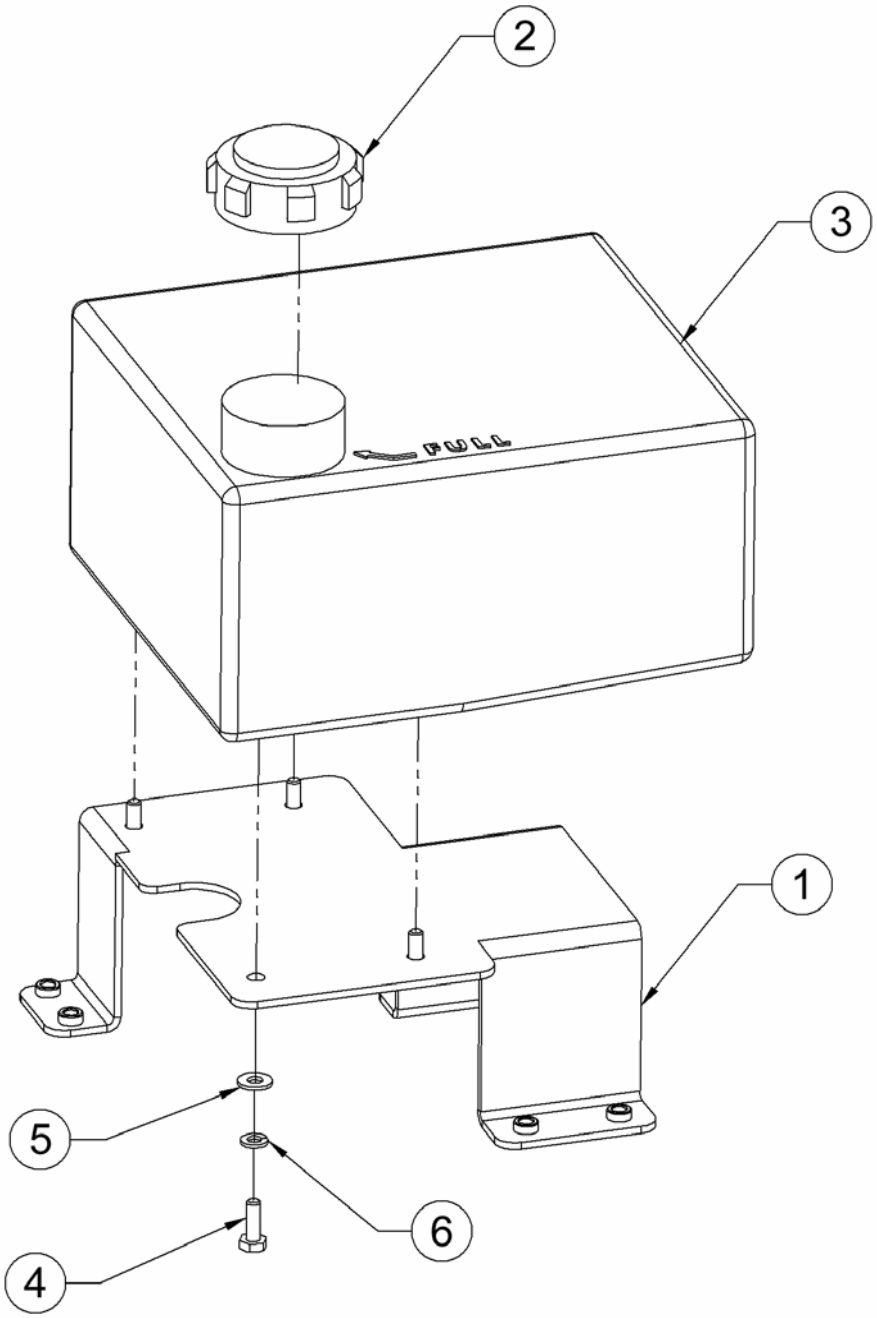
Vac Solenoid & Bracket Assembly - LH

	NUMBER	DESCRIPTION
1	294-115-235	Vac Solenoid Bracket Assembly
2a	294-002-032	Solenoid, 110V
2b	294-002-274	Solenoid, 240V
3	294-115-236	Electric Shock Hazard/Electrocution Sticker
4	294-115-237	Hand Crush/Force From Side Sticker
5	294-115-238	Heat, Hot Surface, Burn Hazard Sticker
6	809-849-085	Screw, 1/4-20 X 1/2, Hex Head, Gr 8, Black
7	01-054	Washer, 1/4 Split, Zinc
8	294-115-309	Ground Wire Assembly - Vac Solenoid
9	01-033	Washer, #10, External Tooth Lock, Zinc
10	835-540-002	Nut, #10-32, Hex, Zinc



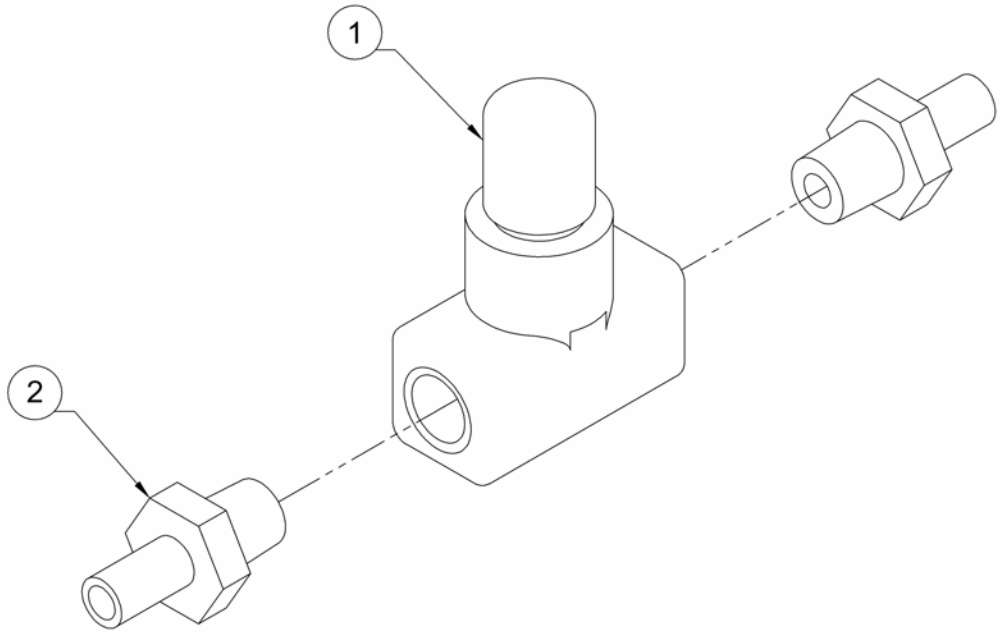
294-115-165 Cleaner Tank Assembly

	NUMBER	DESCRIPTION
1	294-115-044	Cleaner Tank Bracket
2	294-115-092	Cleaner Tank Cap
3	294-115-048	Cleaner Tank (includes Cap)
4	809-849-125	Screw: 1/4-20 X 3/4, Hex Head
5	948-753-102	Washer: 1/4, Flat, Black
6	951-148-008	Washer: 1/4, Split, Lock



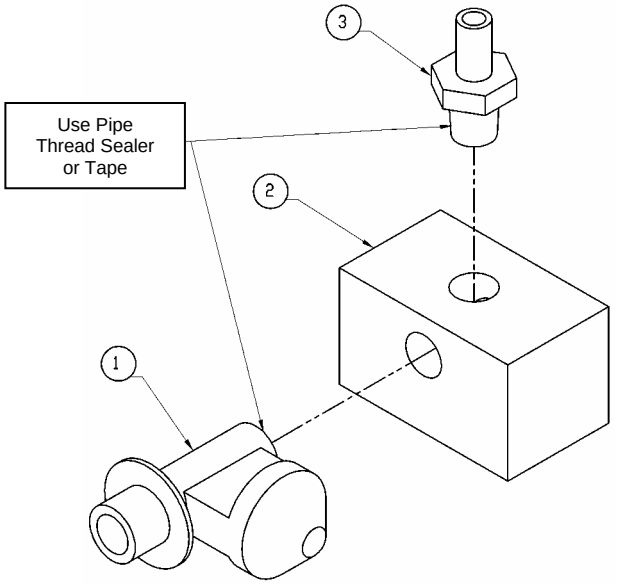
294-115-075 Flow Valve Assembly

	NUMBER	DESCRIPTION
1	04-112	Flow Control Valve
2	294-115-071	Stem Adapter, 1/4 MPT X 3/8



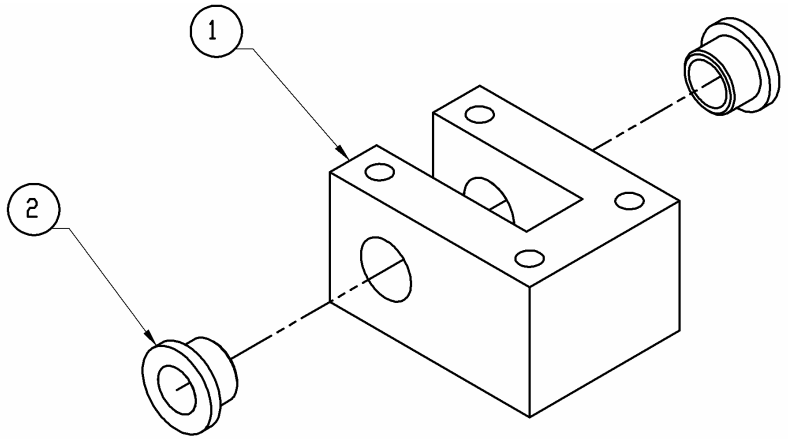
294-115-065 Nozzle Mount Assembly

	NUMBER	DESCRIPTION
1	294-115-066	Nozzle Body
2	294-115-064	Nozzle Body Mounting Block
3	294-115-071	Stem Adapter, 1/4 MPT X 3/8



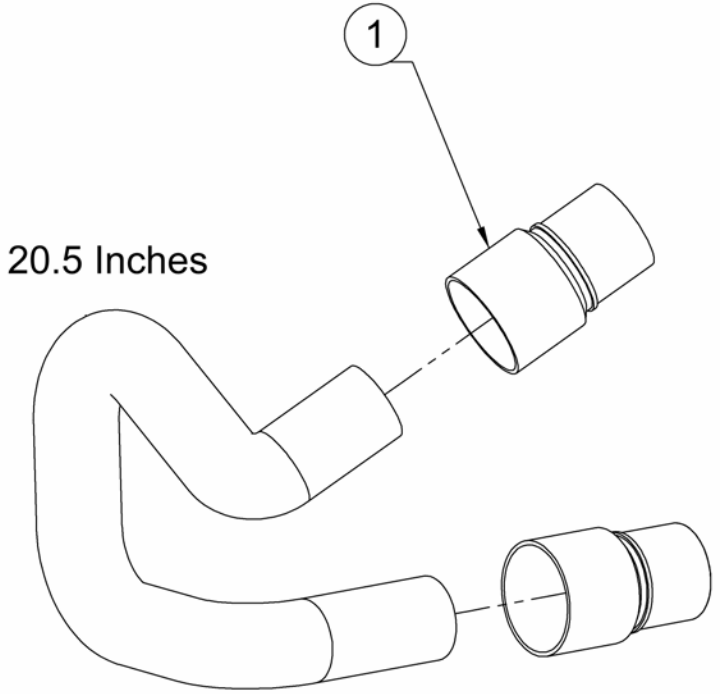
294-115-021 Pivot Bracket Assembly

	NUMBER	DESCRIPTION
1	294-115-022	Pivot Bracket
2	04-017	Flange Bushing



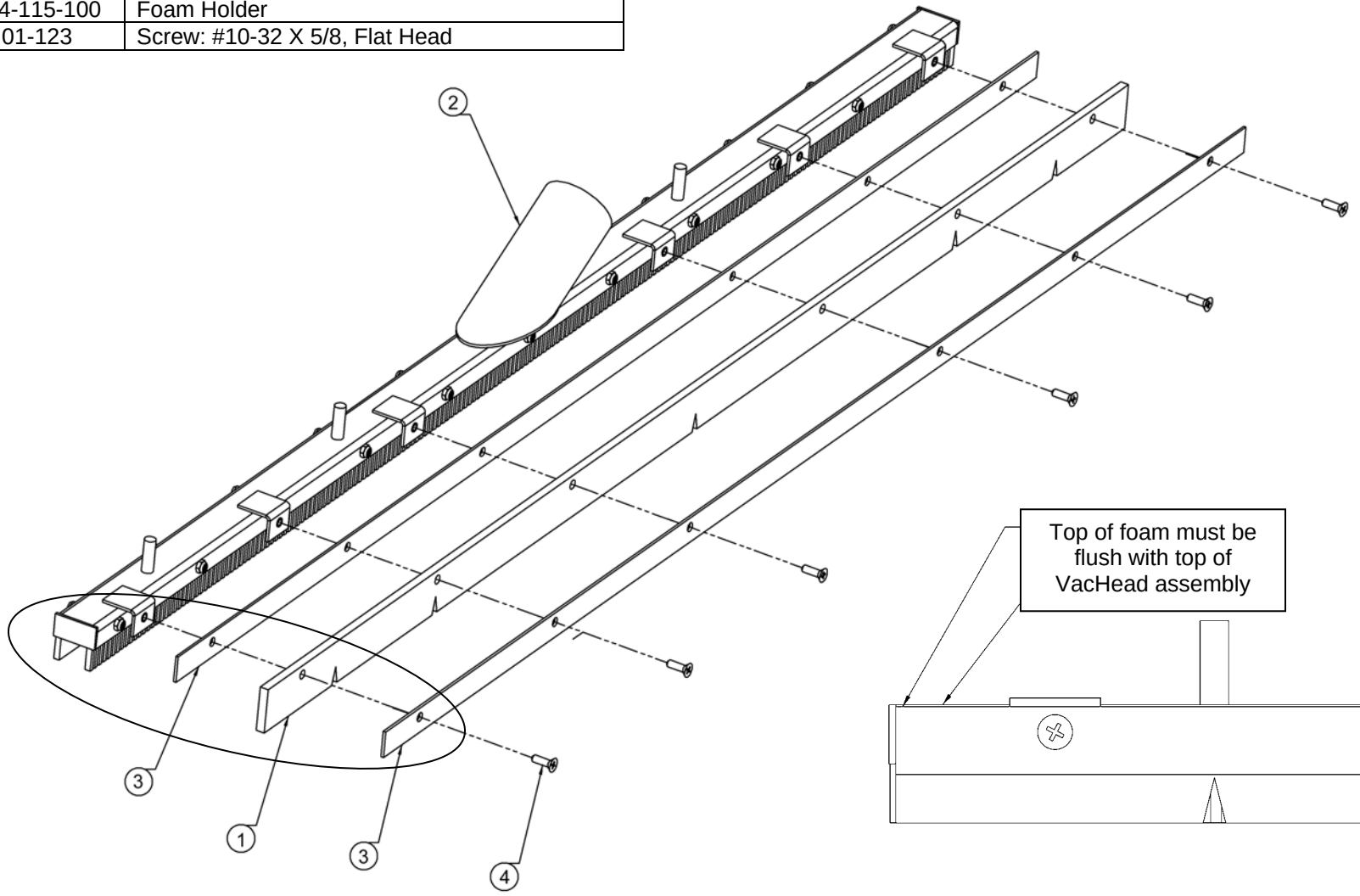
294-115-113 Vacuum Hose Assembly

	NUMBER	DESCRIPTION
1	04-150	Slip Adapter: 1-1/2 X 2



294-115-095 VacHead Assembly (Page 1 of 2)

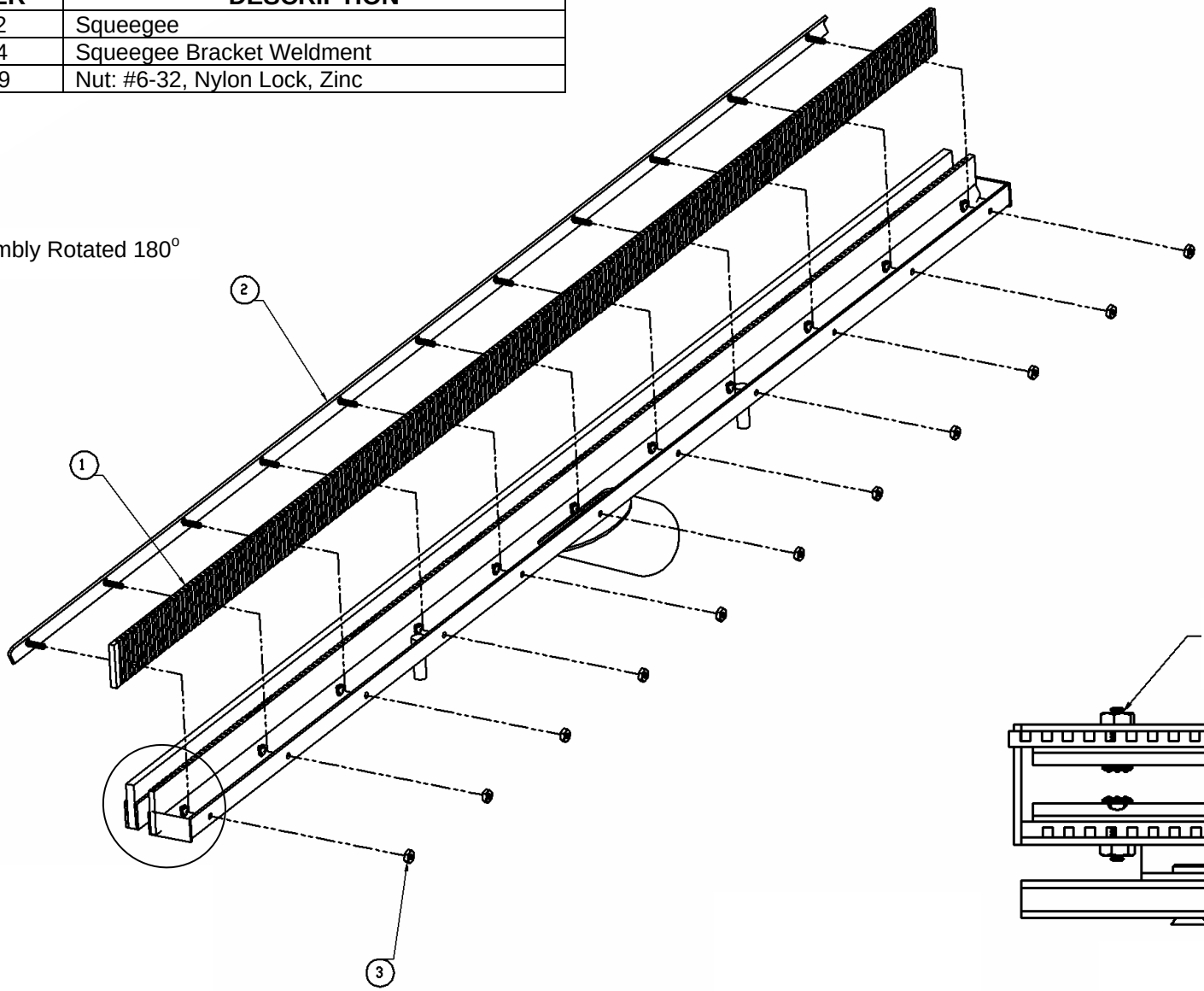
	NUMBER	DESCRIPTION
1	294-115-029	Cleaner Foam
2	294-115-101	VacHead Weldment
3	294-115-100	Foam Holder
4	01-123	Screw: #10-32 X 5/8, Flat Head

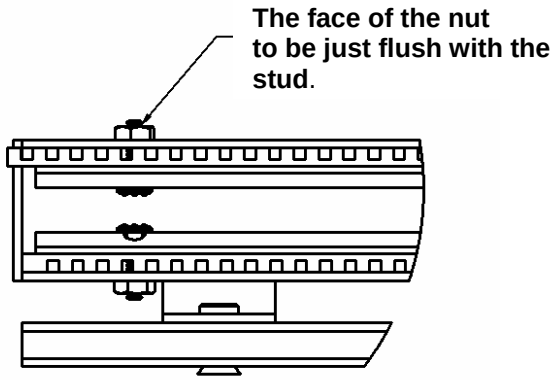


294-115-095 VacHead Assembly (Page 2 of 2)

	NUMBER	DESCRIPTION
1	SV-72	Squeegee
2	SV-A4	Squeegee Bracket Weldment
3	01-229	Nut: #6-32, Nylon Lock, Zinc

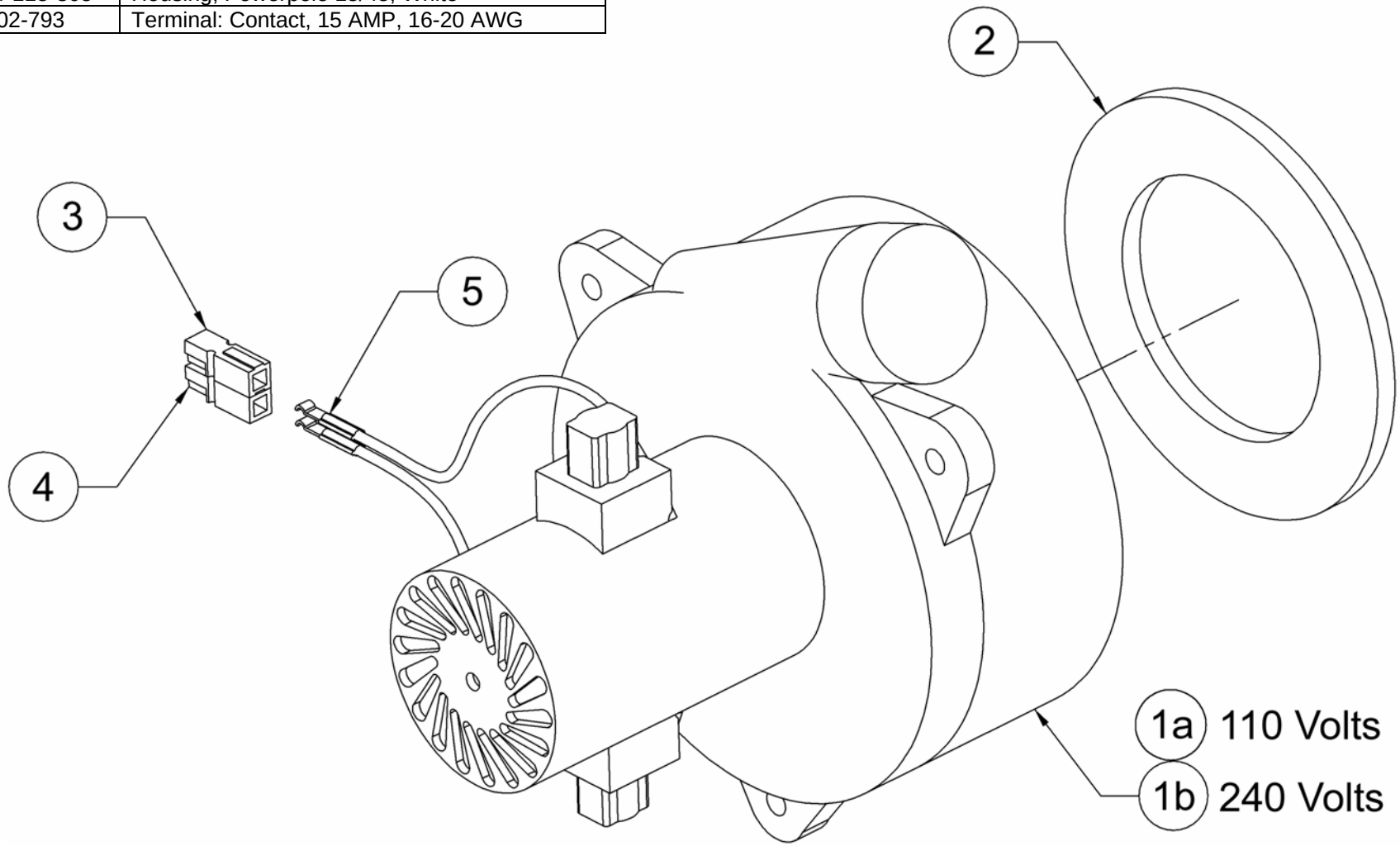
VacHead Assembly Rotated 180°





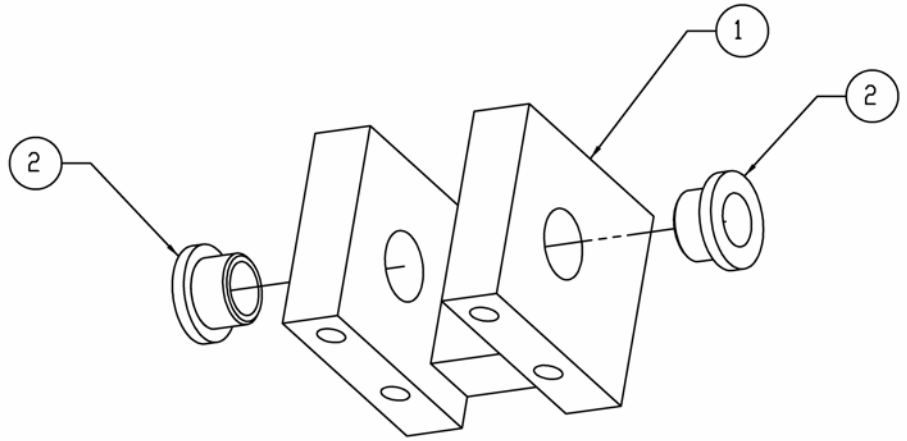
294-115-343 Vacuum Motor Assembly

	NUMBER	DESCRIPTION
1a	02-214	Motor: 110V
1b	02-255	Motor: 240V
2	A-8307	Tank Seal
3	294-115-304	Housing, Powerpole 15/45, Black
4	294-115-305	Housing, Powerpole 15/45, White
5	02-793	Terminal: Contact, 15 AMP, 16-20 AWG



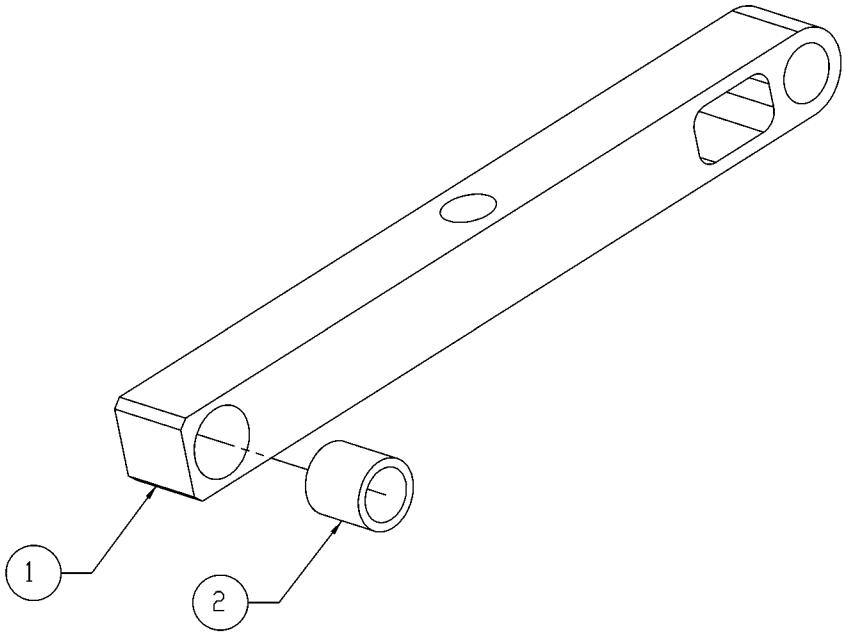
294-115-225 Vacuum Pivot Block Assembly

	NUMBER	DESCRIPTION
1	294-115-226	Vac Pivot Block
2	04-017	Flange Bushing



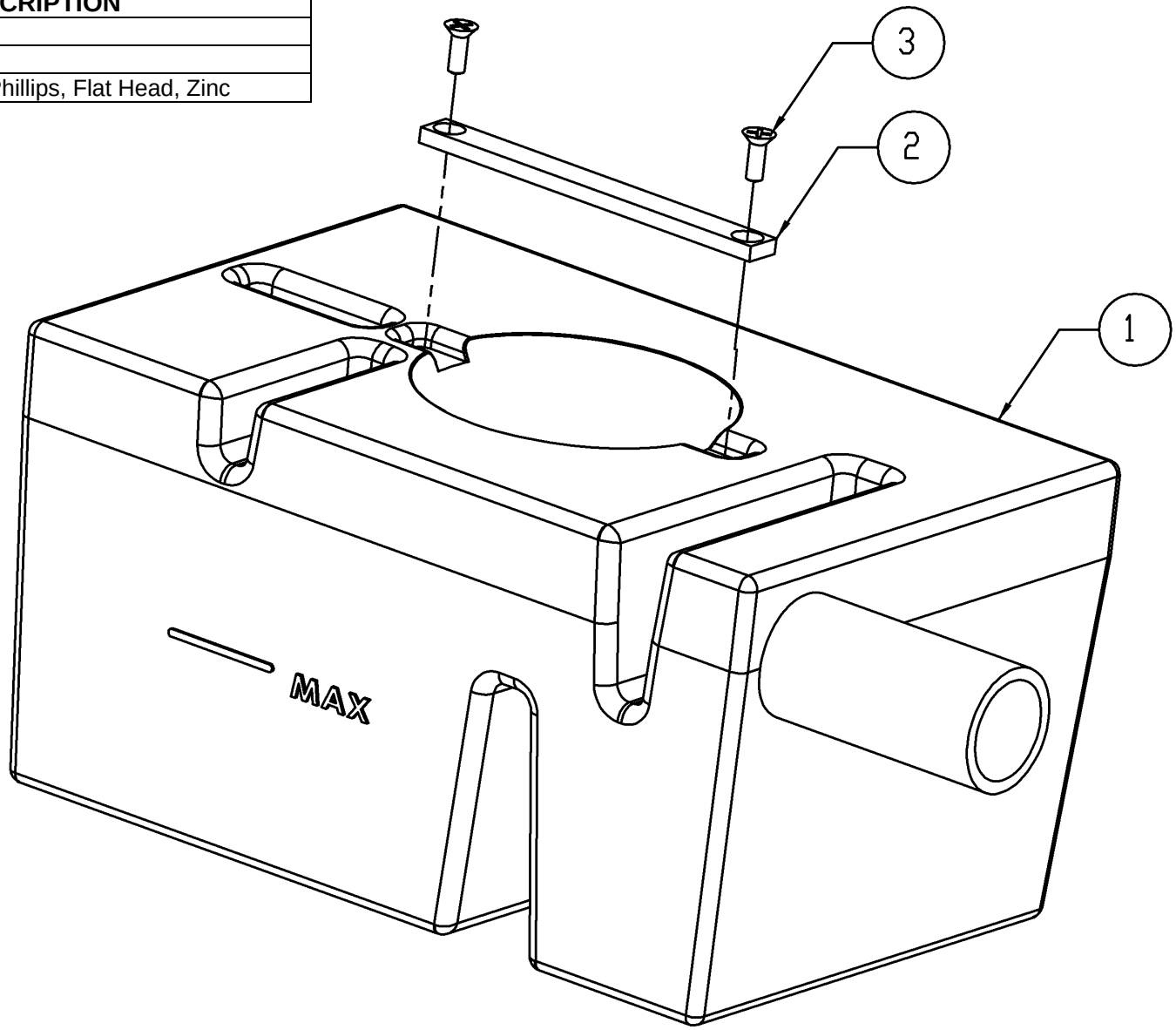
294-115-224 Vacuum Pivot Arm Assembly

	NUMBER	DESCRIPTION
1	294-115-216	VacHead Pivot Arm
2	294-115-015	Bushing: .50 OD X .38 ID X .5 , Bronze



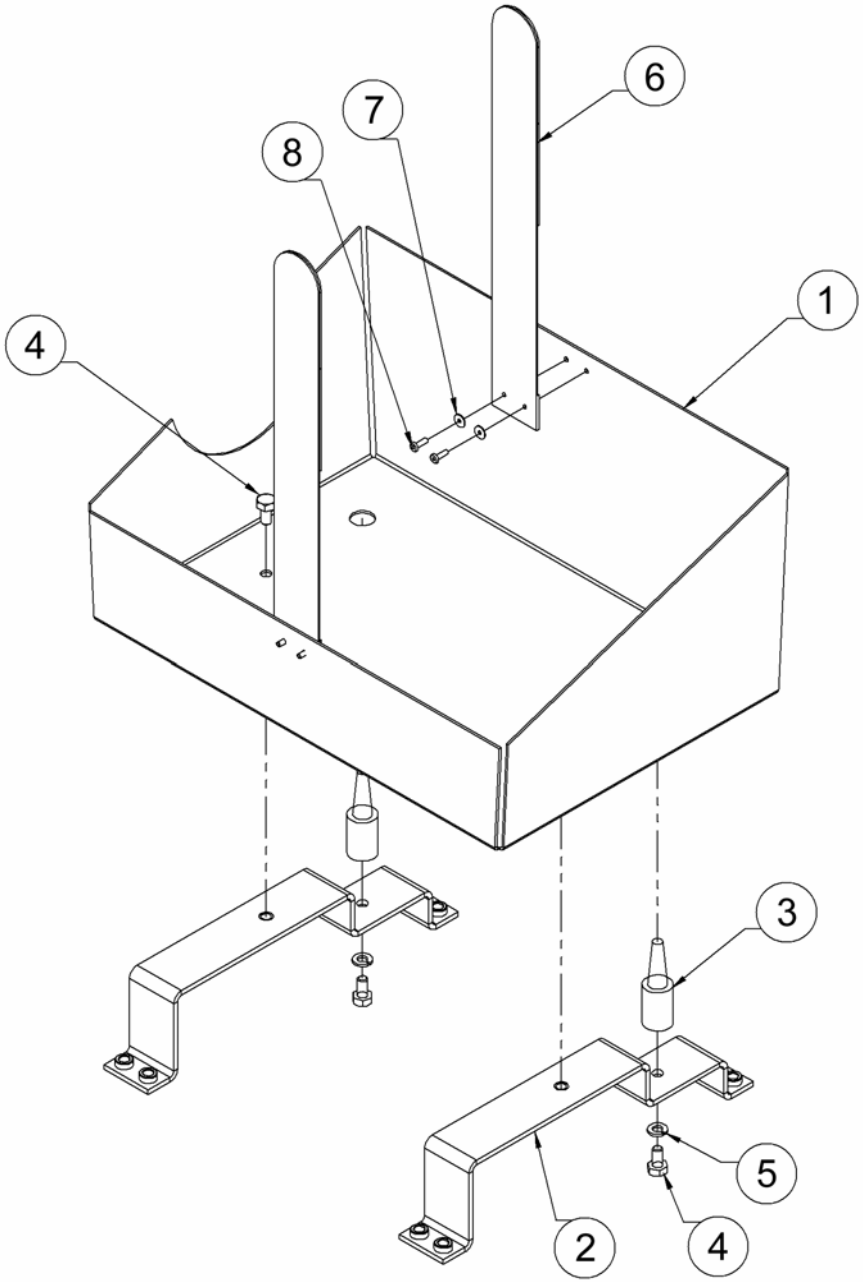
SA-1129 Waste Tank Assembly

	NUMBER	DESCRIPTION
1	C-8341	Polyethylene Tank
2	A-8308	Waste Tank Handle
3	01-148	Screw: 1/4-20 X 3/4, Phillips, Flat Head, Zinc



294-115-233 Waste Tank Guard Assembly

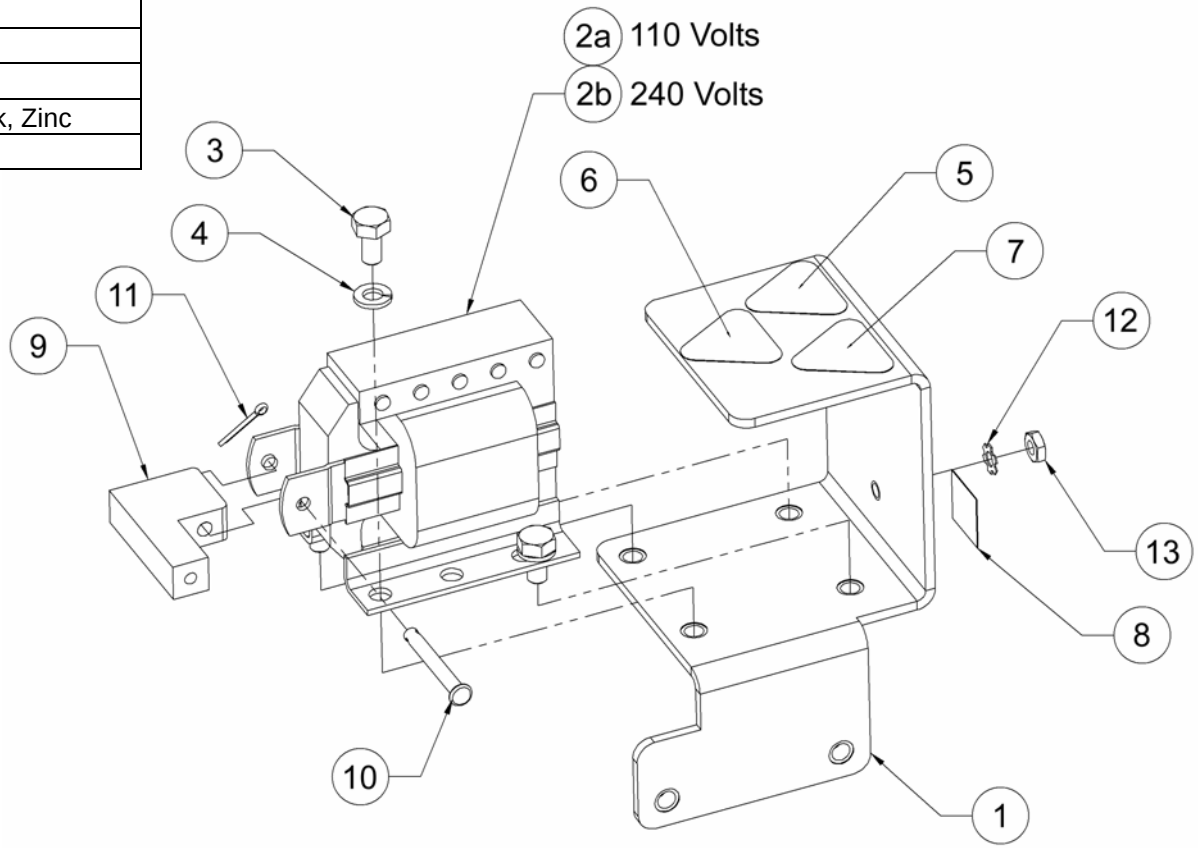
	NUMBER	DESCRIPTION
1	294-115-227	Waste Tank Guard
2	294-115-040	Waste Tank Bracket
3	A-8331	Tank Locating Pin
4	809-849-085	Screw, 1/4-20 X 1/2, Hex Head, Gr 8, Black
5	951-148-008	Washer, 1/4 , Split, Black
6	294-115-247	Cord Strap - Express Tank
7	01-303	Washer, .344 OD X .10 ID, .025 Thick, SS
8	01-130	Rivet, 1/8 X 1/2 Large, Aluminum



CONDITIONING
Oiling and Buffing

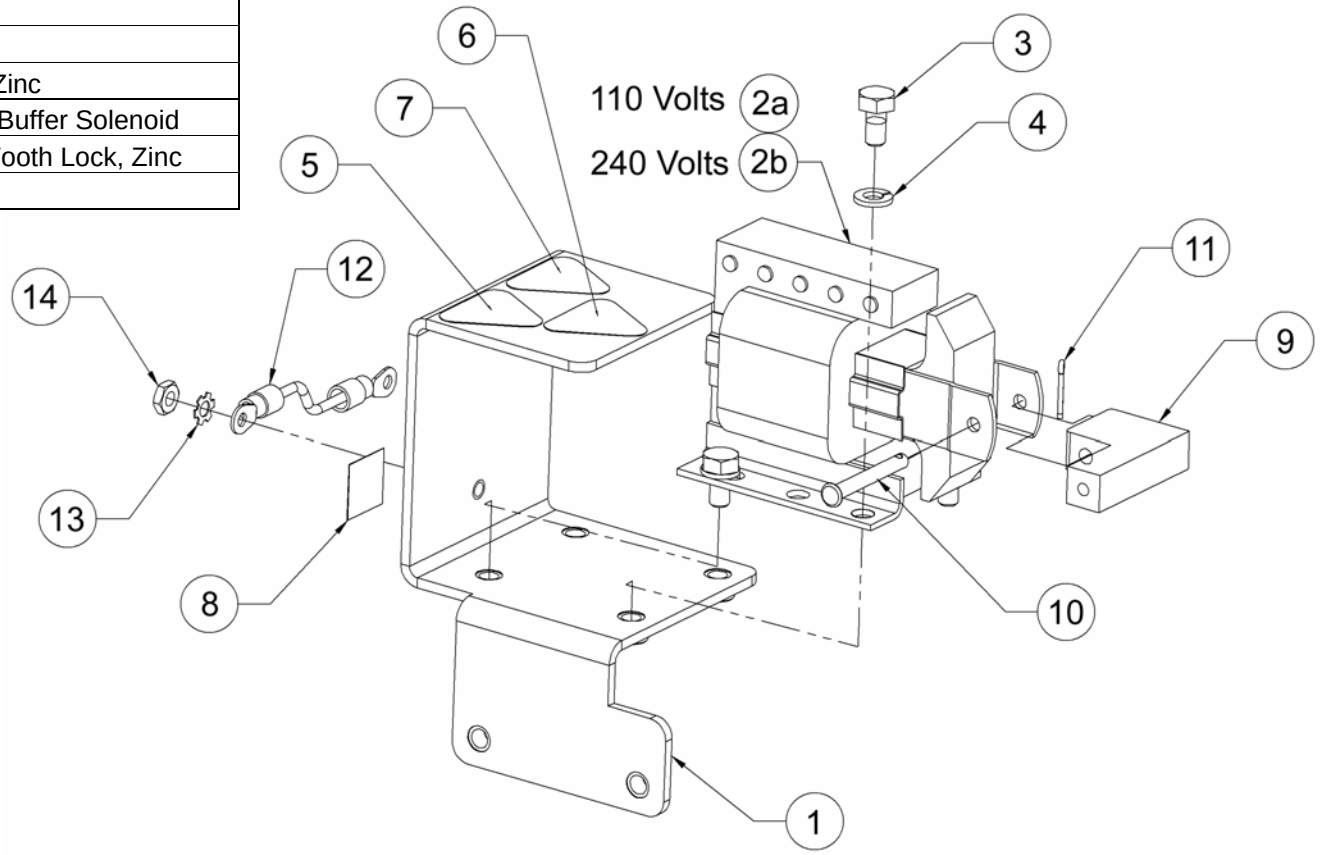
Buffer Solenoid & Bracket Assembly - RH

	NUMBER	DESCRIPTION
1	294-115-241	Buffer Solenoid Bracket Assembly - Rh
2a	294-002-033	Solenoid, 110V
2b	294-002-275	Solenoid, 240V
3	809-849-085	Screw, 1/4-20 X 1/2, Hex Head, Gr 8, Black
4	951-148-008	Washer, 1/4, Split, Black
5	294-115-236	Electric Shock Hazard/Electrocution Sticker
6	294-115-237	Hand Crush/Force From Side Sticker
7	294-115-238	Heat, Hot Surface, Burn Hazard Sticker
8	294-115-256	Earth (Ground) Sticker
9	294-115-090	Solenoid Mount, Buffer
10	01-038	Pin, 3/16 X 1-1/2, Clevis
11	01-080	Pin, 1/16 X 1/2, Cotter, Zinc
12	01-033	Washer, #10, External Tooth Lock, Zinc
13	835-540-002	Nut, #10-32, Hex, Zinc



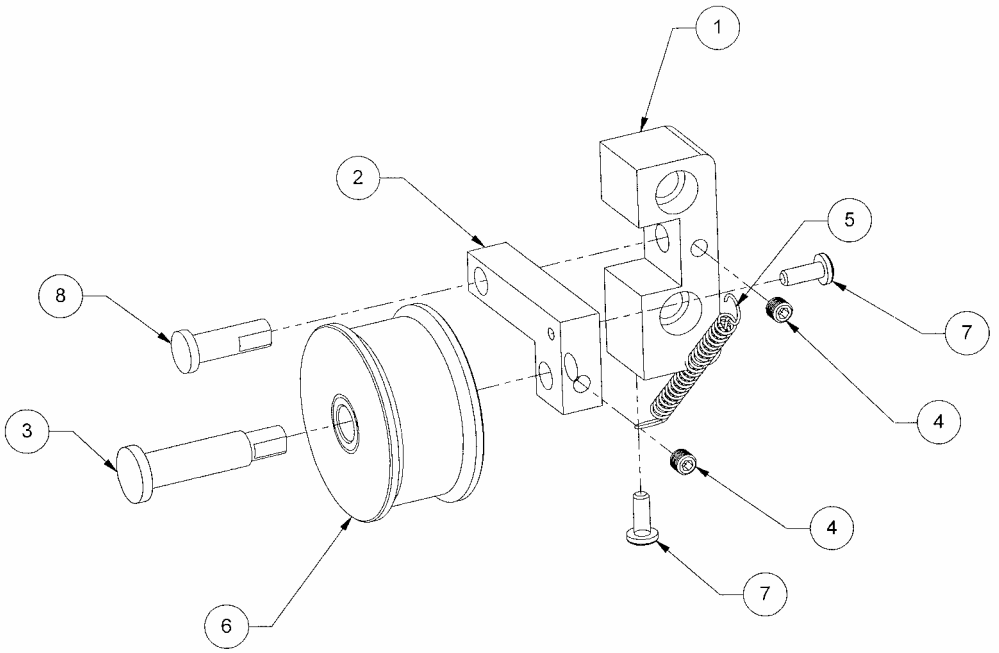
Buffer Solenoid & Bracket Assembly - LH

	NUMBER	DESCRIPTION
1	294-115-244	Buffer Solenoid Bracket Assembly - Lh
2a	294-002-032	Solenoid, 110V
2b	294-002-274	Solenoid, 240V
3	809-849-085	Screw, 1/4-20 X 1/2, Hex Head, Gr 8, Black
4	951-148-008	Washer, 1/4, Split, Black
5	294-115-236	Electric Shock Hazard/Electrocution Sticker
6	294-115-237	Hand Crush/Force From Side Sticker
7	294-115-238	Heat, Hot Surface, Burn Hazard Sticker
8	294-115-256	Earth (Ground) Sticker
9	294-115-090	Solenoid Mount, Buffer
10	01-038	Pin, 3/16 X 1-1/2, Clevis
11	01-080	Pin, 1/16 X 1/2, Cotter, Zinc
12	294-115-329	Ground Wire Assembly-Buffer Solenoid
13	01-033	Washer, #10, External Tooth Lock, Zinc
14	835-540-002	Nut, #10-32, Hex, Zinc



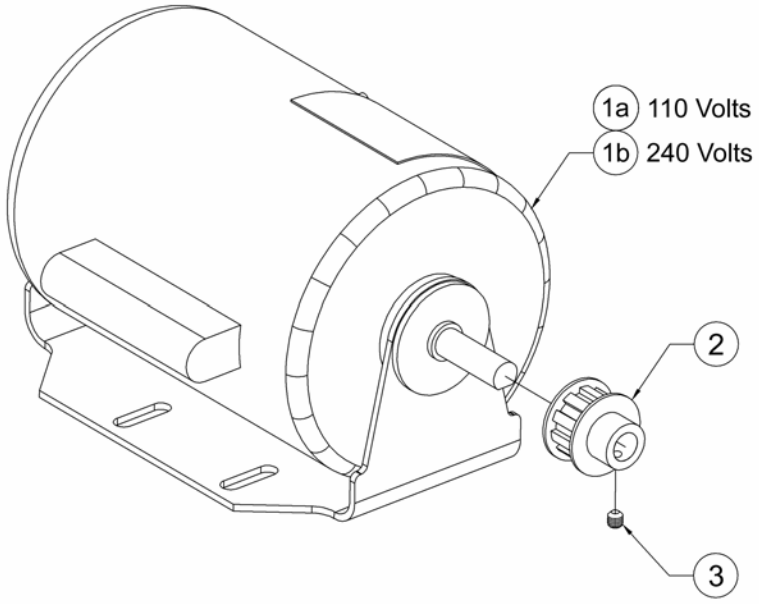
294-115-139 Belt Tensioner

	NUMBER	DESCRIPTION
1	294-115-140	Belt Tensioner Mount
2	294-115-204	Idler Pivot Arm
3	A-5556	Roller Pin
4	01-029	Screw, #10-32 X 3/16, Soc, Set, Cup Point, Black
5	A-5558	Idler Spring
6	SA-6534	Tension Pulley Assembly
7	01-001	Screw, #6-32 X 3/8, Phillips, Round Head, Zinc
8	A-5557	Pivot Arm Pin



294-115-038 Buffer Motor Assembly 110 Volts
294-002-270 Buffer Motor Assembly 240 Volts

	NUMBER	DESCRIPTION
1a	294-115-038	Buffer Motor Assembly 110 Volts (includes # 2 and # 3)
1b	294-002-270	Buffer Motor Assembly 240 Volts (includes # 2 and # 3)
2	A-0425	Pulley Modification
3	01-041	Screw: 1/4-20 X 1/4, Set, Socket Head, Cup Point

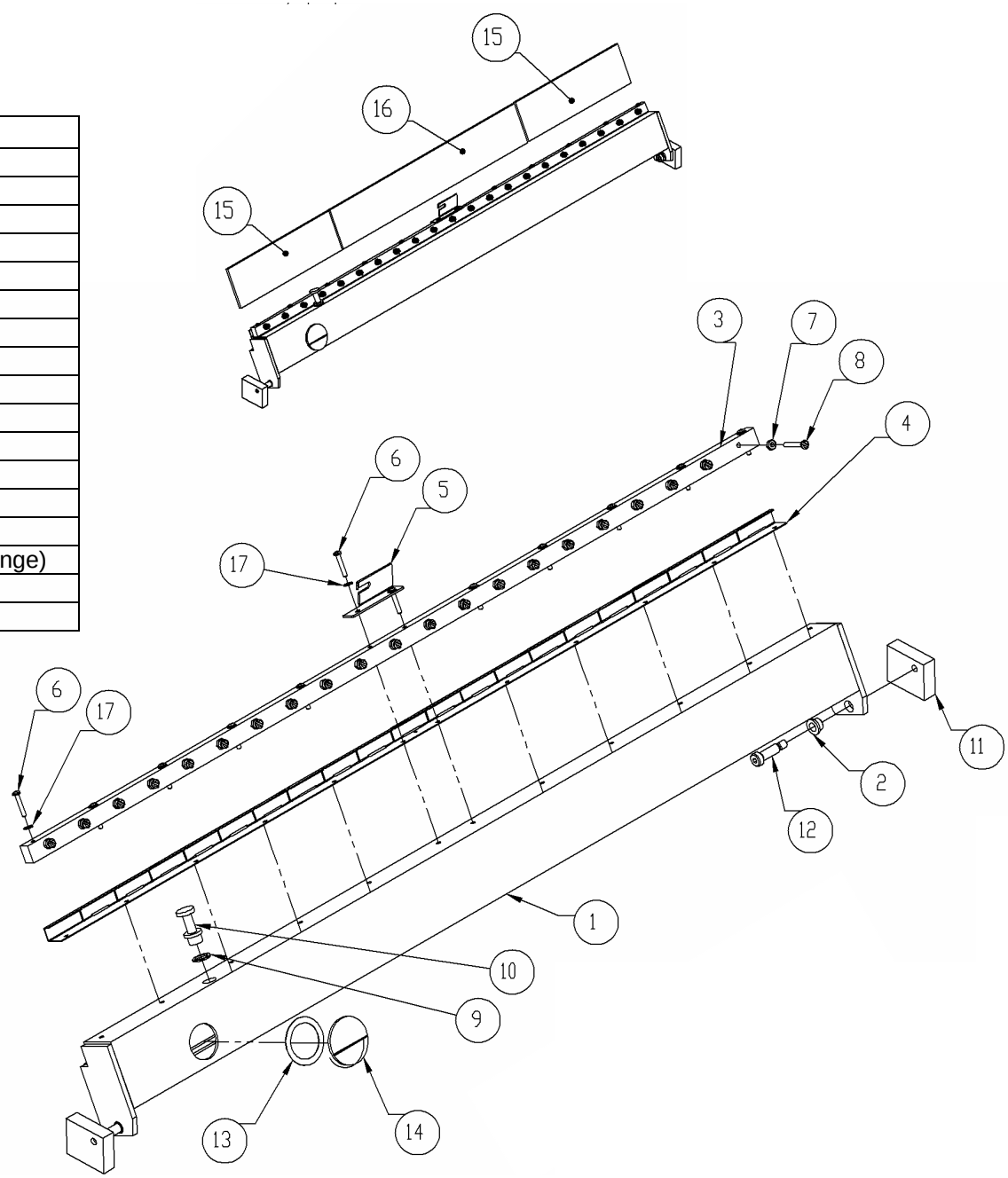


294-115-085 Oil Tank Assembly

	NUMBER	DESCRIPTION
1	294-115-084	Oil Tank Weldment
2	04-017	Flange Bushing
3	B-0661	Bar
4	B-0660	Angle
5	294-115-160	Bracket
6	01-248	Screw: #8-32 X 1, Phillips, Pan Head
7	01-032	Nut: #10-32, Hex
8	01-423	Screw: #10-32 X 1, Phillips, Round Head
9	04-093	Dipstick Seal: Rubber, .76 X .579 X .062
10	A-0330	Tank Plug
11	294-115-083	Oil Tank Mounting Bracket
12	01-351	Screw: 3/8 Diameter X 1, Shoulder
13	294-115-193	Sight Glass Tape
14	294-115-189	Sight Glass Disk
15	294-115-181	Foam: Medium Low Output, 3-1/4 X 11 (Orange)
16	294-115-182	Foam: High Output, 3-1/4 X 20 (Blue)
17	951-632-060	Washer: #8, External Tooth, Lock

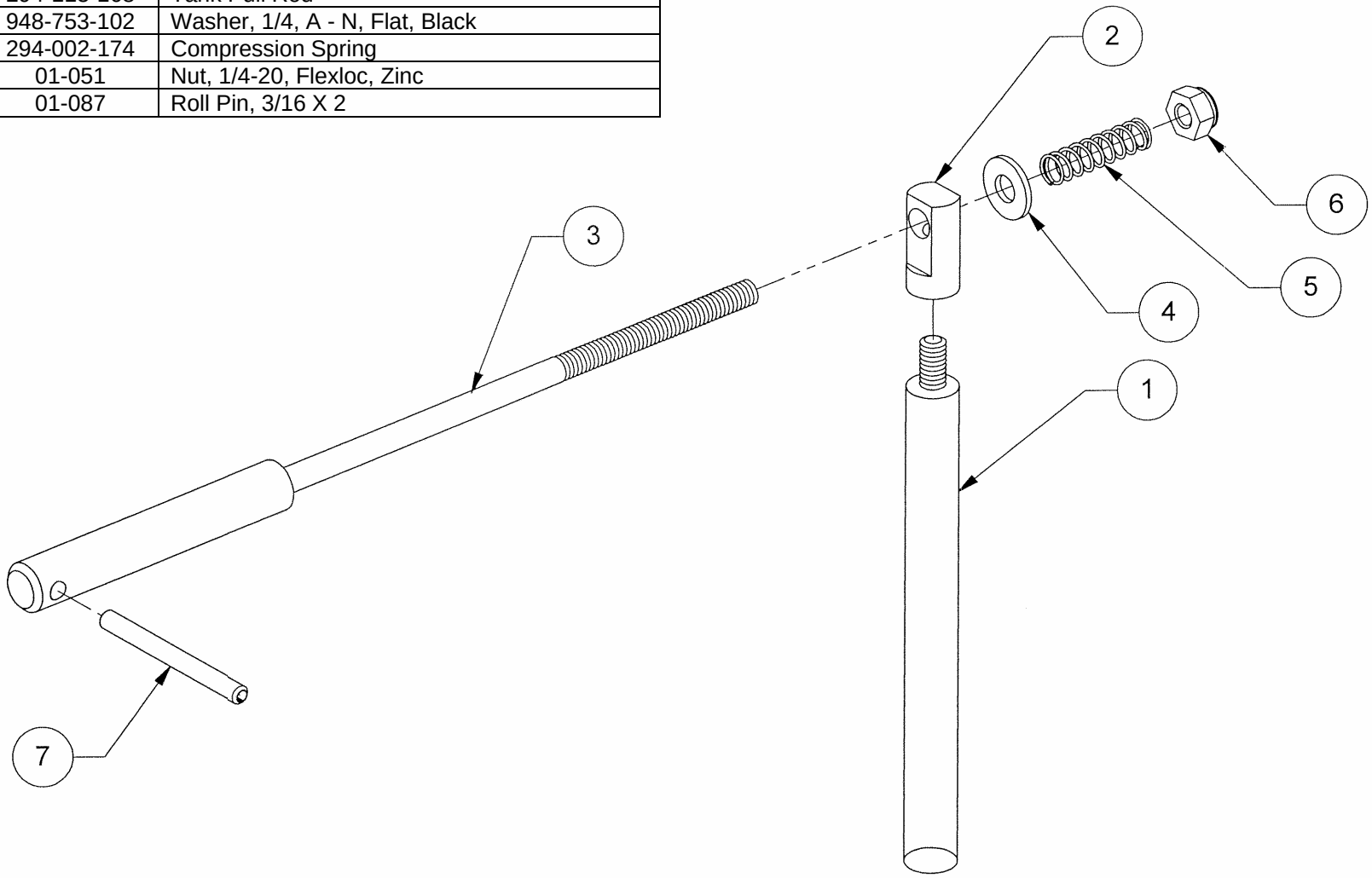
ALTERNATE FOAMS

294-115-177	Foam: Super High Output, 3-1/4 X 48 (Black)
294-115-178	Foam: High Output, 3-1/4 X 48 (Blue)
294-115-179	Foam: Medium High Output, 3-1/4 X 48 (Red)
294-115-180	Foam: Medium Low Output, 3-1/4 X 48 (Orange)
294-115-176	Foam: Low Output, 3-1/4 X 48 (Tan)

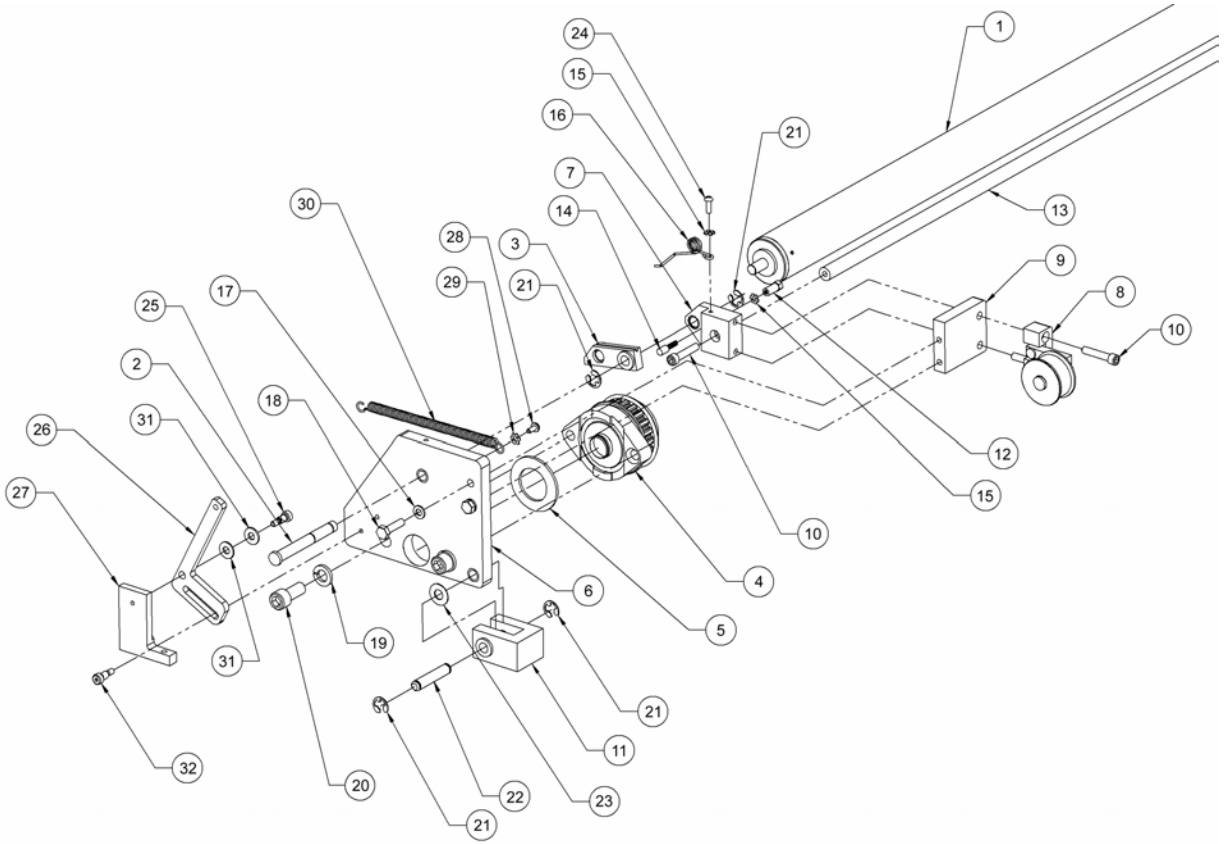


294-115-162 Oil Tank Lift Assembly

	NUMBER	DESCRIPTION
1	294-115-188	Tank Pull Post
2	294-115-190	Tank Pull Post Pivot
3	294-115-168	Tank Pull Rod
4	948-753-102	Washer, 1/4, A - N, Flat, Black
5	294-002-174	Compression Spring
6	01-051	Nut, 1/4-20, Flexloc, Zinc
7	01-087	Roll Pin, 3/16 X 2

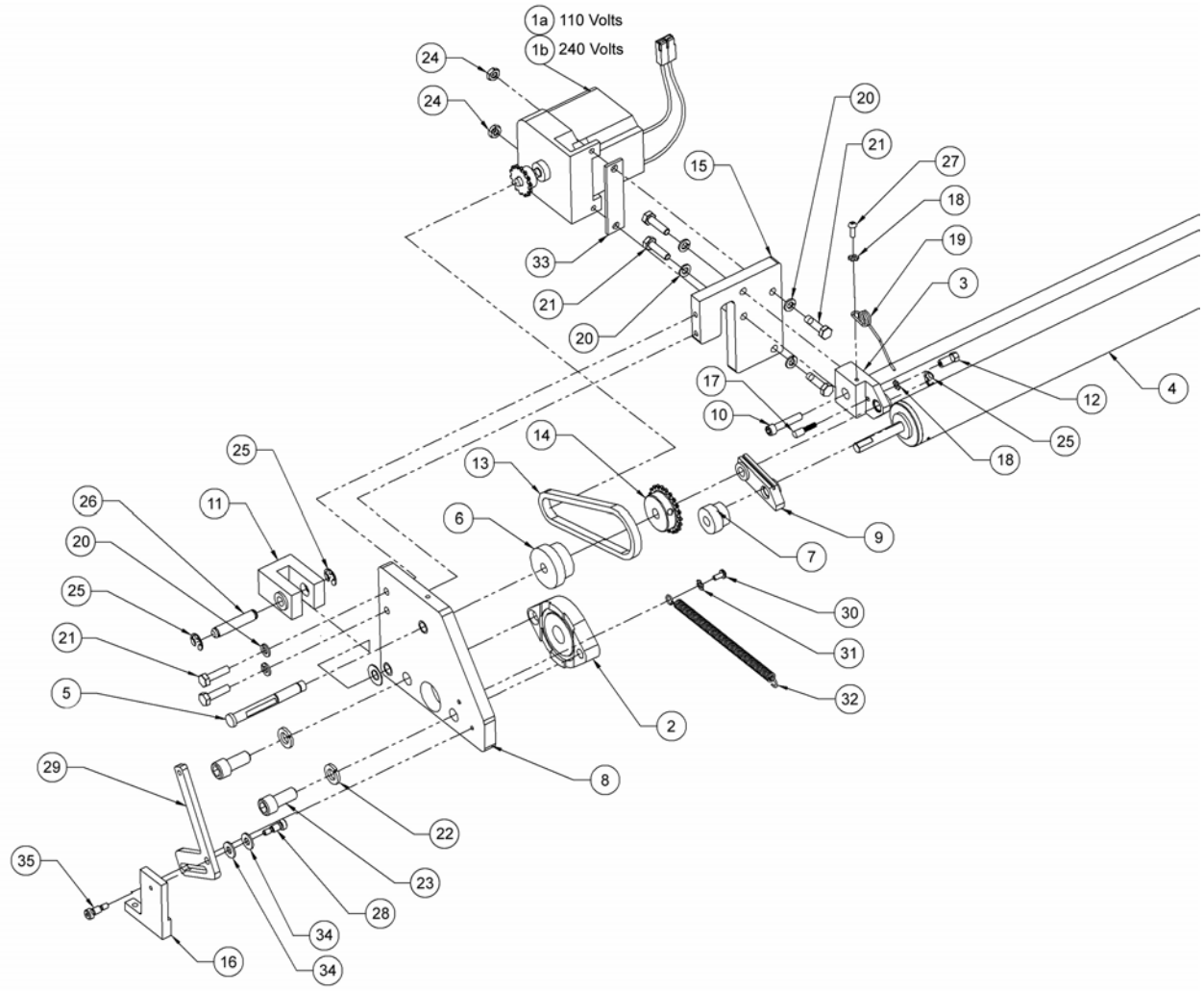


Oil Transfer / Buffer Mount Assembly (Page 1 of 3, Right Side)



	NUMBER	DESCRIPTION
1	294-115-013	Roller Assembly
2	294-115-004	Shaft - Transfer Roller
3	SA-1023R	Right Roller Support Assembly
4	SA-6002	Buffer Drive Assembly
5	A-0575	Shim
6	294-115-014	Buffer Side Plate Assembly
7	SA-3023R	Roller Drive Shaft Support Arm Assembly, Right
8	294-115-139	Belt Tensioner Assembly
9	294-115-009	Transfer Roller Mount - Buffer Motor Side
10	810-349-200	Screw, 1/4-20 X 1 1/4, Socket Head, Patch
11	294-115-021	Pivot Bracket Assembly
12	A-0464	Positive Stop Nut
13	294-115-157	Stiffener Bracket, Upper
14	A-0463	Positive Stop Screw
15	01-016	Washer, #8, External Tooth Lock, Zinc
16	A-0583	Oil Transfer Roller Spring
17	01-054	Washer, 1/4, Split, Zinc
18	809-849-165	Screw, 1/4-20 X 1, Hex Head, Gr 8, Black
19	951-068-002	Washer, 7/16, Split
20	294-115-020	Screw, 7/16-14 X 1, Socket Head
21	919-010-400	Retaining Ring E - Style
22	294-115-154	Pin, 3/8, Clevis
23	964-572-000	Thrust Washer
24	828-133-082	Screw, #8-32 X 1/2, Round Head
25	01-349	Bolt, 1/4 X 3/8, Shoulder, Black
26	294-115-088	L - Link, Buffer Engagement
27	294-115-086	Link Pivot Mount - Right Side
28	01-019	Screw, #10-32 X 3/8, Phillips, Pan Head, Zinc
29	01-033	Washer, #10, External Tooth Lock, Zinc
30	294-115-171	Extension Spring
31	948-753-102	Washer, 1/4, A - N, Flat, Black
32	880-239-140	Bolt, 1/4 X 1/2, Soc Shoulder, Black Finish

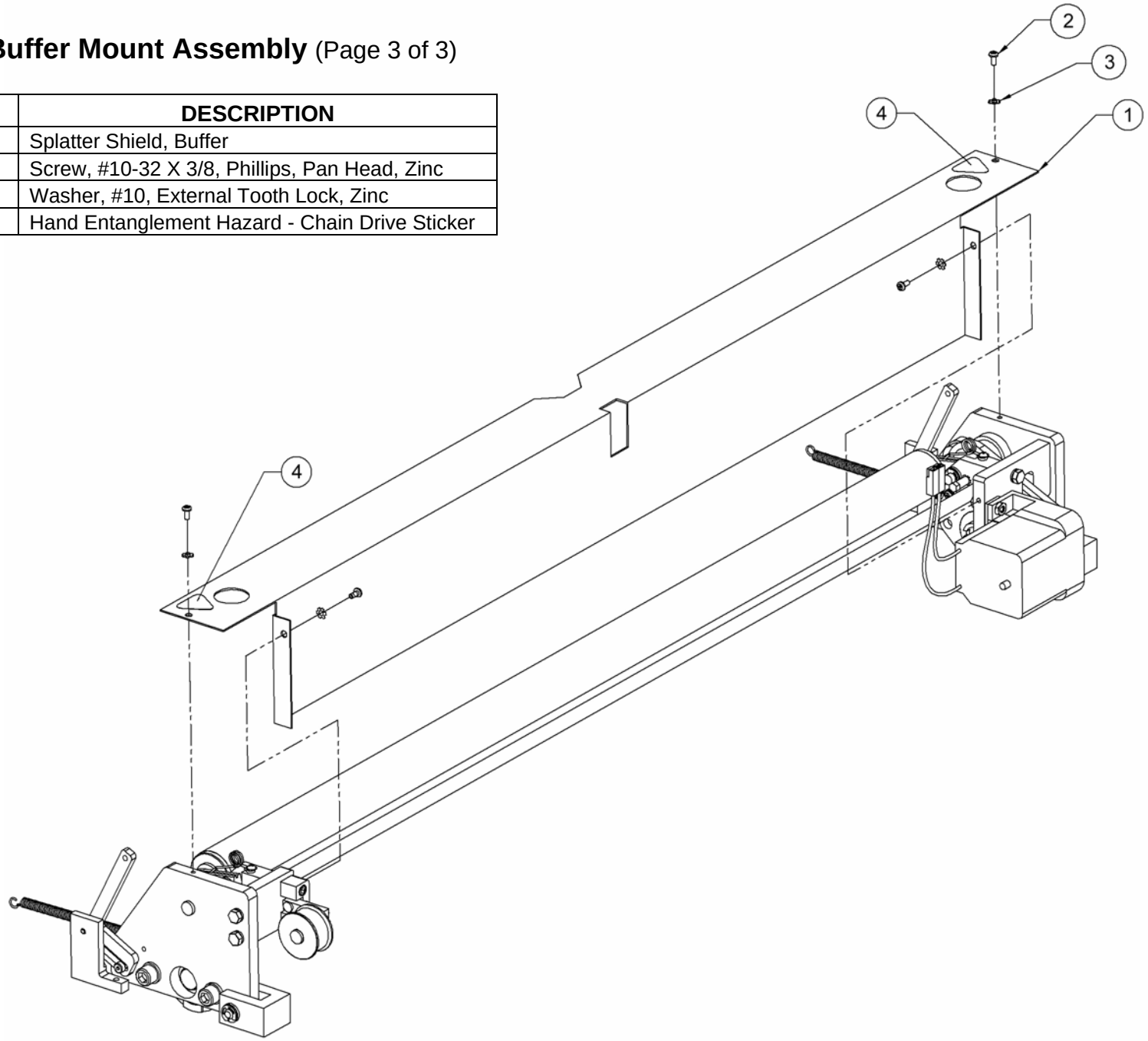
Oil Transfer / Buffer Mount Assembly (Page 2 of 3, Left Side)



	NUMBER	DESCRIPTION
1a	294-115-006	Transfer Roller Motor Assembly: 110V
1b	294-115-267	Transfer Roller Motor Assembly: 240V
2	B-0077	Swivel End Bearing Modification
3	SA-3023L	Roller Drive Shaft Support Arm Assembly, Left
4	294-115-013	Roller Assembly
5	294-115-004	Shaft - Transfer Roller
6	294-115-002	Transfer Roller Gear - Large
7	294-115-003	Transfer Roller Gear - Small
8	294-115-014	Buffer Side Plate Assembly
9	SA-1023L	Left Roller Support Assembly
10	810-349-200	Screw, 1/4-20 X 1 1/4, Socket Head, Patch
11	294-115-021	Pivot Bracket Assembly
12	A-0464	Positive Stop Nut
13	294-115-007	Transfer Roller Chain
14	A-0951	Sprocket Modification
15	294-115-008	Transfer Roller Mount - Trans. Roller Side
16	294-115-158	Link Pivot Mount - Left Side
17	A-0463	Positive Stop Screw
18	01-016	Washer, #8, External Tooth Lock, Zinc
19	A-0583	Oil Transfer Roller Spring
20	01-054	Washer, 1/4, Split, Zinc
21	809-849-165	Screw, 1/4-20 X 1, Hex Head, Gr 8, Black
22	951-068-002	Washer, 7/16, Split
23	294-115-020	Screw, 7/16-14 X 1, Socket Head
24	01-340	Nut, 1/4-20, Jam
25	919-010-400	Retaining Ring E - Style
26	294-115-154	Pin, 3/8, Clevis
27	828-133-082	Screw, #8-32 X 1/2, Round Head
28	01-349	Bolt, 1/4 X 3/8, Shoulder, Black
29	294-115-088	L - Link, Buffer Engagement
30	01-019	Screw, #10-32 X 3/8, Phillips, Pan Head, Zinc
31	01-033	Washer, #10, External Tooth Lock, Zinc
32	294-115-171	Extension Spring
33	294-002-082	Transfer Roller Motor Spacer
34	948-753-102	Washer, 1/4, A - N, Flat, Black
35	880-239-140	Bolt, 1/4 X 1/2, Soc Shoulder, Black Finish

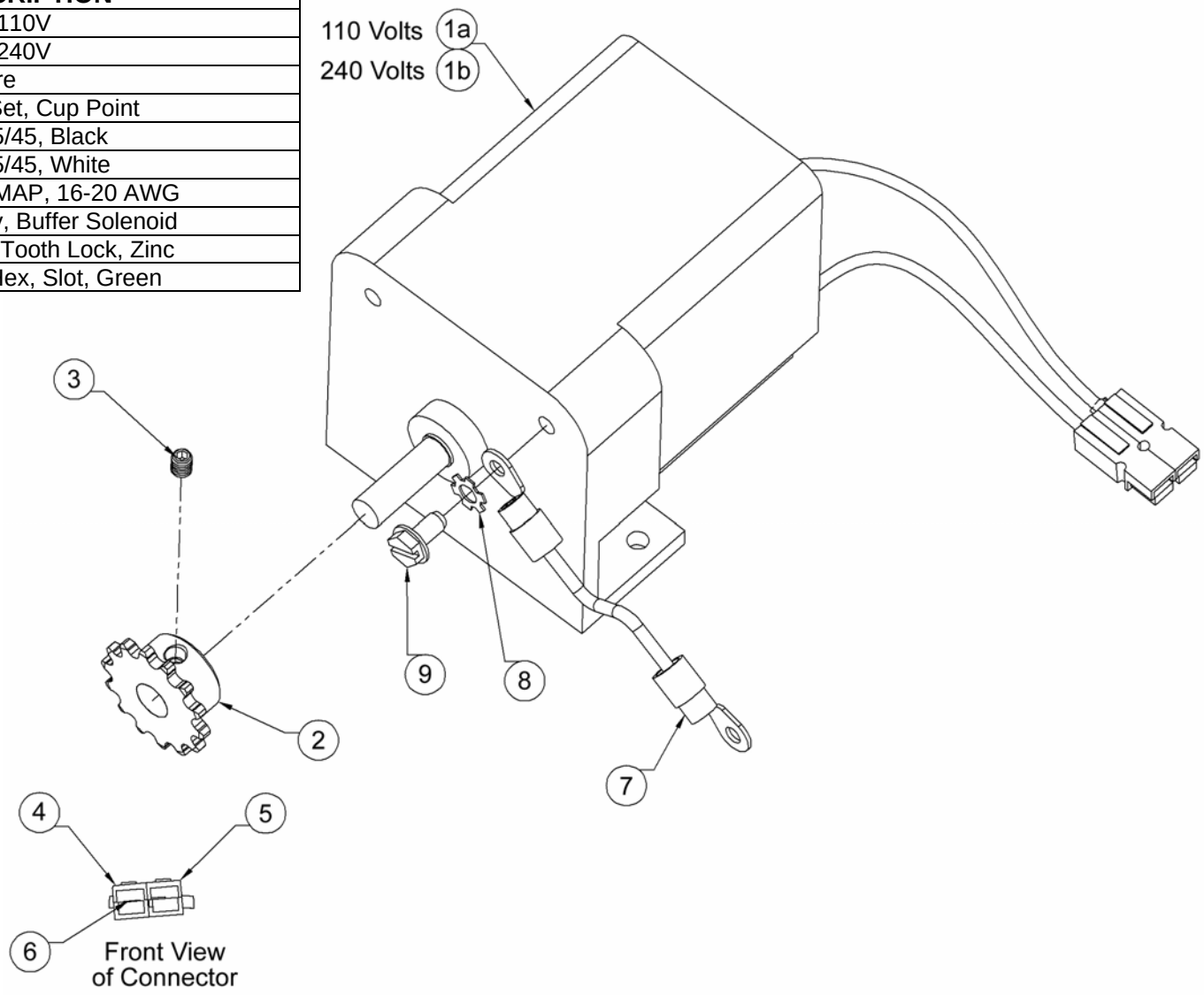
Oil Transfer / Buffer Mount Assembly (Page 3 of 3)

	NUMBER	DESCRIPTION
1	294-115-028	Splatter Shield, Buffer
2	01-019	Screw, #10-32 X 3/8, Phillips, Pan Head, Zinc
3	01-033	Washer, #10, External Tooth Lock, Zinc
4	294-115-245	Hand Entanglement Hazard - Chain Drive Sticker



294-115-006 110V Transfer Roller Motor Assembly
294-115-267 240V Transfer Roller Motor Assembly

	NUMBER	DESCRIPTION
1a	294-115-005	Transfer Roller Motor: 110V
1b	294-115-268	Transfer Roller Motor: 240V
2	294-001-006	Sprocket: 14 T, 3/8 Bore
3	01-188	Screw: #10-24 X 1/4, Set, Cup Point
4	294-115-304	Housing, Powerpole 15/45, Black
5	294-115-305	Housing, Powerpole 15/45, White
6	02-793	Terminal: Contact, 15 MAP, 16-20 AWG
7	294-115-329	Ground Wire Assembly, Buffer Solenoid
8	01-033	Washer, #10, External Tooth Lock, Zinc
9	294-115-292	Screw, #10-32 X 3/8, Hex, Slot, Green



Part Number Index