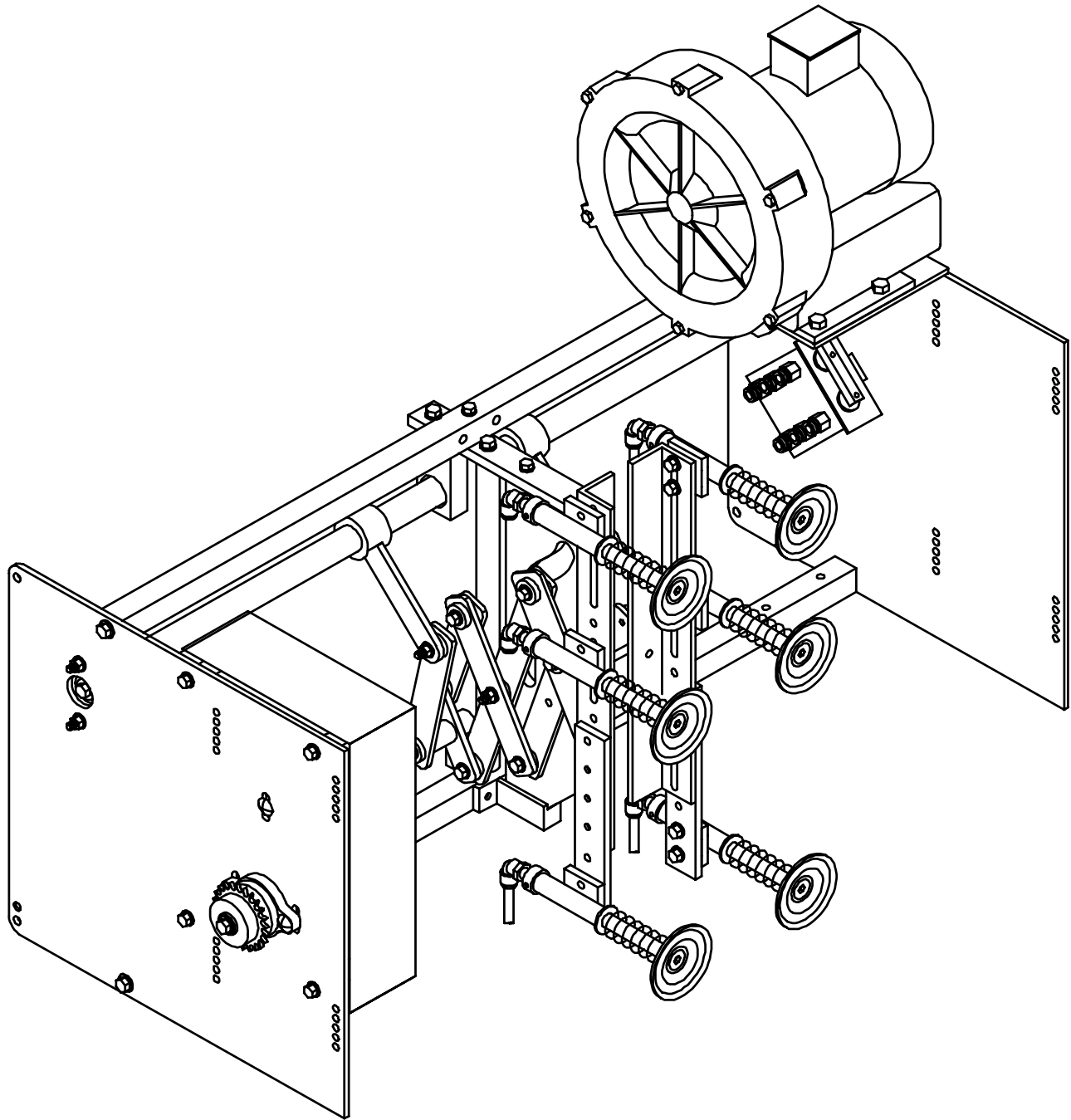


Section - A

Vacuum Feed Attachment



Vacuum Feed Attachment - Option

Tray Box Former



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A.0 Introduction

PURPOSE

The Vacuum Feed Attachment is a mechanically operated system for picking and feeding of corrugated blanks during the use of the Tray Box Former and the Bliss Box Former.

The system incorporates a vacuum motor to create suction for blank picking. It also gives the user the advantage of positively picking a blank from the hopper and placing it on the blank feed rollers. The advantage of positive picking and feeding is to help maintain accurate adhesive programming by keeping the blank movement "In Time" with the adhesive programming segment wheel.

Another feature when using the Vacuum Feed Attachment, is that it will pick and feed warp blanks which are within the specified tolerances set by the Fiber Box Association for score and slotted corrugated fiberboard sheets.

A.1 Set-Up and Adjustments

See Next Page.

VACUUM FEED MOUNTING PLATES LOCATION

After the height of the Blank Feed Roll Assembly has been determined (Ref. Tray Box Former Manual, Section 5.0, Figure 5-6...Ref. Bliss Box Former Manual, Section 5.0, Figure 5-5) and the assembly is bolted in position, mount the Vacuum Feed Mounting Plates (0047900 & 0048000) to the frame uprights so the bottom of the Vacuum Feed Mounting plates are 1 1/2" above the top of the Blank Feed Wheel Shaft Mounting Plates (0017706, Standard Tray & Standard Bliss ...0017707, Wide Base Tray & Wide Base Bliss). After locating and mounting the Vacuum Feed Mounting Plates, assemble the vacuum feed parts per the assembly print, less the Vacuum Feed Drive Chain, then the adjustments may be started.

NOTE: The Plate-to-plate dimension of 1 1/2" as stated above, is for most blank sizes. If the blank to be used is extremely long, a different dimension may be required.

Vacuum Feed Attachment - Option

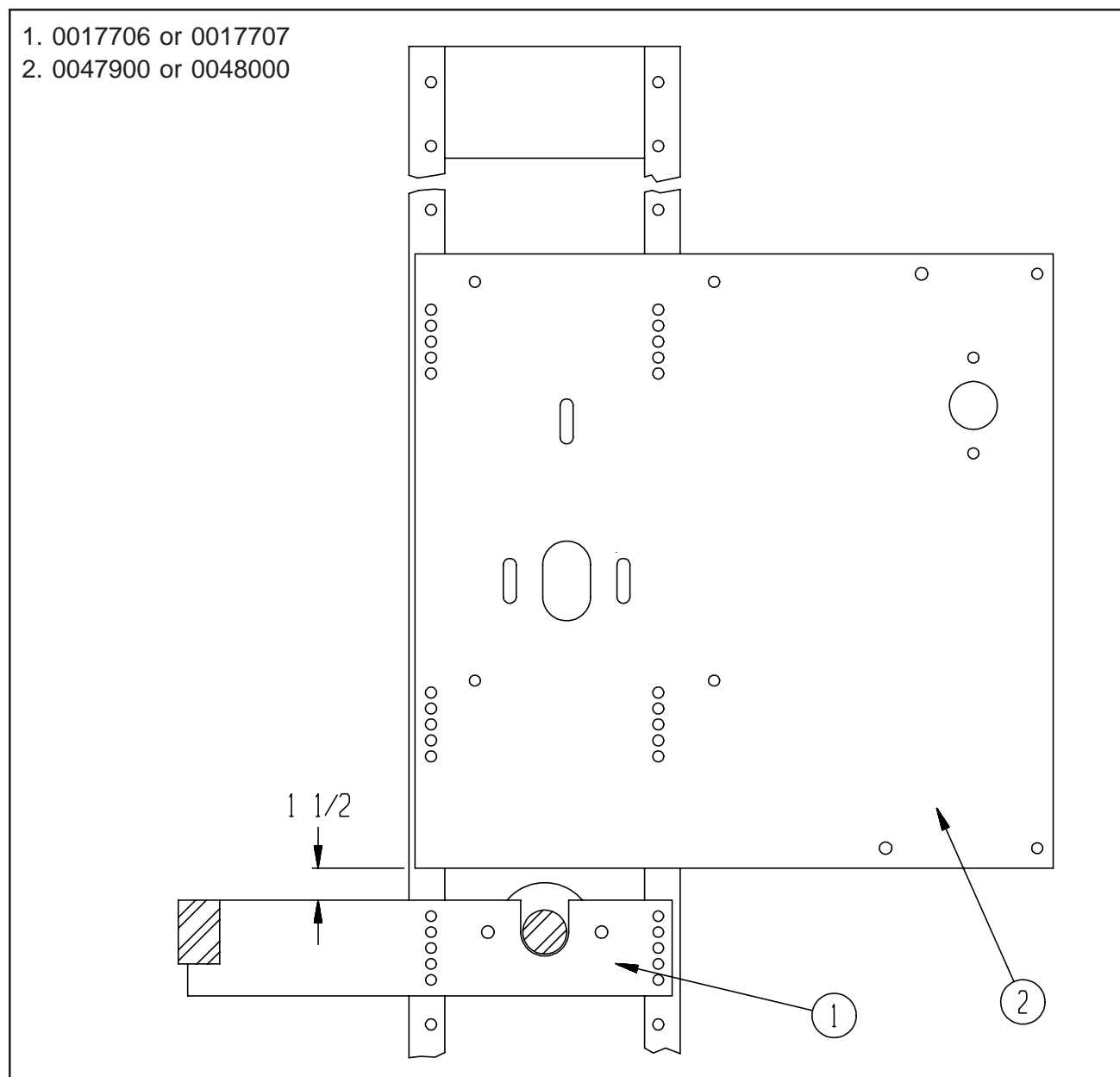


Figure A-1: Vacuum Feed Mounting Plates Location

SLIDE BEARING BLOCK ADJUSTMENT

Without the Vacuum Feed Drive Chain connected, adjustments for the attachment can be started by jogging the machine until the Mandrel is on the return stroke. With Mandrel on the return stroke, stop the machine when the forming end of the Mandrel is even with the front of the Vertical Guide Bars (0017901, Standard Tray & Standard Bliss...0017903 R/L, Wide Base Tray & Wide Base Bliss). Next, the lowest point of travel for the Slide Bearing Block (0047800) must be set. At the lowest point of travel there should be 3/4" between the bottom the Slide Bearing Block and the top of the lower Vacuum Cup Cam Support Bar (0047000, Standard Tray & Standard Bliss...0047002, Wide Base Tray & Wide Base Bliss). With the Slide Bearing Block in the position (a 3/4" spacer may be used to rest the block on), the Vacuum Feed Connecting Rods (0046900) are adjusted and installed.

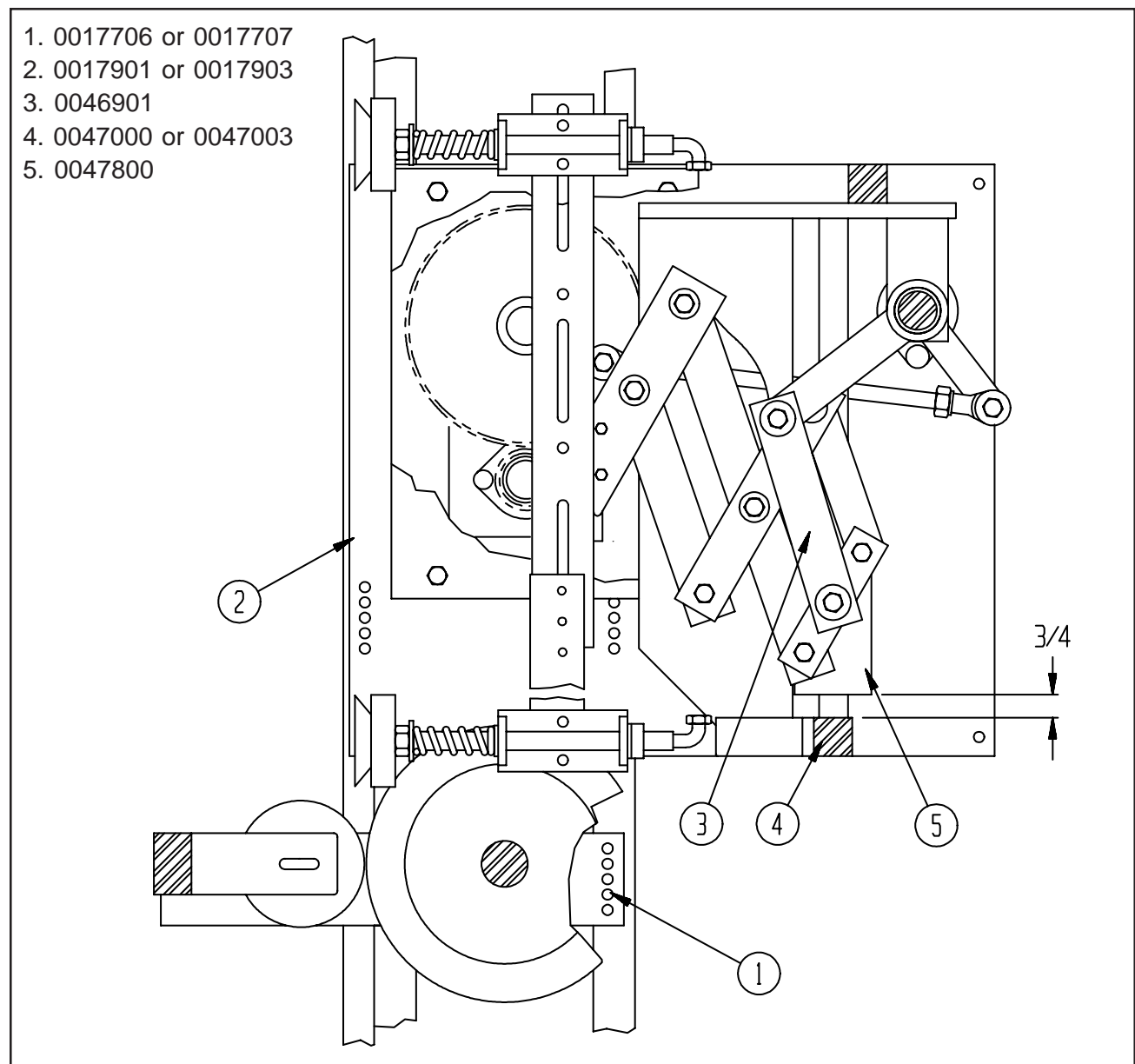


Figure A-2: Slide Bearing Block Adjustment

Tray Box Former



VACUUM FEED DRIVE CONNECTING ROD ADJUSTMENT

To adjust the Vacuum Feed Drive Connecting Rod (0045800), thread the Rod End Bearings (0501001) in or out on the Con Rod until a centerline-to-centerline dimension of 12 5/8" is obtained. Before installing the Drive Connecting Rod (0045800) be sure the Slide Bearing Block (0047800) is at the lowest point of travel and the Connecting Rods (0046900) are adjusted and installed. With these adjustments done, the arm welded to the Vacuum Cup operating Shaft (0045900, Standard Tray & Standard Bliss...0045901, Wide Base Tray & Wide Base Bliss) should be pointing toward the rear of the attachment. Next, mount one end of the adjusted Drive Connecting Rod to the Vacuum Feed Drive Gear (0045300) using the Drive Gear Crank Spacer Bushing (0201700). After mounting to the Drive Gear, rotate the gear until the other end of the Drive Connecting Rod can be mounted to the arm welded to the Vacuum Cup Operating Shaft.

Vacuum Feed Attachment - Option

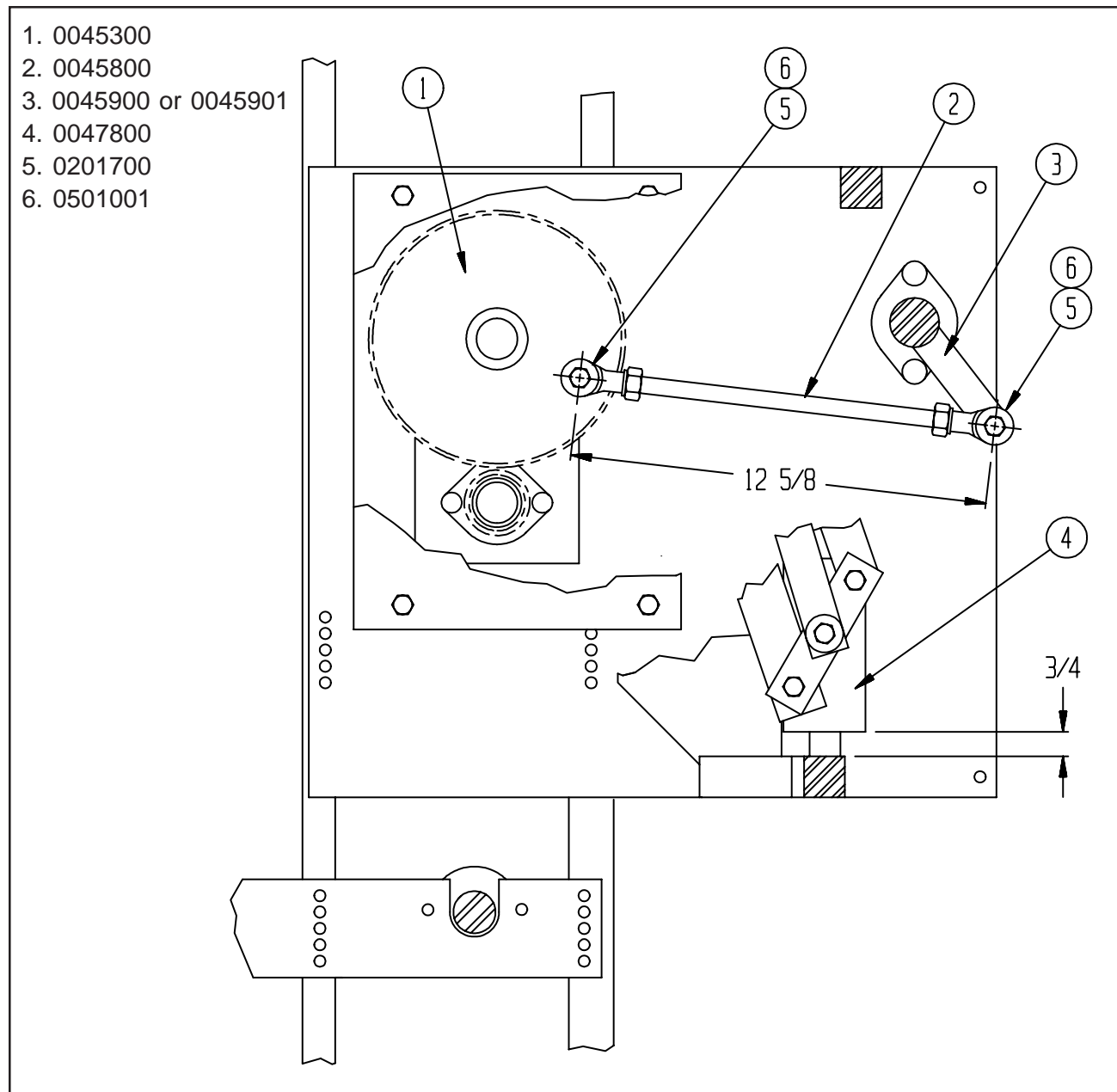


Figure A-3: Vacuum Feed Drive Connecting Rod Adjustment

VACUUM FEED DRIVE CHAIN INSTALLATION

FIGURE A

After all of the Con Rods have been adjusted and installed, the Vacuum Feed Drive Chain (#40 chain with a connecting link) is installed. To install the Drive Chain, loosen the bolts which hold the Vacuum Feed Drive Mounting Plate (0045700) to the Vacuum Feed Mounting Plate (0048000) and slide the Drive Mounting Plate to the bottom of the adjusting slots in the Vacuum Feed Mounting Plate.

FIGURE B

Next, install the Drive Chain from the Vacuum Feed Drive Sprocket (0045400, 0045401 or 0045402) to the Vacuum Feed Ratio Change Sprocket (0045600, 0045601 or 0045602), then slide the Drive Mounting Plate upward in the slots until the Drive Chain is snug and retighten the mounting bolts.

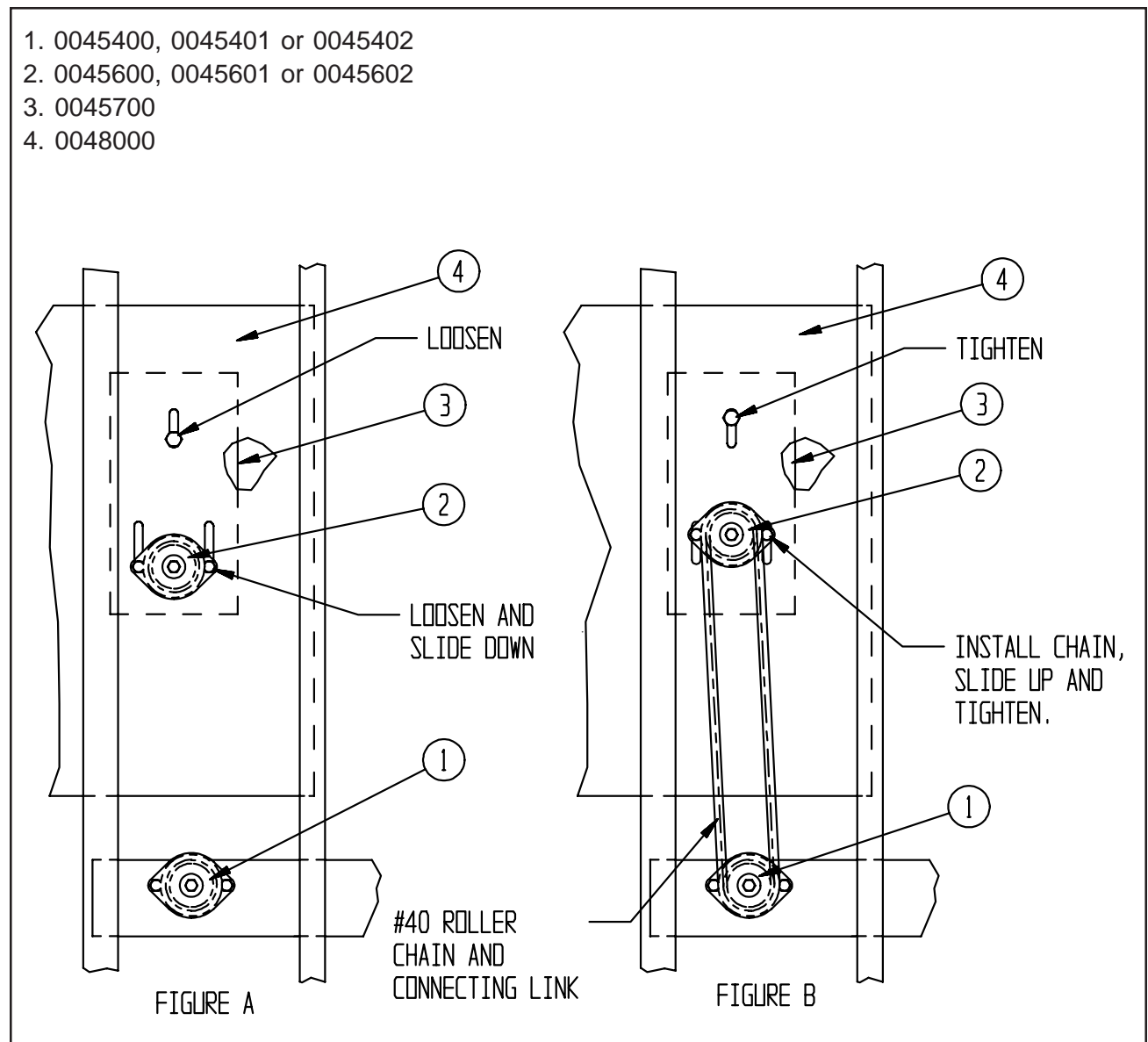


Figure A-4: Vacuum Feed Drive Chain Installation

Tray Box Former



VACUUM FEED TIMING ADJUSTMENT

NOTE: Throughout the remainder of the instruction sheet the term, Original Starting Position, shall be used to describe the position of the machine when the Mandrel is on the return stroke with the forming end of the Mandrel even with the front of the Vertical Guide Bars (0017901, Standard Tray & Standard Bliss...0017903 R/L, Wide Base Tray & Wide Base Bliss) and Slide Bearing Block (0047800) is at the lowest point of travel.

Before adjusting the timing, set the machine to the original starting position. Next, cycle the machine to determine whether the blanks should be fed earlier (with the Mandrel closer to the beginning of the return stroke). When the timing direction has been determined, return the machine to the original starting position and begin adjusting the timing by either of the following methods:

NOTE: When adjust the timing, the Mandrel must always be on the return stroke.

METHOD #1: ADJUSTING THE TIMING AT THE DRIVE SPROCKET

With the machine in the original starting position, loosen the Take-Up Chain Idler which is located inside of the lower frame on the left side of the machine and slide the Idler up to release chain tension. To adjust the timing to feed blanks later, jump the chain back (in counter-clockwise direction) on the Blank Feed Drive Sprocket (0043200, 40B10...0044500, 40B15) which is located on the pinion Transmission Shaft inside of the lower frame on the left side of the machine. To adjust the timing to feed blanks earlier, jump the chain ahead (in a clockwise direction) on the Blank Feed Drive Sprocket. To check the timing, slide the Chain Idler down to remove the slack from the chain and tighten the Idler. Then cycle the machine to check the timing.

NOTE: This is a good starting point for most machines. However, some blanks require more adjustment than others and trial and error procedure should be followed until the correct timing is achieved.

1. 0043200 or 0044500
2. 0045400, 0045401 or 0045402

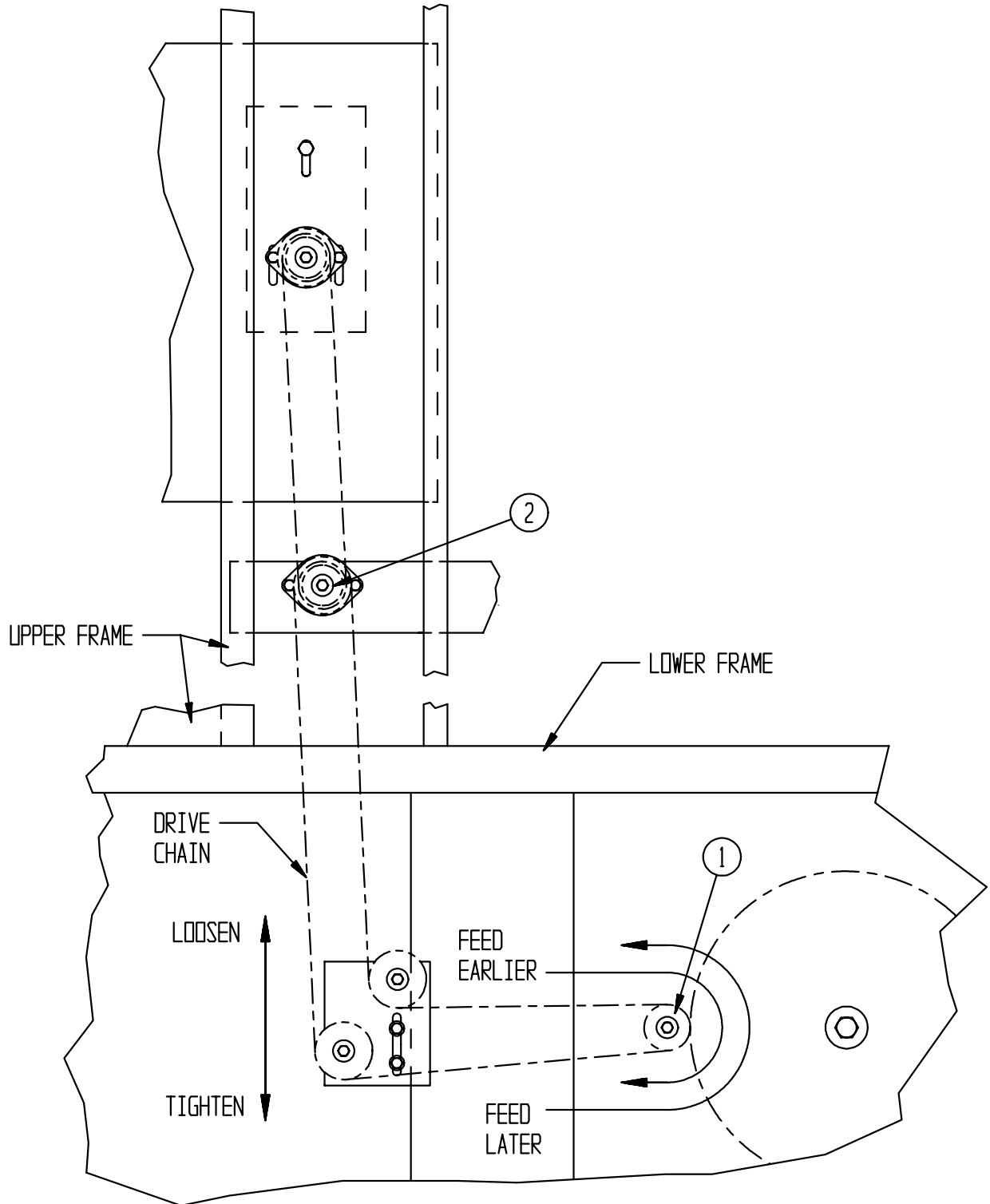


Figure A-5: Vacuum Feed Timing Adjustment (Method #1)

Tray Box Former



VACUUM FEED TIMING ADJUSTMENT (CONTINUED)

METHOD #2: ADJUSTING THE TIMING AT THE PINION GEAR

With the machine in the original starting position, remove the Vacuum Feed Drive Mechanism Guard (0048200). With the guard removed, remove the 3/8" bolt which holds the Pinion Transmission Gear (0029501) to the Pinion Drive Axle (0045500) and remove the Pinion Gear. To adjust the timing to feed blanks later (with the Mandrel closer to the end of the return stroke) rotate the Blank Feed Wheel, in the normal direction of rotation, until the Mandrel seems to be in the correct location to allow the blanks to be fed without hitting the top of the Mandrel and also allow the blanks to be on the Bottom Stops (0030902) before the Mandrel starts the forming stroke. Reinstall Pinion Gear and cycle the machine to check the timing.

To adjust the timing to feed blanks earlier (with the Mandrel closer to the beginning of the return stroke) jog the machine until the Mandrel has finished the return stroke, gone through the forming stroke and is just beginning the return stroke. Remove the Pinion Transmission Gear (0029501) and rotate the Blank Feed Wheel, in the normal direction of rotation, until the Mandrel seems to be in the correct location to allow the blank to be fed without hitting the top of the Mandrel and also allow the blanks to be on the Bottom Stops before the Mandrel starts the forming stroke. Reinstall Pinion Gear and cycle the machine to check the timing. When the correct timing is achieved, reinstall the Vacuum Feed Drive Mechanism Guard.

NOTE: This is a good starting point for most machines. However, some blanks require more adjustments than others and a trial and error procedure should be followed until the correct timing is achieved.

1. 0029501
2. 0048200

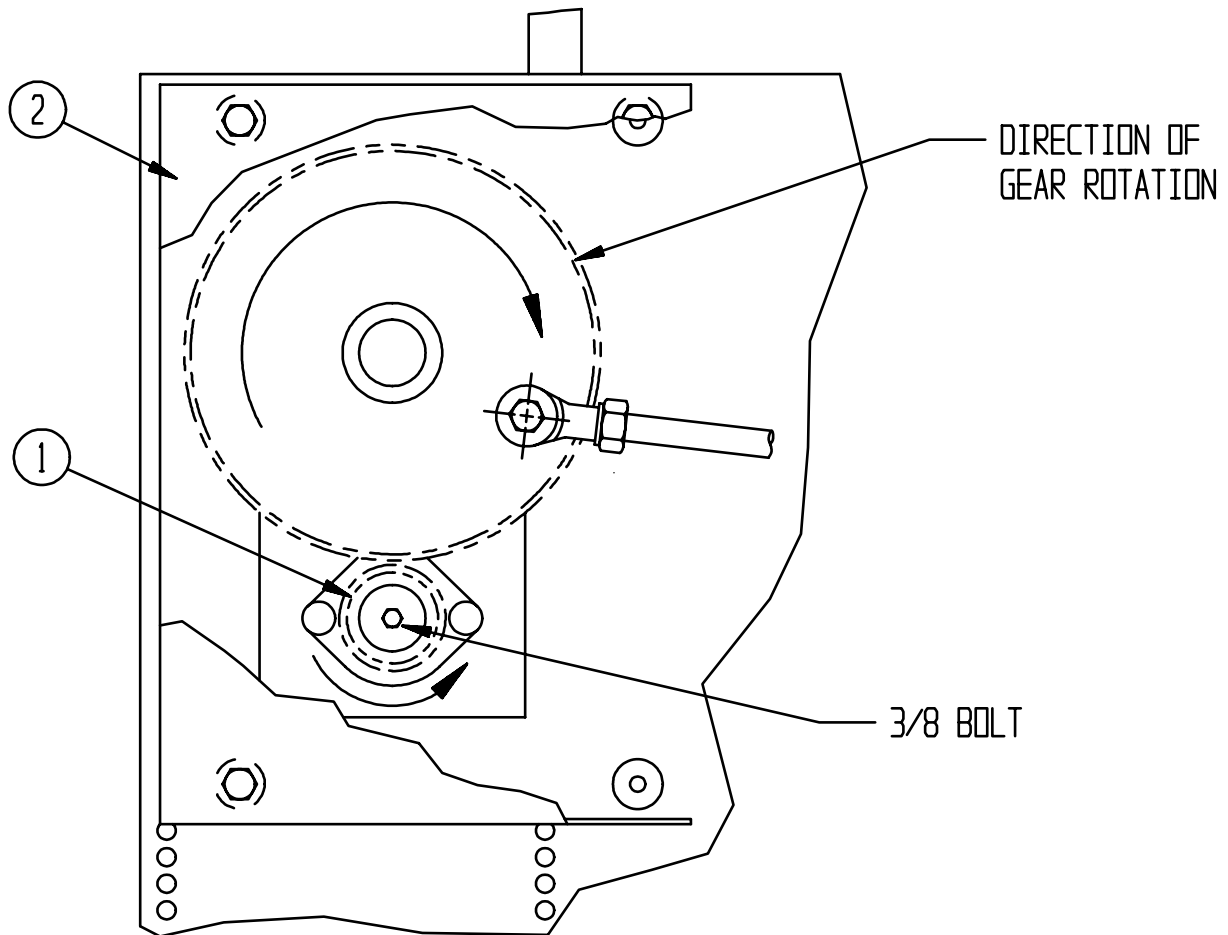


Figure A-6: Vacuum Feed Timing Adjustment (Method #2)

Vacuum Feed Attachment - Option

BLANK HOPPER ADJUSTMENT

For field installation, the following parts should be installed before the hopper is adjusted: (1) Blank Hopper Loading Support (0013605), (2) the Hopper Bottom Stop Plate Bar (0049100) and the Hopper Bottom Stop Plates (0049000) should be bolted together and mounted to the Blank Hopper Loading Support, (3) the Blank Support Knives (0010502 R/L) should be mounted to the Hopper Bottom Stop Plates (1 per Plate on the outer edge), (4) the Tray Blank Support Blades (0019505 R/L or 0019513 R/L) should be mounted on the upper set of the Tray Blank Blade Support Bars (0018902 R/L) for the Tray Box Former machines or the Blank Support Bars (0019006 R/L or 0019007 R/L) should be mounted on the Blank Hopper Panels (0017802 R/L) for a Bliss Box Former machine, (5) the Blank Hopper Guides (0039500) should be mounted on the Vertical Guide Bars below the Tray Blank Blade Support Bars (Tray Box Former) or below the Blank Support Bars (Bliss Box Former).

To adjust the hopper, set a blank on the Blank Hopper Loading Support (13605) and adjust the Tray Blank Support Bars (18902 R/L) or the Blank Hopper Panels (17802 R/L) by loosening the 5/16 bolt and sliding the Bars or Panels up or down on the Vertical Guide Bars. The location for the Tray Box Former should be set to the position where the Tray Blank Support Blades are in the center of the cut-out slots on the blank when the blank is resting on the horizontal portion of the Blank Hopper Loading Support. If the Blanks are not square or the slots are not cut accurately, adjust the Support Blades so the blank sets straight in the Vertical Guide Bars. The location for the Bliss Box Former should be set to the position where the Blank Support Bars are slightly above the center of the cut-out notches on the blank or to a position that will allow the blank to rest on the Blank Support Bars when the blank is not on the horizontal portion of the Blank Hopper Loading Support.

1. 0010502
2. 0013605
3. 0018902
4. 0019505 or 0019513
5. 0049000
6. 0049100

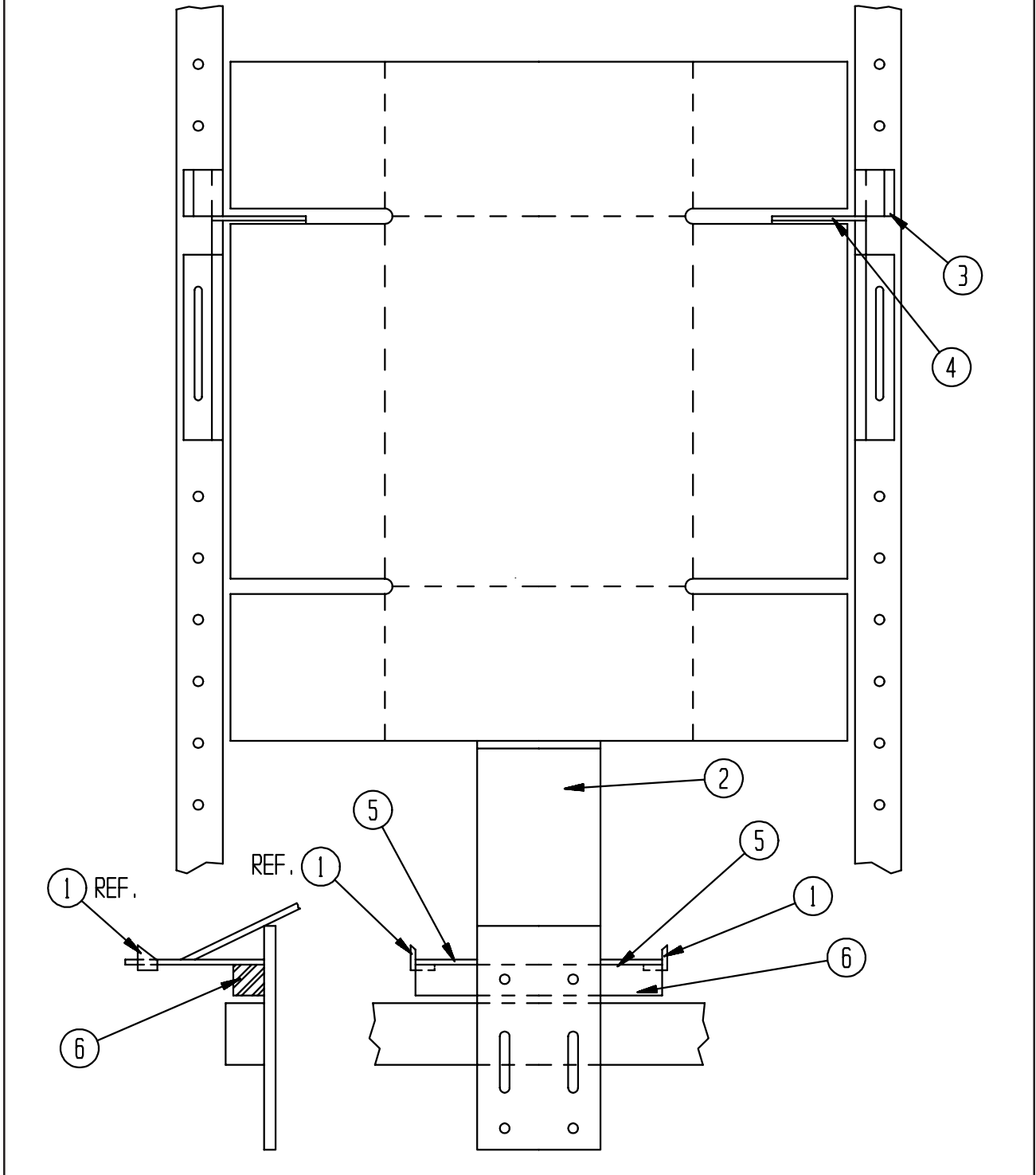


Figure A-7: Blank Hopper Adjustment

Vacuum Feed Attachment - Option

SET-UP OF VACUUM FEED CUP LOCATIONS

When setting the height and width locations of the vacuum cups, the lower set of cups should be adjusted first. With the Slide Bearing Block (0047800) at the lowest point of travel, adjust the lower Vacuum Cup Tube Support Brackets (0038101) to clear the Blank Feed Roller Shaft (0015205, Standard Tray & Standard Bliss...0015206, Wide Base Tray & Wide Base Bliss) by 1/8" to 1/4". Next, jog the machine until the Slide Bearing Block is at the maximum up position and adjust the width setting of the lower cups to where the inside edges of the Cup Pads are in line (above) with the Blank Support Knives (0010502 R/L) mounted on the Hopper Bottom Stop Plates (0049000). To adjust the upper set of cups, the width should be the same as the lower cups and the height should be adjusted to have the Knives mounted on the Tray Blank Blade Support Bars (0018902 R/L) or the Bliss Blank Hopper Panels (0017802 R/L). This is a very general method for adjusting the cup location, larger blanks and special blank designs may require different cup locations or more cups. Plemons Machinery requires a blank or a blank specification in order to ship the correct parts for locating the cups because there may be some special parts to manufacture in order to obtain the best cup location.

NOTE: For very shallow tray blanks, do not set up the lower set of Vacuum Cups to contact the blank below the end panel score line if the end panel is shallow enough to break away from the Cup Pads when the blank is pulled through the Blank Support Knives.

1. 0010502 R/L
2. 0015205 or 0015206
3. 0038101
4. 0049000

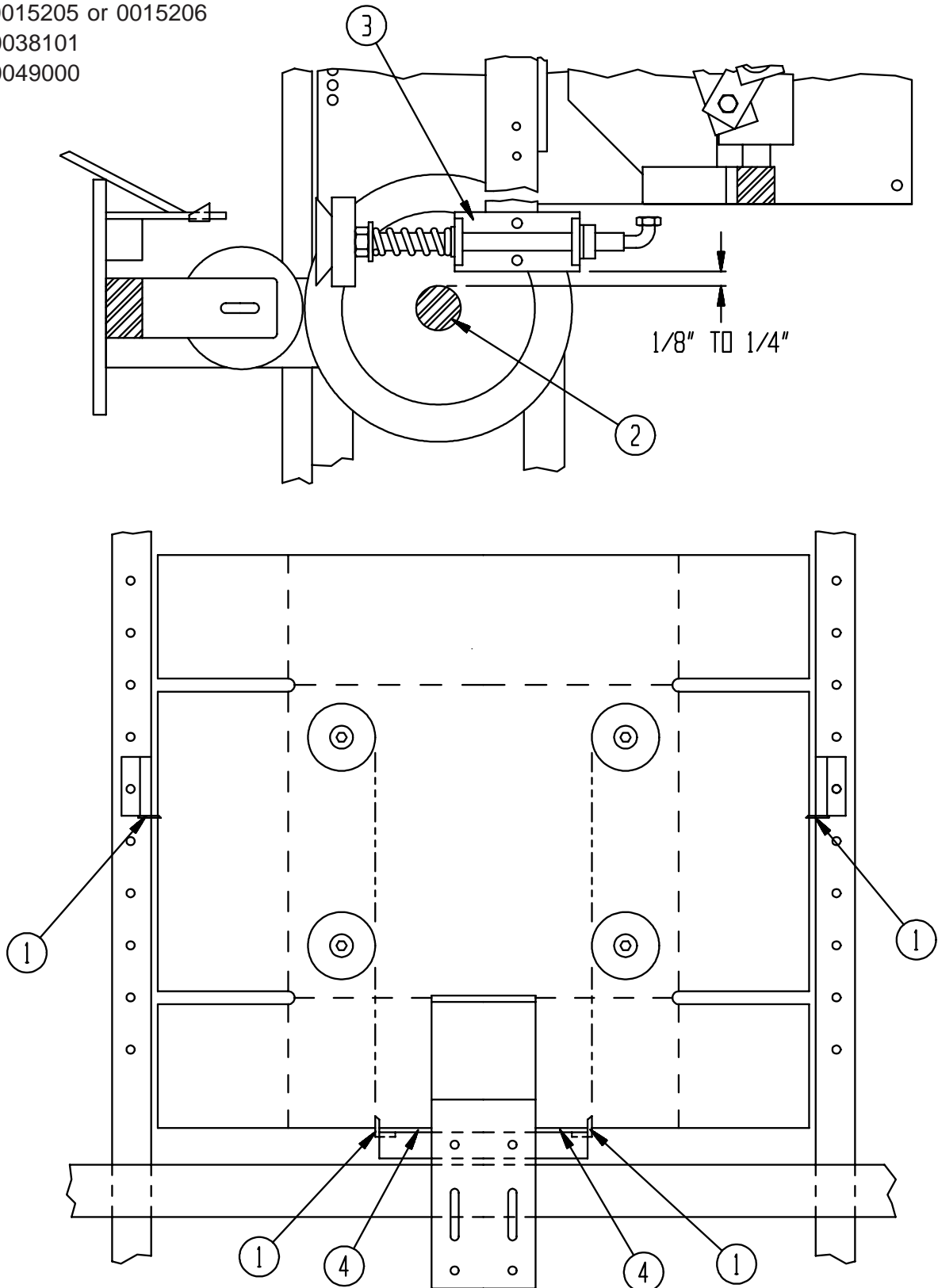


Figure A-8: Set-Up of Vacuum Feed Cup Locations

Vacuum Feed Attachment - Option

Tray Box Former



SUCTION CUP MOUNTING TUBE ADJUSTMENT

When making the adjustments for the Suction Cup Mounting Tubes (0037901) the only adjustment necessary is for the return (blank releasing) stroke, the forward (blank picking) stroke will be set by adjusting return stroke.

With the Cam Follower Bearing (0501400) in the vertical portion of the cam track in the Vacuum Cup Operating Plate Cam (0047700) and the Slide Bearing Block at approximately the lowest point of travel, turn the Vacuum Blower "on" and place a blank on the Vacuum Cup Pads (0039200). Next with the blank being held by suction to the Vacuum Cup Pads, the Suction Cup Mounting Tubes should be adjusted to hold the blank between the Vertical Guide Bars and against the Blank Rear Stops (0025000) mounted on the rear side of the Vertical Guide Bars. To adjust the tubes, slide the tubes in or out until the blank is held against the Blank Rear Stops and use the set of collars to maintain the location by sliding them snugly against the Vacuum Cup Tube Support Bracket (0038101) and tightening the set screws. After adjusting the Tubes, release suction at the manifold by lifting the Vacuum Valve Cover Pad (0044800). When suction is released, the cup faces should retract slightly from the blank to allow 1/8" to 1/4" of clearance between the blank and Cup Pads. If the Tubes are not adjusted so the Cup Pads clear the blank when the suction is released, the Cup Pads will wear excessively or will be torn from the Vacuum Cup Bolt (0039100) and will be damaged.

Vacuum Feed Attachment - Option

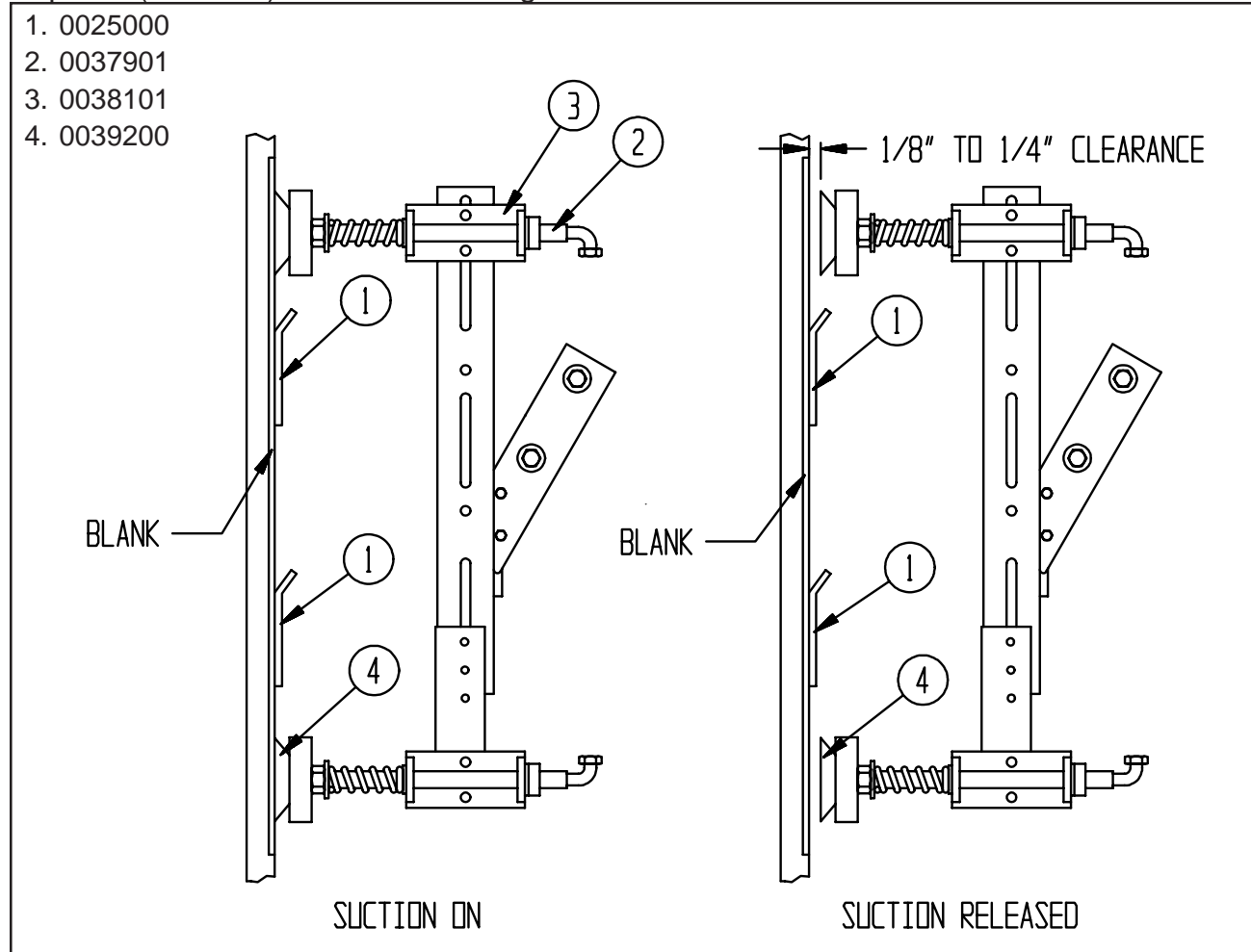


Figure A-9: Suction Cup Mounting Tube Adjustment

VACUUM VALVE OPERATING CAM ADJUSTMENT

To adjust the Vacuum Valve Operating Cam (0038001), load the hopper with blanks, turn the Vacuum Blower "on" and jog the machine until a blank is pulled from the hopper by the Vacuum Cups. With the Blank held to the Vacuum cups by suction continue to jog the machine until the blank is between the Vertical Guide Bars, against the Blank Rear Stops and the bottom the blank is just touching the Blank Feed Wheel (0018001, Standard Tray & Standard Bliss ...0018002, Wide Base Tray & Wide Base Bliss) and the Blank Feed Idle Roller (0018100). When the bottom of the blank just touches the Blank Feed Wheel, the Vacuum Valve Operating Cam should be set to start releasing suction. When the Bottom of the blank is in line with the centerline of the Blank Feed Wheel, suction should be completely released. The suction must be completely released when the bottom of the blank is in line with the centerline of the Blank Feed Wheel, releasing suction too early will allow the blank to become misaligned and may not feed properly, releasing too late will allow the blank to be held too long which may result in misprogramming of adhesive or tearing the Cup Pads from the Vacuum Cup Bolts.

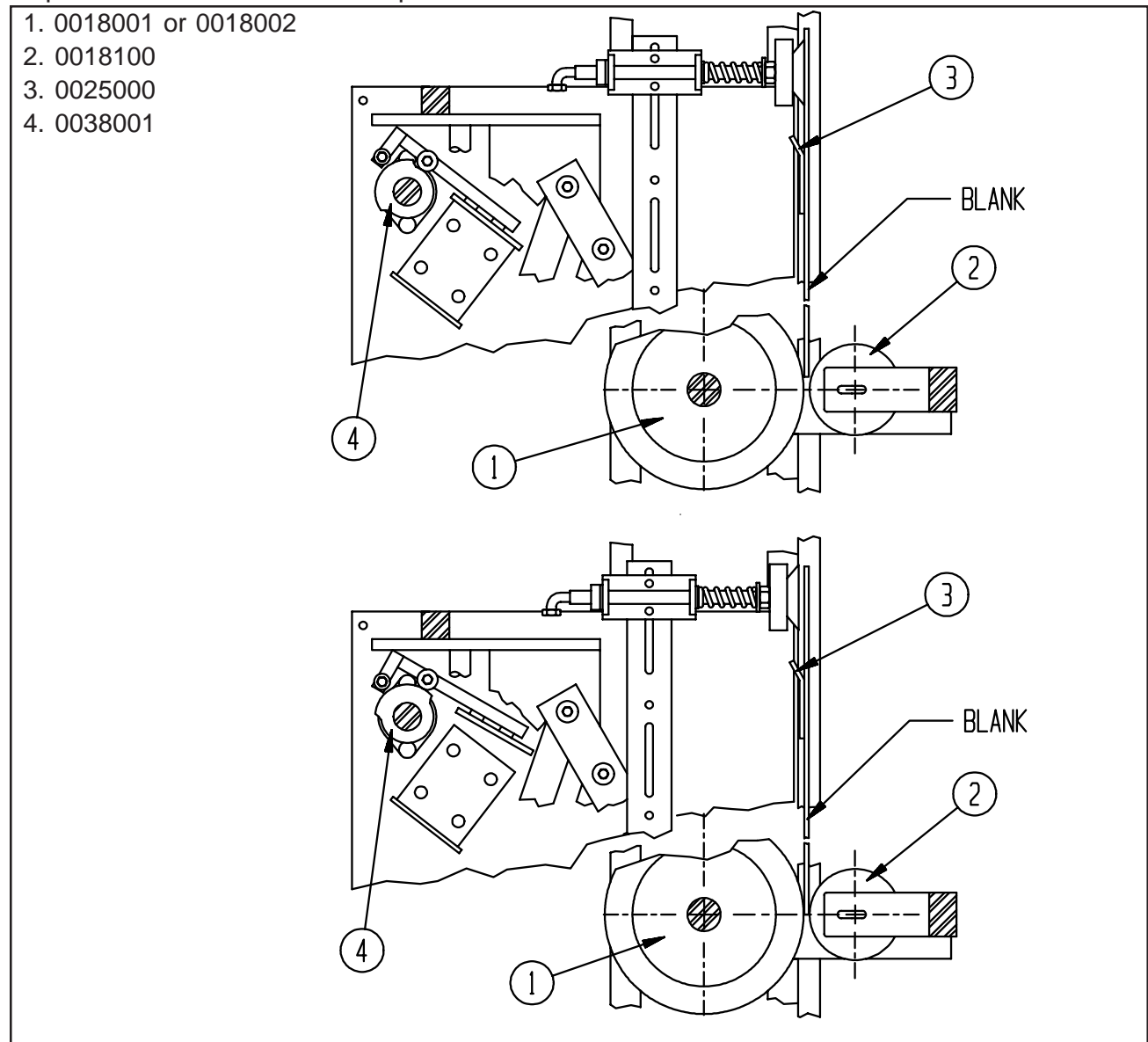


Figure A-10: Vacuum Valve Operating Cam Adjustment

Tray Box Former



LOCATION OF BLANK SUPPORT KNIVES

When using the Vacuum Feed Attachment, the Blank Support Knives (0010502 R/L) are used to allow a picked blank to leave the hopper while the trailing blanks are held in the hopper by the knives. To run a standard tray or bliss blank, there are usually two sets (1R/1L) of knives used. One set is located on the Hopper Bottom Stop Plates (0049000) to hold the bottom of the blank in the hopper. Another set is located on the upper Tray Blank Blade Support Bars (0018902R/L) or on the Bliss Blank Hopper Side Panels (0017802 R/L) to hold the upper portion of the blank in the hopper. If the blanks are extremely weak or heavy an extra set of knives may be mounted to the Blank Hopper Guide (0039500) to help keep the blanks in the hopper. When mounting the knives, a flat washer or two may be required as a spacer between the knife and the mounting surface, to avoid cutting the blank when it is picked. If spacers are required, use only enough to allow a blank to be picked and still hold the trailing blank; spacing too much will allow the trailing blank to pass through the knives.

MINIMUM AMOUNT OF BLANKS IN HOPPER

When operating Vacuum Feed Attachment, refill the hopper with blanks when the amount of blanks in the hopper is approximately even with the front edge of the Adhesive Melt Pots.

VACUUM FEED ATTACHMENTS GUARDS

All guards for the Vacuum Feed Attachment, the Vacuum Feed Drive Mechanism Guard (0048200) and the Vacuum Feed Rear Guard (2002700, Standard Tray & Standard Bliss ...2002800, Wide Base Tray & Wide Base Bliss), must be securely in place prior to operating the machine. All guarding must always be in place while operating the machinery. Extreme caution should be taken while making adjustments or size changes with the guards off.

Vacuum Feed Attachment - Option



OVERALL OPERATION OF THE VACUUM FEED ATTACHMENT

With the hopper full of blanks and the Speed Control Knob (0027500) and turned down to the slowest speed (clockwise), turn the Vacuum Blower “on” and jog the machine until a blank is picked from the hopper by the Vacuum Cups. Continue to jog the machine through the cycle allowing the Vacuum Feed Mechanism to pull the blank between the Vertical Guide Bars and against the Blank Rear Stops. With the blank in this position, continue the cycle until the blank is pinched between the Blank Feed Wheel and the Blank Feed Idler Roller with the bottom edge of the blank even with the centerline of the Blank Feed Wheel. With the blank in this position, check the Vacuum Valve Operating Cam to insure that it is positioned properly to completely release suction. Also check the Cup Pads to insure that they have retracted slightly from the blank to eliminate interference. After checking the Cam and Cup Pads, continue to jog the machine until the blank is through the Blank Feed Wheel and Roller and drops on to the Blank Bottom Stops. The blank should be on the Bottom Stops before the mandrel begins the forming stroke. After achieving the correct timing, the adhesive programming may need to be readjusted. After timing and adhesive programming have been adjusted and the operator is satisfied that the machine is operating correctly, the Speed Control Knob may be set to the desired production rate (counter-clockwise).

A.2 Troubleshooting

INTRODUCTION

Table A-1 provides a logical sequence of tests that are designed to isolate problems with the Vacuum Feed Attachment. This table includes a list of probable causes and remedies. Referring to Section 5.0 will aid in understanding the operation and functions of various components and systems that interact with the Vacuum Feed Attachment and help in diagnosing and repair of the machine.

A.3 Troubleshooting Chart

See Next Page.

Tray Box Former



Table A-1: Vacuum Feed Attachment - Troubleshooting Chart

TROUBLE	PROBABLE CAUSE	POSSIBLE REMEDY
1. Vacuum Blower does not operate.	A. Main disconnect switch is in the "OFF" position.	A. Turn main disconnect switch to "ON" position.
	B. Blower "ON-OFF" switch in "OFF" position.	B. Turn switch to "ON" position.
	C. Loose wires.	C. Check For loose wire and terminal connections or broken wires.
	D. Defective motor starter (0401300).	D. Replace motor starter.
	E. Blower shuts off after short period of operation.	E. Check incoming voltage versus wired voltage.
	F. Blower shuts off after prolonged period operation.	F. Replace blower unit if necessary.
2. No suction at vacuum cups.	A. Blower not operating.	A. Refer to Troubleshooting Guide Section 1.
	B. Poly flow vacuum tubing (0037300) damaged.	B. Check tubing for loose connections, cracks or holes. Replace if necessary.
	C. Suction hole in the vacuum cup bolt (0039100) clogged with fiber.	C. Push clogged fiber thru with rod while blower is operating.
	D. Vacuum valve cover pad (0044800) not seating on vacuum valve manifold (0044600).	D. Adjust to allow cover pad to seat on manifold.
	E. Vacuum cup pads (0039200) damaged or worn out.	E. Replace if necessary.
3. Suction does not release.	A. Vacuum valve operating cam (0038001) is not adjusted correctly.	A. Adjust cam (refer to cam adjustment section).
4. Vacuum feed mechanism cycles but does not pull a blank from the hopper.	A. Vacuum blower is not operating.	A. Refer to Troubleshooting Guide Section 1.)
	B. Vacuum cups contact blank over slots or holes.	B. Reposition vacuum cups.
	C. Lower set of vacuum cups position to low.	C. Reposition cups. (Refer to cup placement section).
	D. Blank support knives (0010502 R/L) not allowing blank to be pulled from hopper.	D. Use 1 or 2 washers to space knives out.
	E. Too few blanks in the hopper.	E. Add blanks to hopper.
5. Blank drops from vacuum cups before it is placed into feed wheels.	A. Vacuum valve operating cam (0038001) not adjusted correctly.	A. Adjust cam. (Refer to Cam adjustment section).
	B. Return stroke for vacuum cup mounting tubes (0037901) not adjusted correctly.	B. Adjust tubes. (Refer to tube adjustment section).
	C. Vertical guide bars set to tight.	C. Adjust. (Refer to Section 5.0 in the Tray Box Former manual or Section 5.0 in the Bliss Former Manual).

Vacuum Feed Attachment - Option



Tray Box Former

Table A-1: Vacuum Feed Attachment - Troubleshooting Chart (Continued)

TROUBLE	PROBABLE CAUSE	POSSIBLE REMEDY
6. More than one blank being puled from hopper.	A. Blank support knives (0010502 R/L) not in deep enough to hold trailing blank.	A. Remove washer between knife and mounting surface.
	B. Vertical guide bars not adjusted correctly.	B. Adjust (Refer to Section 5.0 in the Tray Former manual or Section 5.0 in the Bliss Former manual).
	C. Blanks interlocking due to cut outs or coating.	C. Check with corrugated supplier.
	D. Blanks vary in width.	D. Check with corrugated supplier.
7. Blank hits top of mandrel on return stroke.	A. Blanks are being fed to early.	A. Adjust timing (Refer to timing method #1 or #2).
8. Forming mandrel hits blank before blank is on bottom stops.	A. Blanks are being fed to late.	A. Adjust timing (Refer to timing method #1 or #2).
9. Vacuum blower blowing not sucking.	A. Wrong direction of rotation for blower motor.	A. For 3 Phase machines reverse wires M1 and M2.

A.4 Maintenance

See Next Page.

Tray Box Former



A.5 Primary Lubrication

A lubrication program is also vital to the successful performance of the Vacuum Feed Attachment. The following lubrication check list outlines the critical requirements. Daily lubrication requires the use of 10 wt. oil or lighter. (See Table A-2)

Table A-2: Primary Lubrication

ITEM	INSPECTION	FREQUENCY	ACTION
Vacuum feed linkage bushings.		Daily	Lubricate with 10 wt. oil or lighter.
Linear slide bearing block assembly. (0047800)		Daily	Lubricate with 10 wt. oil or lighter.
Rod end bearings for 0045800 and 0046900.		Daily	Lubricate with 10 wt. oil or lighter.
Bushing in cam top bracket. (0047501)		Daily	Lubricate with 10 wt. oil or lighter.
Suction cup mounting tubes. (0037901)	Check for lubricant	Weekly	Lubricate with 10 wt. oil or lighter.
Vacuum cup operation plate cam. (0047700)	Check for lubricant	Weekly	Lubricate with 10 wt. oil or lighter.
Roller chain drives.	Check for excessive wear and oil.	1 to 2 Months	Lubricate with chain oil
Vacuum feed drive gear (0045300)	Check for gear grease	6 Months	Lubricate with open type gear grease

A.6 Primary Maintenance

A continuous maintenance program is vital to the successful performance of the Vacuum Feed Attachment. The following maintenance check list outlines the critical requirements. (See Table A-3)

Table A-3: Primary Maintenance

ITEM	INSPECTION	FREQUENCY	ACTION
Bolted joints and set screws	Check for tightness	Daily	Tight all bolts and set screws
Vacuum cup tube support brackets (0038101)	Check for excessive wear.	Weekly	Replace as necessary
Vacuum cup pads (0039200)	Check for excessive wear or breaks.	Weekly	Replace if worn or broken
Poly flow vacuum tubing (0037300)	Check for holes, cracks and loose connections.	Weekly	Replace if holes or cracks exist, tighten loose connections.

A.7 Blower Maintenance

See Next Page.



A.8 Vacuum Regenerative Blower Maintenance

1. All models are equipped with sealed bearings.
2. Should excessive amounts of material pass through the blower, it is suggested that the cover and impeller be removed periodically and cleaned to avoid impeller imbalance. Impeller imbalance greatly speeds bearing wear, thus reducing blower life.

A.9 Vacuum Regenerative Blower - Troubleshooting

Chart Figure A-4: Vacuum Regenerative Blower - Troubleshooting Chart

		POSSIBLE CAUSE	REMEDY
IMPELLER DOES NOT TURN	HUMMING SOUND	<ol style="list-style-type: none"> 1. *One phase of power line not connected 2. *One phase of stator winding open. 3. Bearings defective. 4. Impeller jammed by foreign material. 5. Impeller jammed against housing or cover. 6. **Capacitor open 	<ol style="list-style-type: none"> 1. Connect 2. Contact factory 3. Change bearings 4. Clean 5. Adjust 6. Change capacitor
	NO SOUND	<ol style="list-style-type: none"> 1. *Two phases of power line not connected. 2. *Two phases of stator winding open. 	<ol style="list-style-type: none"> 1. Connect 1. Contact factory
IMPELLER TURNS	BLOWN FUSE	<ol style="list-style-type: none"> 1. Insufficient fuse capacity rating. 2. Short circuit. 	<ol style="list-style-type: none"> 1. Use fuse of proper 2. Repair
	MOTOR OVERHEATED OR PROTECTOR TRIPS	<ol style="list-style-type: none"> 1. High or low voltage. 2. *Operating in single phase condition. 3. Bearings defective. 4. Impeller rubbing against housing or cover. 5. Impeller or air passage clogged by foreign material. 6. Unit operating beyond performance range. 7. **Capacitor shorted. 8. *One phase of stator winding short circuited. 	<ol style="list-style-type: none"> 1. Check input voltage 2. Check connections 3. Check bearings 4. Adjust 5. Clean 6. Contact factory 7. Change capacitor 8. Contact factory
	ABNORMAL SOUND	<ol style="list-style-type: none"> 1. Impeller rubbing against housing or cover. 2. Impeller or air passages clogged by foreign material. 3. Bearing defective. 	<ol style="list-style-type: none"> 1. Adjust 2. Clean 3. Change bearings
	PERFORMANCE BELOW STANDARD	<ol style="list-style-type: none"> 1. Leak in piping. 2. Piping and air passages clogged. 3. Impeller rotation reversed. 4. Leak in compressor flange. 5. Low voltage. 	<ol style="list-style-type: none"> 1. Tighten 2. Clean 3. Check wiring 4. Tighten cover 5. Check input voltage

Notes:

** Single Phase Unit & * Three Phase Unit

Vacuum Feed Attachment - Option

Tray Box Former



A.10 Drive Combinations Chart

Table A-5: Vacuum Feed Drive Combinations

RATIO	JACK SHAFT	MATT FEED SHAFT		VACUUM FEED
4:1	0043200	0045400		0045600
	40B10	40B24	40A20	40B20
6:1	0044500	0045400		0045601
	40B15	40B24	40A20	40B30
8:1	0044500	0045402		0045602
	40B15	40B18	40A18	40B36

A.11 Blank Length

Table A-6: Maximum Blank Length

RATIO	MATT FEED WHEEL 0018001 (9" DIA. WHEEL)	MATT FEED WHEEL 0018002 (10 1/2" DIA. WHEEL)
4:1	33"	38"
6:1	47"	54 1/2"
8:1	61"	

Vacuum Feed Attachment - Option



Tray Box Former

A.12 Vacuum Feed Tray & Bliss Hopper Parts List

STANDARD BLISS FORMER AND TRAY FORMER HOPPER - VACUUM FEED

PART NO.	DESCRIPTION	QTY.
0010502L	KNIFE, MATT SUPPORT	1
0010502R	KNIFE, MATT SUPPORT	1
0039500	MATT GUIDE	1

STANDARD BLISS FORMER HOPPER -VACUUM FEED

PART NO.	DESCRIPTION	QTY.
0017802L	PANEL, BLANK HOPPER	1
0017802R	PANEL, BLANK HOPPER	1
0019006L	ANGLE, BLANK SUPPORT	1
0019006R	ANGLE, BLANK SUPPORT	1
0019007	BAR, BLANK SUPPORT	2

Vacuum Feed Attachment - Option

Tray Box Former

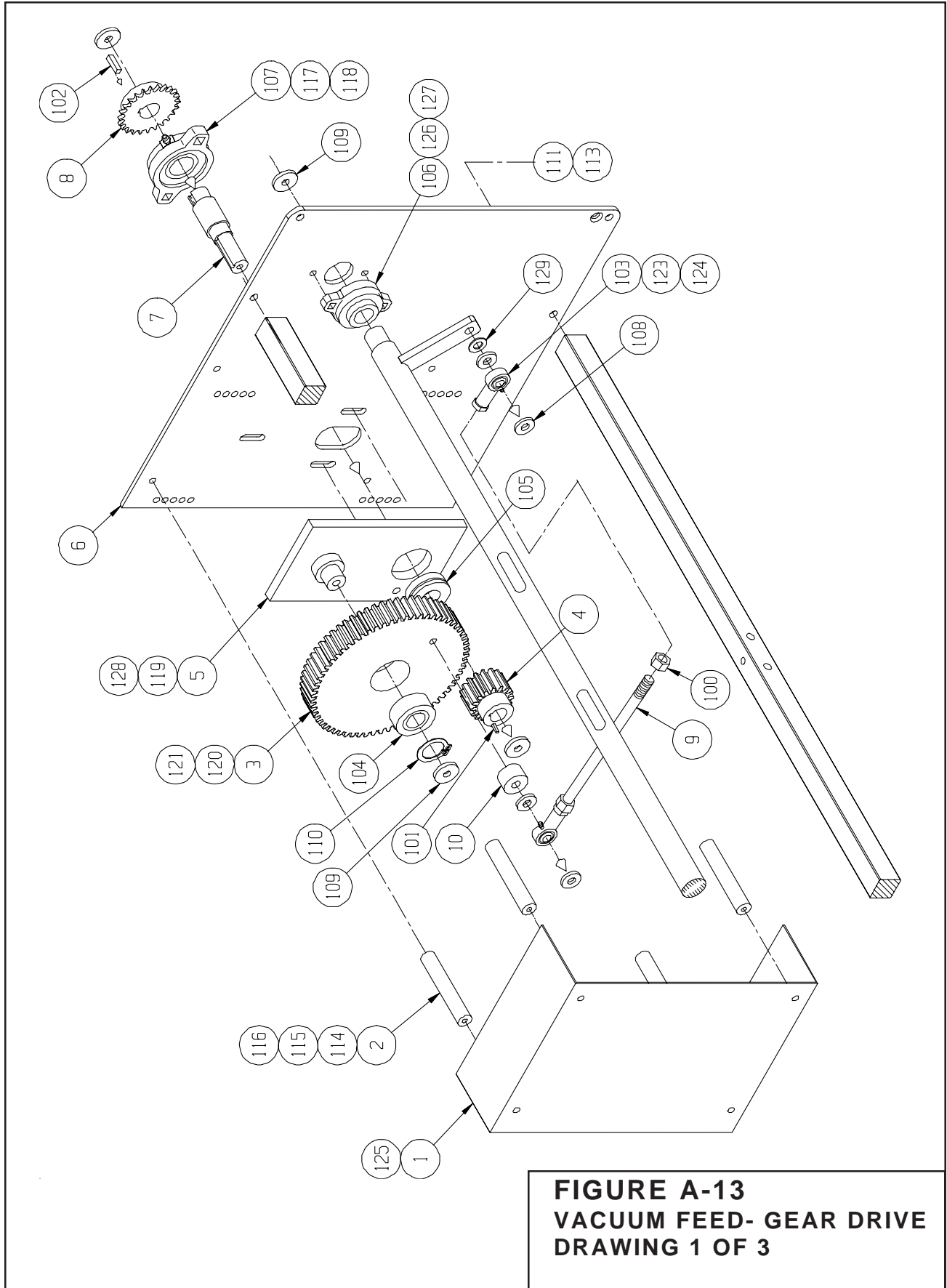


FIGURE A-13
VACUUM FEED-GEAR DRIVE
DRAWING 1 OF 3

ITEM	PART NO.	DESCRIPTION	QTY.
1	0048200	GUARD, VACUUM FEED GEAR	1
2	0048100	STUD, GUARD MOUNT	4
3	0045301	GEAR, VACUUM FEED DRIVE	1
4	0029501	GEAR, VACUUM PINION	1
5	0045700	PLATE, VACUUM FEED DRIVE MT.	1
6	0048000	PLATE, LEFT VACUUM FEED	1
7	0045501	AXLE, PINION DRIVE	1
8	0045600	SPROCKET, 40B20 (4:1)	1
	0045601	SPROCKET, 40B30 (6:1)	1
	0045602	SPROCKET, 40B36 (8:1)	1
9	0045800	ROD, VACUUM FEED DRIVE	1
10	0201700	BUSHING	1
100		7/16-20 STD HEX NUT	2
101	0900204	KEY, 3/16 SQ. X 1 1/4 LG	1
102	0900301	KEY, 1/4 SQ. X 1 LG	1
103	0501000	7/16" ROD END	2
104	0501300	BEARING, VACUUM DRIVE GEAR	1
105	0500401	BEARING, LOWER FRAME R/H	1
106	0501200	BEARING, 1"	1
107	0501201	BEARING, 1 3/16"	1
108	1500100	WASHER	4
109	1500500	WASHER	4
110	1803900	SNAP RING, VACUUM FEED	1
111		3/8-16 HEX HD CAP SCR X 1 LG	4
113		3/8 STD LOCK WASHER	7
114		5/16-18 HEX HD CAP SCR X 1 LG	4
115		5/16-18 STD LOCK WASHER	10
116		5/16 SAE FLT WASHER	10
117		3/8-16 CARRIAGE BOLT X 1 3/4 LG	2
118		3/8-16 STD HEX NUT	2
119		3/8-16 CARRIAGE BOLT X 3 LG	1
120		7/16-14 HEX HD CAP SCR X 2 1/2	1
121		7/16 STD LOCK WASHER	2
123		7/16-14 HEX HD CAP SCR X 1 3/4	
124		7/16-14 STD HEX NUT	1
125		5/16-18 HEX HD CAP SCR X 3/4 LG	4
126		5/16-18 CARRIAGE BOLT X 1 1/4 LG	2
127		5/16-18 STD HEX NUT	2
128		3/8-16 FIBER LOCK NUT	1
129		7/16 SAE FLT WASHER	1

HARDWARE NOT SHOWN

Vacuum Feed Attachment - Option



Vacuum Feed Attachment - Option

Tray Box Former



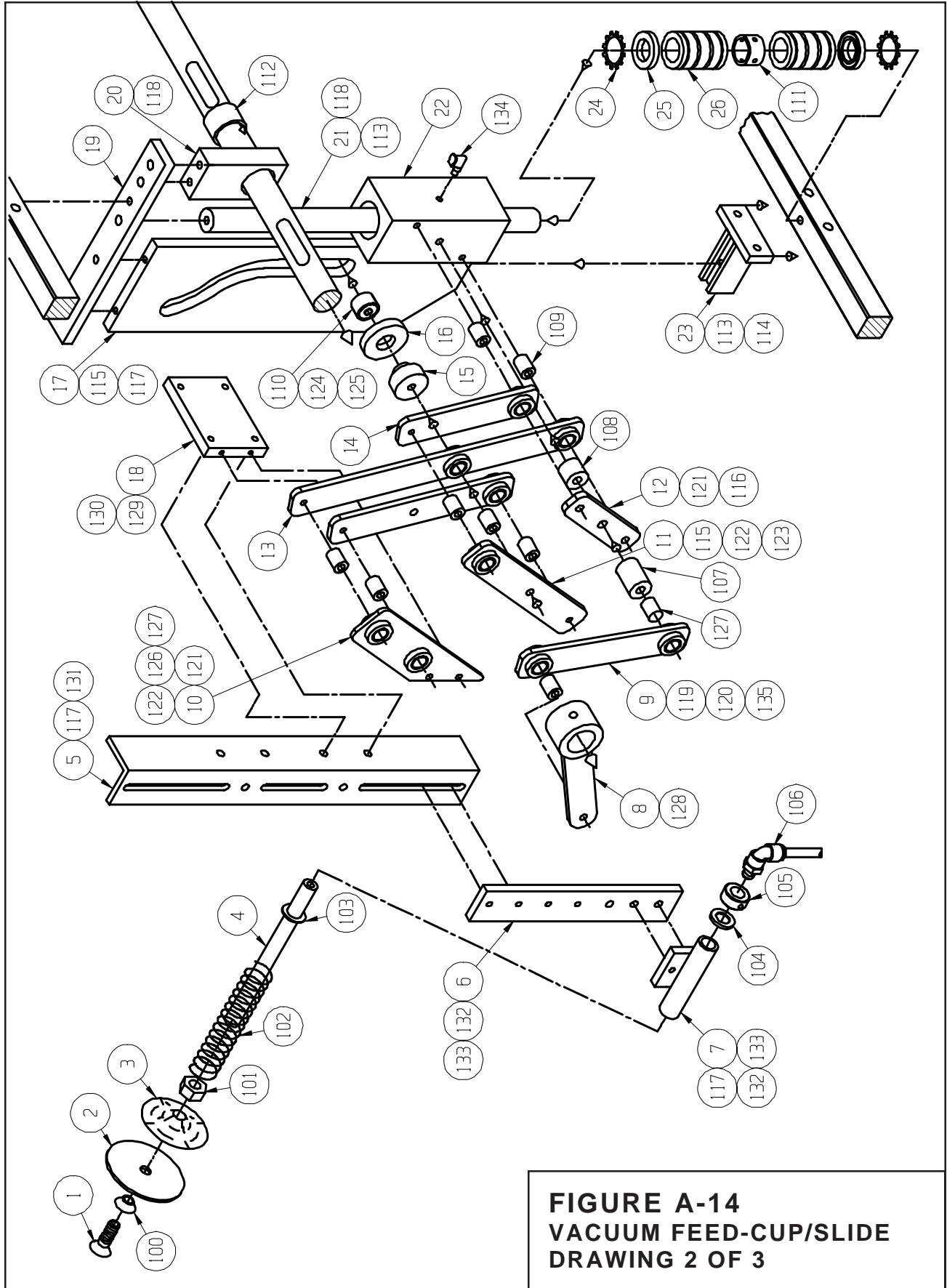
FIGURE A-14
VACUUM FEED-CUP/SLIDE
DRAWING 2 OF 3

ITEM	PART NO.	DESCRIPTION	QTY.
1	0039100	BOLT, VACUUM CUP	6
2	0039200	PAD, VACUUM CUP	6
3	0039000	PLATE, VACUUM CUP BACKING	6
4	0037901	TUBE, SUCTION CUP MT.	6
5	0039300	BRACKET, VACUUM CUP MT.	2
6	0048900	BAR, VACUUM CUP BTM PLCMT	2
7	0038101	BRACKET, VAC. CUP TUBE SUPP	6
8	0046000	LEVER, VACUUM CUP SLIDE	2
9	0046901	LINK, VACUUM FEED CON	2
10	0046700	BRACKET, CUP MOUNT PLATE	2
11	0046500	LEVER, VERTICLE ALIGNMENT	4
12	0046800	PLATE, MAIN LINKAGE MOUNT	2
13	0046600	LEVER, MOUNTING PLATE CARR.	2
14	0046400	LINKAGE, VACUUM CUP MT PLATE	2
15	0046100	SPACER, CAM FOLLOWER	2
16	0046200	CAM FOLLOWER WEAR	2
17	0047700	CAM, VACUUM CUP OPERATE	1
18	0046300	PLATE, VACUUM CUP MOUNTING	1
19	0047501	BRACKET, VACUUM FEED CAM	1
20	0047502	BEARING, VACUUM FEED SHAFT	1
21	0047400	SHAFT, VAC FEED SLIDE BLOCK	1
22	0047800	BLOCK, SLIDE BEARING	1
23	0047600	BRACKET, VACUUM CAM BTM	1
24	0047200	RETAINER, LINEAR BEARING	2
25	0047300	SEAL, LINEAR BEARING	2
26	0047100	BEARING, LINEAR SLIDE	2
100	1501900	WASHER, VACUUM	6
101		1/2-13 HALF NUT	6
102	1202100	SPRING, VACUUM CUP	6
103	8036102	5/8 AN FLT WASHER	6
104	1502000	WASHER, NEOPRENE	6
105	0100400	SET COLLAR	6
106	1804000	3/8 TUBE ELBOW, 1/4 NPT	6
107	0207800	BUSHING	2
108	0201100	BUSHING	2
109	0205100	BUSHING	16
110	0501400	CAM ROLLER,1"	1
111	0204700	BUSHING	1
112	0207500	BUSHING	1
113		3/8-16 HEX HD CAP SCR X 1 3/4	4
114		3/8 STD LOCK WASHER	9
115		5/16-18 HEX HD CAP SCR X 1 1/2	3
116		5/16 STD LOCK WASHER	23
117		5/16-18 HEX HD CAP SCR X 1	10
118		3/8-16 HEX HD CAP SCR X 1	3
119		3/8-16 HEX HD CAP SCR X 4	2
120	1500101	WASHER	2
121		5/16-18 HEX HD CAP SCR X 1 3/4	10
122	1500102	WASHER	2
123		5/16-18 HEX HALF NUT	4
124		5/16-18 HEX HD CAP SCR X 5	1
125		5/16-18 FIBER LOCK NUT	1

ITEM	PART NO.	DESCRIPTION	QTY.
126		5/16-18 STD HEX NUT	4
127	0206400	BUSHING	4
128		3/8-16 OVAL CUP SET SCR X 1/2	2
129		1/4-20 HEX HD CAP SCR X 3/4 LG	4
130		1/4 STD LOCK WASHER	4
131		5/16-18 SAE FLT WASHER	8
132		5/16-18 HEX HD CAP SCR X 3/4	8
133	1501100	SPACER	8
134	1807800	OIL CUP	1
135	0202200	BUSHING	18

HARDWARE NOT SHOWN

Vacuum Feed Attachment - Option



Vacuum Feed Attachment - Option

Tray Box Former

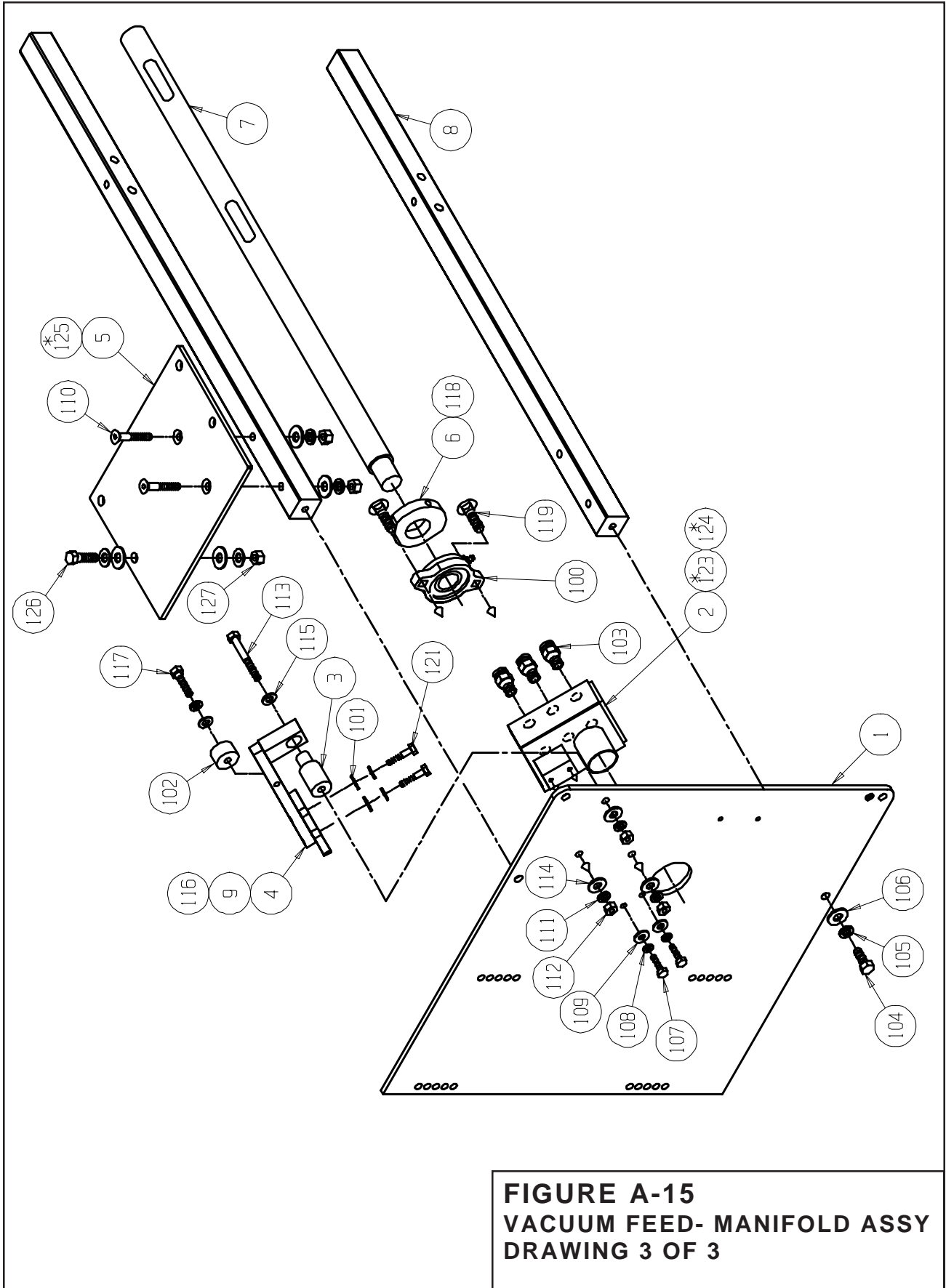


FIGURE A-15
VACUUM FEED-MANIFOLD ASSY
DRAWING 3 OF 3

ITEM	PART NO.	DESCRIPTION	QTY.
1	0047900	PLATE, VACUUM FEED MT-RT	1
2	0044600	MANIFOLD, VACUUM DUMP VALVE	1
3	0044700	PIVOT, VACUUM VALVE ARM	1
4	0045000	ARM, VACUUM VALVE OPER.	1
5	0048301	BASE, VACUUM BLOWER MT.	1
6	0038001	CAM, VACUUM VALVE OPER.	1
7	0045900	SHAFT, VAC. CUP OPER. (SB)	1
	0045901	SHAFT, CAC. CUP OPWER. (WB)	1
8	0047000	BAR, VAC. CUP CAM SUPPORT (SB)	2
	0047002	BAR, VAC CUP CAM SUPPORT (WB)	2
9	0044800	PAD, VACUUM VALVE COVER	1
100	0501200	BEARING, 1"	1
101	1501500	WASHER	2
102	0500900	CAM ROLLER, 1 1/8"	1
103	1804100	3/8 TUBE CONNECTOR, 1/4 NPT	6
104		3/8-16 HEX HD CAP SCR X 1	2
105		3/8 STD LOCK WASHER	6
106		3/8 SAE FLT WASHER	6
107		1/4-20 HEX HD CAP SCR X 1	2
108		1/4 STD LOCK WASHER	4
109		1/4 SAE FLT WASHER	4
110		5/16-18 SCKT FLT HD SCR X 2	2
111		5/16 STD LOCK WASHER	5
112		5/16-18 STD HEX NUT	4
113		5/16-18 HEX HD CAP SCR X 3	1
114		5/16-18 SAE FLT WASHER	4
115	1500102	WASHER	1
116		5/16-18 FIBER LOCK NUT	1
117		5/16-18 HEX HD CAP SCR X 1 1/4	1
118		5/16-18 FLAT PT SET SCR X 1/2	1
119		5/16-18 CARRIAGE BOLT X 1 1/4	2
121		1/4-20 HEX HD CAP SCR X 1 1/4	2
*123	0077200	HOSE CLAMP	1
*124	0042000	HOSE	1
*125	0042100	1 H/P, 3 PHASE VACUUM MOTOR	1
126		3/8-16 HEX HD CAP SCR X 1 1/4	4
127		3/8-16 STD HEX NUT	4

*Not Shown

Vacuum Feed Attachment - Option



Vacuum Feed Attachment - Option

Tray Box Former



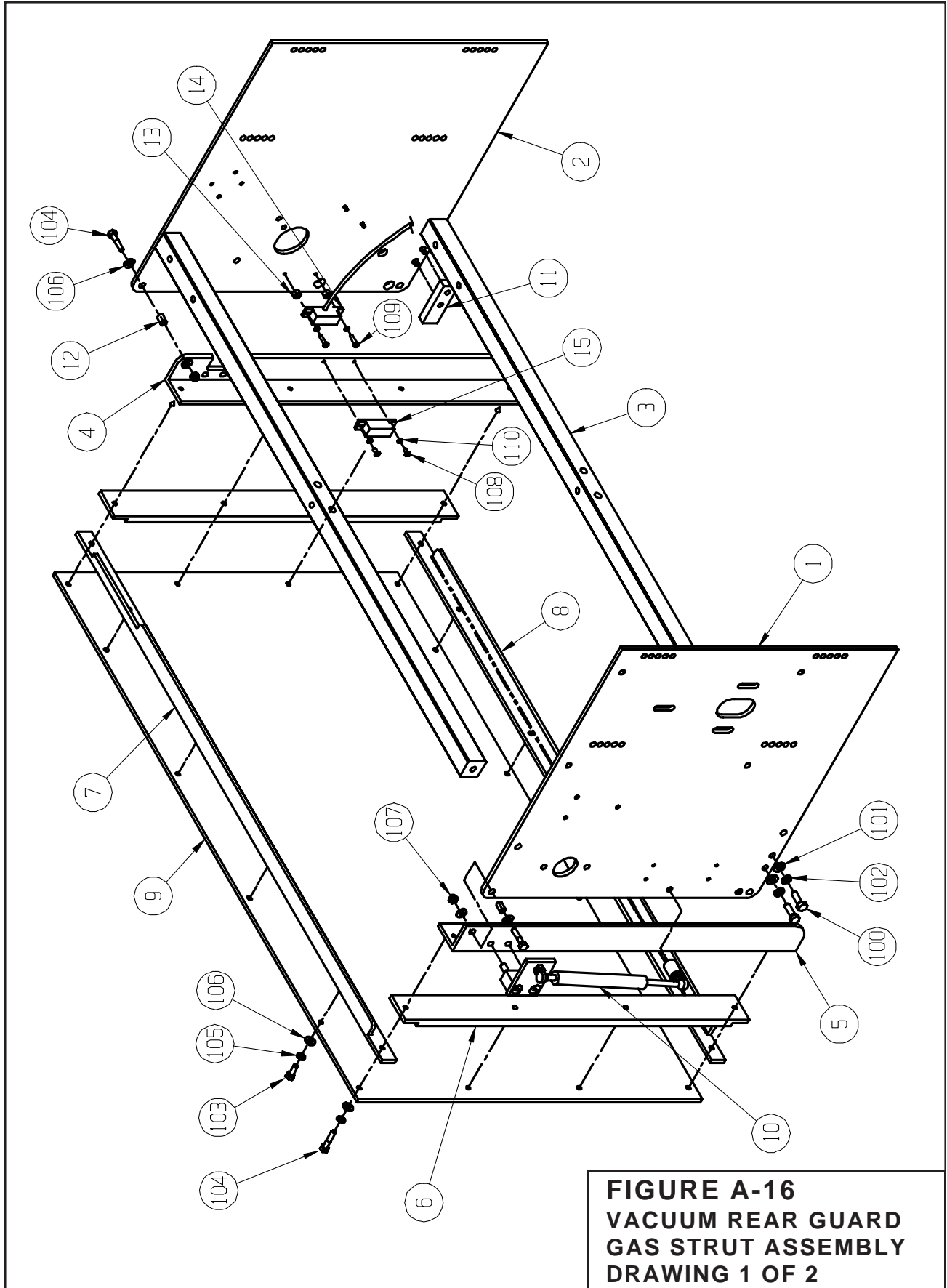
FIGURE A-16
VACUUM REAR GUARD
GAS STRUT ASSEMBLY (1 OF 2)

ITEM	PART NO.	DESCRIPTION	QTY.
1	0048000	PLATE, VACUUM FEED (LEFT)	1
2	0047900	PLATE, VACUUM FEED (RIGHT)	1
3	0047000	BAR, VACUUM CUP CAM (SB)	2
	0047002	BAR, VACUUM CUP CAM (WB)	2
^4	0053505	GUARD, REAR VACUUM FEED (R/H)	1
^5	0053405	GUARD, REAR VACUUM FEED (L/H)	1
^6	0054102	SPACER, VACUUM FEED	2
^7	0053711	SUPPORT, REAR GUARD (SB)	1
	0053713	SUPPORT, REAR GUARD (WB)	0
^8	0053710	LOWER SUPPT, REAR GUARD (SB)	1
	0053712	LOWER SUPPT, REAR GUARD (WB)	0
^9	0053800	PANEL, VACUUM FEED GUARD (SB)	1
	0053801	PANEL, VACUUM FEED GUARD (WB)	0
^10		GAS STRUT ASSEMBLY	REF
^11	0053602	STOP, GUARD	2
^12	0208000	BUSHING	2
^13	0201900	BUSHING	2
^14	0401600	INTERLOCK SWITCH	1
15	0401601	INTERLOCK MAGNET	1
100	8008300	5/16-18 SCKT FLAT HD SCR X 1.0	4
101	8035800	5/16 SAE FLAT WASHER	4
102	8036700	5/16 STD LOCK WASHER	4
103	8006900	1/4 NC X 3/4 HEX HD SCR	8
104	8007100	1/4 NC X 1 1/4 HEX HD SCR	10
105	8036600	1/4 STD LOCK WASHER	16
106	8035700	1/4 SAE FLAT WASHER	20
107	8025500	1/4 NC FIBER LOCK NUT	2
108	8016100	#8-32 X 3/8 ROUND HD SCR	2
109	8016500	#8-32 X 3/4 ROUND HD SCR	2
110	8036400	WASHER, #8 SPLIT LOCK	

Note

^ = These parts may be purchased as a preassembled package, Assembly No. 2002705. (continued on next page)

Vacuum Feed Attachment - Option



Vacuum Feed Attachment - Option

Tray Box Former



FIGURE A-17 VACUUM REAR GUARD GAS STRUT ASSEMBLY (2 OF 2)

ITEM	PART NO.	DESCRIPTION	QTY.
1	0048000	PLATE, VACUUM FEED (LEFT)	REF
2	0053404	GUARD, REAR VACUUN FEED (L/H)	REF
^3	0209701	BUSHING, ANCHOR MTG	2
^4	0054005	MOUNTING BLOCK	2
^5	0053603	PLATE, MOUNTING	2
6	8024800	5/16 NC HALF NUT	4
^7	0054003	MOUNTING STUD	4
^8	0054002	GAS SPRING (AC 83-90)	2
9	8004700	5/16 NC SCKT FLAT HD SCR X 3/4	2
10	8035800	5/16 SAE FLAT WASHER	4
11	8025600	5/16 FIBER LOCK NUT	4
12	8005101	5/16 NC SCKT FLAT HD SCR X 2	4
^13	0054004	GAS SPRING CLIP	4

Note

^ = These parts may be purchased as a preassembled package, Assembly No. 2002705.(See previous page)

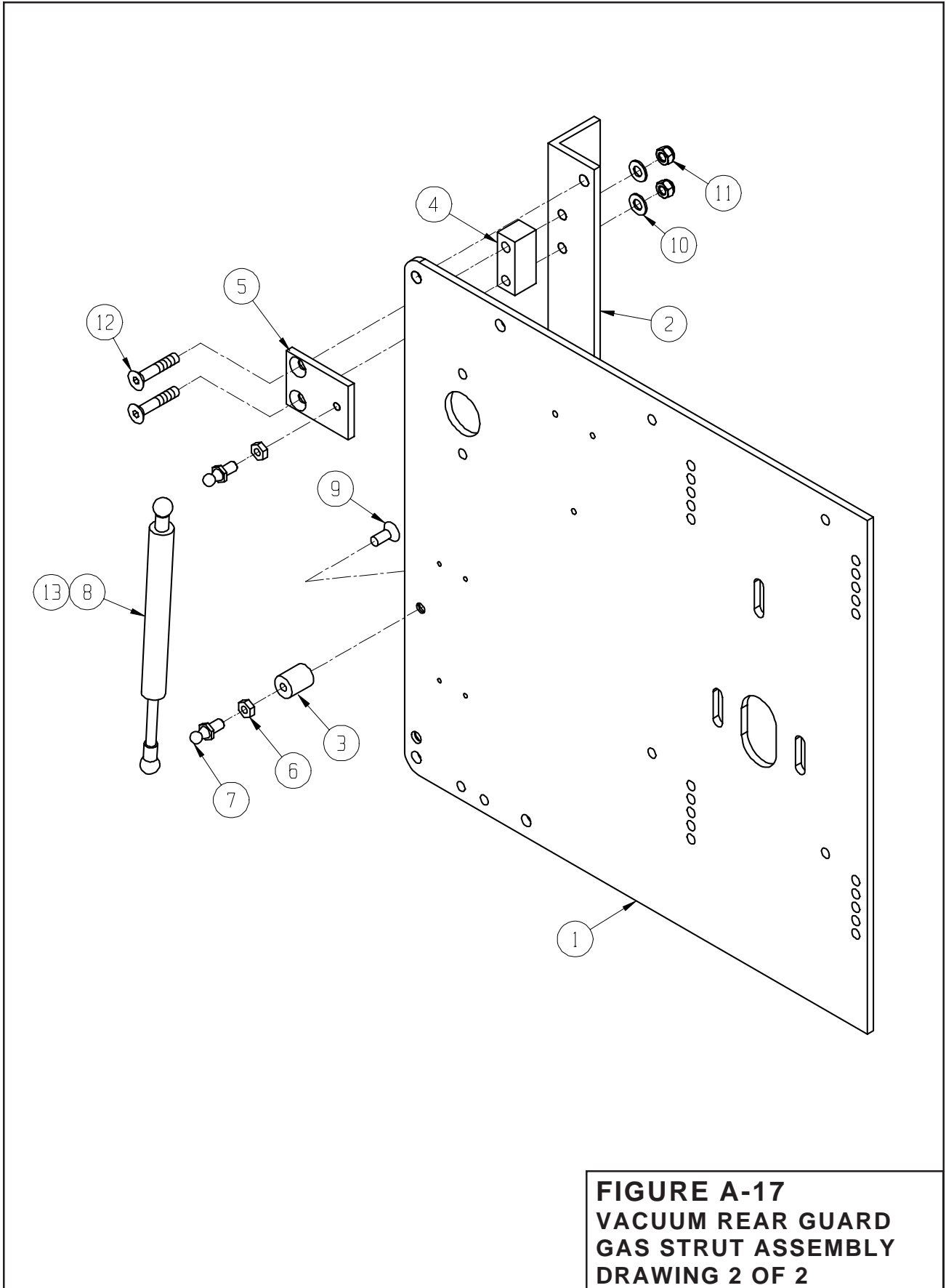


FIGURE A-17
VACUUM REAR GUARD
GAS STRUT ASSEMBLY
DRAWING 2 OF 2

Vacuum Feed Attachment - Option

Tray Box Former



FIGURE A-18 PIAB CUP ASSEMBLY VACUUM FEED OPTION

ITEM	PART NO.	DESCRIPTION	QTY.
1	0039100	BOLT, VACUUM CUP	1
2	0041501	WASHER, RETAINER	1
3	0041601	VACUUM CUP, PIAB	1
4	0041500	PLATE, VACUUM CUP	1
5	0037901	TUBE, SUCTION CUP MT	1
6	1202100	SPRING, VACUUM CUP	1
7	8036102	5/8 AN FLAT WASHER	1
8	0038101	BRACKET, VACUUM TUBE SUPP	1
9		#10-32 SCKT HD CAP SCR X 5/8	4

Vacuum Feed Attachment - Option

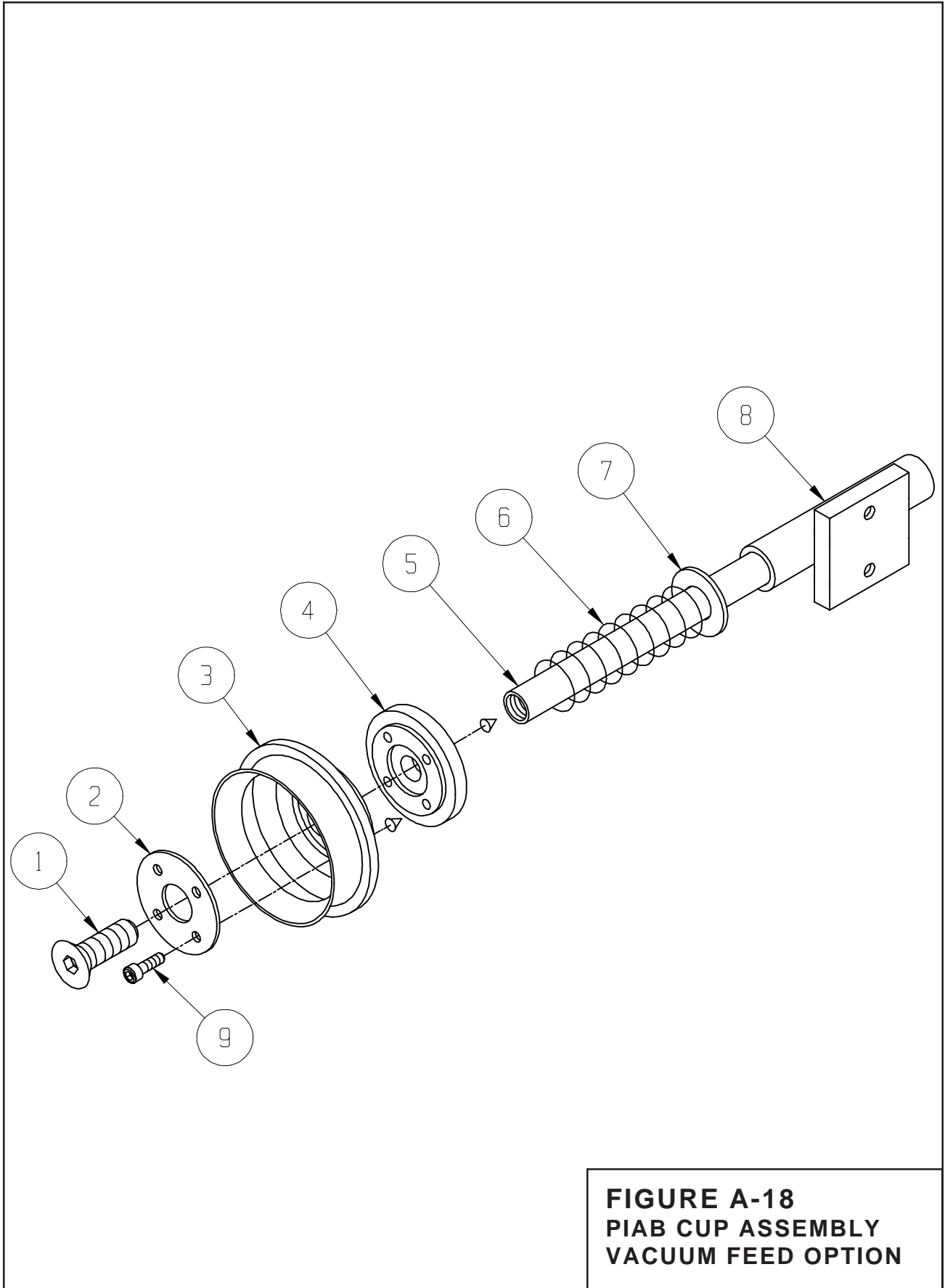


FIGURE A-18
PIAB CUP ASSEMBLY
VACUUM FEED OPTION

Vacuum Feed Attachment - Option

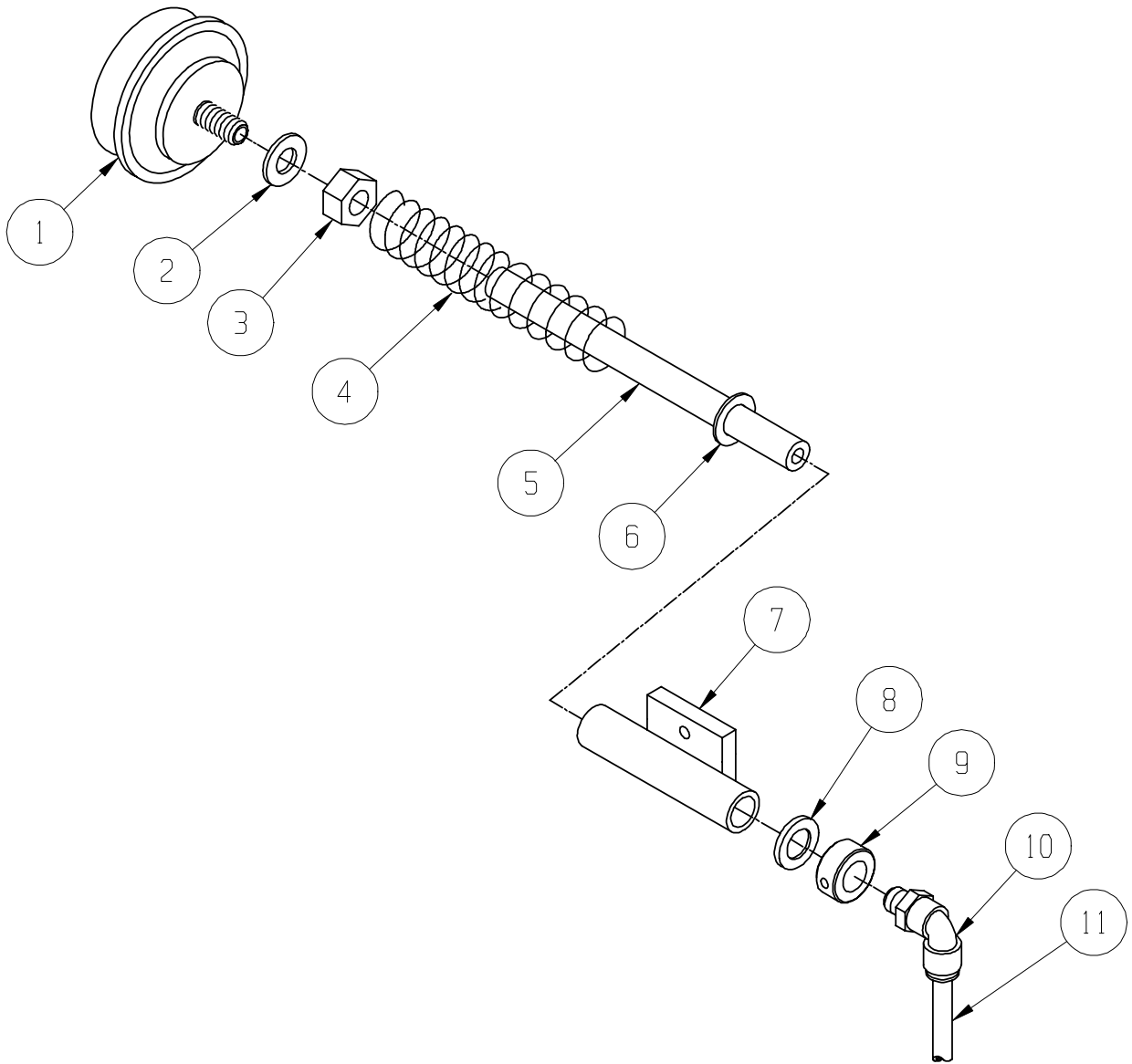
Tray Box Former



FIGURE A-19
VACUUM CUP ASSEMBLY (OPTION)

ITEM	PART NO.	DESCRIPTION	QTY.
1	0041607	CUP, BLUE MINI	2
2	8036100	1/2 SAE FLAT WASHER	2
3	8025100	1/2-13 HEX HD NUT	2
4	1202100	SPRING, VACUUM	2
5	0037901	TUBE, SUCTION CUP MOUNT	2
6	8036102	5/8 SAE FLAT WASHER	2
7	0038101	BRKT, VACUUM CUP TUBE SUPP	REF
8	1502000	WASHER, NEOPRENE	REF
9	0100400	5/8 SET COLLAR	REF
10	1804000	3/8 TUBE ELBOW (1/4 NPT)	REF
11	0037300	3/8 POLY FLOW TUBING	REF

Vacuum Feed Attachment - Option



**FIGURE A-19
VACUUM CUP
ASSEMBLY (OPTION)**

Vacuum Feed Attachment - Option

Tray Box Former



FIGURE A-20
VACUUM CUP ASSEMBLY (OPTION)

ITEM	PART NO.	DESCRIPTION	QTY.
1	0041602	CUP, BLUE VICAS	2
2	1202100	SPRING, VACUUM	2
3	0037903	TUBE, SUCTION CUP MOUNT	2
4	8036102	5/8 SAE FLAT WASHER	2
5	0038101	BRKT, VACUUM CUP TUBE SUPP	REF
6	1502000	WASHER, NEOPRENE	REF
7	0100400	5/8 SET COLLAR	REF
8	1804000	3/8 TUBE ELBOW (1/4 NPT)	REF
9	0037300	3/8 POLY FLOW TUBING	REF

Vacuum Feed Attachment - Option

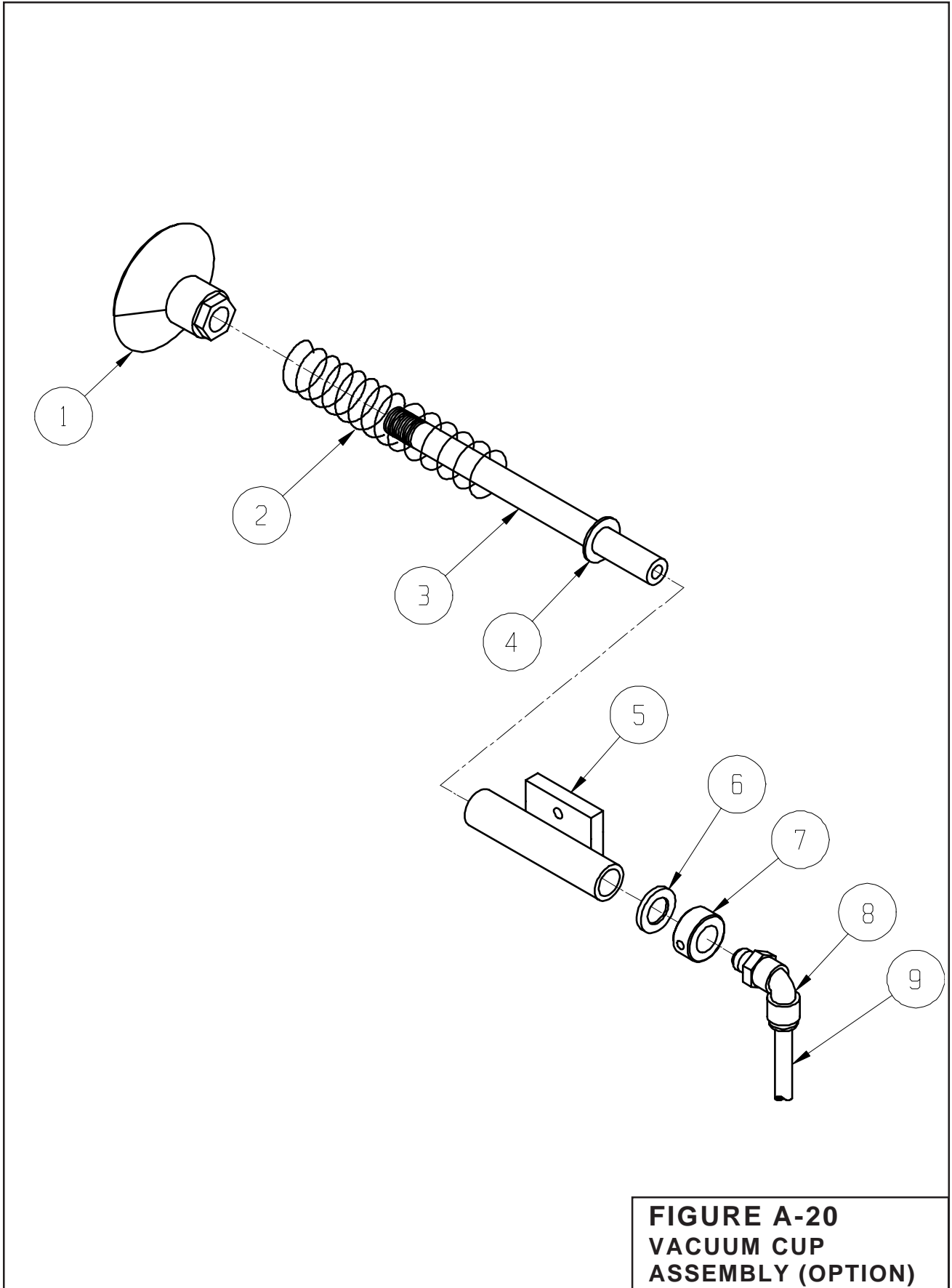


FIGURE A-20
VACUUM CUP
ASSEMBLY (OPTION)

Vacuum Feed Attachment - Option

FIGURE A-21 MUFFLER FILTER WITH SCREEN RETAINER KIT

ITEM	PART NO.	DESCRIPTION	QTY.
1	0042100	1 HP 3 PH VACUUM MOTOR	REF
2	0042101	MUFFLER FILTER	6
3	0042102	SCREEN RETAINER	2
4	0045201	VACUUM ADAPTER	REF

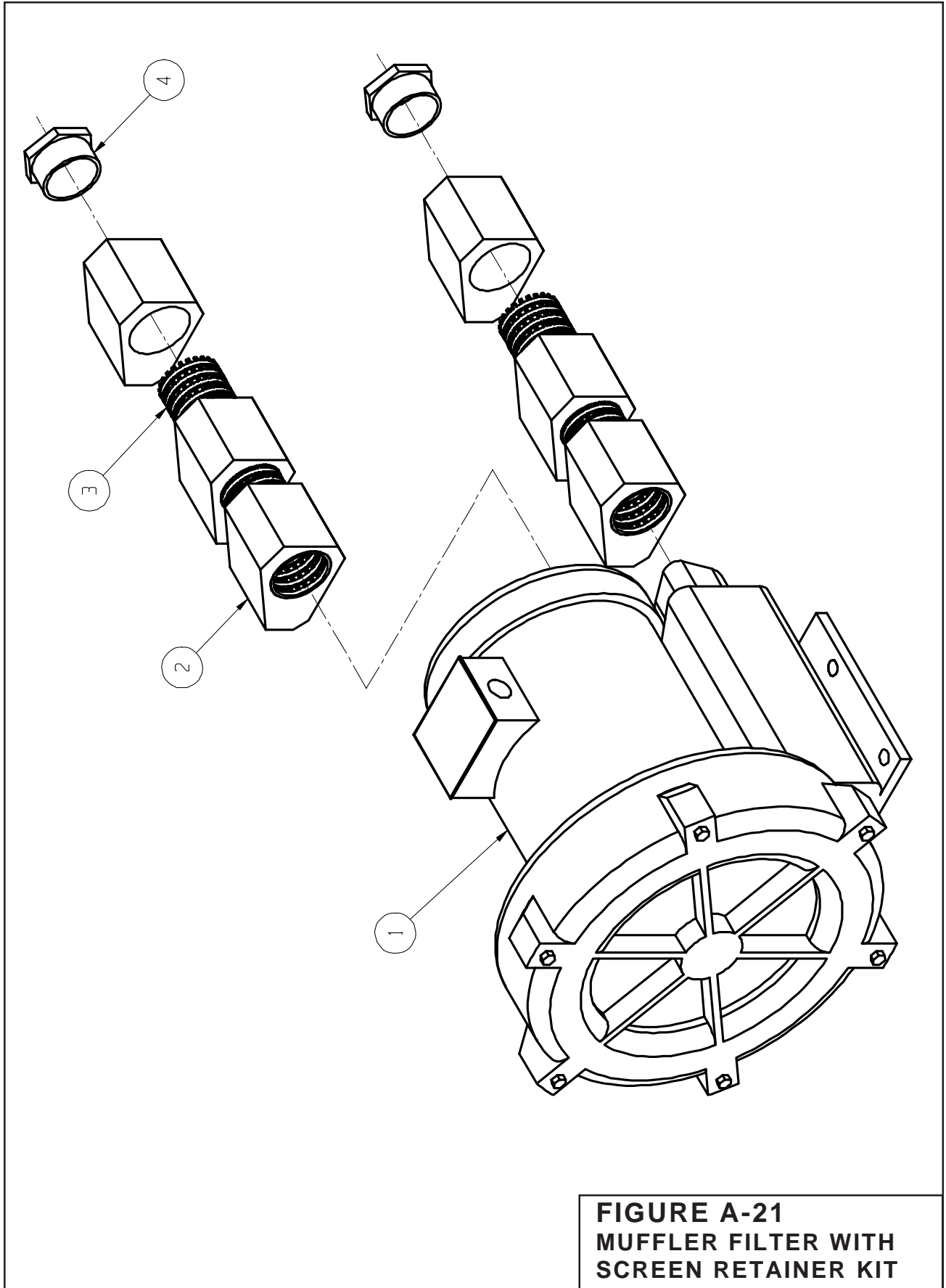


FIGURE A-21
MUFFLER FILTER WITH
SCREEN RETAINER KIT

Vacuum Feed Attachment - Option

Tray Box Former



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Vacuum Feed Attachment - Option