HAMER-FISCHBEIN® LLC

A DURAVANT COMPANY

Model 100-2-R2

Empress™ Series

Sewing Head

Part #37776

Rev B/ July 2016

OPERATOR'S MANUAL

Two needle format

Low noise/vibration

Patented self-lubrication

Compact design

www.fischbein.com

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1 USE OF MANUAL

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Use of Manual

NOTE: ***Installers and operators of this equipment should read this entire document before attempting to handle or operate the Model 100-2-R2 Empress™ Series Sewing Head. Locate all additional manuals supplied with the machine and refer to them as necessary.***

For more than one hundred years, the Hamer-Fischbein family of companies has designed, manufactured and provided bag packaging equipment and complete systems to a worldwide customer base, specific to their applications. We offer a full range of filling, weighing, handling, and palletizing equipment to all industries that package their respective products in bags.

Hamer-Fischbein's family of brands - Hamer-Fischbein, Hamer, Fischbein Saxon, Inglett, Nestaflex®, Nestainer®, and Postainer™ - represent quality, durability, and value. These brands are widely used in the agricultural, milling, chemical, pet food, animal feed, building materials, mineral, food, medical, and pharmaceutical industries. Our designs meet local and global safety standards and are often used in corrosive and harsh packaging environments.

All Hamer-Fischbein products, parts and service are available through our worldwide network of highly qualified and factory-trained distributors. Hamer-Fischbein takes great pride in working closely with our customers to find the right packaging solution. Over 90 years in the packaging business has given us the opportunity to solve a range of packaging requirements. We look forward to sharing our expertise and provide bag-closing solutions for you.

Your Sewing Head is supported by a group of factory trained Customer Service Representatives and our worldwide network of distributors are ready to assist your company in meeting your technological requirements and business objectives.

HAMER-FISCHBEIN® LLC

A DURAVANT COMPANY

Orders, questions and comments can be addressed to Hamer-Fischbein through the worldwide web at www.fischbein.com or by writing or calling our North American or European offices:

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1.1. Application of Manual

This service manual is written as a guide to the proper installation, operation and service of the Fischbein Company Model 100-2-R2 Empress™ Series Sewing Head. Basic knowledge of the system is essential to ensure satisfactory service.
This manual will provide the knowledge so that with proper maintenance, the Model 100-2-R2 Empress™ Series Sewing Head will provide years of trouble-free performance to its users.

NOTE: Some models may vary in configuration of switches, timers, and other devices. Only the devices found on the particular system being serviced should be considered. Components not found may be ignored.

1.2. Revision

The revision level of this manual is A dated May 2013. As with all our manuals, we are constantly making improvements based on suggestions and comments from our customers, distributors and employees. Please contact us with your comments and suggestions. Found in the back of this manual is Technical Manual Change Request Form that should be used to document any desired or necessary changes and suggestions.

1.3. Safety Statement

The Fischbein Model 100-2-R2 Empress™ Series Sewing Head is an automatic machine and certain precautions must be taken.

Fischbein is not responsible for damage or injuries caused by misuse of the equipment, careless operation, or if it is used for purposes which it was never designed.

1.3.1. List of Warnings, Cautions and Notes

Throughout this manual; applicable warnings, cautions, and notes have been placed. Each user of the Model 100-2-R2 Empress™ Series Sewing Head should be familiar

with each of these. It is imperative that all personnel involved in the operation or maintenance of this system follow the basic safety precautions outlined below.

Warnings will be preceded by

Cautions will be preceded by

Notes will be preceded by

Warnings

WHEN POWER IS ON, PROXIMITY SENSORS ARE ARMED AND ANY METALLIC OBJECT WITHIN ITS FIELD OF CONDUCTIVITY CAN, WITHOUT WARNING, TRIGGER A FUNCTION.

THIS SYSTEM IS EQUIPPED WITH INTERNAL TIMERS. THESE TIMERS, WHEN SATISFIED, WILL CAUSE THE EQUIPMENT TO CONTINUE WITH ITS SEQUENCE OF OPERATION.

OPERATORS MUST ALWAYS WEAR PROPER EYE AND FOOT PROTECTION WHEN OPERATING THIS MACHINE AND NOT WEAR LOOSE CLOTHING OR JEWELRY.

LONG HAIR MUST BE PULLED BACK AND TIED TO AVOID GETTING CAUGHT IN THE BELTS AND ROLLERS.

TURN OFF AND LOCK OUT THE ELECTRICAL AND PNEUMATIC SUPPLIES TO THE MACHINE BEFORE PERFORMING ANY MAINTENANCE.

BE SURE TO WEAR THE PROPER EYE, FOOT AND HAND PROTECTION. LONG HAIR MUST BE TIED BACK AND OPERATORS MUST AVOID WEARING EXCESSIVELY BAGGY CLOTHING THAT COULD GET CAUGHT IN MOVING PARTS.

- ALL GUARDS MUST BE PROPERLY MOUNTED TO THE MACHINE BEFORE BEING OPERATED.
- REMOVE ALL TOOLS AND MAINTENANCE EQUIPMENT BEFORE STARTING THE SYSTEM.
- ELECTRICAL SERVICE AND TROUBLESHOOTING OF THIS UNIT MUST BE PERFORMED BY TRAINED AND QUALIFIED PERSONNEL.
- ALL OSHA REGULATIONS SUCH AS ELECTRICAL AND PNEUMATIC LOCKOUTS MUST BE FOLLOWED.
- PERSONAL INJURY CAN BE CAUSED BY HAZARDOUS CONDITIONS ON ANY EQUIPMENT. TO AVOID INJURY, THE INVOLVED PERSONNEL SHOULD BE CONSTANTLY ALERT FOR ANY UNSAFE CONDITIONS AND USE ALL POSSIBLE CARE, ALONG WITH COMMON SENSE, AND A STRICT ADHERENCE TO ACCEPTED SAFETY STANDARDS AND LOCAL CODES.
- LOCKOUT/TAGOUT ARE TO BE USED WHEN MAINTENANCE SHUTDOWNS OR ENTRY INTO THE OPERATING SPACE OF THE MACHINE IS NECESSARY. FOLLOW ALL LOCAL LOCKOUT/TAGOUT REQUIREMENTS.
- THE MODEL 100-2-R2 SEWING HEAD IS DRIVEN BY A STRONG MOTOR, CONTAINS MOVING PARTS, HAS PINCH POINTS, AND SHARP EDGES. USERS SHOULD BECOME FAMILIAR AND TRAINED ON PROPER OPERATION AND SAFETY PRIOR TO OPERATING.
- THE SEWING HEAD IS NOT A STAND-ALONE MACHINE; THEREFORE, CARE MUST BE TAKEN TO PROVIDE THE CORRECT DRIVE SYSTEM AND PROPER PROTECTION FROM THE DRIVE COMPONENTS. FOLLOW THE RECOMMENDATIONS IN THE MANUAL ABOUT THE DRIVE SYSTEM.
- REPLACEMENT OF THE CONNECTING NEEDLE DRIVE ROD MUST BE PERFORMED BY AN AUTHORIZED FISCHBEIN REPRESENTATIVE, EQUIPPED WITH THE SPECIAL TOOLS NECESSARY.
- THE SEWING HEAD IS NOT SUITABLE TO OPERATE IN AN AREA WHERE EXPLOSIVE MATERIALS ARE PRESENT (EXPLOSIVE GAS, VAPORS, POWDERS OR LIQUIDS).

THE WARRANTY STATEMENT IS VOIDED WHEN:

1. THE INITIAL START-UP IS PERFORMED BY PERSONS OTHER THAN A FISCHBEIN APPROVED TECHNICIAN OR REPRESENTATIVE.
2. MODIFICATIONS OR CHANGES ARE MADE ON THE MODEL 100-2-R2 SEWING HEAD WITHOUT THE AUTHORIZATION OR APPROVAL OF FISCHBEIN.
3. PROGRAMMABLE CONTROLLER OR OTHER ELECTRICAL COMPONENTS ARE DAMAGED FROM WELDING DONE IN THE VICINITY OF THE SYSTEM.
4. PARTS ARE DAMAGED FROM HIGH-PRESSURE WATER OR STEAM CLEANING EQUIPMENT.
5. PARTS ARE DAMAGED DUE TO IMPROPER OPERATION OF THE MODEL 100-2-R2 SEWING HEAD BY UNAUTHORIZED PERSONNEL.
6. THE MACHINE IS OPERATED WITH THE CONTROL BOX DOOR OPEN. THE PROGRAMMABLE CONTROLLER AND OTHER COMPONENTS IN THE BOX ARE SENSITIVE TO DIRT, MOISTURE AND MANY OTHER FOREIGN ELEMENTS.
7. THE MODEL 100-2-R2 SEWING HEAD IS NOT PROPERLY MAINTAINED.

Cautions

BE ALERT TO ANY HAZARDOUS CONDITIONS.

CLEAN UP ANY SPILLED LUBRICANTS, PRODUCT OR OTHER MATERIALS AS PROMPTLY AS POSSIBLE.

BEFORE EVERY EQUIPMENT STARTUP, INSURE THAT ALL PERSONNEL ARE CLEAR AND THAT EVERYONE WITHIN THE AREA IS AWARE THAT THE SYSTEM IS ABOUT TO RESTART.

PERMIT ONLY AUTHORIZED, TRAINED PERSONNEL TO START SYSTEM.

ALWAYS USE GENUINE FISCHBEIN PARTS. OUR PARTS ARE SPECIFICALLY DESIGNED FOR FISCHBEIN EQUIPMENT TO PROVIDE OPTIMUM PERFORMANCE AND SAFETY. USE OF NON-FISCHBEIN PARTS CAN ALSO VOID THE PRODUCT WARRANTY.

WHEN USED IN A DUSTY ENVIRONMENT, NEMA12 (IP54) ELECTRICAL EQUIPMENT MUST BE USED.

- FREQUENTLY CLEAN THE MACHINE TO PREVENT ACCUMULATION OF DUST AND DEBRIS. DOING THIS PREVENTS THE ACCUMULATION OF MATERIAL THAT MAY CAUSE MALFUNCTIONS OR POOR PERFORMANCE.
- ANY SOURCES OF LEAKS OF THE MACHINE'S LUBRICATING OIL MUST BE REPAIRED IMMEDIATELY TO PREVENT POSSIBLE CONTAMINATION OF THE PRODUCT BEING PACKAGED AND SAFETY HAZARDS AROUND THE SYSTEM.
- LET THE MACHINE DO THE WORK. DO NOT PULL THE BAG OR THE MATERIALS THROUGH IT.
- WHEN CLEANING THE SEWING HEAD, USE ONLY FISCHBEIN CLEANING SOLVENT 5-101.
- DO NOT USE AGGRESSIVE CLEANING PRODUCTS AS THEY MAY DAMAGE THE RUBBER SEALS.
- DO NOT ATTEMPT ANY REPAIRS OF THE 100-2-R2 SEWING HEAD UNLESS QUALIFIED TO DO SO.

Notes

- *Installer and operators of this equipment should read this entire document before attempting to handle or operate the Model 100-2-R2 Sewing Head. Locate all additional manuals supplied with the machine and refer to them as necessary.*
- *Employees shall receive training by the employer on proper equipment operation and shutdown of this machine. Contact our customer service department for training.*
- *This system is only to be operated in the environment it is designed and rated for. Be sure to check the NEMA rating of the machine to ensure it is compatible to its application.*

Table 1.1 List of Acronyms

Acronym	Definition
CW	Clockwise
CCW	Counter-Clockwise
ft	Foot
HP	Horse Power
kg	Kilogram
m	Meter or minute
mm	Millimeter
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Administration
PSIG	Pounds per Square Inch Gauge
RPM	Revolutions per Minute
VAC	Volts Alternating Current
VDC	Volts Direct Current

1.5 Warranty Statement

Nothing contained in this document is intended to extend any promise, warranty or representation, expressed or implied, regarding the FISCHBEIN products described herein. Any such warranties or other terms and conditions of products shall be in accordance with the standard terms and conditions of sale for such products, which are available upon request. FISCHBEIN reserves the right to make changes and improvements to products without notice and without incurring any obligation to make such changes or add such improvements to products sold previously.

THE WARRANTY STATEMENT IS VOIDED WHEN:

1. THE INITIAL START-UP IS PERFORMED BY PERSONS OTHER THAN A FISCHBEIN APPROVED TECHNICIAN OR REPRESENTATIVE.
2. MODIFICATIONS OR CHANGES ARE MADE ON THE MODEL 100-2-R2 SEWING HEAD WITHOUT THE AUTHORIZATION OR APPROVAL OF FISCHBEIN.
3. PROGRAMMABLE CONTROLLER OR OTHER ELECTRICAL COMPONENTS ARE DAMAGED FROM WELDING DONE IN THE VICINITY OF THE SYSTEM.
4. PARTS ARE DAMAGED FROM HIGH-PRESSURE WATER OR STEAM CLEANING EQUIPMENT.
5. PARTS ARE DAMAGED DUE TO IMPROPER OPERATION OF THE 100-2-R2 SEWING HEAD BY UNAUTHORIZED PERSONNEL.
6. THE MACHINE IS OPERATED WITH THE CONTROL BOX DOOR OPEN. THE PROGRAMMABLE CONTROLLER AND OTHER COMPONENTS IN THE BOX ARE SENSITIVE TO DIRT, MOISTURE AND MANY OTHER FOREIGN ELEMENTS.
7. THE MODEL 100-2-R2 SEWING SYSTEM IS NOT PROPERLY MAINTAINED.

Warranted parts damaged by any of the above will not be replaced or repaired without an additional charge for this service.

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Sewing Head

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2 MODEL 100-2-R2 INTRO

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2. Introduction to the Model 100-2-R2 Empress™ Series Sewing Head

The Fischbein 100-2-R2 sewing head is a heavy duty two-needle commercial sewing machine. The Model 100-2-R2 Sewing Head can sew bags of different materials, such as plastic, woven polypropylene, multi-wall paper bags, composite bags, jute bags and others.

For proper operation, these heads are normally mounted on Fischbein double pedestal stands and conveyor systems. Mounting the system in this way enables adjustments of the system for differences in bag height and varying bag speed through the system. The Model 100-2-R2 is used for two-thread applications and uses standard knives. No rotary air knife is currently available.

Figure 2-1 and Figure 2-2 are provided to identify typical components in the Model 100-2-R2 Empress™ Series Sewing Head Machine.

NOTE: ***The figures shown are only common elements and do not reflect all configurations. Your machine may look different than shown.***

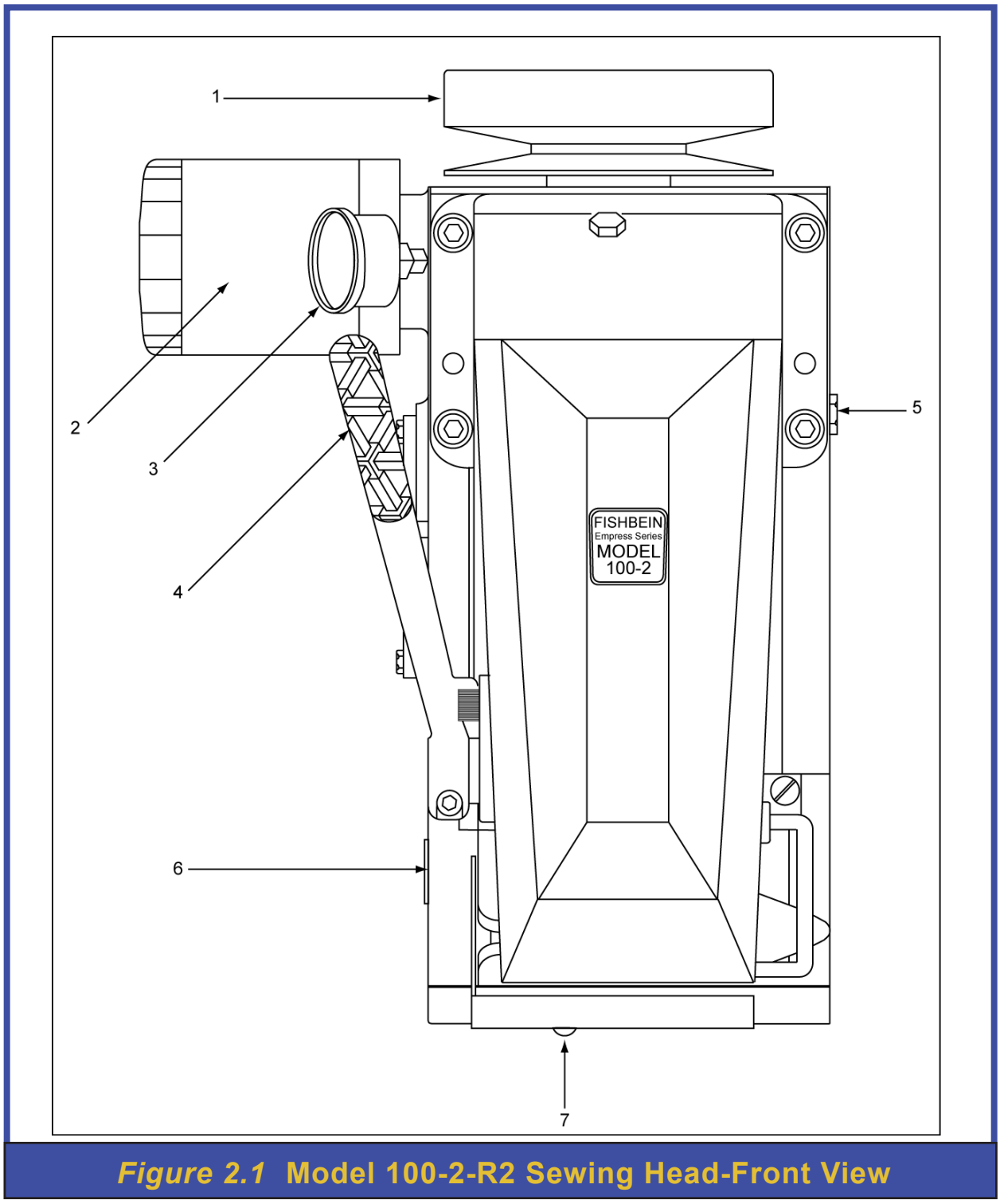

Figure 2.1 **Model 100-2-R2 Sewing Head-Front View**

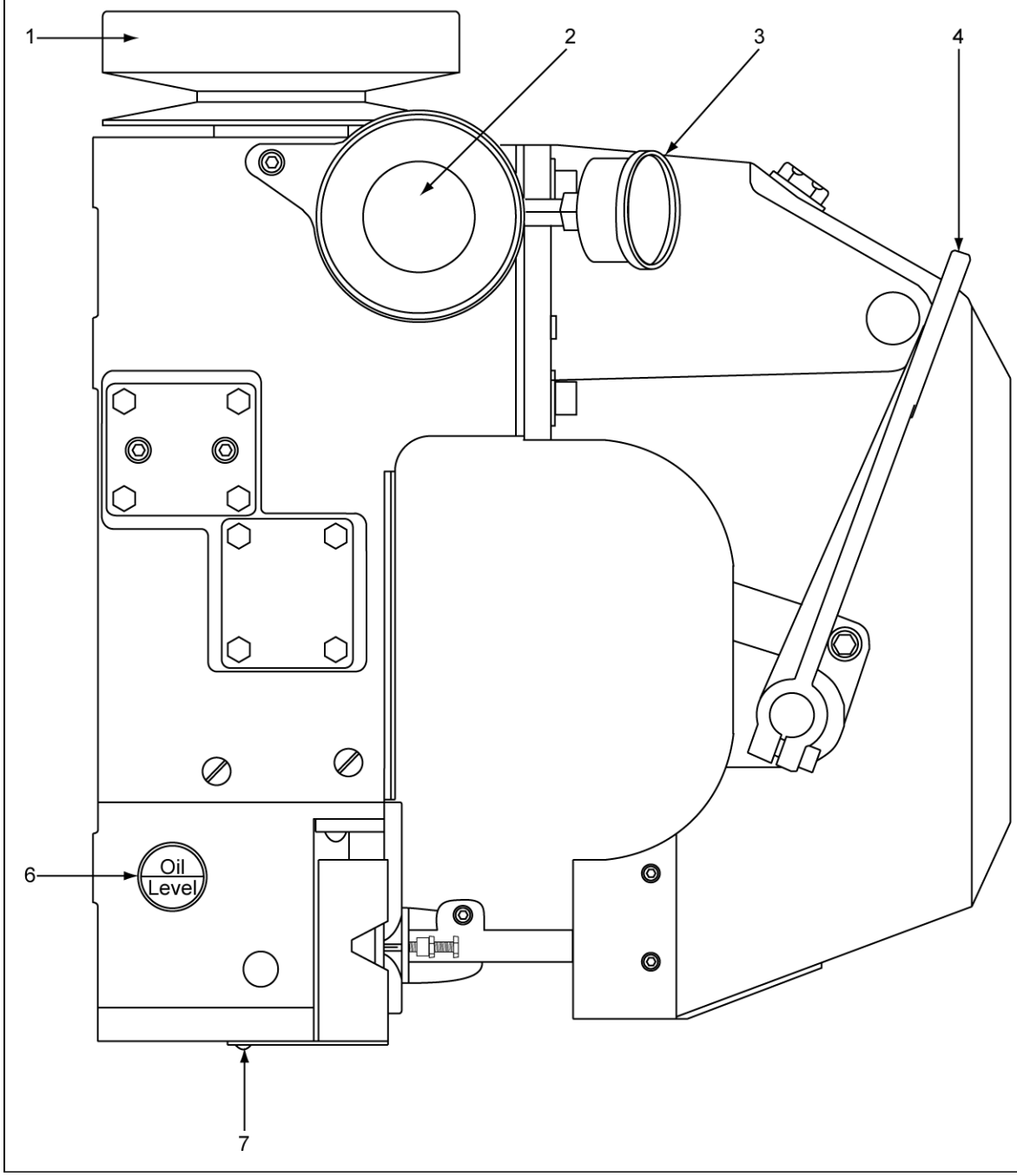

Figure 2.2 **Model 100-2-R2 Sewing Head-Side View**

Table 2.1 Model 100-2-R2 Sewing Head Components

	Component
1	Variable Pulley Drive
2	Oil Filter
3	Oil Pressure Gauge
4	Hand Lever
5	Breather Plug
6	Oil Level Window
7	Drain Plug

2.1. System Characteristics

2.1.1. General

The Model 100-2-R2 is designed to operate in a range up to 1350 RPM at approximately 2.5 stitches per inch. The weight of the machine is approximately 58 pounds (26,4 kg). The Model 100-2-R2 has an oil capacity of 1 quart (0.95 litres) using Rykon #68 oil (Part Number: 10200) or Food Grade Oil (#31047).

2.1.2. Drive Motor

The Sewing Head is belt driven from an external motor. Fischbein recommends either a 1 HP or 746W motor for use with the Model 100-2-R2.

2.1.3. Measuring Stitch Length

Use the gauge tool to measure the length of 10 stitches sewn. Divide the length measured by the number of stitches. Refer to Figure 2-3.

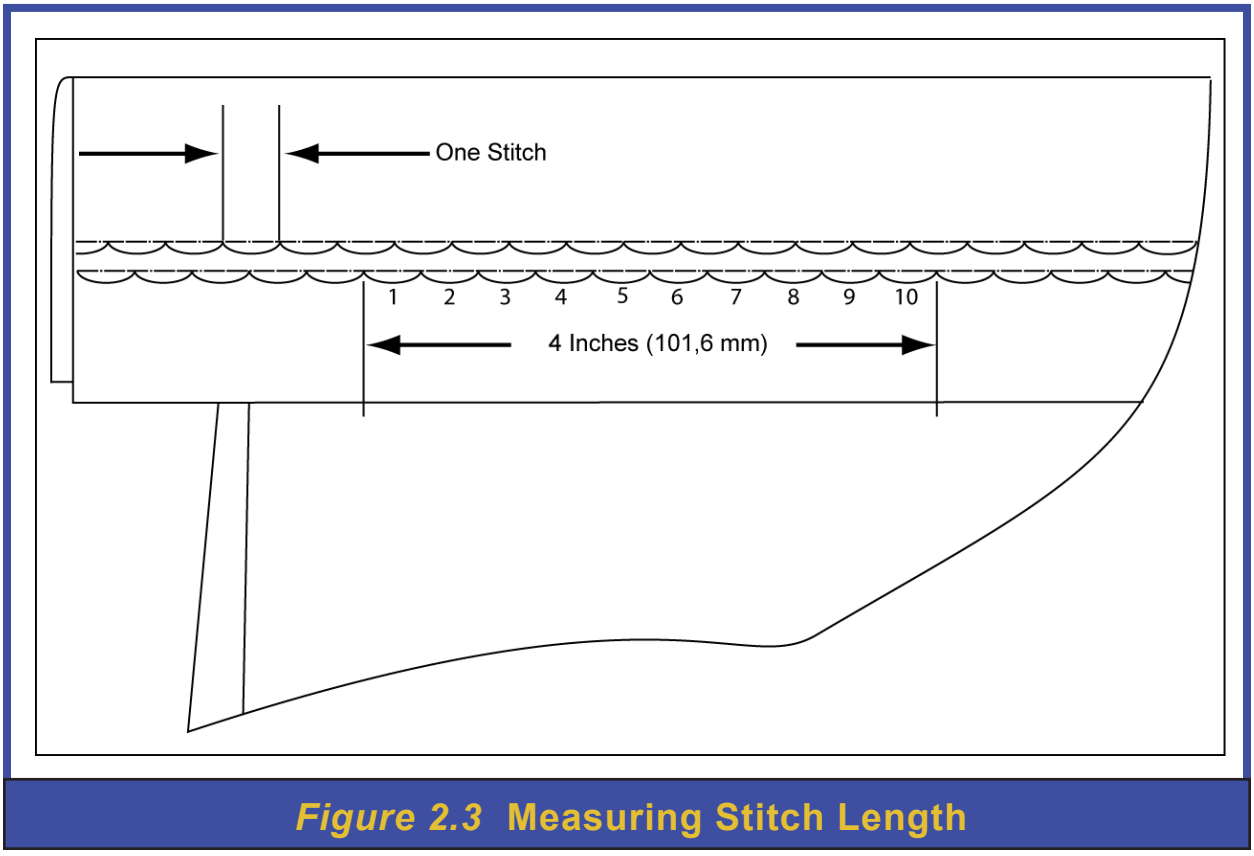

Figure 2.3 **Measuring Stitch Length**

Figure 2-3 displays 10 stitches covering a distance of 4 inches (101.6 mm).
Distance Measured / Number of Stitches = Stitch Length
4” (101,6 mm) / 10 = 0.4” (10,16 mm)

2.2. Determining Sewing Head Speed

⚠ **THE MAXIMUM RPM OF THE MODEL 100-2-R2 SEWING HEAD IS 1800 RPM.**

The speed of the sewing head needs to be 2% faster than the conveyor that carries the product to it. This is because the sewing head needs to pull the bag taut through the infeed to maximize the sewing system performance.

However, the speed of the infeed should match the speed of the conveyor.
To calculate the sewing head speed necessary to meet production rates, the following variables must be known.
1. Process speed (Bags/min, spacing between bags or Bag Conveyor Speed)

2. Speed of the conveyor designated to carry bags to the sewing system
3. Desired or required space between bags (often dictated by other equipment such as weighing and filling)
4. The number of stitches required on the closure

Two basic conversion tables have been provided in Table 2-2 and 2-3 for quick reference.

***NOTE:** Refer to Paragraph 5.4.1 to adjust the sewing head speed.*

2.2.1. English Formula

The formula for calculating Sewing Head speed (RPM) is performed by increasing the conveyor speed by 2% and multiplying that number by the desired stitch per length.

***NOTE:** One stitch equals one revolution of the sewing head.*

Example-A conveyor operating at 40 ft/min and a desired stitch length of 2.5 stitches per inch. [Stitches required (rev/ft)] x [Conveyor speed (ft/min) + 2%] = RPM

Step 1-Convert 2 stitches per inch into stitches per foot to equal the conveyor variable. ***[Stitches required (rev/ft)]*** 2.5 stitches per inch = 30 stitches per foot or 30 revolutions per foot

Step 2-Increase the conveyor speed by 2% to account for the necessary pull on the bag. ***[Conveyor speed (ft/min) + 2%]*** 40 ft/min +2% = 40.8 ft/min

Step 3-Multiply both values to determine the necessary Sewing Head speed.
[Stitches required (rev/ft)] x [Conveyor speed (ft/min) + 2%] = RPM
30 rev/min x 40.8 ft/min = 1224

Table 2-2 is provided for a quick reference of Sewing Head Speed using the English system.

THE MAXIMUM RPM OF THE MODEL 100-2-R2 SEWING HEAD IS 1350 RPM.

***NOTE:** Table 2-2 does not factor in a 2% increase of conveyor speed.*

Table 2-2 Quick Reference Speed Chart (English)

FISCHBEIN 100-2-R2 SEWING HEAD

STITCH LENGTH (rev/inch)

CONVEYOR SPEED (ft/min)	2.25	2.5	2.75	3.0	3.25
30	810	900	990	1080	1170
35	945	1050	1155	1260	1365
40	1080	1200	1320	1440	1560
45	1215	1350	1485	1620	1755
50	1350	1500	1650	1800	
55	1485	1650			
60	1620	1800			
65	1755				
70					
75					

2.2.2. Metric Formula

The formula for calculating Sewing Head speed (RPM) is performed by increasing the conveyor speed by 2% and dividing that number by the desired stitch per length.

NOTE: ***One stitch equals one revolution of the sewing head.***

Example-A conveyor operating at 12 meter/min and a desired stitch length of 8 mm per stitch. **[Conveyor speed (m/min) + 2%] X 1000/ [Stitches required (mm/rev)]** = RPM

Step 1- Increase the conveyor speed by 2% to account for the necessary pull on the bag. **[Conveyor speed (m/min) + 2%],** 12 meter/min + 2% = 12,24 m/min

Step 2-Convert conveyor speed to mm to equal the stitch length variable.
12,24 m/min= 12 240 mm/min

Step 3-Divide the Conveyor speed by the desired stitch length to determine the necessary Sewing Head speed. **[Conveyor speed (m/min) + 2%] X 1000 / [Stitches required (mm/rev)]** = RPM, 12 240 mm/min / 8 mm/stitch = 1530 RPM

Table 2-3 is provided for a quick reference of Sewing Head Speed using the Metric system.

THE MAXIMUM RPM OF THE MODEL 100-2-R2 SEWING HEAD IS 1800 RPM.

Table 2-3 Quick Reference Speed Chart (metric)

FISCHBEIN 100-2-R2 SEWING HEAD

		STITCH LENGTH (mm/rev)						
CONVEYOR SPEED (m/min)		11,0	10,5	10,0	9,5	9,0	8,5	8,0
	9	818	857	900	947	1000	1059	1125
	10	909	952	1000	1053	1111	1176	1250
	11	1000	1048	1100	1158	1222	1294	1375
	12	1091	1143	1200	1263	1333	1412	1500
	13	1182	1238	1300	1368	1444	1529	1625
	14	1273	1333	1400	1474	1556	1647	1750
	15	1364	1429	1500	1579	1667	1765	
	16	1455	1524	1600	1684	1778		
	17	1545	1619	1700	1789			
	18	1636	1714	1800				
	19	1727						
	20							

2.3. Bag Handling Capacity

2.3.1. Maximum Linear Rate of Sewing

The maximum bag speed output of the Model 100-2-R2 can be calculated once the bag stitch length has been determined.

2.3.1.1. English Formula

Dividing 1350 RPM (maximum sewing rate) by Stitches per foot produces the Linear Feet per Minute. 1350 RPM / (stitch per foot) = Linear Feet per Minute

Example-a stitching length of 2.5 stitches per inch

Step 1-Convert 2.5 stitches per inch to stitches per foot, 2.5 x 12 = 30 stitches per foot

Step 2-Divide 1350 RPM by 30 stitches per foot. 1350 / 30 = 45.00 Linear Feet per Minute

2.3.1.2. Metric Formula

Multiplying the length per stitch in meters and 1350 RPM (maximum sewing rate) produces the Linear Meters per Minute.

Example (Metric system)-a stitching length of 10.2 mm per stitch

Step 1-Convert 10.2 mm per stitch to meters per stitch, 10,2mm = 0.0102 meters per stitch

Step 2-Multiply 1350 RPM by 0.0102 meters per stitch. 1350 x 0.0102 = 13.77 Linear Meters per Minute

2.3.2. Actual Bag Capacity

The actual bag speed output of the Model 100-2-R2 can be calculated in bags per minute using the width of each bag and establishing the between-bag spacing on the conveyor.

NOTE: A minimum of 7.9 inches (200 mm) between bags is recommended for plain sewing.

Linear Rate of Sewing / [(bag width) + (bag spacing distance)] = Bags per Minute
Linear Rate of Sewing / Linear Length of each Bag = Bags per Minute
Refer to paragraph 2.3.1 for information on calculating Linear Rate of Sewing.

2.3.2.1. English Formula

Example- an 18 inch wide bag with a spacing of 7.9 inches at the Maximum Linear Rate of sewing

Step 1-Determine the Linear Rate of Sewing
Using the examples in paragraph 2.3.1., the Linear Rate of Sewing is 45 Linear Feet per Minute

Step 2-Determine the total effective Linear Length of each bag
[(bag width) + (bag spacing distance)], 18 inches + 7.9 inches =25.5 inches

Step 3-Convert the Linear Length of each bag to feet to equal the Linear Rate variable
25.5 inches =2.125 feet

Step 4-Divide the Linear Rate of Sewing by the Linear Length
Linear Rate of Sewing / Linear Length of each Bag = Bags per Minute
45 feet per minute / 2.125 feet = 21.177 Bags per Minute

2.3.2.2. Metric Formula

Example- a 457,2 mm wide bag with a spacing of 200 mm at the Maximum Linear Rate of sewing

Step 1-Determine the Linear Rate of Sewing
Using the examples in paragraph 2.3.1., the Linear Rate of Sewing is 13.77 Linear Meters per Minute

Step 2-Determine the total effective Linear Length of each bag
[(bag width) + (bag spacing distance)], 457,2 mm + 200 mm =657,2 mm

Step 3-Convert the Linear length of each bag to meters to equal the Linear Rate variable, 657,2 mm =0.657 meters

Step 4-Divide the Linear Rate of Sewing by the Linear Length
Linear Rate of Sewing / Linear Length of each Bag = Bags per Minute
13.77 meters per minute / 0.657 meters = 20.959 Bags per Minute

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Rev B/July 2016

3 INSTALLATION & HANDLING

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3.0 Installation and Handling

3.1. Unpacking Procedure

Each Fischbein sewing head is packaged to protect the unit during normal shipping, storage and handling. The sewing head is packed in a corrugated box with cardboard padding surrounding it. It is then taped shut. Before the unit is unpacked, inspect the box for any signs of damage incurred during shipping. After the unit is unpacked, inspect the sewing head itself for damage.

NOTE: Report any damages in writing to the shipper and to your authorized Fischbein representative. Locate your sewing head's serial number and model number and record these numbers for future reference.

Figure 3.1 **Sewing Head Identification Plate**

Reading from left to right, the first six numbers that are stamped on the housing represent the serial number. The next five numbers represent the model number. The model number and serial number are also printed on the plate attached to the side of the housing.

3.1.1. Tool Kit

Included in the packaging of the sewing system is a Tool Kit with various tools and pieces used for routine adjustments and maintenance on the Model 100-2-R2. Refer to Figure 3-1.

Figure 3.2 **Tool Kit**

3.2. System Lubrication

The Model 100-2-R2 Sewing Head will be filled at the factory and is delivered with oil. The system should have 1 quart (0.95 liters) of oil upon receipt and can be verified at the oil level window gauge. Identify the Breather Plug located on the right side of the sewing head. Refer to Figure 3-3.

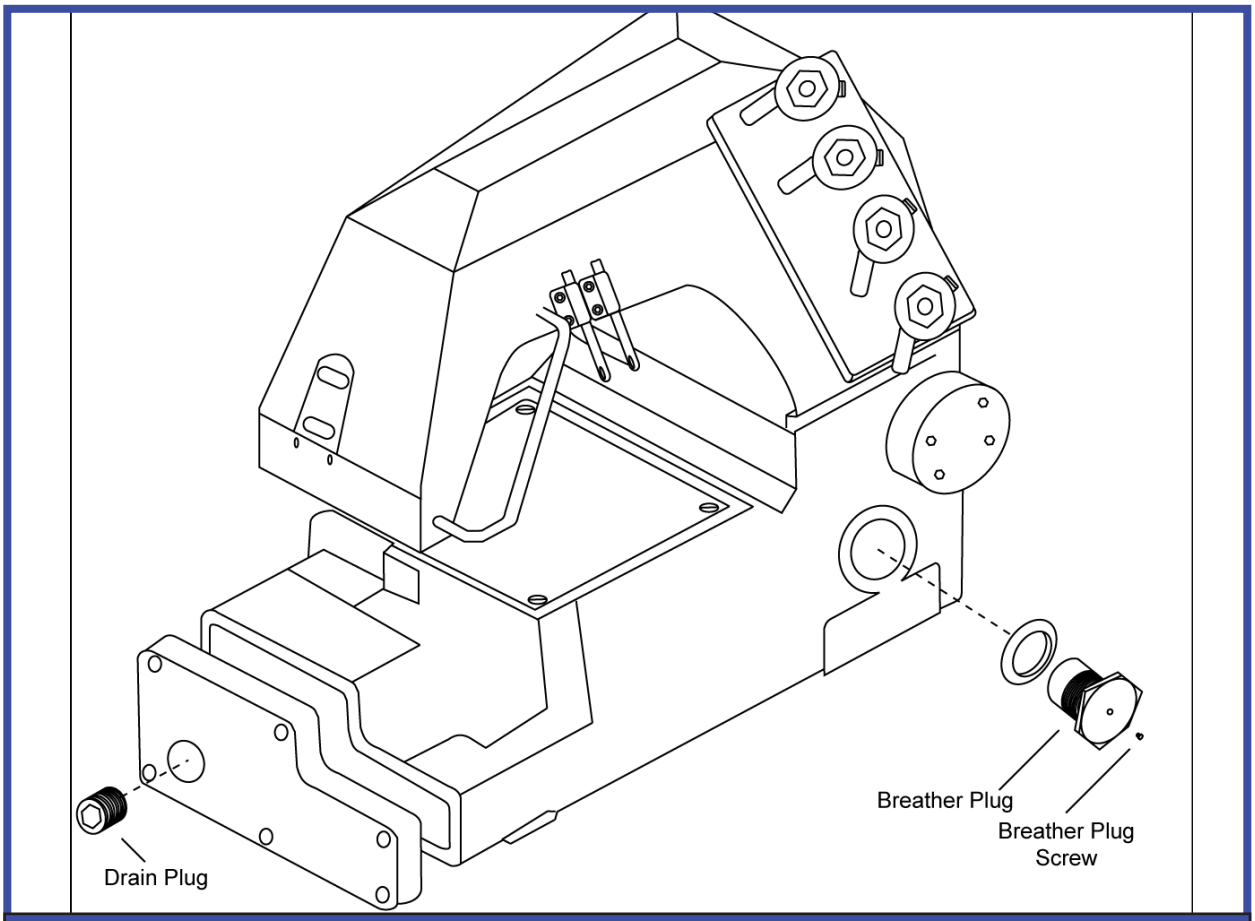

Figure 3.3 **Breather Plug**

Installed in the breather Plug will be a screw used to maintain the oil with in the sewing head for shipping. This screw must be removed.

THE BREATHER PLUG SCREW MUST BE REMOVED PRIOR TO OPERATING THE MODEL 100-2-R2 SEWING HEAD. FAILURE TO REMOVE THE BREATHER PLUG SCREW MAY RESULT IN MACHINE DAMAGE.

If the Oil level has fallen below the level line in the window, Oil must be added to the sewing head in accordance with Paragraph 5.1.3.

3.3. Mounting the Sewing Head

THE SEWING HEAD IS VERY HEAVY AND CAN BE AWKWARD TO HANDLE ALONE. FOR SAFETY OF THE INSTALLERS AND THE SEWING HEAD, A DOLLY PLATFORM SHOULD BE USED TO TRANSPORT THE SEWING HEAD.

Due to the size and weight of the sewing head, a cart should be used to transport it. It is best to have a helper to install the sewing head. Be sure to hold the sewing unit by the main housing. The sewing head is attached to the overarm assembly by a mounting plate with three hex head bolts. The mounting plate attaches to the overarm assembly with two hinges. The hinges allow for easy access to various areas of the sewing head. When the sewing head is rotated into the closed position, the outer swinging edge of the mounting plate will come to rest on two jack bolts.

Refer to Figure 3-4.

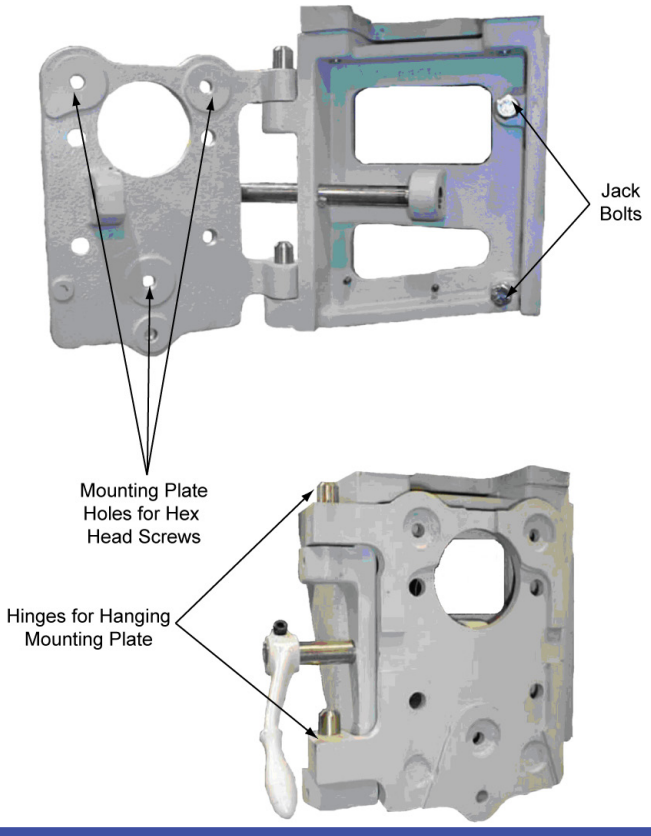

Figure 3.4 **Sewing Head Mounting Plate**

The jack bolts are used to provide the needed support during use and enable the latch pin to firmly hold the plate. The mounting plate is locked into the closed position with a latch pin, which is pushed in and rotated to secure the mounting plate. The locking rod passes through a hole in the sewing frame and then through one in the mounting plate, when in the closed position.

The jack bolts are pre-set at the factory for the mounting plate that accompanies the sewing system. If the jack bolts are not properly adjusted, the sewing head can possibly vibrate causing damage or other parts to come loose. The jack bolts must be raised or lowered so that they come into firm contact with the mounting plate. Both bolts come with a lock nut to keep them in position.

3.3.1. Adjusting the Jack Bolts

The Jack Bolts will only have to be adjusted if they become loose or if replacing the plate.
To adjust the Jack Bolts:
1. Loosen the Lock Nuts and turn the Jack Bolts clockwise five turns.
2. Rotate the plate into the closed position until it comes into contact with the Jack Bolts and then use the Latch Pin to secure the plate.
3. If the Latch Pin will not tighten, turn the lower Jack Bolt in increments counter clockwise until the Latch Pin tightens firmly before it has rotated the full 90°.

NOTE: Do not fully lock the Latch Pin before adjusting the upper Jack Bolt.

4. Secure the lower lock nut to hold the lower Jack Bolt in position.
5. Gradually turn the top Jack Bolt counter clockwise until it comes into contact with the plate.
6. Unscrew the top jack one additional rotation.
7. Secure the upper lock nut to hold the upper Jack Bolt in position.
8. Fully lock the Latch Pin and verify the Mounting Plate and Jack Bolts are flush.

When the plate is in the closed position and secured into place, the Latch Pin will tighten completely before rotating the entire 90° and press firmly on the Jack Bolts.

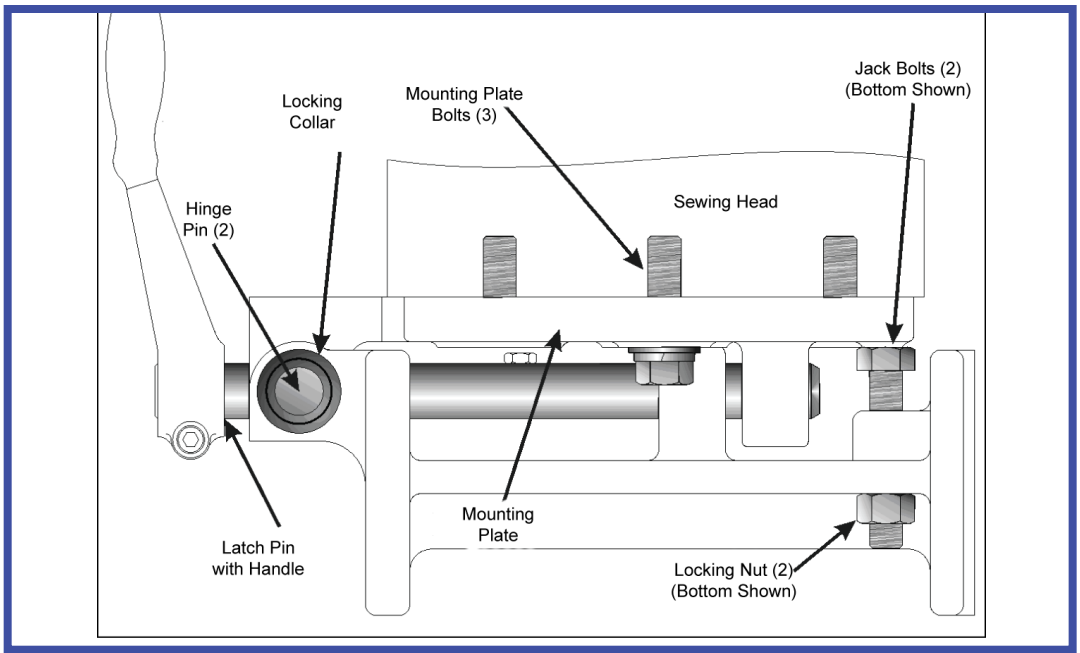

Figure 3.5 **Sewing Head Mounting Plate & Jack Bolts**

3.4. Sewing Head Disposal

If a Fischbein sewing head becomes damaged beyond repair or simply worn to a non-functional state, the oil from the unit must be drained before disposal.
Refer to Paragraph 5.1.1 to drain the sewing head of oil.

⚠ **DISPOSE OF THE OIL ACCORDING TO APPROPRIATE LOCAL ENVIRONMENTAL REGULATIONS.**

After the oil has been drained and disposed of, bring the sewing head to a recycling center or metal scrap facility.

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HAMER-FISCHBEIN® LLC

A DURAVANT COMPANY

Model 100-2-R2

Empress™ Series

Sewing Head

Part #37776

Rev B/ July 2016

4 OPERATING THE MODEL 100-2-R2

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4. Operation of the Model 100-2-R2 Sewing Head

4.1. Pre Operation Inspections

4.1.1. General

General Inspections identify any existing condition detrimental to the operation of the machine. Many failed inspections are related to the cleanliness of the machine and the poorly maintained portions of the machine.

VERIFY ALL ELECTRICAL POWER AND PNEUMATIC PRESSURE IS SECURED ON THE SYSTEM PRIOR TO PERFORMING ANY SYSTEM INSPECTION OR MAINTENANCE. FAILURE TO DO SO CAN RESULT IN PERSONNEL INJURY OR EQUIPMENT DAMAGE.

1. Inspect the machine for loose fasteners, mechanisms making unusual noises, or squealing. Troubleshoot the causes for these conditions and resolve the issues.

2. Verify oil level and pressure is within expected levels throughout operation of the sewing unit. Failure to maintain oil at proper levels can cause severe machine degradation.

3. Check for evidence of oil leakage. Identify and repair cause for leakage prior to continuing operations with the sewing unit.

4.1.2. Gauge Tool

The gauge tool is a necessary tool for verifying certain adjustments of the Model 100-2-R2. The gauge, part number 10230, is included within the included tool kit. The gauge is exactly 3” long at the longest point and can be used to measure stitch length, Feed Dog height, and Looper Distance.

Refer to Figure 4-1.

Figure 4.1 Gauge Tool

The gauge tool has three measurement functions. It can be used to check the height of the Feed Dog, the height of the needle at the top of its travel, and to check the timing of the Looper relative to the needle.

NOTE: Rotating the pulley drive one full revolution and verifying the needle eyes line up with the Looper eyes on both the back stroke and forward stroke can provide a quick visual reference point from which to make necessary adjustments.

4.1.2.1. Feed Dog Measurement

With a thickness of 1/16” (1,6mm), the gauge tool is used to check the height of the Feed Dog above the throat plate at the top of the stroke. The measurement is made with the Presser Foot on the machine and no thread or tape between the Presser Foot and the Feed Dog. The gauge should just fit between the throat plate and Presser Foot. If it does not fit, the Feed Dog should be checked for wear and replaced if needed. If the Feed Dog is not worn, then adjust to a height of 1/16” (1,6mm) in accordance with Paragraph 5.3.5.

Use the straight edge of the gauge tool to verify the parallel alignment of the Feed Dog and Throat Plate. If adjustment of the Feed Dog is necessary, refer to Paragraph 5.3.5.

4.1.2.2. Primary Needle Height Measurement

Standing the gauge on edge, with the cut out edge down to allow space for the Feed Dog, allows for checking the height of the needle at the top of its travel. The bottom of the primary needle eyelet height from the top of the throat plate must be comparable to within +/- 1/16” of the height gauge tool measurement of 1-1/8” (28,6mm). The measurement is made from the throat plate to the bottom of the eye of the primary needle.

Refer to Figure 4-2. If an adjustment of the needle is needed, refer to Paragraph 5.3.2.

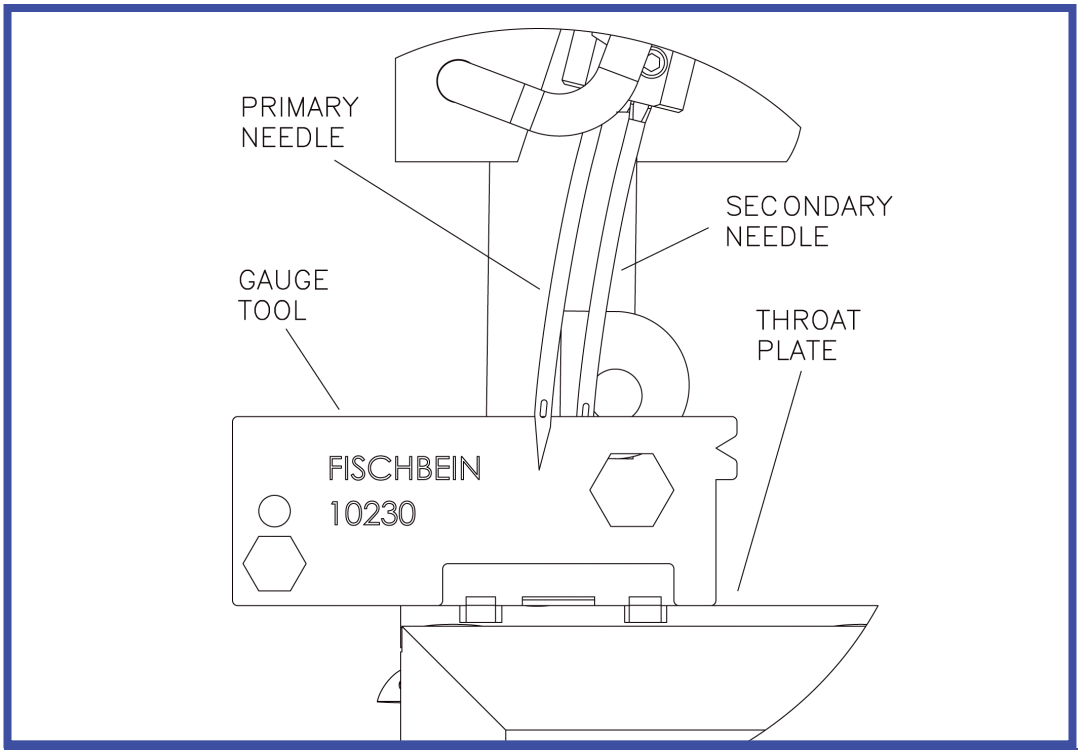

Figure 4.2 **Needle Height Check**

4.1.2.3. Primary Looper to Primary Needle Distance Measurement

Placing the gauge with the V shaped notch perpendicular to the needle will check the stroke or timing of the Looper relative to the needle. Refer to Figure 4-3. With the Primary Looper retracted into the machine as far as it will go, and the needle placed in the V shaped notch, verify the tip of the Primary Looper meets the edge of the gauge tool. If necessary, adjust the distance between the Primary Looper and needle using Paragraph 5.3.4.

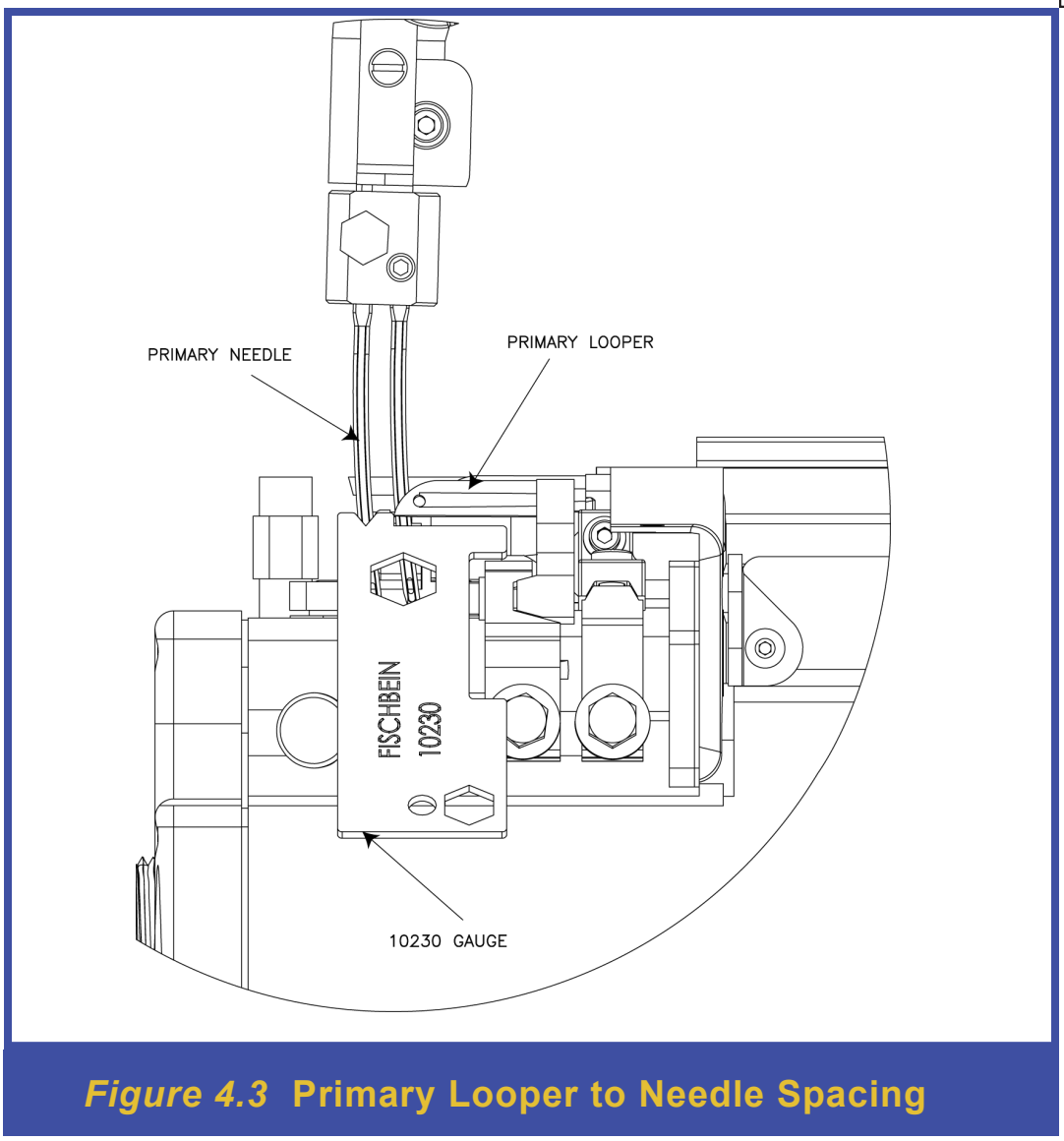

Figure 4.3 **Primary Looper to Needle Spacing**

4.1.3. System Inspection

When installed on a production line, the Model 100-2-R2 Sewing Head may be a part of a larger operation. Care should be taken to inspect the entire system line to ensure no hazards exist. These include, but are not limited, to the following. Refer to specific unit technical manuals for troubleshooting and adjustments as needed.

1. Inspect all electrical cables for cracking, excessive wear, or cuts in the outer sheath of the cable. If any of these conditions occur, replace the cables and reapply cable ties to the appropriate cable hangers.

2. Inspect all motor wiring to be securely terminated in the control panels.
3. Inspect the Variable Pulley Drive belt for worn surfaces, cracks or tears. Replace belt if needed.
4. Inspect machine cabling for being neatly coiled and stored off the floor in a pinch free environment. Do not allow cables to lie on the floor due to increased possibilities of damage to the cable.

4.2. Threading the Sewing Head

VERIFY ALL ELECTRICAL POWER AND PNEUMATIC PRESSURE IS SECURED ON THE SYSTEM PRIOR TO PERFORMING ANY SYSTEM INSPECTION OR MAINTENANCE. FAILURE TO DO SO CAN RESULT IN PERSONNEL INJURY OR EQUIPMENT DAMAGE.

1. Lock out compressed air and electrical power so the machine cannot run.
2. Refer Figure 4-4 and 4-5. Thread the needles as shown.

NOTE: A pair of needle nose pliers may help in threading small areas.

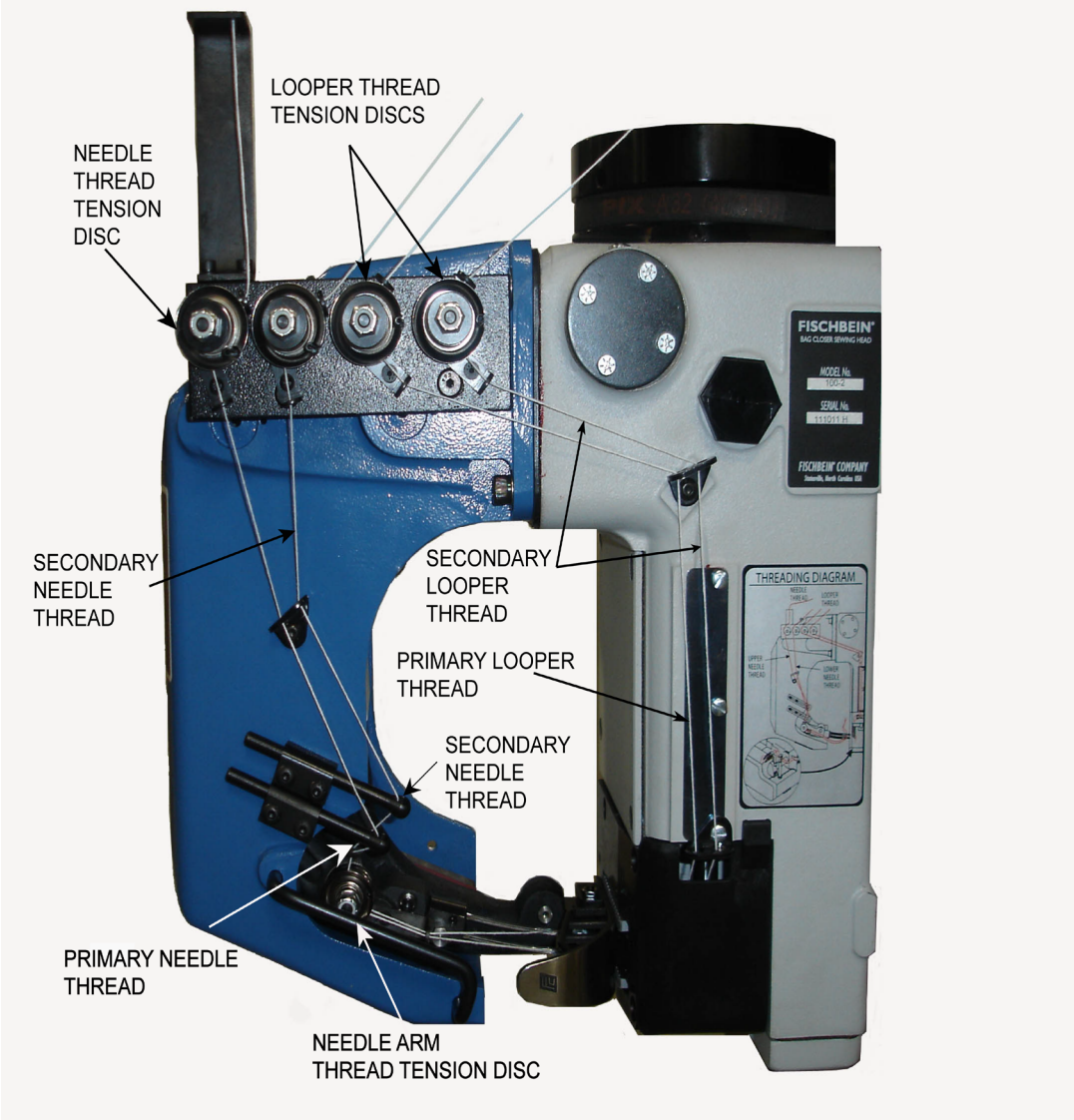

Figure 4.4 **Sewing Head Thread Route**

3. The thread at the needles is laced through from machine's infeed side towards the needle. Let the thread stick out 4" (102mm) on the other side of each needle.
4. The thread at the Looper must first go through the top hole and then through the bottom hole. About 4" (102mm) should be left sticking out of the Looper.

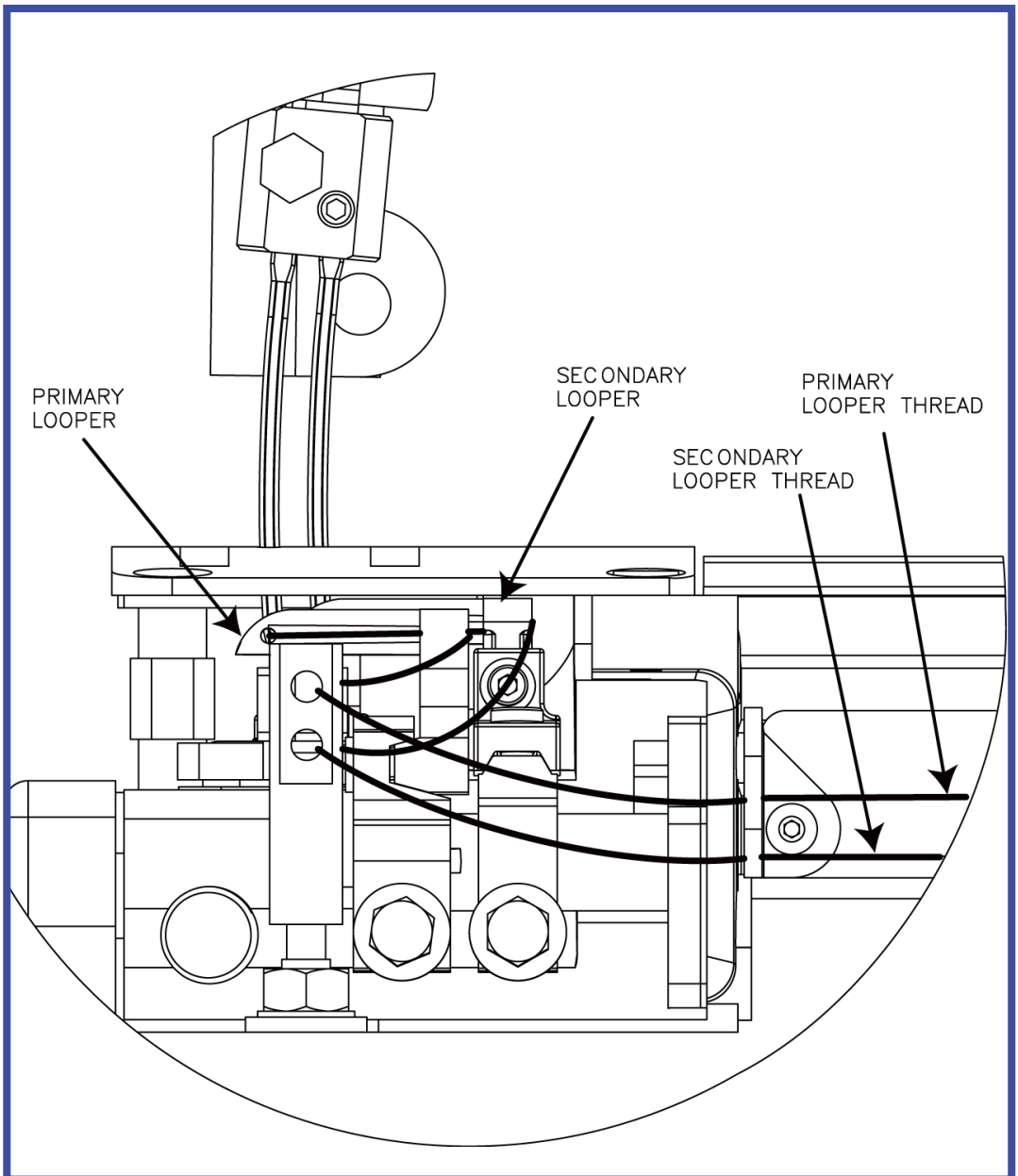

Figure 4.5 **Primary and Secondary Looper Thread Route**

NOTE: Threading the loopers can be made easier with the 11122 threading wire. The thread is insert into the eyelet of the threading wire and the metal wire is then routed through the looper eyelets to quicken the threading process.

NOTE: To complete a chain off, a piece of bag material should be placed between the presser foot and the throat plate before running the machine.

5. Loosen the sewing head drive belt tension by unlocking the drive motor. Refer to Paragraph 5.4 if necessary.
6. Turn the Variable Drive Pulley by hand in a clockwise direction so the sewn bag proceeds forward through at least three complete cycles. This will start the chaining process.
7. Run the system to clear out the test bag material, before attempting to run a bag through the system.

4.3. Model 100-2-R2 Sewing Head Operation

Oil pressure of a running sewing head will be between 15 psi (1 bar) to 40 psi (2,8 bar).

NOTE: Upon initial start-up or after an oil change, run the sewing head in short 2-3 second bursts until system pressure has been reached.

Typical operation and control of the Sewing System is accomplished through integrated system controls or with a manually operated start/stop pushbutton on stand alone units. Refer to the appropriate system level technical manual for control operations of the Model 100-2-R2 Sewing Head.

4.4. Clean-Up of the Model 100-2-R2 Sewing Head

Clean-up the Model 100-2-R2 Sewing Head is necessary to ensure the machine remains in good working order.
1. Blow or brush debris free using compressed air.
2. If necessary, use a duster or soft bristle sweeper to remove any loose sediment.
3. Wipe clean any lubricating oil that may be present on the sewing head.

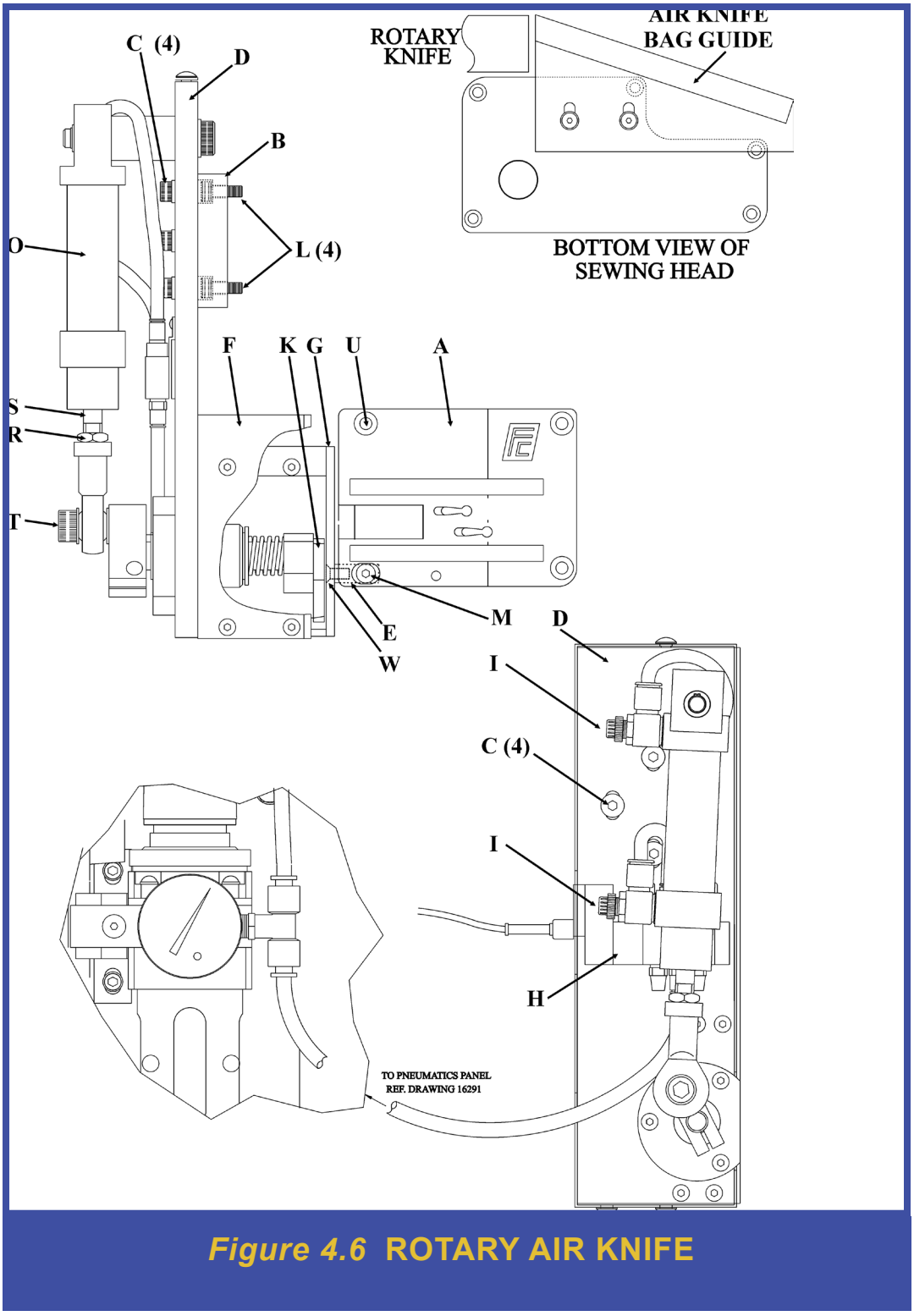

Figure 4.6 **ROTARY AIR KNIFE**

4.5. Mounting and Adjusting the Rotary Knife

1. Refer to Figure 4.6. Mount the modified throat plate (A) to the sewing head using the original three flat head screws through three of the holes (U).

2. The mounting block (B, Figure 4.6) is mounted to the outside face of the pivot knife bracket (Figure 4.7) on the side of the housing. The four original screws are removed and replaced with four 10-32 x 7/8" cap screws (L, Figure 4.6).

3. The knife assembly is mounted to the block (B) with four M6 metric cap screws (C) through the slotted holes in the support plate (D). NOTE: The air cylinder (O) will have to be rotated to gain access to all four screws (C). The cylinder (O) can be moved by removing cap screw (T). The slots provide for vertical adjustment for the assembly. These screws only need to be finger tight initially.

4. Move the throat plate mounting block (E, Figure 4.6) until it touches the back of the throat plate. Move the assembly up and down until the tapped hole in the mounting block (E) lines up with the countersunk slot in the throat plate (A). Secure with an M4 metric flat head screw (M).

5. Tighten the four M6 socket head cap screws (C) and replace the air cylinder (O), with cap screw (T).

6. Remove the side cover (F) and tighten the M4 metric flat head screw (W) that secures the mounting block (E) to the fixed knife blade (G). (Figure 4.6 and 4.7)

7. Replace the cover (F).

8. Mount the outer cover on the rotary air knife assembly.

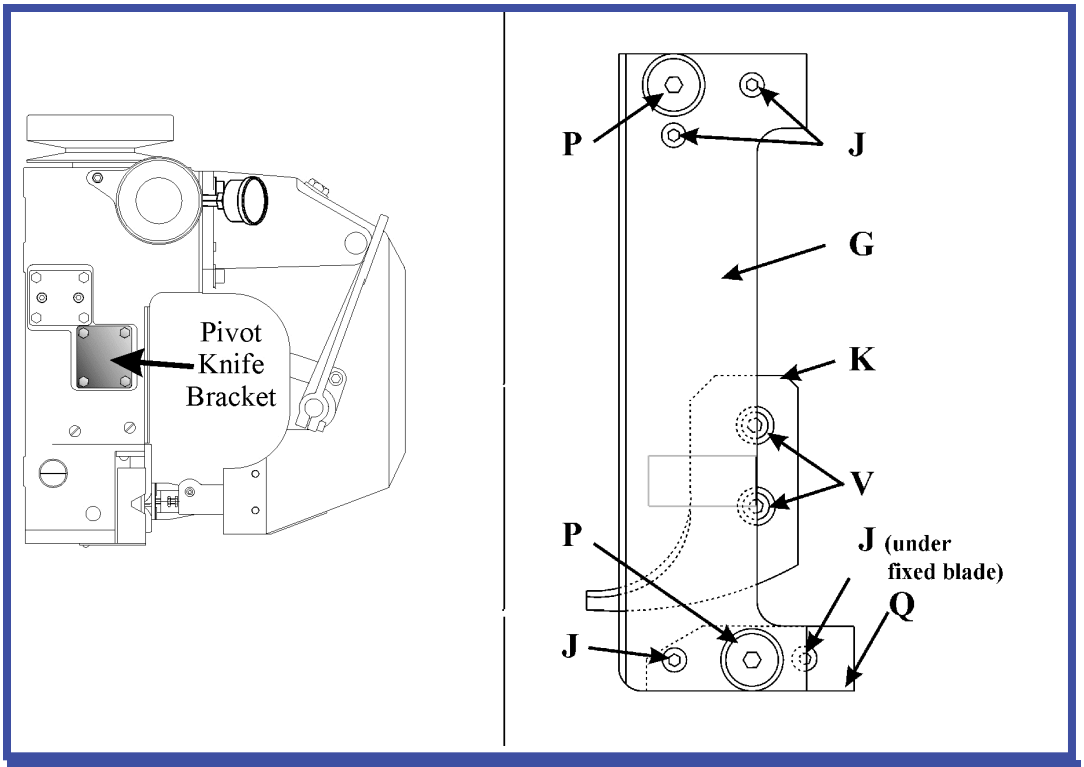

Figure 4.7 **PIVOT BRACKET AND KNIFE BLADES.**

4.6. Rotary Knife Adjustment and Maintenance

1. A regulator/filter assembly is required and is offered as an option. The air pressure to the air knife must be 90-PSI (6,2 bar) minimum.

2. If the thread is not cut off cleanly, it is usually the result of a dull knife set or a maladjusted fixed knife blade (G). (Figure 4.7)

3. Adjust the flow control valves (I) on the air cylinder (O) to provide a smooth operation of the air knife. (Figure 4.6) Turning out (counterclockwise) the adjustment screw on the valve will increase the speed of the air knife. The valves (I) are adjusted at the factory for maximum airflow and the fastest cut.

4. To replace the blades, first remove the side cover (F), (Figure 4.6). Remove screws P and W to remove the fixed blade (Figure 4.6 and 4.7). Remove screws V to remove the movable blade (K). Replace the old blades with new. (#31112 and #31113)

5. The cutting edges of the fixed blade (G) and movable blade (K) must contact each other. If they do not, the cut edges of the thread will be frayed, or the thread will not be cut completely through. The four M4 set screws (J) provide this adjustment. (Figure 4.7) Three are in the fixed blade (G), and one is in the lower fixed blade bracket (Q). Adjust the screws (J) until there is contact between the cutting edges. There may be a small gap along the back edges of the two knife blades as a result.

6. The contact between the two knives should periodically be coated with a light layer of grease. Wheel bearing grease is used at the factory.

7. The tip of the movable knife blade (K) must not extend beyond the cutting edge of the fixed knife blade (G). If it does, loosen nut (R) on the air cylinder (O). The air cylinder (O) must be in the retracted position as shown in Figure 4.6. Screw the shaft (S) of air cylinder (O) in or out until the tip of the movable knife is retracted beyond the cutting edge of the fixed blade (G).

8. Further assistance is available from your Fischbein representative or by calling the Technical Service Department at the Fischbein Company. (page 12)

HAMER-FISCHBEIN® LLC

A DURAVANT COMPANY

Model 100-2-R2

Empress™ Series

Sewing Head

Part #37776

Rev B/ July 2016

5 MAINTENANCE

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5. Scheduled Maintenance

The maintenance and repair of the Model 100-2-R2 Sewing Head, in most plants, will be the duty of maintenance personnel. However, some routine care of the machine can be performed by the operators. Refer to Table 5-1 for Daily Care of the Sewing Head. Report any malfunction of the system to supervisor or maintenance personnel.

⚠ **DO NOT ATTEMPT ANY REPAIRS OF THE SEWING HEAD MACHINE UNLESS QUALIFIED TO DO SO.**

Table 5-1 Routine Care of the Model 100-2-R2

ACTION	FREQUENCY
Use a brush, rag, compressed air, or vacuum system to remove debris from the machine surfaces.	Daily
Monitor Oil Pressure remains between 15-40 psi (1-2,8 bar)	Daily
Monitor Oil Level.	Daily
Check pulley belt for proper tension and excessive wear.	Daily
Oil Change (Including Oil Filter)	Every 500 Operating Hours

5.1. Oil Change

Oil changes must be performed every 500 operating hours or as needed to maintain optimal Sewing Head performance. Both the system fluid and the Oil Filter must be replaced each oil change.

Rykon # 68 Oil (part number 10200) or Food Grade Oil (#31047) are the oils that should be used in the Model 100-2-R2 Sewing Head. The Fischbein part number for replacement Oil Filters is 15054.

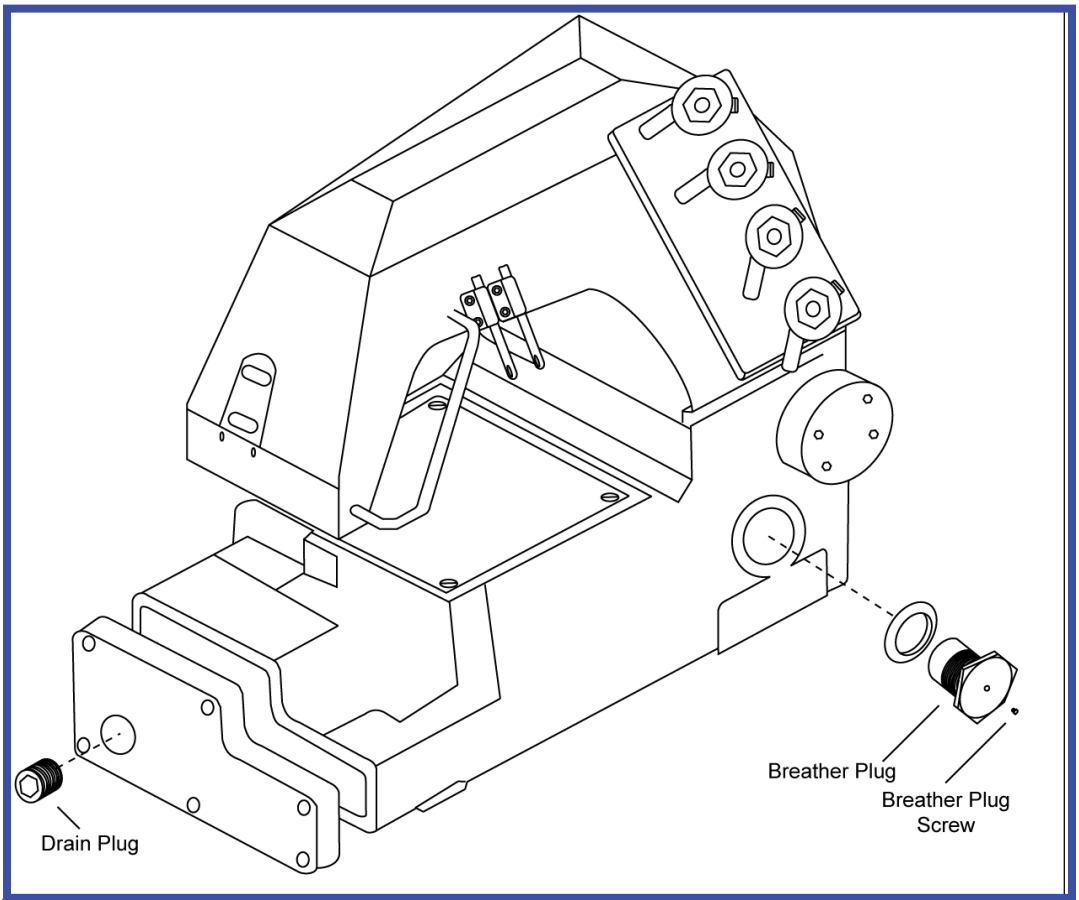

Figure 5.1 Oil Ports

5.1.1 Oil Draining

1. Secure electrical power and Lock Out system compressed air prior to performing maintenance on the Sewing Head.
2. Remove the Breather plug.
3. Unscrew the Drain Plug from the bottom cover of the sewing head.

NOTE: The Drain Plug is magnetic.

4. Clean metal particles or any debris form the Drain Plug.
5. Use Teflon tape and wrap the threads of the Drain Plug.
6. Securely fasten the Drain Plug into the bottom Cover.
7. Dispose of used oil in accordance with local regulations.

5.1.2. Oil Filter Replacement

1. Verify system electrical power and compressed air have been secured and the Drain Plug is installed.
2. Remove the old filter from the sewing head.
3. Fill Fischbein replacement Oil Filter, part number 15054, with Rykon # 68 oil, part number 10200 or Food Grade Oil (#31047).
4. Coat the seal on the new oil filter with a thin film of oil.
5. Install the new filter hand tight.

NOTE: Do not over tighten the Oil Filter. Coating the filter seal and system fluid pressure will provide the necessary seal for the filter.

5.1.3. Filling Sewing Head with Oil

The oil capacity of the Model 100-2-R2 is 1 quart (0.95 liter). A fluid level indicator sight glass is installed on the left hand side of the machine. If the oil level falls below the level indicator line or if performing an oil change, add oil to the system as follows.

1. Verify system electrical power and compressed air have been secured, the Drain Plug is installed, and the Oil Filter is installed.
2. If not already performed, remove the Breather Plug.
3. Use clear tubing and funnel provided in the Tool Kit, part number 10240-2, to deliver oil to the sewing head through the Breather Port until the oil level is at or slightly above the oil level line indicator.
4. Use Teflon tape and wrap the threads of the Breather Plug.

5. Securely fasten the Breather Plug into the Breather Port.
6. Restore electrical power and compressed air to the sewing head.
7. Run the Sewing Head in short 2-3 second bursts until system pressure indicates between 15-40 psi (1-2,8 bar).

NOTE: System pressure will increase between 15-40 psi (1-2,8 bar) using short bursts, however the sewing head does not fully warm up until after approximately 2 hours of usage.

8. Check system for leakage and periodically monitor system pressure until system is fully warmed up.

5.2. System Adjustments

5.2.1. Thread Tension

Figure 5-2 identifies the adjustable components for thread tensioning.

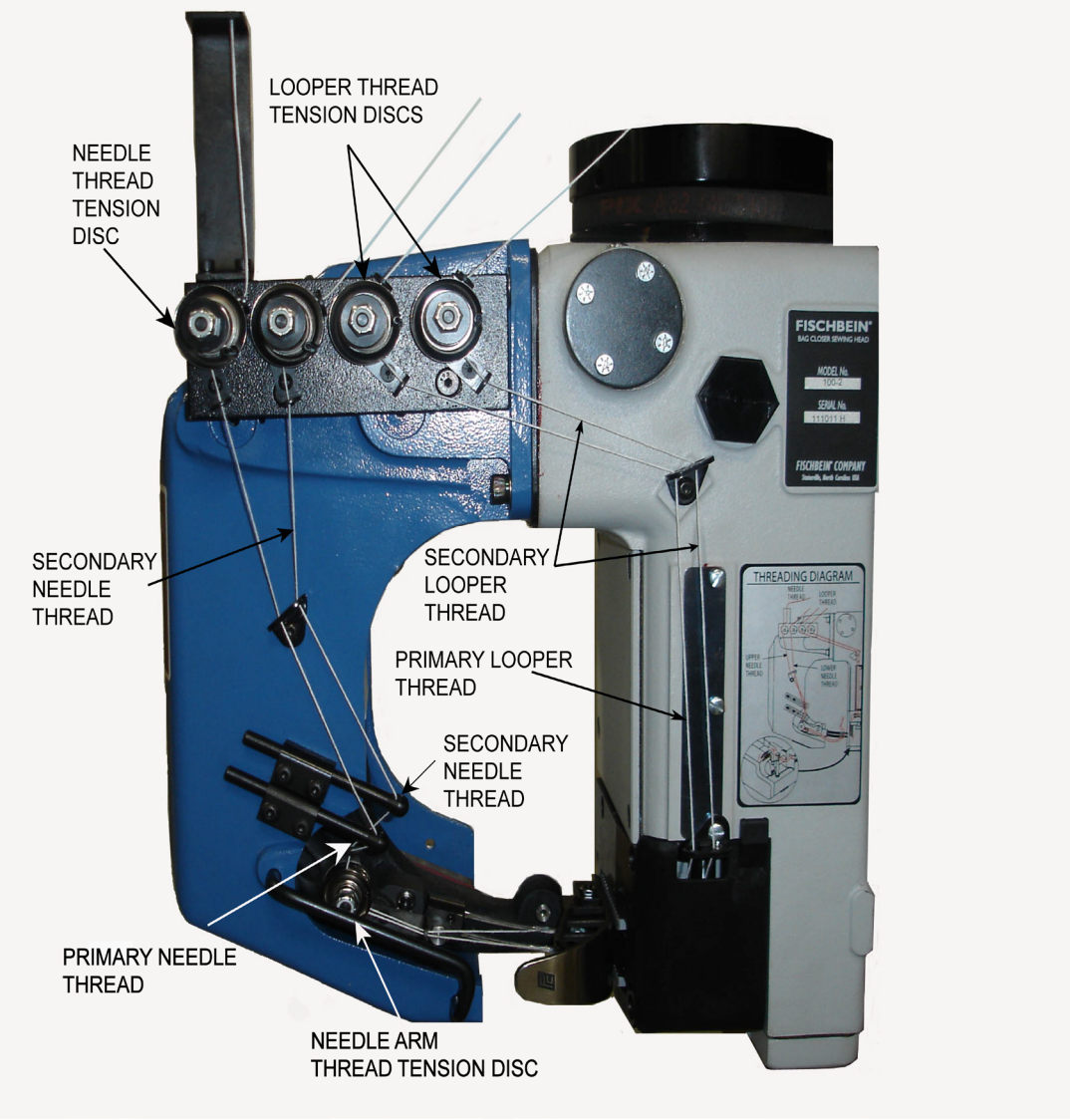

Figure 5.2 **Thread Tensioning Components**

5.2.1.1. Looper Thread Tension

The Looper thread tension is adjusted using the Looper thread tensioners.
The tension on the Looper thread must be light and even as the thread is pulled with a steady, even motion. If the tension is not even, or a large force is required to pull the thread, the source of the problem must be found and corrected before running the machine.

5.2.1.2. Needle Thread Tension

The needle thread tension is adjusted using the needle thread tensioners and the needle arm thread tensioners. The needle thread tension should put a noticeable drag on the thread. Tension also varies with stitch length and thickness of material to be sewn. Some adjustment may be necessary with different combinations of threads and materials sewn.

The needle arm thread tensioner prevents thread pulled by the thread pull off tensioner from sagging too close to the needle. Tension is very slight and the adjustment is fixed. Factory settings of tension are made for a 4-ply paper bag with a stitch length of 2.5 stitches per inch (10 mm per stitch) using Fischbein synthetic thread 12/5, unless otherwise specified when ordered, which is valid in most cases.

5.2.1.3. Thread Pull Off Tension

Adjusting the Thread Pull off Tensioners is not normally required as these tensioners are set at the factory. However, if needed, loosen the socket button head screws on the Thread Pull Off tensioner and slide towards the Throat Plate for thicker materials and away from the Throat Plate for thinner materials.

⚠ **DO NOT RUN THE SEWING HEAD WITH THE SOCKET HEAD BUTTON SCREWS LOOSE IN THE THREAD PULL OFF. ALWAYS TIGHTEN BOLTS AFTER EACH ADJUSTMENT AND TEST THE MACHINE.**

5.2.2. Stitch Length

The standard factory setting of the stitch length is 3/8” (10 mm per stitch). Other stitch lengths can be set according to customer requirements.
Refer to Paragraph 2.1.3 for more information on measuring stitch length.

If a change is needed, perform the following.
1. Position the feed dog below the surface of the throat plate by rotating the drive pulley clockwise.
2. Stand the sewing head on its drive pulley so that no oil can flow out when removing the bottom cover.
3. Secure the head to prevent it from rotating on its pulley.
4. Remove the oil drain plug from the bottom cover.

NOTE: The drain hole will provide access to a socket cap screw used in adjusting the stitch length.

5. Loosen the cap screw using a 3/16" allen wrench, but do not remove the socket cap screw. The screw may fall into the housing if it is removed.
6. The stitch length is changed by sliding the adjustable link along the slotted groove. Moving link toward the throat plate shortens the stitch. Moving it away from the throat plate lengthens it.

NOTE: Stitch length can vary between 2.3 to 3.3 stitches per inch (8 mm to 11 mm per stitch).

7. When the desired setting has been achieved, tighten the socket cap screw, but not fully yet.
8. To check the stitch length, tilt the sewing head enough to rotate the drive pulley, without allowing the oil to leak out of the drain hole. Put a sample piece of bag under the presser foot. Rotate the drive pulley clockwise through ten cycles and remove the bag sample. Calculate the stitch length and make necessary adjustment to the socket cap screw.
9. Tighten socket cap screw after obtaining the desired setting.
10. Wrap new Teflon® tape around the drain plug, and install it back into place.
11. Synchronize the sewing head to the conveyor and infeed in accordance with Paragraph 5.4.

5.2.3. Presser Foot Pressure Adjustment

The Presser Foot pressure may be adjusted using the adjustment screw found on the top of the sewing head.
Refer to Figure 5-3.

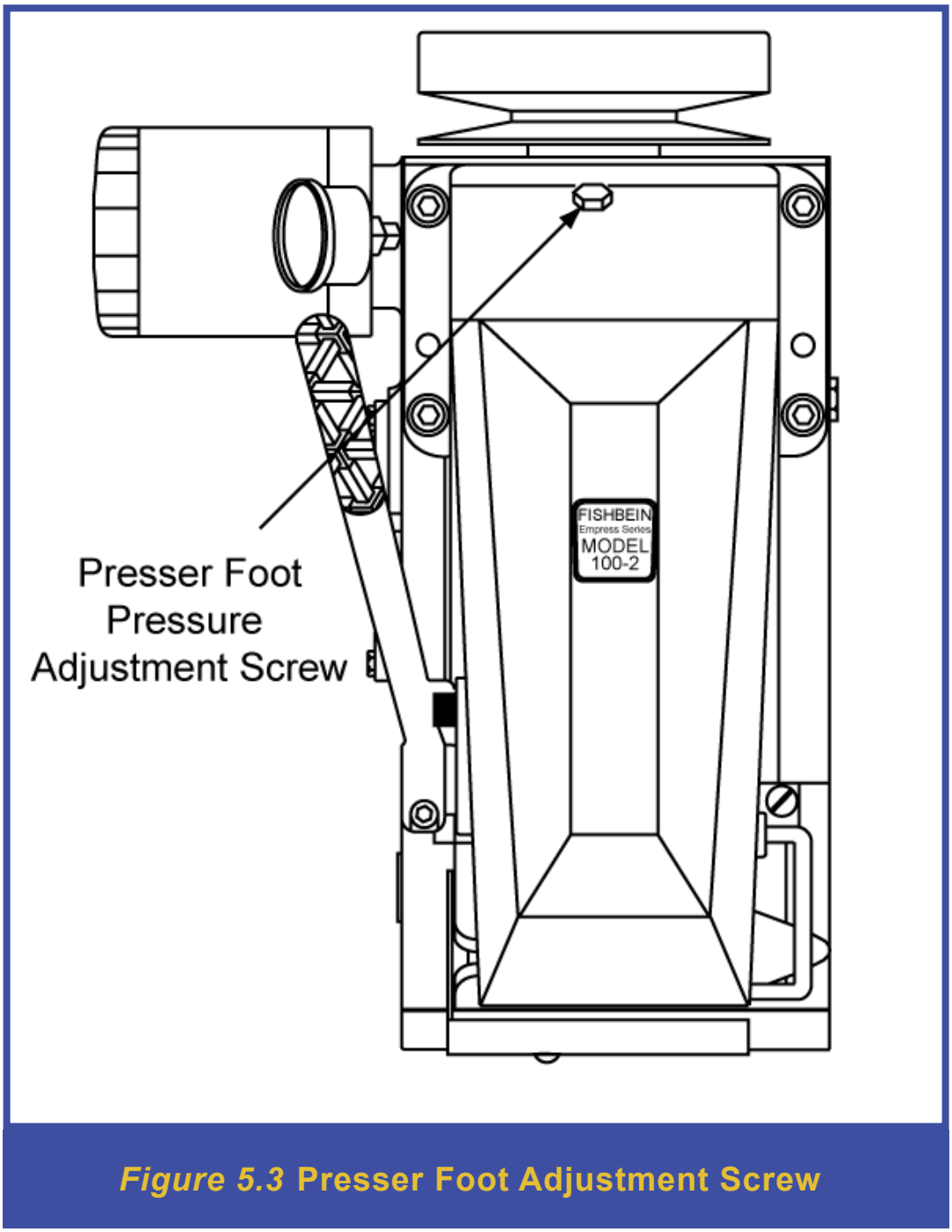

Figure 5.3 **Presser Foot Adjustment Screw**

To perform and adjustment of the Presser Foot pressure, perform the following.
1. Turn the hex head screw CW until fully tightened.
2. Loosen the hex head screw CCW five turns.

NOTE: Do not remove the hex head screw. Removing the screw will cause the spring loaded internal assembly to fail within the sewing head.

3. Check system performance and determine if more or less pressure is needed.
4. Adjust pressure as necessary by rotating the hex head CW for greater pressure or CCW for less pressure.

5.2.4. Cork Seal Replacement

The cork seal is located between the bottom cover plate and the sewing head housing. Refer to Figure 5-4.

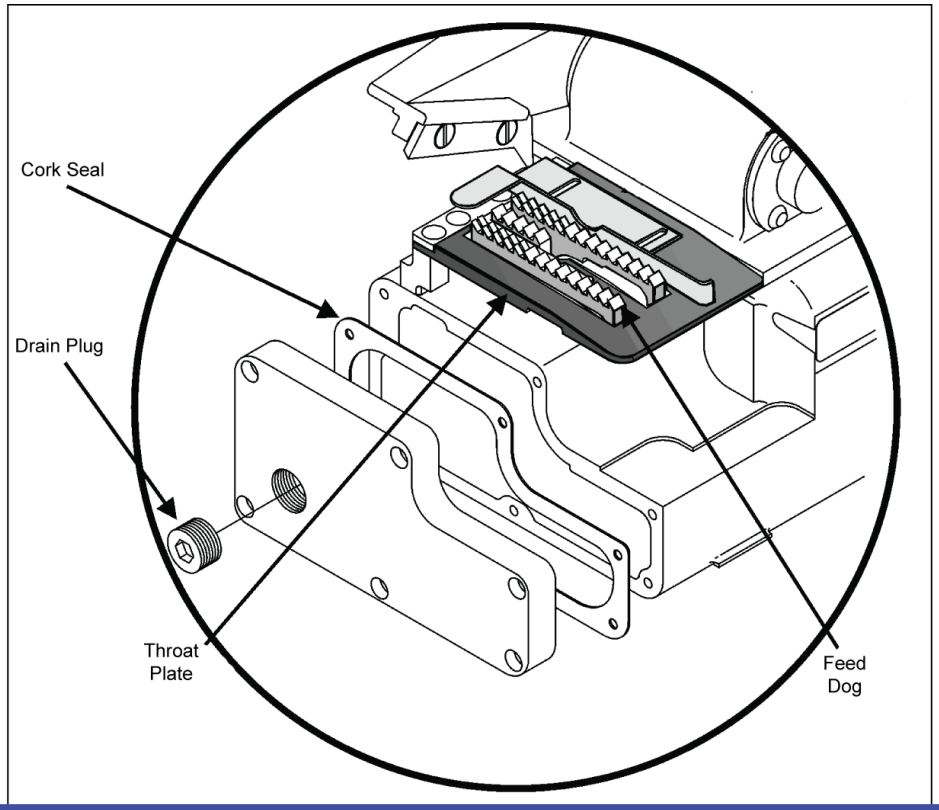

Figure 5.4 **Cork Seal**

If the bottom cover plate is removed or if leakage exists from the cork seal, replace the seal, part number 10093. Grease or system fluid may be applied to insure a tight seal.

5.2.5. Needle Replacement

The Model 100-2-R2 Sewing Head has two individual needles that can be replaced individually from one another. Refer to Figure 5-5.

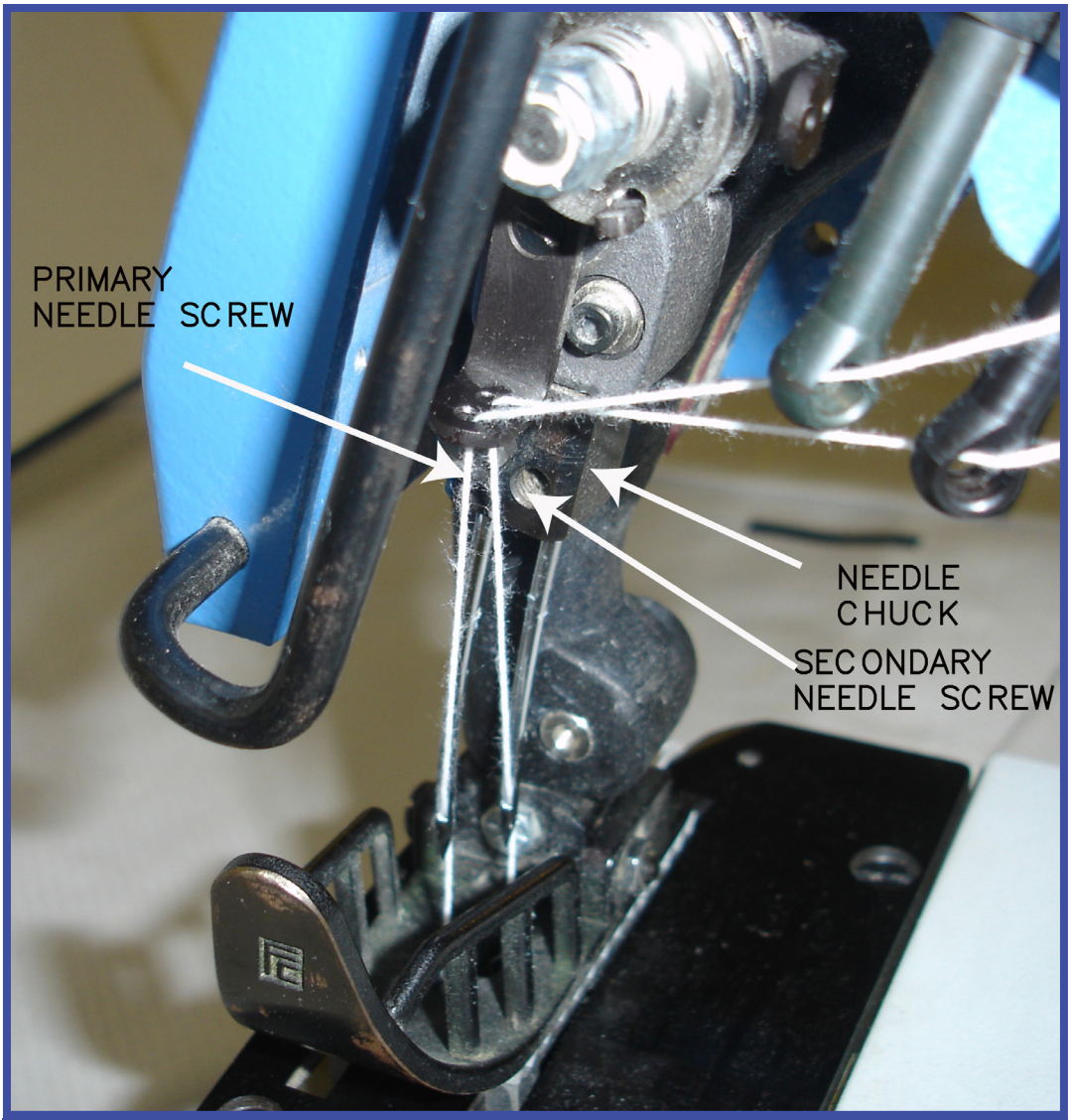

Figure 5.5 **Needle Replacement**

1. Loosen the appropriate screw from the Needle Chuck and carefully remove the needle.
2. Insert new needle, with flat surface facing the screw, fully into the needle chuck.
3. Tighten the screw to clamp the needle in the chuck.
4. As needed, fine tune the performance of the new needle and sewing head in accordance with Paragraph 5.3.

5.2.6. Feed Dog Replacement

1. Move the Hand Lever toward the oil pressure gauge to move the Presser Foot upward away from the Throat Plate.
2. Maintain the Hand lever in this position.

NOTE: A 6mm spacer wedged between the Hand Lever and screw at the base of the Hand lever will hold the lever in place.

3. Refer to Paragraph 5.2.5 and remove both needles.
4. Loosen and remove three screws holding the Throat Plate in place. Refer to Figure 5-6.

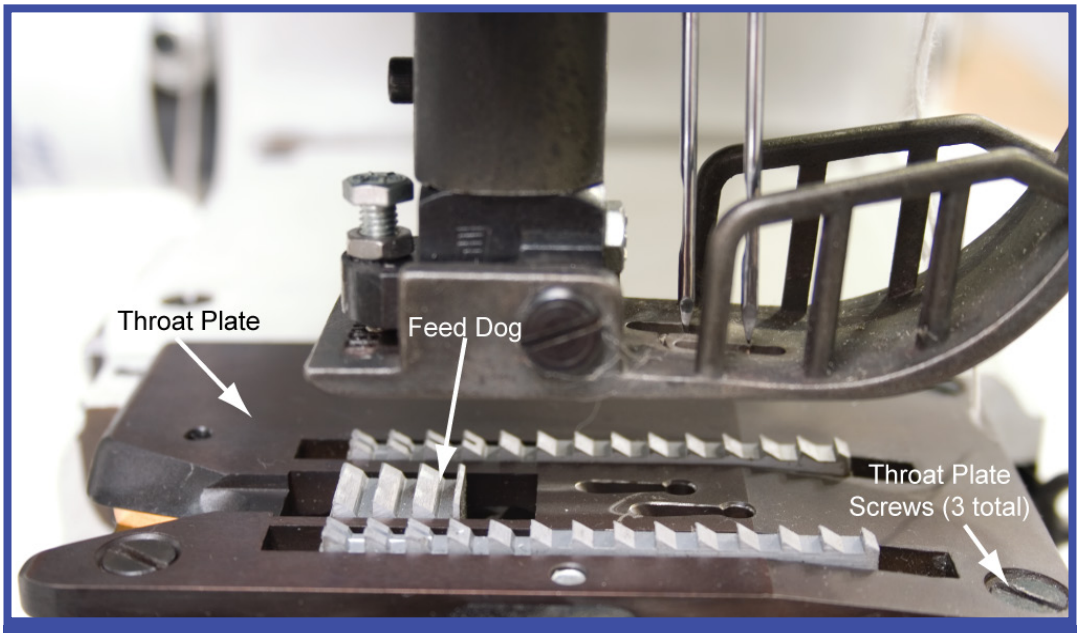

Figure 5.6 **Feed Dog and Throat Plate Removal**

5. Loosen screw securing Feed Dog in place and remove Feed Dog.
6. Install New Feed Dog and secure fully onto shaft by tightening screw.
7. Install Throat Plate and three screws.
8. Install removed needles. Refer to Paragraph 5.2.5.
9. Make necessary adjustments to new Feed Dog in accordance with Paragraph 5.3.5 and Paragraph 5.3.6.

5.2.7. Throat Plate Replacement

1. Move the Hand Lever toward the oil pressure gauge to move the Presser Foot upward away from the Throat Plate.
2. Maintain the Hand lever in this position.

NOTE: A 6mm spacer wedged between the Hand Lever and screw at the base of the Hand lever will hold the lever in place.

3. Refer to Paragraph 5.2.5 and remove both needles.
4. Loosen and remove three screws holding the Throat Plate in place. Refer to Figure 5-6.
5. Install new Throat Plate and three screws.
6. Install removed needles. Refer to Paragraph 5.2.5.
7. Make necessary adjustments to new Throat Plate alignment in accordance with Paragraph 5.3.6.

5.3. Machine Fine Tuning

To verify the Model 100-2-R2 Sewing Head maintains optimum performance, measurements and adjustments can be performed.

NOTE: Rotating the pulley drive one full revolution and verifying the needle eyes line up with the Looper eyes and both the back stroke and forward stroke can provide a quick visual reference point from which to make necessary adjustments.

5.3.1. Presser Foot Adjustment

The presser foot should not be parallel and resting directly on the throat plate. There must be a small gap measuring 0.012” (0,30mm) at the infeed end of the presser foot.

NOTE: This adjustment is to be done without a bag in the sewing head. Adjust the space between the Presser Foot and the Throat Plate as follows. Refer to Figure 5-7.

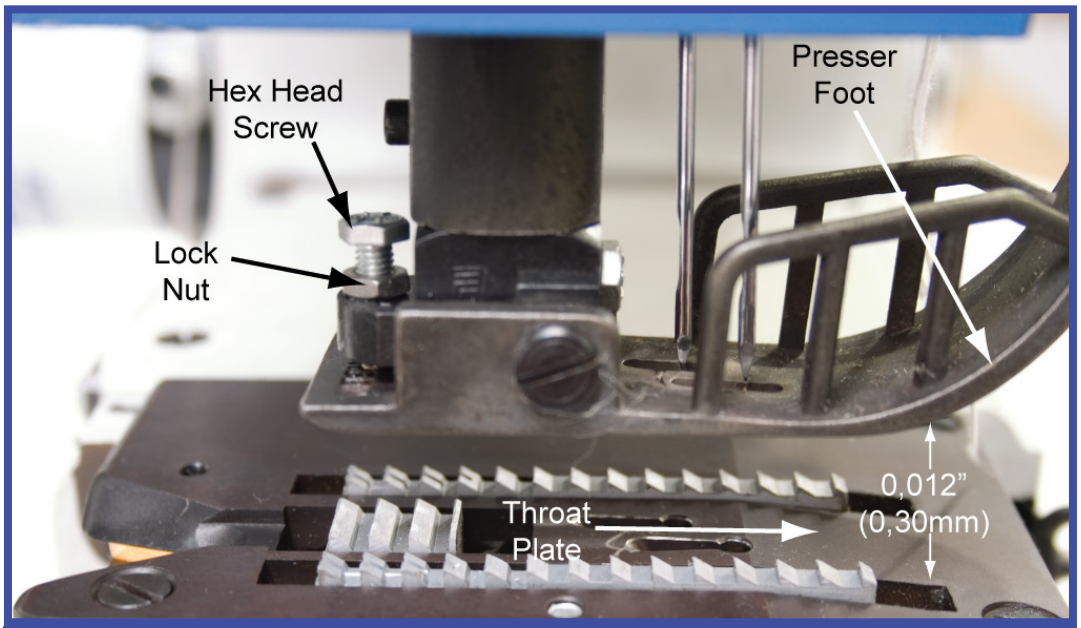

***Figure 5.7* Presser Foot Adjustment**

1. With Presser Foot in the lowered position, measure the distance between the Throat Plate and the Presser Foot infeed. Distance should equal 0.012" (0,30 mm).
2. If adjustment is necessary, loosen the lock nut at the rear of the presser foot.
3. Adjust gap space by turning the hex head screw CW to increase the gap and CCW to decrease the gap.
4. When gap adjustment is within tolerance, fully tighten lock nut.

5.3.2. Needle and Needle Guard Adjustment

Located beneath the Throat Plate is the Needle Guard. The Needle Guard must be set such that the gap space between the guard and needle is 0.008" (0,2 mm). Adjust the space between the Needle Guard and needles as follows. Refer to Figure 5-8 and 5-9.

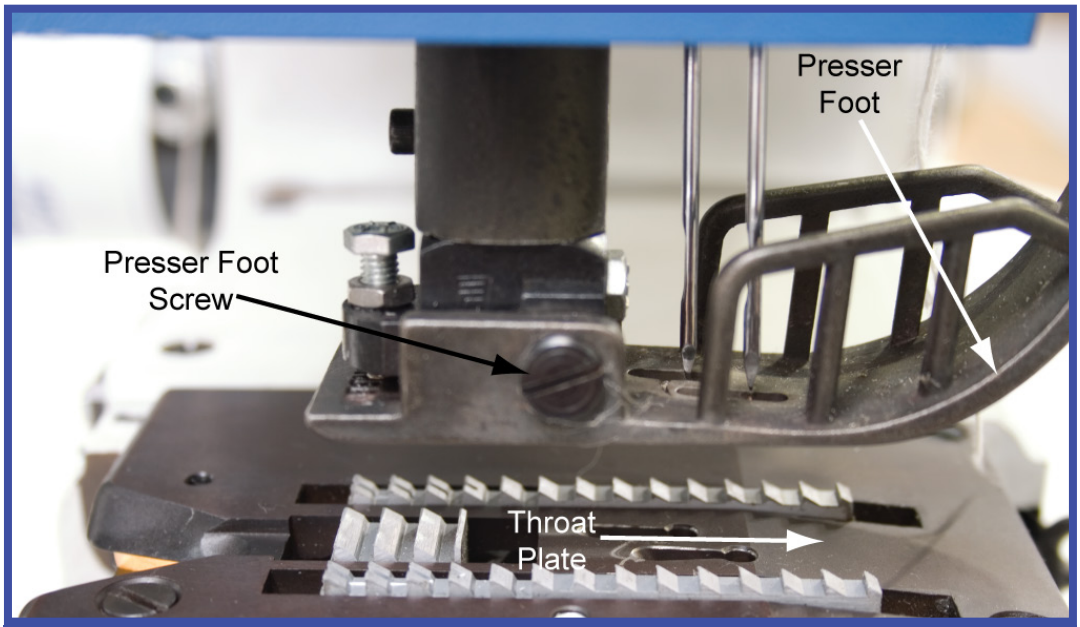

Figure 5.8 **Presser Foot Removal**

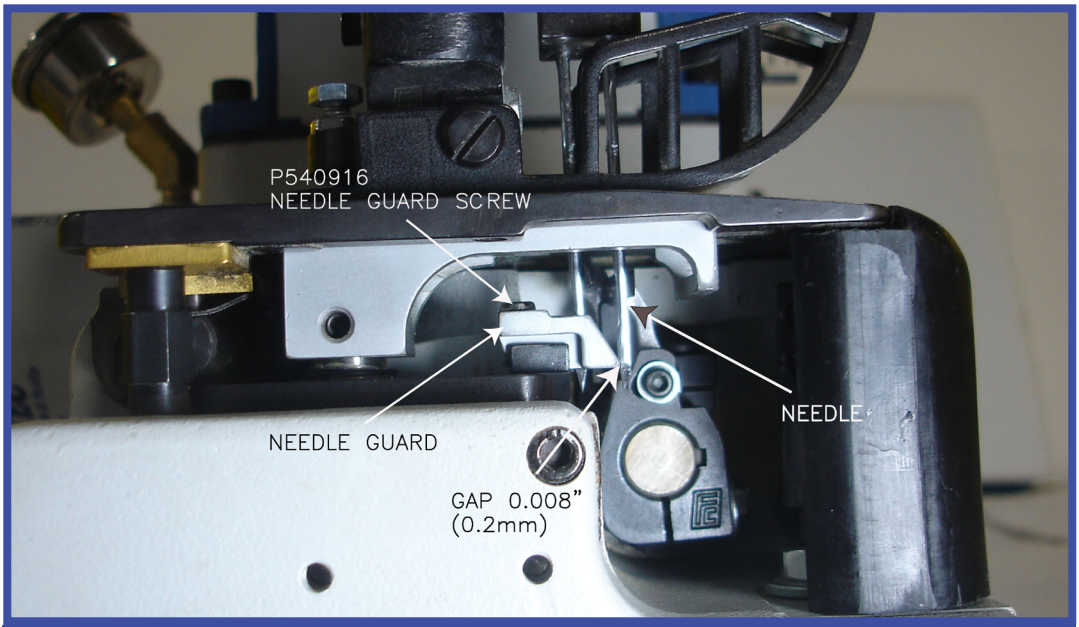

Figure 5.9 **Needle Gap Adjustment**

1. Remove Feed Dog in accordance with Paragraph 5.2.6 to gain access to the Needle Guard.
2. Remove Presser Foot by removing the Presser Foot Screw as shown in Figure 5-8.
3. Measure the distance between the needles and Needle Guide. Distance should measure 0.008” (0,2 mm).
4. If an adjustment is necessary, loosen, but do not remove, the Needle Guard Cap Screw and slide Needle Guard to the appropriate distance. There are separate needle guards present for the two needles. A single screw locks both the needle guards in place.
5. Fully tighten the Needle Guard Cap Screw.
6. Replace Presser Foot and fully tighten the Presser Foot Screw.
7. Replace Feed Dog in accordance with Paragraph 5.2.6.

5.3.3. Needle and Looper Clearance

The needles and Loopers should not touch during machine operation. The maximum gap between each needle and Looper should be 0.003” (0.2 mm) when the Loopers are at the full forward position. Refer to Figure 5-10.

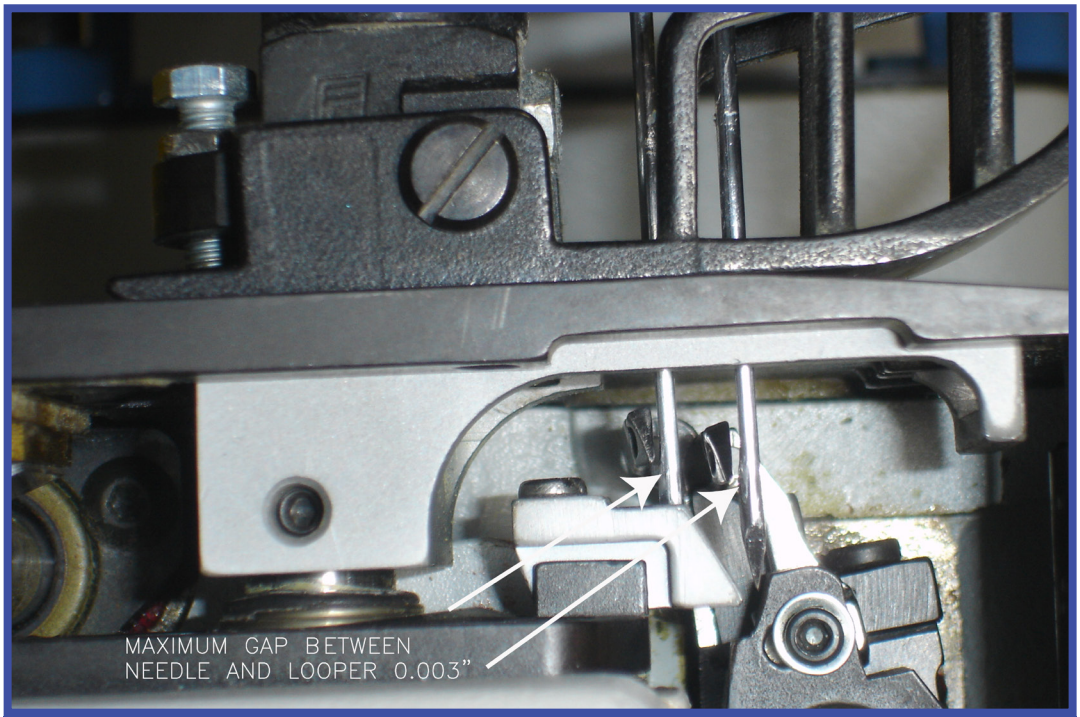

Figure 5.10 **Needle and Looper Clearance Spacing**

8. Rotate the Pulley Drive to Extend the Looper assembly to the full forward position.
9. Measure the distance between the Looper and needle. Distance should measure a maximum of 0.003” (0,08 mm). Ensure the nose of the looper does not interfere with the needle during their forward motion.
10. If adjustment of the gap space is necessary, loosen, but do not remove the Looper adjustment screw and rotate the Looper assembly to the required distance. Refer to Figure 5-11. Refer to section 5.3.4 (Needle and looper distance adjustment) for providing adjustments in spacing.
11. Fully Tighten the Looper adjustment screw.

5.3.4. Needle and Looper Distance Adjustment

The distance measurement between the induvidual Looper assemblies and the needles must be performed when the Looper Assembly has reached the full backward position.

1. Rotate the Pulley Drive to Extend the Looper assembly to the full backward position.
2. Use the gauge tool to measure the distance between the Primary Looper and needle. Refer to Figure 5-12.

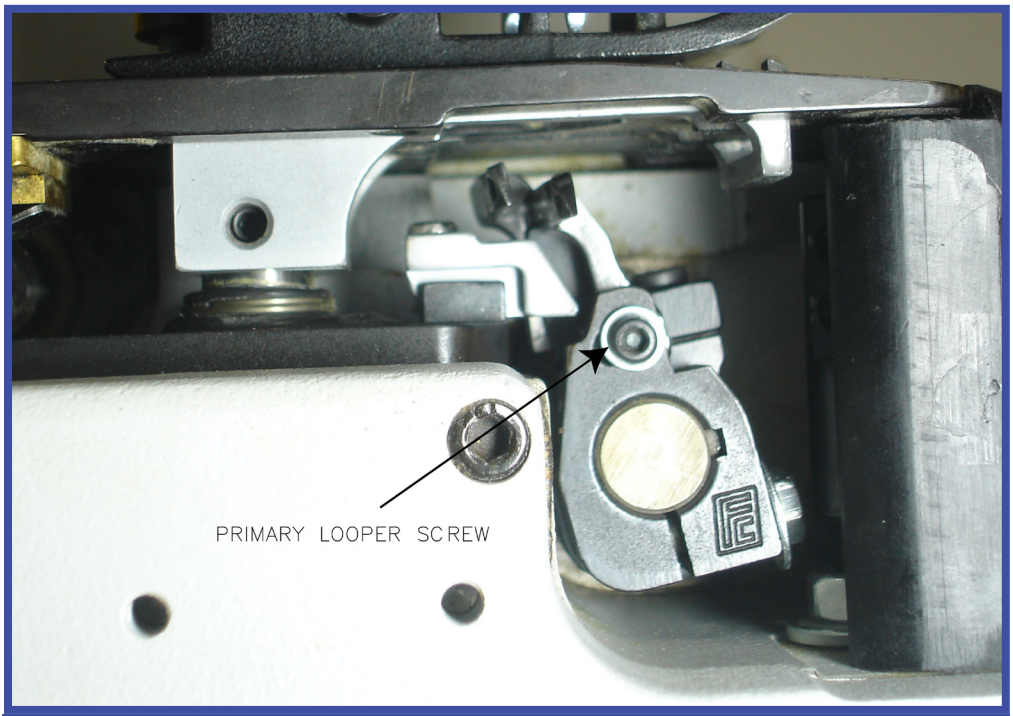

Figure 5.11 **Looper Assembly Screw**

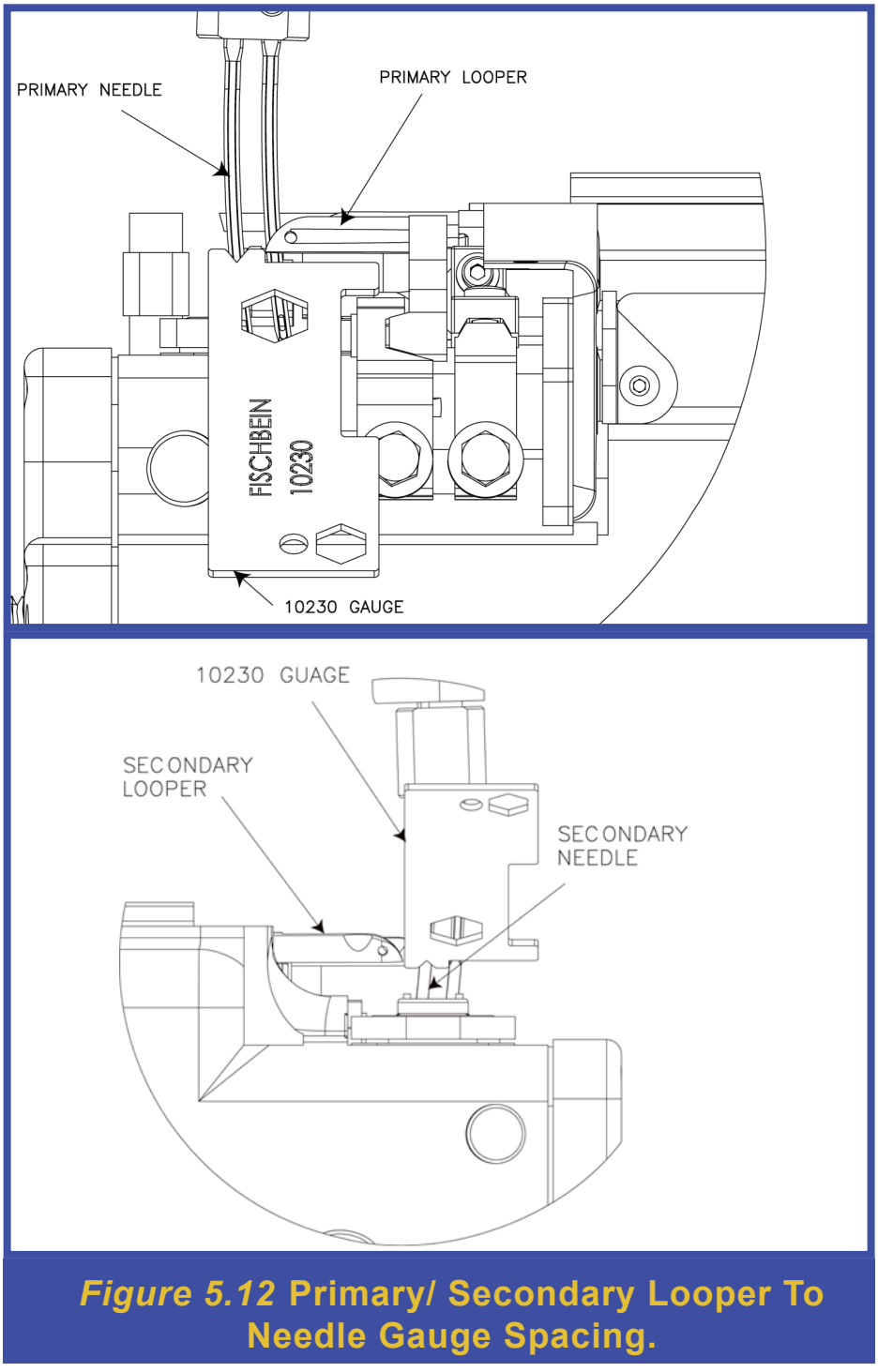

Figure 5.12 **Primary/ Secondary Looper To Needle Gauge Spacing.**

3. If adjustment is necessary, loosen, but do not remove Looper Shaft screw and slide Looper assembly along Looper Shaft to desired position. Refer to Figure 5-13.

4. Fully tighten Looper Shaft screw.

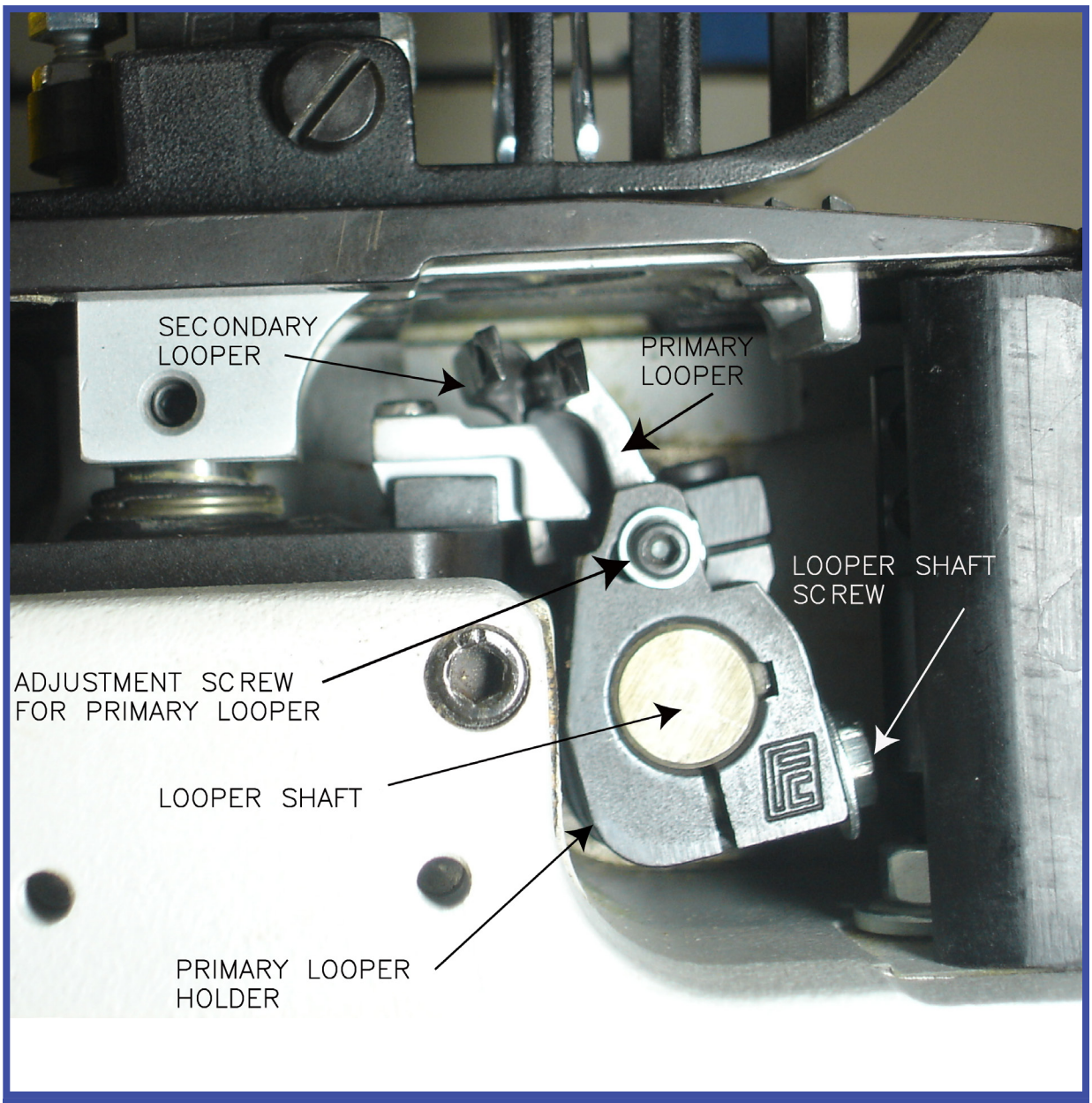

Figure 5.13 **Looper Shaft Screw**

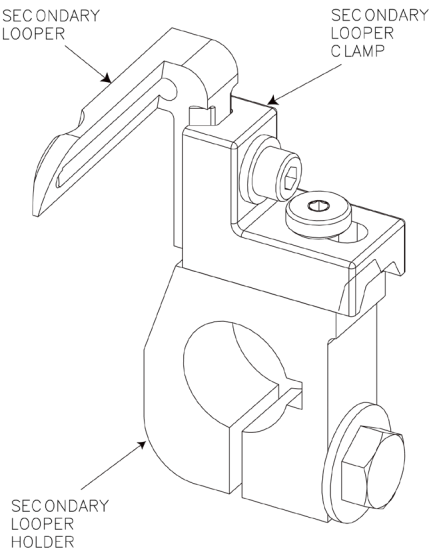

Figure 5.14 Secondary Looper Assembly

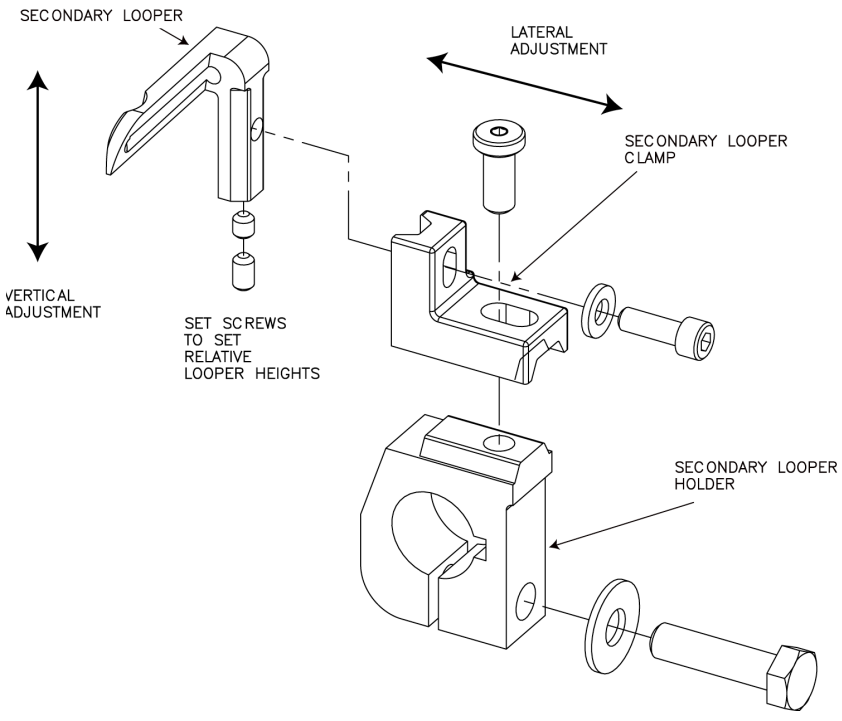

Figure 5.15 Secondary Looper Adjustment

5. During the forward motion of the looper, the nose of the Primary looper must come as close as possible to the scarf present in the side of the needle needle without any interference.
6. The spacing between the scarf of the needle to the nose of the primary looper is set with the screw to lock the position of the primary looper as shown in Figure 5-13. The nose of the primary looper must come as close as possible to the scarf present in the side of the needle without interference.
7. After setting the position of the primary looper, the secondary looper position must be adjusted relative to the needle to achieve the spacing as provided in section 5.3.3 (Needle and Looper Clearance). The Secondary looper clamp assembly as illustrated in Figure 5-15 is designed to achieve this set up.
8. The Secondary looper clamp as shown in Figure 5-15 is designed to provide vertical and lateral movement to the secondary looper. The nose of the secondary looper can be set as close as possible to the scarf present in the side of the needle without any interference similar to the primary looper. Figure 5-15 illustrates the fasteners used to provide vertical and lateral movement to the secondary looper.

5.3.5. Feed Dog Height and Parallel Alignment Adjustment

If the Feed Dog height does not meet the measurements of the gauge tool measurement in Paragraph 4.1.2.1, or if the alignment of the feed dog is not parallel with the Throat Plate, adjust the height or alignment as follows.
1. Stand the sewing head on its drive pulley so that no oil can flow out when removing the bottom cover.
2. Secure the head to prevent it from rotating on its pulley.
3. Remove five screws securing bottom cover plate to housing.
4. Remove bottom cover and Cork Seal.

NOTE: Inspect Cork Seal and replace if necessary.

5. Identify the Feed Dog Shaft and shaft screw.
6. Loosen, but do not remove shaft screw and slide Feed Dog shaft to desired position to meet gauge tool measurement and alignment.
7. Fully tighten shaft screw.
8. Replace Cork Seal and bottom cover.

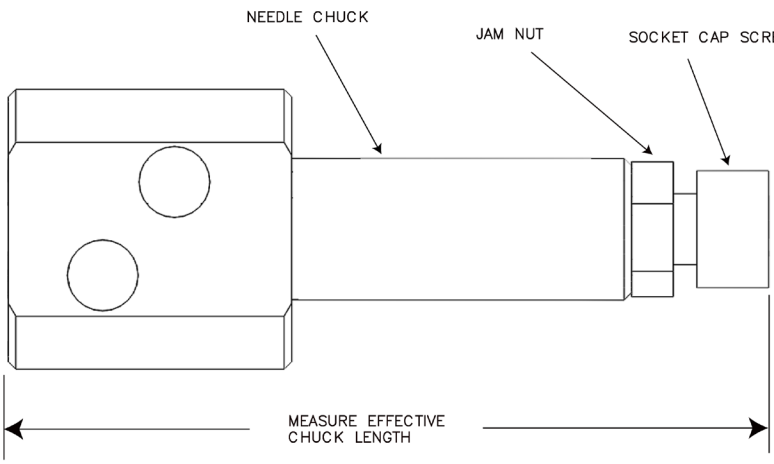

Figure 5.16 **Needle Chuck Effective Length**

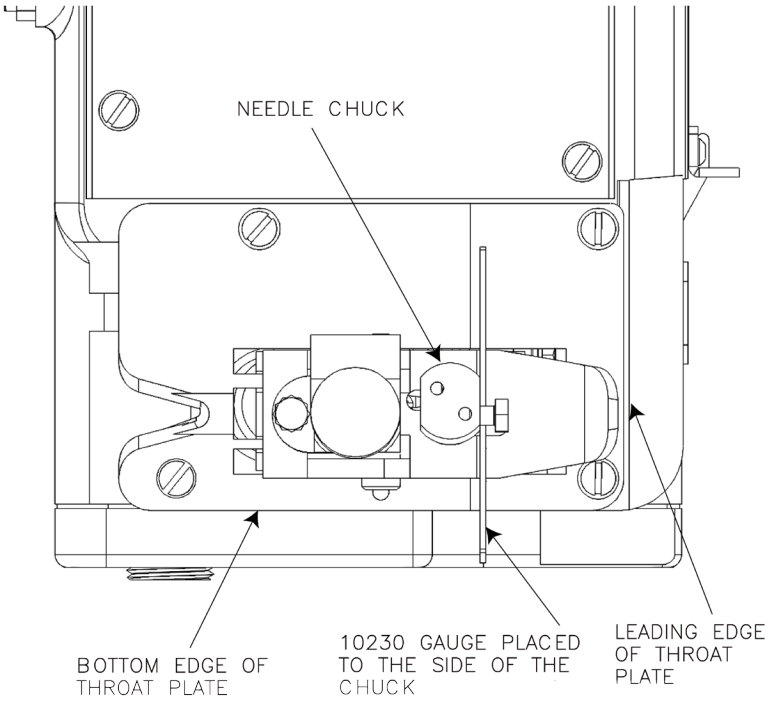

Figure 5.17 **Needle Chuck Parallelism Adjustment**

5.3.6. Needle Chuck Adjustment

The Needle Chuck is set at the factory to be aligned with the Throat Plate. It usually does not require adjustment.
Verify the alignment using the gauge tool as follows.
1. If the chuck is being replaced then measure the effective length of the existing chuck as shown in the figure 5.16 and set the height of the new chuck assembly to the same length.
2. Insert the chuck into the needle arm till it bottoms out in the needle arm and clamp the chuck by tightening the fastener present in the needle arm.
3. Place the 10230 gauge tool to the side of the needle chuck and determine if the chuck is parallel to the edge of the Throat plate. (Refer Figure 5.17)
4. If the needle chuck is not parallel then loosen the fastener that holds the needle chuck to the needle arm and straighten the needle chuck to make it parallel to the throat plate.
5. Tighten the fastener that clamps the needle chuck to the needle arm to complete adjustment.

5.4. Sewing System Synchronization

To produce good bag closures, a sewing system must be properly synchronized with the production line in which it operates. The synchronization is achieved by properly timing three different elements:
1. Bag transport conveyor
2. Sewing system infeed
3. Sewing head

The conveyor and the infeed will be synchronized to travel at the same speed. This will prevent bags from skewing forward or backward as they travel into the sewing system. The sewing head requires that it be set up to run a speed slightly faster than the infeed and the conveyor, typically about 2% faster. The sewing process requires that the bag be pulled taut to produce a stitching pattern that is smooth and flat.
The sewing head, the infeed and the bag transport conveyor can be adjusted to produce the proper set up for a variety of applications. Consult your Fischbein distributor for the proper set up or call Fischbein directly.

5.4.1. Adjusting the Speed of the Sewing Head

The speed of the bag transport belt is measured in feet per minute (meters per minute). The sewing head is equipped with a variable pitch pulley. The two sections of the pulley can be rotated relative to each other in ¼ turn increments. Refer to Figure 5-14.

To adjust the pulley speed, perform the following:

1. Loosen the two set screws with an 1/8 inch allen wrench.

NOTE: Each quarter turn of the pulley is equal to approximately 20 RPM.

2. To increase the speed, rotate the top part of the pulley CCW.
3. To decrease the speed, rotate the pulley CW.
4. Adjust the speed of the sewing head so that it is 2% faster than the bag transport belt.

SET SCREWS SHOULD ONLY BE TIGHTENED ON THE NOTCHED LOCATIONS LOCATED AT EVERY QUARTER TURN OF THE PULLEY. FAILURE TO DO SO WILL DAMAGE THE VARIABLE PULLEY AND PROVIDE INACCURATE SPEEDS.

5. Use a tachometer to measure the revolutions per minute of the pulley. Readjust as desired to meet system performance requirements.

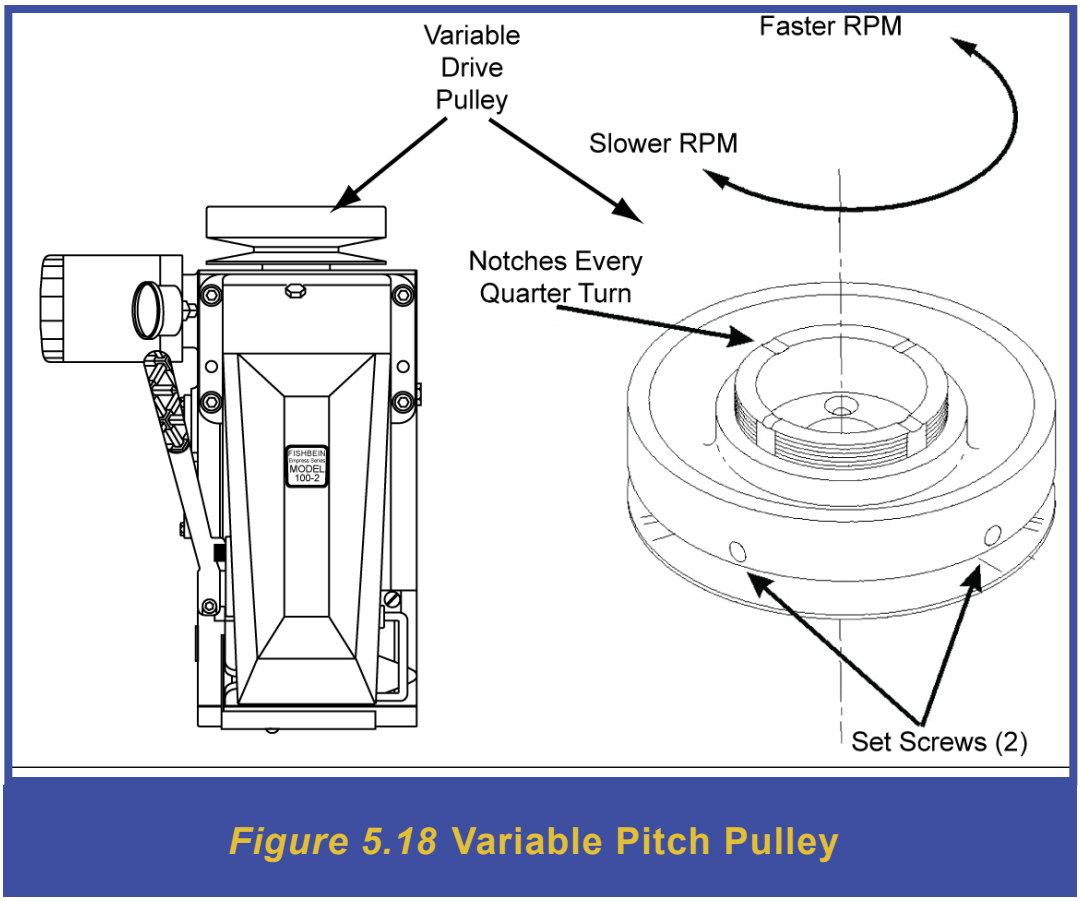

Figure 5.18 **Variable Pitch Pulley**

HAMER-FISCHBEIN® LLC

A DURAVANT COMPANY

Model 100-2-R2

Empress™ Series

Sewing Head

Part #37776

Rev B/ July 2016

6 TROUBLESHOOTING

TROUBLESHOOTING

6.1. Machine runs but does not sew.

CAUSE	SOLUTION	REF.
No thread	Fit a new cone	
Broken thread	Re-thread sewing head	para 4.2
Broken needle	Replace needle	para 5.2.5
Loose drive belt	Tighten drive motor belt	

6.2. Poor quality chain stitch

CAUSE	SOLUTION	REF.
Thread is wrapped around guides or other object	Remove the thread around the object, and re-thread the sewing head	para 4.2
Poor thread tension	Re-adjust thread tension	para 5.2.1
Looper misaligned	Re-adjust Looper	para 5.3.3, 5.3.4
Needle maladjustment	Re-adjust needle	para 5.3.2, 5.3.4
Looper to needle misalignment	Re-adjust the relationship between the Looper and needle	para 5.3.3, 5.3.4
Needle guide misaligned	Re-adjust needle guide	para 5.3.2
Worn Parts	Replace worn parts.	

6.3. No chain stitch

CAUSE	SOLUTION	REF.
Bent needle	Replace needle	para 5.2.5
Dull needle	Replace needle	para 5.2.5
Poor thread tension	Check thread tension	para 5.2.1
Feed dog worn out	Replace feed dog	para 5.2.6
Presser foot worn out	Replace presser foot	para 5.3.2
Needle guide misaligned	Re-adjust needle guide	para 5.3.2

6.4 Poor stitch

CAUSE	SOLUTION	REF.
Throat plate damaged	Replace throat plate	para 5.2.7
Presser foot pressure incorrect	Adjust pressure	para 5.2.3
Feed dog worn	Replace Feed dog	para 5.2.6
Thread tension poorly adjusted	Adjust thread tension	para 5.2.1

6.5. Thread constantly breaks

CAUSE	SOLUTION	REF.
Thread stuck or blocked around thread tensioners	Check thread guide or adjustment	para 5.2.1
Thread tensioners misadjusted	Readjust thread tensioners	para 5.2.1
Needle worn or bent	Replace needle	para 5.2.5
Looper worn or bent	Replace Looper	
Throat plate worn or damaged	Replace throat plate	para 5.2.7
Needle overheating	Use another type of bag, a needle cooler or lubricated thread	
Too much thread tension	Less tension	para 5.2.1
Poor quality thread	Use higher quality thread (Fischbein lubricated thread)	
Worn Thread Eyelets	Change all eyelets in all locations where thread passes through an eyelet.	

6.6. Needle breaks

CAUSE	SOLUTION	REF.
Sewing too close to the bag contents	Adjust the machine a little higher	
Looper setting is off	Reset Looper distances	para 5.3
Needle is askew in the needle chuck	Check needle adjustment	para 5.3.6
Poor synchronization with the system	Examine synchronization	para 5.4
Operator pulling or holding the bag	Let go of the bag	
Needle guide worn or misaligned	Replace or reset needle guide	para 5.3.2
Presser foot is misaligned	Reset the presser foot	para 5.3.1

6.7. Bag gets stuck in the machine.

CAUSE	SOLUTION	REF.
Sewing head starts too late	Check photoeye alignment	
Synchronization with system is not correct	Synchronize again	para 5.4
Drive belt between the motor and sewing head pulley too loose	Replace or tension the belt	
Bag too full	Reduce contents	
Feed dog worn	Replace feed dog	para 5.2.6
Throat plate worn or damaged	Replace throat plate	para 5.2.7
Faulty feed into the machine	Check system before feed into sewing head	
Pressure on the presser foot base too high or too low	Readjust presser foot spring pressure	para 5.2.3

6.8. Bag tears

CAUSE	SOLUTION	REF.
Throat plate damaged	Replace throat plate	para 5.2.7
Too much pressure on presser foot	Reduce pressure	para 5.2.3
Damaged presser foot	Replace presser foot	para 5.3.2
Stitches too close	Reset and check stitch length	para 5.2.2

6.9. Bag tears on sewing line

CAUSE	SOLUTION	REF.
Too much thread tension	Reduce tension	para 5.2.1
Bag too thin	Change bag type	
Stitch too short	Increase size of stitch	para 5.2.2

6.10. Skipped stitches

CAUSE	SOLUTION	REF.
Poor thread tension	Adjust thread tension	para 5.2.1
Thread pull off badly adjusted	Adjust thread pull off	para 5.2.1.3
Poor thread quality	Use higher quality thread (Fischbein lubricated thread)	

6.11. Chain is poorly cut

CAUSE	SOLUTION	REF.
Knives worn	Replace Knives	
Knife springs worn	Replace the knife springs	
Excessive material around the knife	Blast with clean compressed air	

6.11. Chain is poorly cut

CAUSE	SOLUTION	REF.
Knives worn	Replace Knives	
Knife springs worn	Replace the knife springs	
Excessive material around the knife	Blast with clean compressed air	

6.12. Sew line not straight

CAUSE	SOLUTION	REF.
Faulty feed	Check presser foot pressure	para 5.2.3
Poor synchronization	Check and adjust synchronization	para 5.4

6.13. Noise and excessive vibration

CAUSE	SOLUTION	REF.
Internal components loose or worn	Call Fischbein technician	
Sewing head loose	Check and tighten screws	
Drive belt pulley loose	Tighten	

6.14. Sewing head will not turn

CAUSE	SOLUTION	REF.
Internal parts broken	Call Fischbein technician	

6.15. Low oil pressure

CAUSE	SOLUTION	REF.
Not enough oil	Top off oil	para 5.1.3
Faulty lubrication pump	Call Fischbein technician	
Faulty pressure gauge	Change gauge	
Internal oil line plugged	Call Fischbein technician	
Filter blocked	Replace filter	para 5.1.2

6.16. Oil level too low, no oil, or oil on floor

CAUSE	SOLUTION	REF.
Drain plug loose	Tighten plug	
Looper seal leaking oil	Replace seal	
Feed dog seal leaking oil	Replace seal	
Bottom plate of sewing head is loose	Tighten	
Bottom plate cork seal broken	Replace seal	para 5.2.4
Oil gauge broken	Replace oil gauge	
Sewing lever and presser foot lever seal leaking oil	Replace seal	

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HAMER-FISCHBEIN® LLC

A DURAVANT COMPANY

Model 100-2-R2

Empress™ Series

Sewing Head

Part #37776

Rev B/ July 2016

7 PARTS LIST

PRESSER FOOT		THROAT PLATE	FEED DOG
Std. Curved (Replacement)	31223	31216	31224
Presser Foot	31223		
Shank	10155		
Block	10156		
Bolt	10182		
Nut	11309		
Screw	H103258		
Moving Knife Blade	31029*		
Stationary Knife	31032		
Primary Looper	31262		
Secondary Looper	31260		
Needles: C100-S Square Point for Paper C100RP Round Point used for Woven Poly, Burlap			

* P/N 31029 is the standard moving knife; the moving knife for the rotary knife assembly is P/N 31112.

Table 7-0 Model 100-2-R2 Set-Up Parts

Item	P/N	QTY	Description
1	10092	1	Gasket, Top Cover
2	10200	3Qts	Lubricating Oil
3	F103212	6	Screw, soc flat #10-32 x ½
4	15054	2	Oil Filter
5	10093	2	Gasket, Bottom Cover
6	10089	4	Knife Spring
7	31029	4	Knife, Moving
8	31032	4	Knife, Stationary
9	11122	6	Threading Wire.
10	10095	1	Gasket, Manifold Cover
11	15053	1	Gauge, Oil Pressure (60 PSI)
12	31014	1	Seal, Lever Arms
13	C100-S	4	Needles, Square (package of 10)
14	31222	1	Chuck, Needle, 2 Needlehead
15	31112	1	Blade, Moveable Knife
16	SC63234	2	Screw, soc cap #6 – 32 x ¾
17	10213	1	Plug, Drilled Clamp
18	10214	1	Plug, Tapped Clamp
19	10212	1	Plug, Tapped Clamp
20	10211	1	Plug, Drilled Clamp
21	10190	1	Pad, Spring - Presser Foot
22	10077	2	Seal, Feed Dog
23	SC440716	2	Screw, Pan HD #4 – 40 x 7/16 SS
24	10075	2	O-Ring, Feed Slide Rod
25	31224	1	Feed Dog– 2 Needlehead
26	15105	2	Seal, Looper & Knife Shaft Seal
27	15101	2	Nipple, Remote Oil Filter
28	31262	1	Primary Looper, Two Needle head
29	31260	1	Secondary Looper, Two Needle head
30	15105	2	Gasket, Knife Seal
31	F83212	4	Screw, flat head #8 – 32 x ½
32	F103238	12	Screw, flat head #10 – 32 x 3/8
33	F103258	2	Screw, Flat Head #10-32 x 5/8
34	SB103212	2	Screw, Soc Bttn #10-32 x ½
35	31232	1	Assy, Looper Shaft Seal; 2 Needlehead
36	SS1032516	1	Screw, Set #10-32 x 5/16
37	SC103212	1	Screw, clamp needle
38	31113	1	Blade, Fixed Knife
39	31286	1	Washer #4, .25 OD

7.1 Recommended Spare Parts List

Refer to Figure 7-1.

ITEM	PART NO	QTY	DESCRIPTION
1	31216	1	Throat Plate, 2 Needle Head
2	F103258	2	Screw, Flat 10-32 x 5/8
3	F103238	2	Screw, Flat 10-32 x 3/8
4	31032	1	Stationary knife
5	F83214	1	Screw, Flat 8-32 x 1/4
6	10015	1	Post, short-throat plate
7	WN10	6	Washer, Nylon
8	18820	1	Washer, Flat #10, .44OD
9	- -	-	
10	B103214	1	Screw, Binding HD 10-32 x 1/4
11	10112	1	Window, oil level
12	10111	1	Plug, drain – magnetic
13	SC103258	1	Screw, Soc. Cap 10-32 x 5/8
14	15072	1	Cover, bottom
15	31214	1	Pull Off Looper Thread, 2 Needle Head
16	NH1420	1	Nut, Hex 1/4-20
17	WF14	1	Washer, Flat ¼
18	10052	1	Washer, Nylon
19	10093	1	Gasket, cover – bottom
20	SS10321	1	Screw, Soc. Set 10-32 x 1
21	10016	1	Post, long – throat plate
22	10005-S	1	Door, looper
23	15069	1	Ball, chrome
24	15078	1	Spring, pressure
25	B632316	2	Screw, Binding HD 6-32 x 3/16

7.2. Model 100-2-R2 Housing

Refer to Figure 7-1.

ITEM	PART NO	QTY	DESCRIPTION
26	10098	1	Cover, groove – thread
27	31211	2	Eyelet, thread guide – 2 Needlehead
28	SB103212	2	Screw, Soc. BTTN 10-32 x 1/2
29	10116	1	Assy, plug – breather
30	H103212	5	Screw, Hex HD 10-32 x 1/2
31	15053	1	Gauge, oil pressure 60 PSI
32	15079	1	Plate, cover – side
33	10094	1	Gasket, mainshaft seal
34	31227	1	Housing, main 2 Needlehead
35	10095	1	Gasket, cover – manifold
36	15056	1	Manifold, filter-oil assy
37	SC103234	5	Screw, Soc. Cap 10-32 x 3/4
38	15062	1	Nipple, filter oil
39	15064	1	Plug, adjusting – manifold
40	15074	1	Seal, Pressure Control–Manifold
41	15054	1	Cartridge, oil – filter
42	10092	1	Gasket, cover –top
43	10014	1	Plate, cover – top
44	F103238	4	Screw, Flat HD 10-32 x 3/8
45	11268	1	Nut, lock
46	31136	1	Deflector, Splash
47	31137	1	Screw, Tapping # 4 x 3/8AB
48	A3934	1	Washer, Thrust
49	B103238	2	Screw, BTTN 10-32 x 3/8
50	10338	1	O-ring, 7/8 ID
51	10125	1	Plug 1/8 NPT
52	16034	1	Fitting, Adapter 1/8 M x 1/8 F 45 Deg
53	15024	.5	Spacer, Shim
57	B63214	1	Screw, Binder HD # 6-32 x ¼

7.2. Model 100-2-R2 Housing

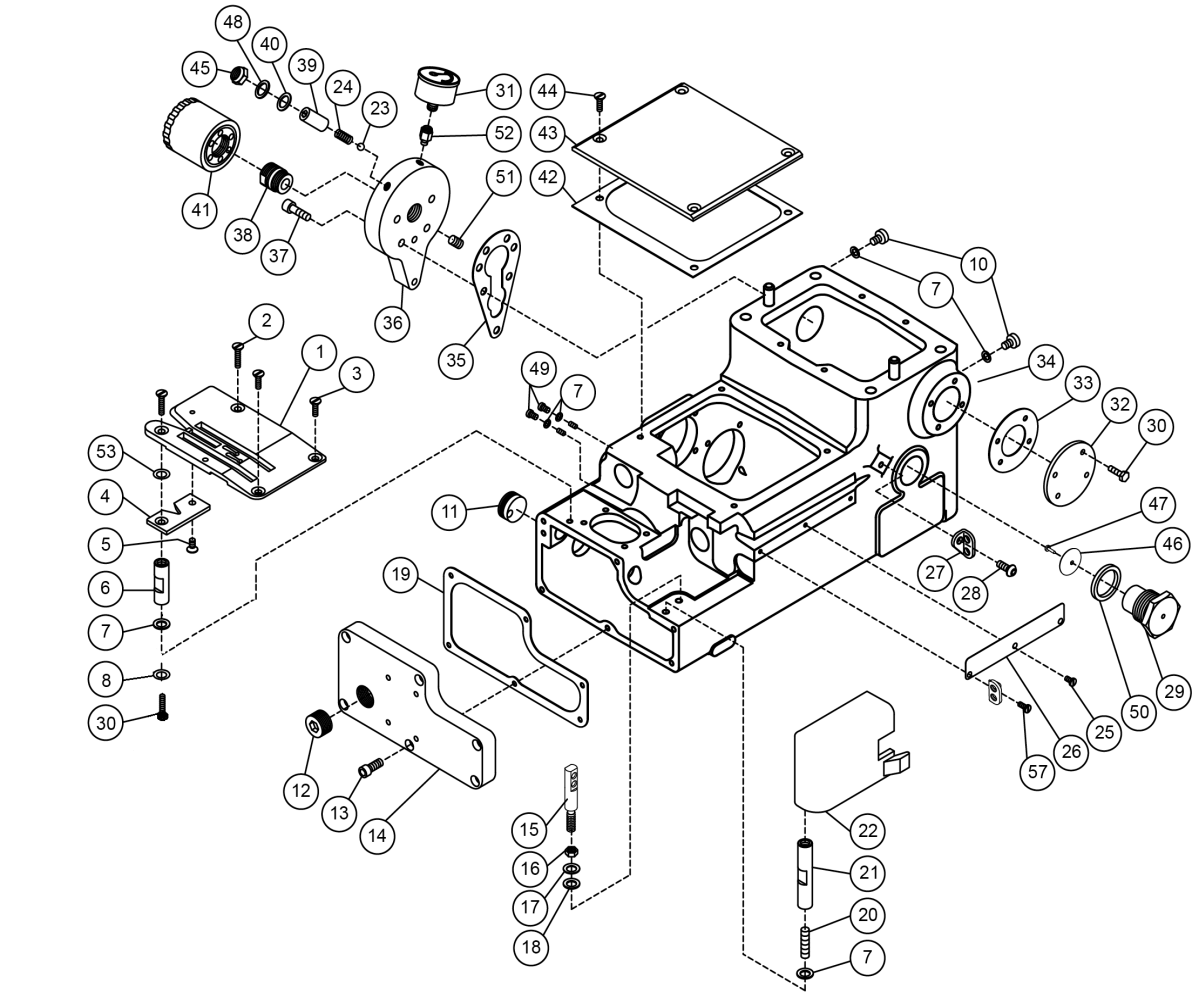

Figure 7.1 **Model 100-2-R2 Housing**

Refer to Figure 7-2.

ITEM	PART NO	QTY	DESCRIPTION
1	10190	1	Pad, spring presser foot
2	F63214	1	Screw, Flat 6-32 x ¼
3	10189	1	Cradle, pad presser foot
4	10004	1	Lever, presser foot
	SC14201	2	Screw, Soc. Cap 1/4-20 x 1
	PS14112	2	Pin, Spring
5	10163	1	Clamp, bearing sheet
6	SF103258	2	Screw, Soc. Flat 10-32 x 5/8
7	10162	1	Sheet, bearing presser foot
8	SC63234	2	Screw, Soc. Cap 6-32 x ¾
9	10213	1	Plug, clamp drilled (presser foot)
10	10214	1	Plug, clamp tapped (presser foot)
11	SC103234	1	Screw, Soc. Cap 10-32 x ¾
12	11309	3	Nut, Hex – Special CZ
13	10155	1	Shank, presser foot
14	10156	1	Block, hinging presser foot
15	H103258	2	Screw, Hex 10-32 x 5/8
16			
17			
18	31223	1	Presser foot, Curved, 2 Needle Head
19	10182	1	Bolt, hinging presser foot
20	31020-KIT	1	Rod, connecting needle drive
	15109	1	Screw, Soc. Set Cone Point ¼-20 x 3/8
	SS142014	1	Screw, Soc. Set ¼-20 x ¼
21	31042	3	Washer, Thrust (special)
22	10029	2	Bushing, lever presser foot
23	10128	2	Spring, garter lever seal
24	F103238	4	Screw, Flat 10-32 x 3/8
25	31014	1	Seal, levers
26	10026	1	Shaft, lever
27	31024-KIT	1	Lever, needle
	SC142014	2	Screw, Soc. Cap 1/4-20 x 1 ¼
28	31222	1	Chuck needle, 2 Needle Head
29	C100-S	2	Needle
30	10212	1	Plug, clamp tapped

7.3. Model 100-2-R2 Needle and Presser Foot Assembly

Refer to Figure 7-2.

ITEM	PART NO	QTY	DESCRIPTION
31	SS103212	1	Screw, Set #10-32 x 1/2
32	10211	1	Plug, clam drilled
33	31212	1	Guide, thread (needle lever), 2 Needle Head
34	F54038	2	Screw, Flat 5-40 x 3/8
35	10119	4	Disc, tension (needle lever)
36	10009	1	Spring, tension (needle lever)
37	NH1428L	1	Nut, Hex 1/4-28 UNF NL
38	10113-S	1	Stud, tension (needle lever)
39	10023	2	Insert, thread – lever shaft bushing
40	SS1032516	2	Screw, Soc. Set 10-32 x 5/16
41	10025	2	Bushing, shaft levers
42	SS1032316	2	Screw, Soc. Set 10-32 x 3/16
43			
44			
45	31237	1	Assembly, presser foot
46	10114	1	Sleeve, Tension
47	SS1032516	1	Screw, Set #10-32 x 5/16

7.3. Model 100-2-R2 Needle and Presser Foot Assembly

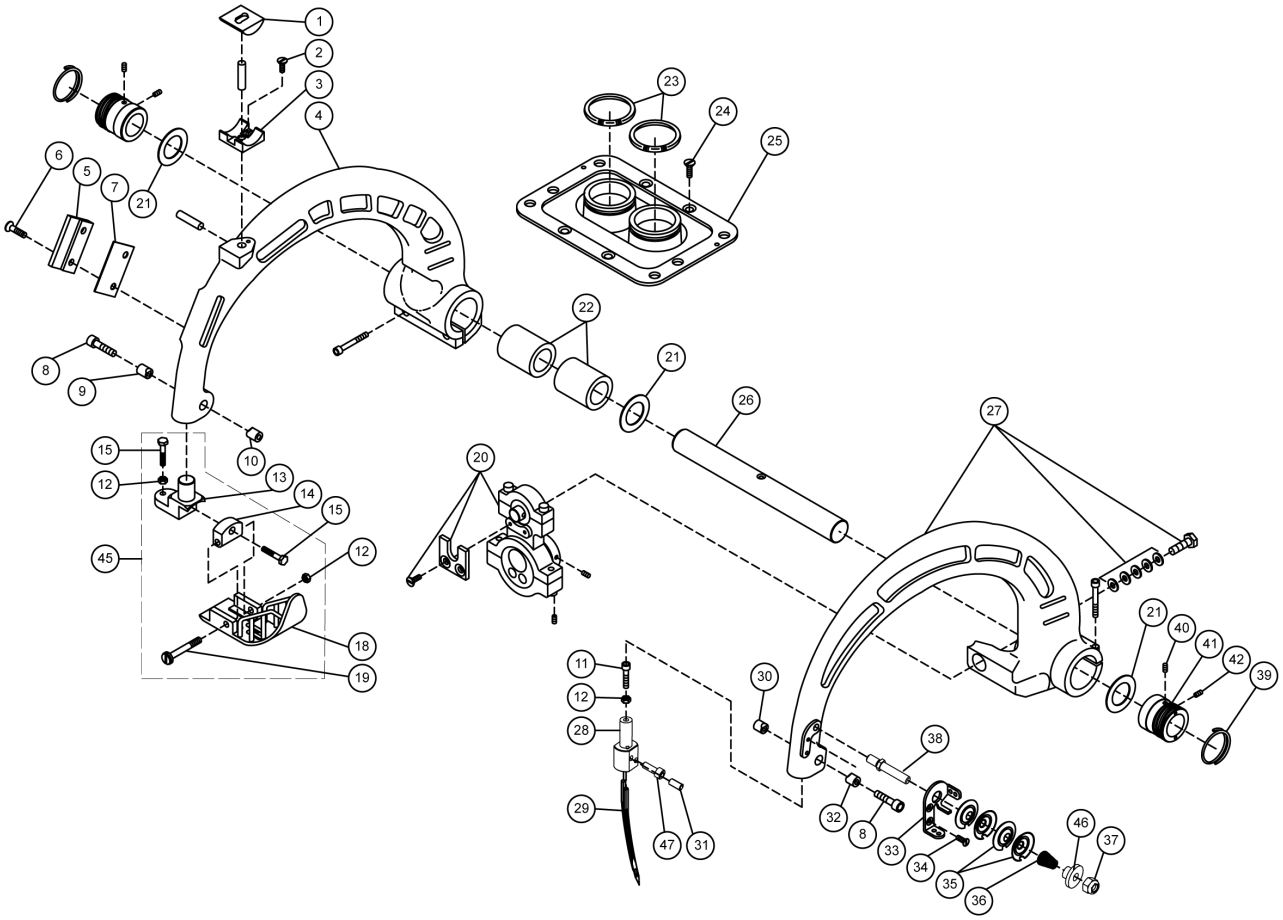

Figure 7.2 Model 100-2-R2 Needle and Presser Foot Assembly

Refer to Figure 7-3.

ITEM	PART NO	QTY	DESCRIPTION
1	31034	1	Lever, lifter presser foot
	SC142034	1	Screw, Soc. Cap 1/4-20 x ¾
2	SS142014	1	Screw, Soc. Set 1/4-20 x ¼
3	10139	1	Bushing, lifter presser foot
4	10186	1	Liner, bushing lifter presser foot
5	10187	1	Spring, lifter lever
6	SC5161858	1	Screw, Soc. Cap 5/16-18 x 5/8
7	10142	1	Cam, lifter presser foot
8	WS10	2	Washer, Spring 10
9	H103278	2	Screw, Hex HD 10-32 x 7/8
10	10161	1	Guide, lever presser foot
11	SS1032516	1	Screw, Soc. Set 10-32 x 5/16
12	10188	1	Guard, tension needle
13	B103238	2	Screw, Binding HD 10-32 x 3/8
14	31031	1	Cover, guard lever
15	10146	1	Plate, presser foot
	PS141	1	Pin, Spring
16	H103234	2	Screw, Hex HD 10-32 x ¾
17	10145	5	Spring, presser foot
18	10144	1	Clamp, spring presser foot
19	1-178	2	Nut, lock
20	31228	2	Pull off, needle thread
21	SB103212	1	Screw, Soc. BTTN 10-32 x ½
22	31211	1	Eyelet, thread Guide

7.4. Model 100-2-R2 Lever-Housing

Refer to Figure 7-3.

ITEM	PART NO	QTY	DESCRIPTION
23	NH1428L	4	Nut ¼-28 locking
24	10114	8	Sleeve, tension
25	10008	2	Spring, tension looper thread
26	10120	8	Disc, tension large
27	10115	4	Stud, tension
28			
29	PS18114	4	Pin, Spring retaining tension disc
30			
31	10007	2	Spring, tension needle thread
32	10234	4	Washer, Spring
33	SC516181	4	Screw, Soc. Cap 5/16-18 x 1
34	WF38	1	Washer, Flat 3/8
35	H3824134	1	Screw, Adj. 3/8-24 x 1 ¾
36	SS142038	1	Screw, Soc. Set 1/4-20 x 3/8
37	31233	1	Housing, levers (LT Blue)
38	10143	1	Shaft, spring presser foot
39	SS1032316	1	Screw, Soc. Set 10-32 x 3/16
40	31225	1	Mount, 4 Thread Tensioner Assembly
41	F103258	2	Screw, Flat 10-32 x 5/8
42			
43	31229	2	Clamp, Eyelet, Needle Thread Pull-off
44	SB103234	4	Screw, Soc. BTTN 10-32 x 5/8
45	31238	4	Guide, Thread 4 Thread Tensioner.
46	31234	1	Plate, Tensioning Assembly, 2 Needlehead
47	H103212	1	Screw, Hex HD #10-32 x ½ CZGH
48	WL10	1	Washer, Lock # 10
49	SF54014	6	Screw, Flat, #5-40 x ¼
50	31249	1	Eyelet spacer, Needle Thread, 2 Needle
51	SC832516	2	Screw, Soc cap #8-32 x 5/16 BO
52	WS8	2	Washer, spring #8

7.4. Model 100-2-R2 Lever-Housing

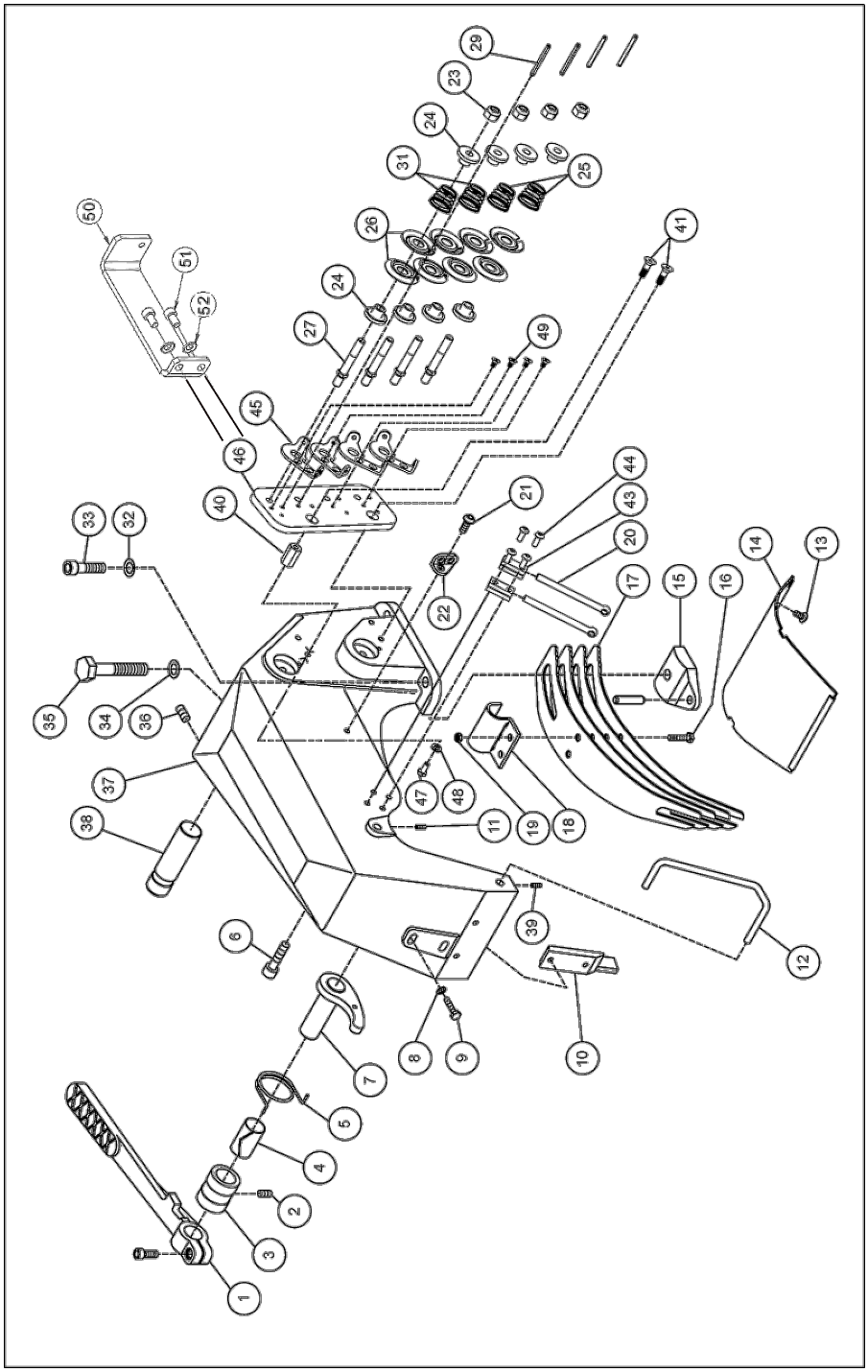

Figure 7.3 **Model 100-2-R2 Lever Housing**

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Refer to Figure 7-4.

ITEM	PART NO	QTY	DESCRIPTION
1	31224	1	Dog Feed, 2 Needle Head
	SS1032516	1	Screw, Soc. Set 10-32 x 5/16
2	F103238	1	Screw, Flat 10-32 x 3/8
3	F103212	3	Screw, Flat 10-32 x ½
4	31264	1	Holder, Guard Needle
5	10077	1	Seal, Dog Feed
6	P540916	1	Screw, Pan HD 5-40 x 9/16
7	10124	1	Ring, Garter-Seal (Feed Dog)
8	31263	1	Needle Guard 3, Two Needle
9	10075	2	O-ring
10	31012	1	Rod, Slide Feed
11	10073	1	Slide Feed
12	31011	1	Rod, Carrier Feed Dog
13	31008	1	Clamp, Rod Dog Feed Carrier
	SC142078	1	Screw, Soc. Cap ¼-20 x 7/8
14	31010	1	Link, Stroke Fedd
15	31009	1	Link, Lift Feed
16	SC142878	1	Screw, Soc. Cap ¼-28 x 7/8
17	10068	1	Pivot, Adjusting Feed Stroke
18	10067	1	Nut, Pivot Feed Stroke
19	31007	1	Lever, Slotted Feed Rocker
20	T3192	1	Key
21	SS1032516	1	Srew, Soc. Set 10-32 x 5/16
22	10109	1	Bushing, Shaft Feed Rocker
23	31005	1	Lever, Pin Feed Rocker
	SC54012	1	Screw, Soc. Cap 5-40 x ½
	H103234	1	Screw, Hex 10-32 x ¾
	WF10	1	Washer, Flat # 10
24	10215	1	Washer, Thrust
25	31023	1	Rod, Connecting Prim. Feed Stroke
26	31006	1	Pin, Rod Feed Stroke Connect

7.5. Model 100-2-R2 Feed Assembly

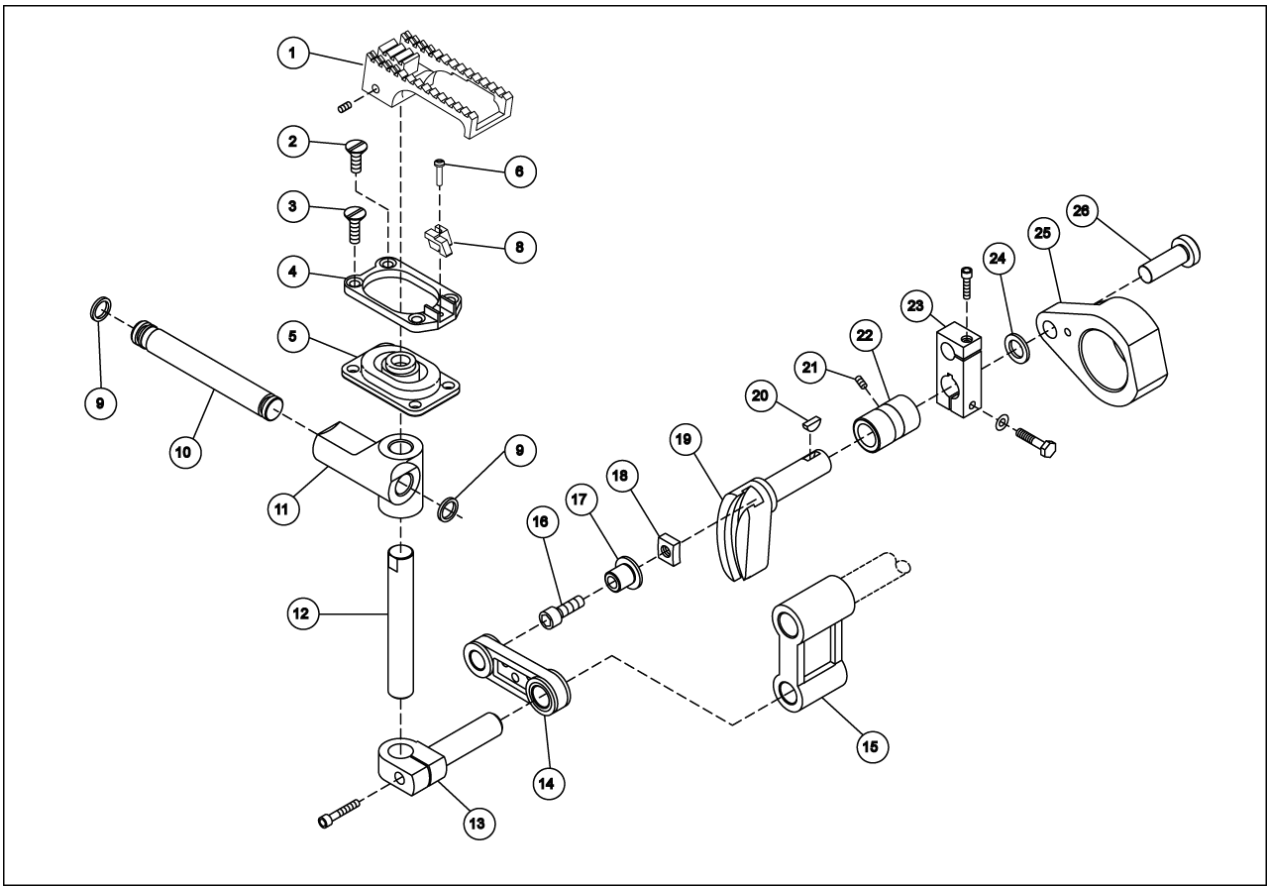

Figure 7.4 **Model 100-2-R2 Feed Assembly**

Refer to Figure 7-5.

ITEM	PART NO	QTY	DESCRIPTION
1	F83214	1	Screw, Flat # 8-32 x ¼
2	31032	1	Stationary Knife
3	31029	1	Moving Knife
4	10089	3	Spring Knife
5	H103212	4	Screw, Hex HD # 10-32 x ½
6	15104	1	Assy, Looper Shaft Seal
7	15105	1	Gasket, Looper Shaft Seal
8	10085	1	Bracket, Pivot Knife
9	10087	1	Screw, Pivot Knife
10	11120	1	Washer, Lock
11	31016	1	Shaft, Knife
12	10056	1	Bushing, Shaft Knife
13	SS103214CP	1	Screw, Soc. Set # 10-32 x ¼ Cone Point
14	10086	1	Link, Knife
15	10084	1	O-ring, Pump Body & Knife Plug
16	10083	1	Shaft, Bell Crank Knife
17	WF10	1	Washer, Flat # 10
18	10082	1	Crank, Bell Knife
	SS540316	1	Screw, Soc. Set # 5-40 x 3/16
19	10080	1	Assembly, Connecting Rod Knife
20	H103258	2	Screw, Hex HD #10-32 x 5/8
21	31015	1	Shaft, main
22	T3192	1	Key
23	10125	1	Plug, Pipe Mainshaft
24	31022	1	Bushing, Mainshaft Needle End
25	T3129	3	Washer, thrust
26	31023	1	Rod, Connecting Prim. Feed Stroke
27	31004	1	Eccentric, Stroke Feed
	15108	1	Screw, Soc. Set ¼-20 x 3/8
	15109	1	Screw, Soc. Set Cone Point ¼-20 x 3/8
28	31028	1	Gear, Drive Pump
29	SS832316CP	1	Screw, Soc. Set 8-32 x 3/16 Cone Point

7.6. Mainshaft Assembly

Refer to Figure 7-5.

ITEM	PART NO	QTY	DESCRIPTION
30	15043	1	Collar, Lock Mainshaft
		REF	Screw, Soc. Cap HD ¼-20 x 3/8
31	15032	1	O-ring, ¾ ID x 15/16 OD
32	P4024	1	Bearing, Thrust
33	31021	1	Bushing, Mainshaft Drive End
34	10094	1	Gasket, Mainshaft Drive End
35	10035	1	Assembly, Seal Mainshaft
36	10038	1	Hub, Pulley
	15108	2	Screw, Soc. Set ¼-20 x 3/8
37	10199	1	Pulley, Adjustable Assembly
	SS142038	2	Screw, Soc. Set ¼-20 x 3/8
38	SF103258	3	Screw, Soc. Flat #10-32 x 5/8
39	SC103212	4	Screw, Soc. Cap #10-32 x 1/2
40	SS832316	1	Screw, Soc. Set #8-32 x 3/16
41	SB103212	2	Screw, Soc. BTTN #10-32 x 1/2
42	15108	2	Screw, Soc. Set ¼-20 x 3/8

7.6. Mainshaft Assembly

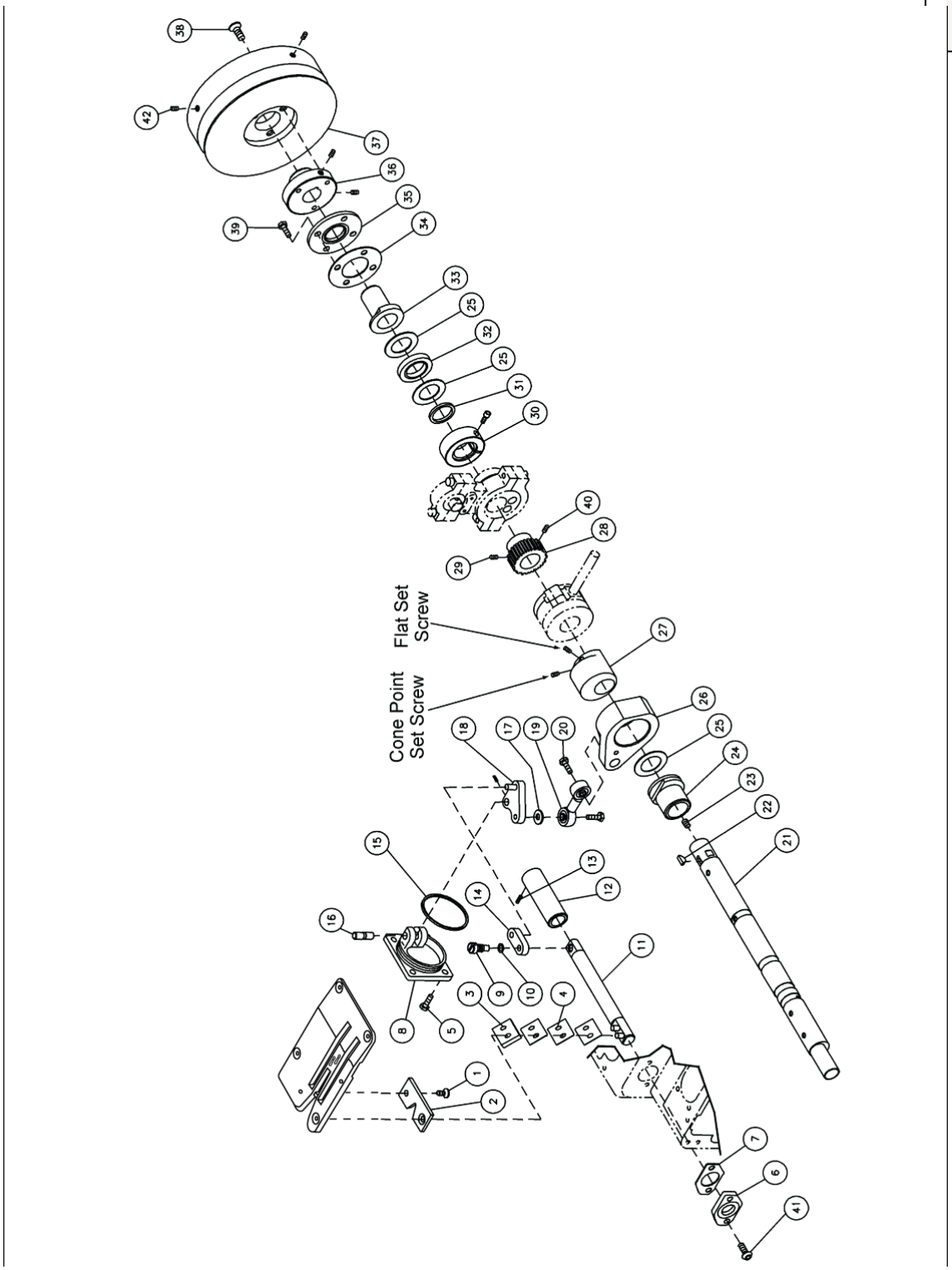

Figure 7.5 **Mainshaft Assembly**

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Refer to Figure 7-6.

ITEM	PART NO	QTY	DESCRIPTION
1	31269	1	Primary Looper Assembly, Two Needle
2	31268	1	Secondary Looper Assembly, Two Needle
3	-	-	-
4	-	-	-
5	-	-	-
6	-	-	-
7	-	-	-
8	31232	1	Assy Seal, Looper Shaft, 2 Needle Head
9	T3192	2	Key
10	31257	1	Looper shaft 2, Two Needle Head
11	31239	1	Bushing, Shaft Looper
12	10173	1	Assembly, Pivot Looper
	15066	2	Washer, Thrust
	15065	1	Clamp
	15039	1	Pin, Pivot Looper
	10153	1	Knuckle, Pivot Looper
	SC103258	1	Screw, Soc. Cap 10-32 x 5/8
13	SS103214CP	1	Screw, Soc. Set 10-32 x ¼ Cone Point
14	15105	1	Gasket, Looper Shaft Seal
15	31018	1	Assembly Cam, Looper
	SS103258CP	1	Screw, Soc. Set Cone Point 10-32 x 5/8
	SS103212	1	Screw, Soc. Set 10-32 x 1/2
16	SF103238	2	Screw, Soc. Flat #10-32 x 3/8

7.7. Looper Assembly

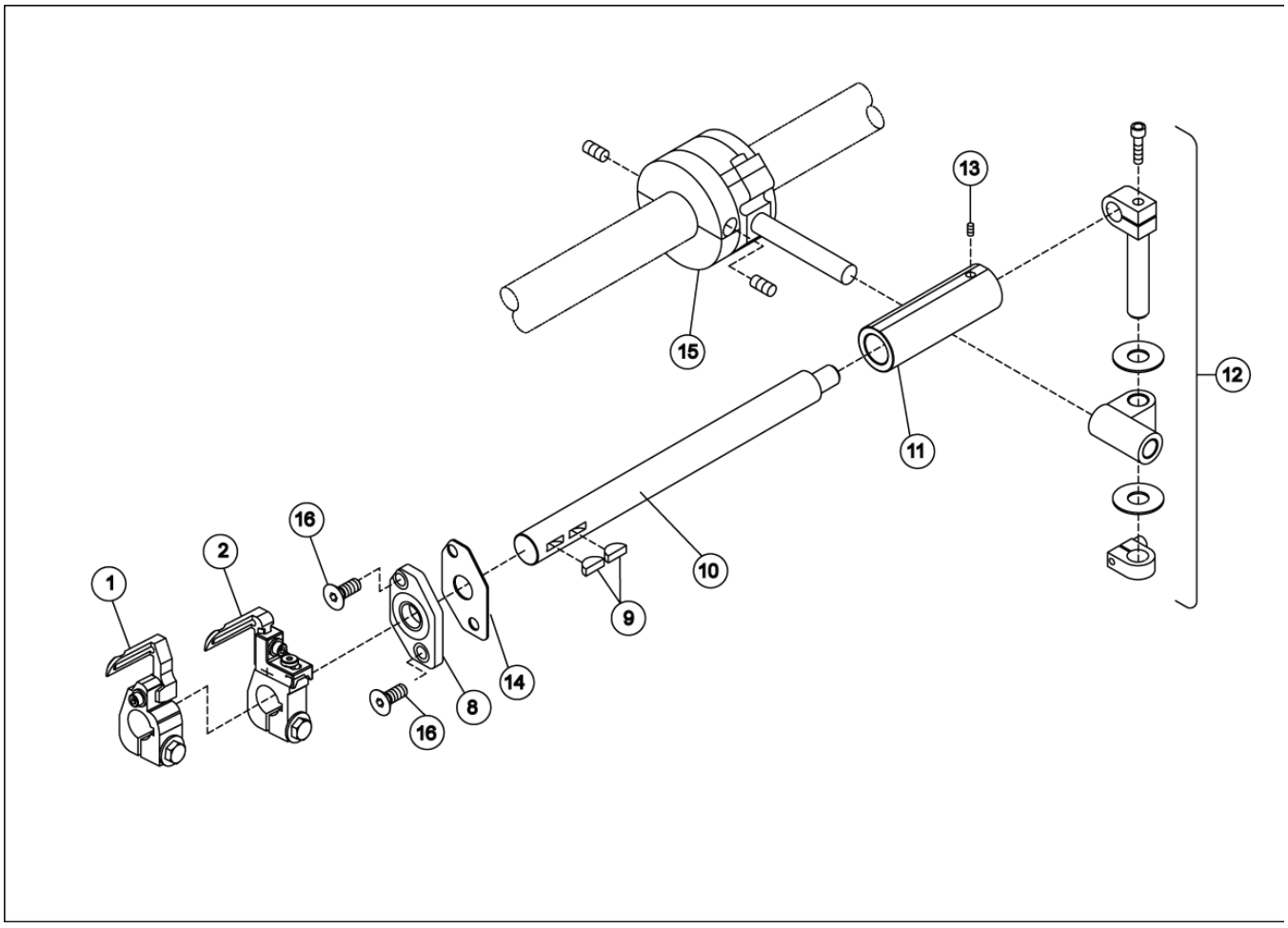
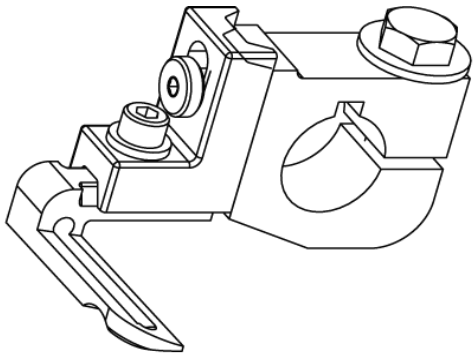


Figure 7.6 Looper Assembly

Refer to Figure 7-7.

31268 Secondary Looper Assembly

ITEM	PART NO	QTY	DESCRIPTION
1	31260	1	Secondary Looper, Two Needle Head
2	31258	1	Secondary Looper Holder, Two Needle Head
3	31259	1	Clamp, Second Looper, Two Needle
4	31286	1	WASHER, #4, OD .25
5	SS440316	1	Screw, Soc Set #4-40 x 3/16 BO
6	31261	1	Low HD Soc Cap Screw 8-32, 3/8 LG
7	WF10	1	Washer, Flat #10
8	H103234	1	Screw, Hex HD #10-32 x 3/4 CZ G8
9	SC440716	1	Screw, Soc Cap #4-40 x 7/16
10	SS44018	1	Screw, Soc Set #4-40 x 1/8 BO



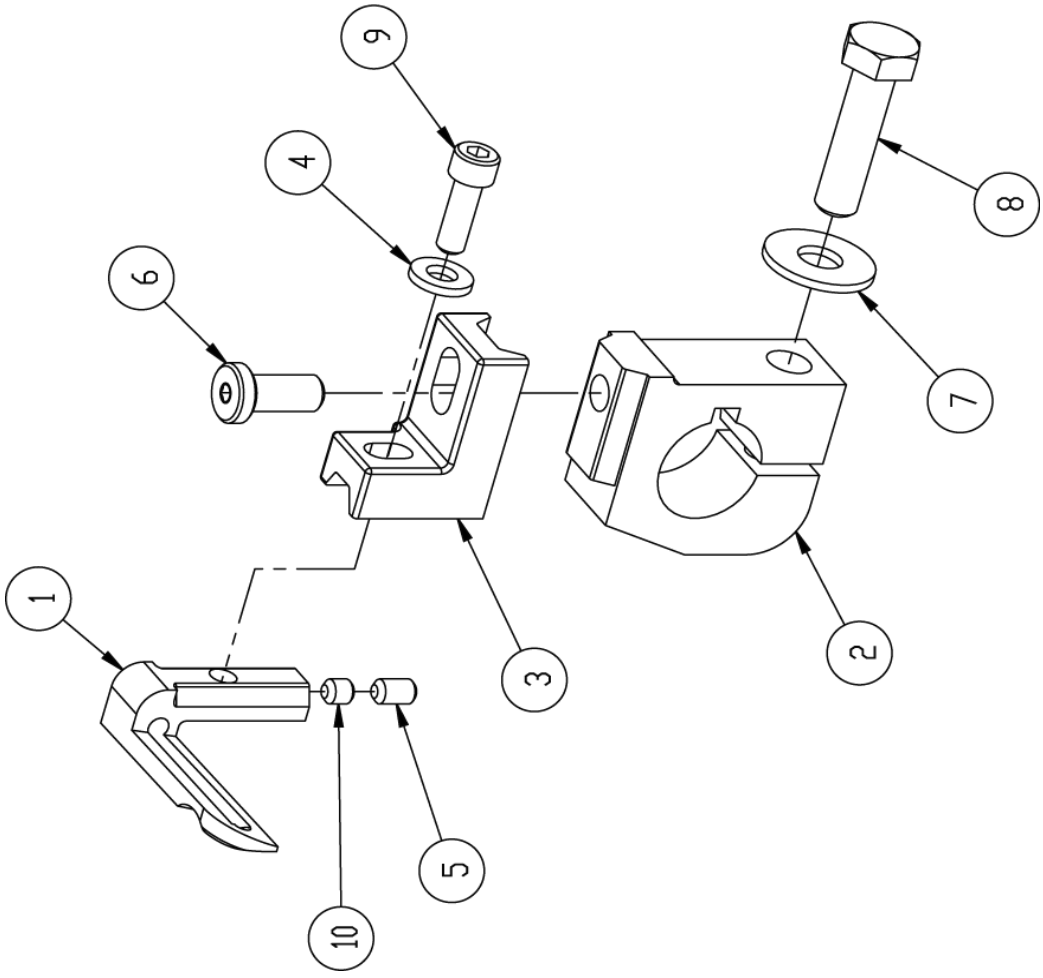


Figure 7.7 **31268 Secondary Looper Assembly, Two Needle**

Refer to Figure 7-8.

31269 Looper and Holder Assembly

ITEM	PART NO	QTY	DESCRIPTION
1	31218	1	Holder, Looper Shaft, 2 Needle Head
2	31262	1	Primary Looper, 2 Needle Head
3	WF5	1	Washer, Flat #5
4	SC54012	1	Screw, Soc Cap #5-40 x 1/2 BO G5
5	WF10	1	Washer, Flat #10
6	H103234	1	Screw, Hex HD #10-32 x 3/4 CZ G8

7.9. 31269 Primary Looper Assembly

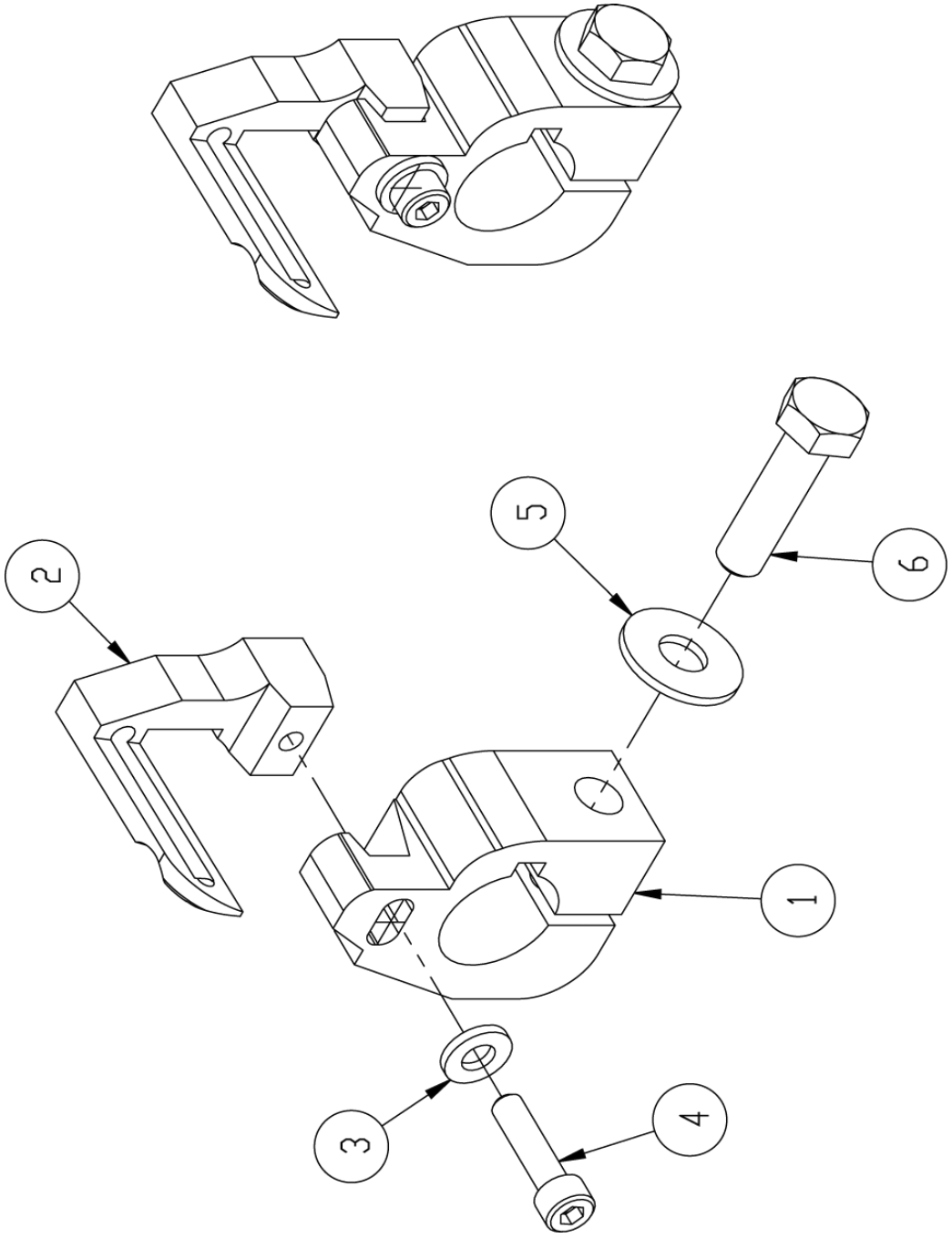


Figure 7.8 31269 **Primary Looper Assembly**

Refer to Figure 7-9.

Oil Pump Assembly

ITEM	PART NO	QTY	DESCRIPTION
1	SC103278	2	Screw, Soc. Cap 10-32 x 7/8
2	H103212	4	screw, Hex HD 10-32 x 1/2
3	15015	1	Mount Pump
4	10084	1	O-ring
5	31096	1	Assembly Gear Pump (Modified)
6	15059	Ref	Fitting, Male Conn 1/8 M x 1/4 T(Part of 15088)
7	15050	1	Assy, Oil Line - Intake
8	67735	3.5”	Tubing, Hydraulic 1/4 OD X .170 ID
9	66085	1	Fitting, Elbow 1/8 F X 1/8 F
10	15088	1	Tubing, Copper (Includes, item #6)
11	A1882	1	Bushing, Neoprene
12	67733	1	Fitting, Conn. 1/8 MNPT X 1/4 T (SP)
13	15077	1	Washer, Nylon Special
14	31043	1	Bracket, Oil Line

7.10. Oil Pump Assembly

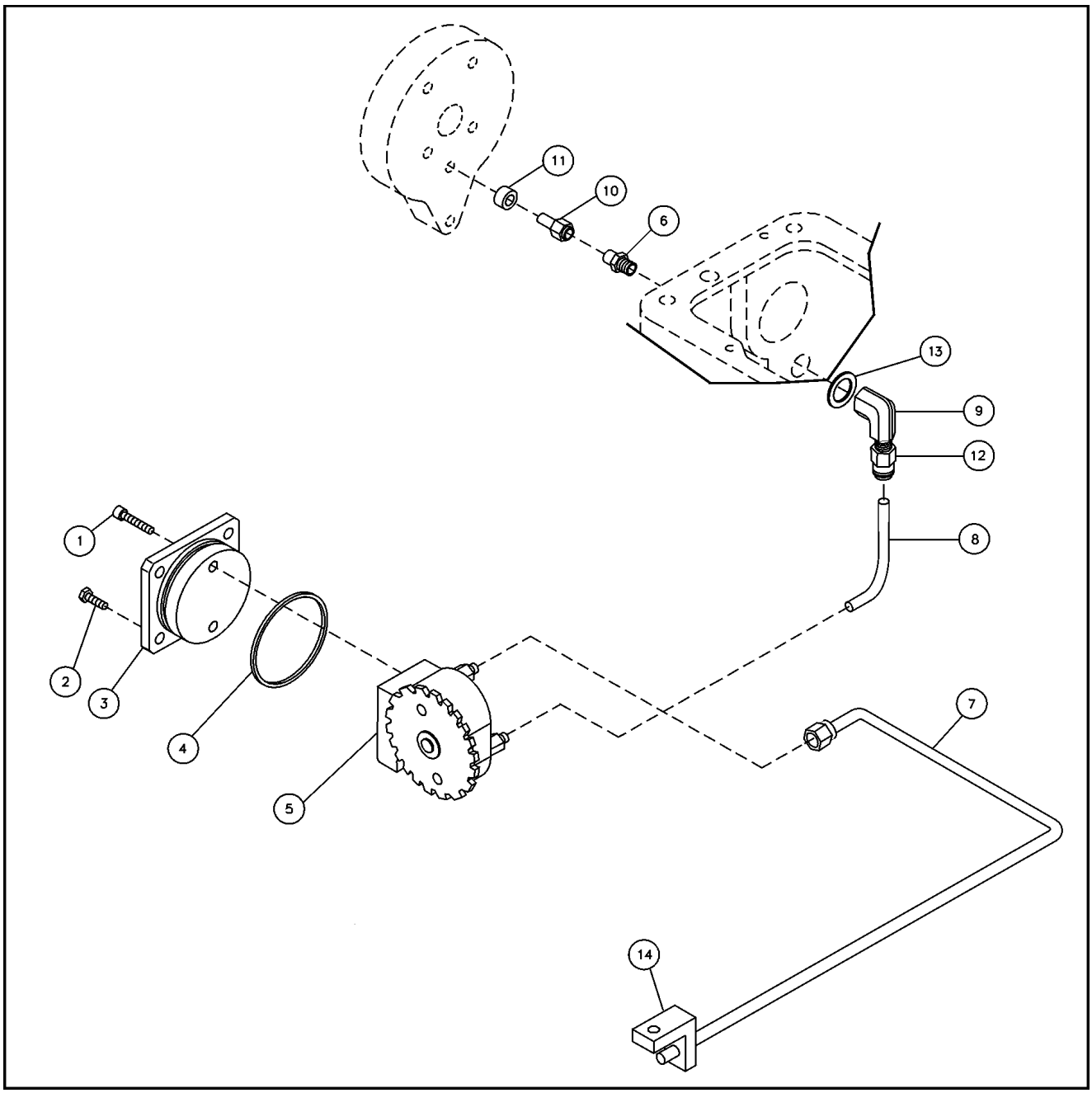


Figure 7.9 Oil Pump Assembly

Refer to Figure 7-10.

31274 Rotary Air Knife (110V)

ITEM	PART NO	QTY	DESCRIPTION
1	31101	1	Kit, Air Cylinder Assembly
2	31131	1	Plate, Support
3	31103	1	Hub, Moveable knife mounting
4	31104	1	Lever, Air Cylinder Drive
5	31138	1	Hub, Driveshaft Support
6	31106	1	Pin, Air Cylinder Pivot
7	31132	1	Cover
8	31108	1	Bracket, Upper Fixed Blade
9	31109	1	Bracket, Lower Fixed Blade
10	31110	1	Block, Mounting
11	31111	1	Shaft, Movable Knife
12	31112	1	Blade, Movable Knife
13	31113	1	Blade, Fixed Knife
14	15066	1	Washer, Thrust-.312 Id X .750
15	31115	1	Cover, Side
16	31271	Ref	Throat Plate, 2 Needle, Rotary Knife
17	31139	2	Bearing, MTRC Flanged
18	SFM510	1	Screw, Soc Flat M5 X 10mm
19	31128	1	Kit, Soleniod
20	31120	1	E-Ring, Circlip D8
21	Phm258	2	Screw, Pan Hd M2.5 X 8mm
22	31122	1	Spring, Compression
23	31272	1	Support Block, Throat plate
24	31129	6.0 Ft	Tubing, Polyurethene, Green, 6mm
26	WFM10	1	Washer, Flat M10
27	SCM1022	1	Screw, Hex M10 X 22mm
28	16035	1	Cordgrip, 1/2Npt
29	SFM412	1	Screw, Soc Flat M4 X 12mm
30	SBM510	3	Screw, Soc Button M5 X 10mm
31	SC103278	4	Screw, Soc Cap #10-32 Unf X 7/8
32	SCM618	4	Screw, Soc Cap M6 X 18mm

7.11. 31274 ROTARY AIR KNIFE (110VAC)

Refer to Figure 7-10.

ITEM	PART NO	QTY	DESCRIPTION
33	SCM825	1	Screw, Soc Cap M8 X 25mm
34	SFM416	8	Screw, Soc Flat M4 X 16mm
35	SFM48	7	Screw, Soc Flat M4 X 8mm
36	SSM46	4	Screw, Soc Set M4 X 6mm
37	T3192	2	Key, Wooddruff
38	WFM12	1	Washer, Flat M12
39	WFM6	4	Washer, Flat M6
40	WFM8	2	Washer, Flat M8
41	31156	1	Guide, Air Knife Bag
42	SC103238	2	Screw, Soc Cap #10-32 Unf X 3/8
43	WF10	2	Washer, Flat #10
44	WL10	2	Washer, Lock #10
45	16291	Ref	Dwg, Pneu Schem Std Needle Cooler
46	P4139	1	Seal, Moisture (1/2”)
47	31158	1	Label, Voltage (110 V)
48	SFM312	1	Screw, Soc Flat M3 x 12mm

7.11. 31274 ROTARY AIR KNIFE (110VAC)

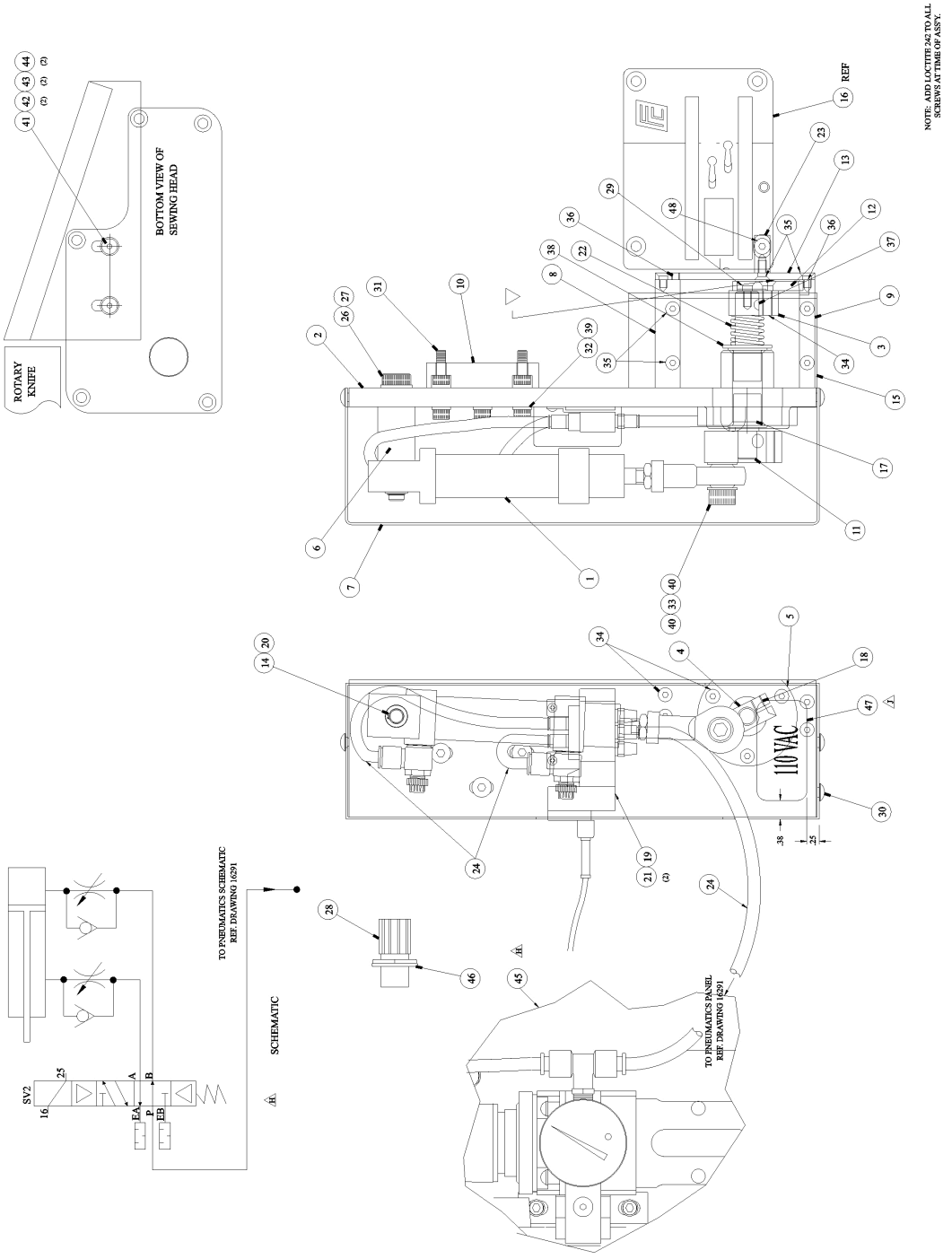


Figure 7.10. 31274 Rotary Knife Assembly (110V)

Refer to Figure 7-11.

31275 Rotary Air Knife (25V)

ITEM	PART NO	QTY	DESCRIPTION
1	31101	1	KIT, AIR CYLINDER ASSY
2	31131	1	PLATE, SUPPORT
3	31103	1	HUB, MOVABLE KNIFE MOUNTING
4	31104	1	LEVER, AIR CYLINDER DRIVE
5	31138	1	HUB, DRIVESHAFT SUPPORT
6	31106	1	PIN, AIR CYLINDER PIVOT
7	31132	1	COVER
8	31108	1	BRACKET, UPPER FIXED BLADE
9	31109	1	BRACKET, LOWER FIXED BLADE
10	31110	1	BLOCK, MOUNTING
11	31111	1	SHAFT, MOVABLE KNIFE
12	31112	1	BLADE, MOVABLE KNIFE
13	31113	1	BLADE, FIXED KNIFE
14	15066	1	WASHER, THRUST-.312 ID X .750
15	31115	1	COVER, SIDE
16	31271	Ref	Throat Plate, 2 Needle, Rotary Knife
17	31139	2	BEARING, MTRC FLANGED
18	SFM510	1	SCREW, SOC FLAT M5 X 10mm
19	31162	1	KIT, SOLENIOD, 24VDC
20	31120	1	E-RING, CIRCLIP D8
21	PHM258	2	SCREW, PAN HD M2.5 X 8mm
22	31122	1	SPRING, COMPRESSION
23	31272	1	SUPPORT BLOCK, THROAT PLATE
24	31129	6.0 ft (1,83M)	TUBING, POLYURETHENE, GREEN, 6mm
25			
26	WFM10	1	WASHER, FLAT M10
27	SCM1022	1	SCREW, HEX M10 X 22mm
28	16035	1	CORDGRIP, 1/2NPT

7.13. 31275 ROTARY AIR KNIFE (24VDC)

Refer to Figure 7-11.

31274 Rotary Air Knife (110V)

ITEM	PART NO	QTY	DESCRIPTION
28	16035	1	CORDGRIP, 1/2NPT
29	SFM412	1	SCREW, SOC FLAT M4 X 12mm
30	SBM510	3	SCREW, SOC BUTTON M5 X 10mm
31	SC103278	4	SCREW, SOC CAP #10-32 UNF X 7/8
32	SCM618	4	SCREW, SOC CAP M6 X 18mm
33	SCM825	1	SCREW, SOC CAP M8 X 25mm
34	SFM416	8	SCREW, SOC FLAT M4 X 16mm
35	SFM48	7	SCREW, SOC FLAT M4 X 8mm
36	SSM46	4	SCREW, SOC SET M4 X 6mm
37	T3192	2	KEY, WOODDRUFF
38	WFM12	1	WASHER, FLAT M12
39	WFM6	4	WASHER, FLAT M6
40	WFM8	2	WASHER, FLAT M8
41	31156	1	GUIDE, AIR KNIFE BAG
42	SC103238	2	SCREW, SOC CAP #10-32 UNF X 3/8
43	WF10	2	WASHER, FLAT #10
44	WL10	2	WASHER, LOCK #10
45	16291	REF	DWG, PNEU SCHEM STD NEEDLE COOLER
46	P4139	1	SEAL, MOISTURE (1/2”)
47	31148	1	LABEL, VOLTAGE (24 VDC)
48	SFM312	1	Screw, Soc Flat M3 x 12mm

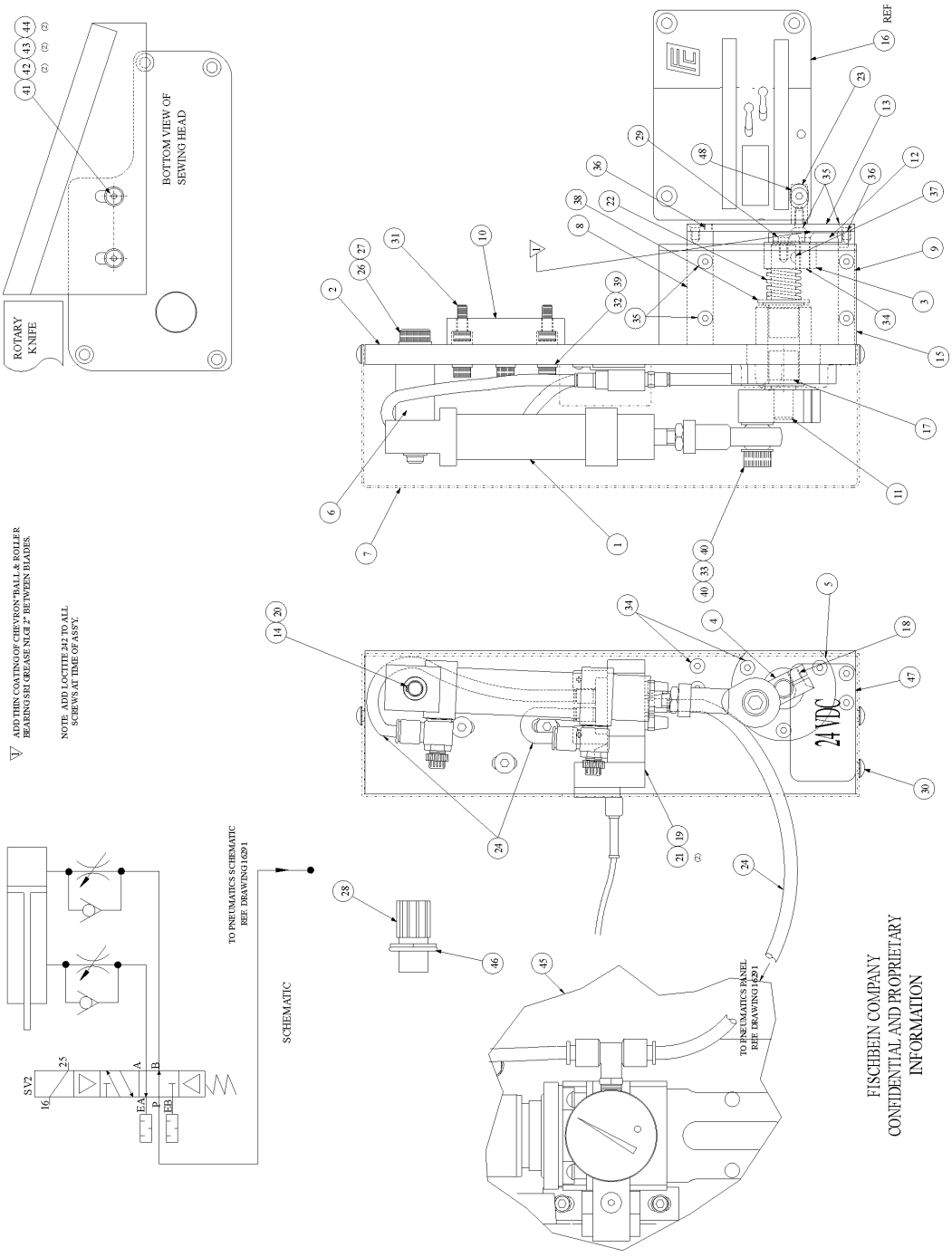


Figure 7.11. 31275 Rotary Knife Assembly (24V)

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