TOWNSEND®

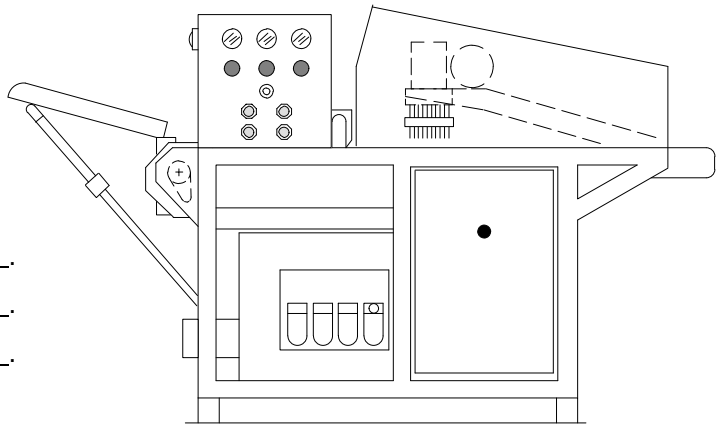
Stork Food Systems

TECHNICAL MANUAL

Part number: 14288-6E-30
Language: English
Date: 2009-04-17

This manual covers the following machine:

1450 Injector



Serial No.:_____.

Voltage/Hz:_____.

Amperage:_____.

Stork Townsend Inc.
2425 Hubbell Avenue | Des Moines, IA 50317 USA
N. America: 800 247-8609 | Intl.: 515 265-8181 | Fax: 515 263-3355
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Stork Townsend B.V.
Industrielaan 63 - 5349 AE Oss | P.O. Box 292 - 5340 AG Oss | The Netherlands
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TABLE OF CONTENTS

SECTION 1 SAFETY

— Contents —

Read instructions and review safety information (pages 5 through 11) before using or servicing the machine.

ATTENTION!

Read and understand this manual. This is an obligation for all who use or maintain this machine, and for all who supervise its use.

This symbol is used in this manual to indicate specific safety precautions.

Supervisors:

Make sure copies of this manual are provided to all who will use or maintain this machine. A training program should be instituted to ensure material contained in this manual is understood and followed by all. Training should be repeated periodically to reinforce safe procedures.

When the machine is relocated or sold, this manual must also be supplied to the new user**.** Additional copies and translations are available from:

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Des Moines, IA 50317 USA

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Use this machine only for purpose for which it was designed and intended. Do not alter its design. Use only genuine Stork Townsend repair parts or accessories.

Airborne noise

The noise pressure level emitted by this machine: . . . . . 83 dB(A)
(calculated at the operator position, according to ISO 11204)

You must wear hearing protection when operating this machine.

See more safety information on the following pages.

To All INSTALLERS
OPERATORS,
MAINTENANCE PERSONNEL, AND
CLEAN-UP PERSONNEL.

Read and understand all instructions and safety precautions, especially the following:

1. **Start machine only if you are completely ready to run the machine.**

   Lock out electrical supply to machine if there is risk of injury from unexpected start of machine, or if there is possibility of electrical shock.

   "Lock out" means the electrical supply required to run the machine is positively prevented from reaching the machine by using a lockable type switch.

   Stop operation immediately if machine malfunctions, or if operating conditions are unsafe.

2. **Keep hands and clothing away from sharp edges, and from any moving parts.**

   Stay alert. Keep eyes on hands and product zone while working. Do not force product or machinery — allow machine to do the work it is intended to do.

   Stop operation if you are not physically able to be alert, or do not have required strength or agility to operate machine safely. Do not operate at speed that hinders safe operation.

Also read and understand the instructions and precautions on the following pages.

SAFETY INSTRUCTIONS

1. Read and follow this manual before installing, operating, cleaning, or servicing this machine.
2. Before operating this machine, verify that all safety features are working correctly (see page 25).
3. Report any malfunctions immediately to supervisor.
4. Malfunctions of safety devices must be corrected before operating the machine. If machine is operating abnormally, clear instructions must be provided for safe handling of the equipment until abnormal conditions are corrected.
5. Operate this machine only after being trained for its correct and safe operation. Training should be repeated at regular intervals.
   a. Keep hands and clothing clear of all moving parts.
   b. Do not contact any sharp edges.
   c. Keep hands and clothing clear of injector head, and conveyor drive crank arms while electrical supply is connected to machine.
   d. Allow conveyor to carry product to needle zone — do not force product.
   e. Read and follow completely the cleaning instructions listed in this manual.
   f. During investigation of any problem, if injury could result from unexpected start of machine, or if there is possibility of electrical shock, make sure electrical supply is locked out (see page 8).
6. Use this machine only for purpose for which it was designed and intended. Do not alter its design. Use only genuine Stork Townsend repair parts or accessories.

If machine malfunctions during use, stop use of machine immediately. Notify supervisor immediately.

Also read and understand precautions on the following page.

SAFETY PRECAUTIONS

Do Not install or operate this machine in any manner or for any purpose different from that for which it was designed and intended.

Do Not connect electrical supply until machine is completely assembled and installed, and all guards, covers, safety devices, and other parts are properly installed.

Do Not operate machine until daily safety circuit test has been performed (see page 25).

Do Not service, repair, adjust, or investigate any problem until electrical supply is locked out (see page 8) if injury could result from unexpected start of machine, or if there is possibility of electrical shock.

Do Not operate machine with any damaged, missing, or malfunctioning parts or safety devices.

Do Not modify or remove any parts or safety devices, or substitute parts not intended for use on this machine.

Do Not press or force product into needle zone.

Do Not contact sharp edges. Handle needles with extreme care. Dispose of needles properly and safely.

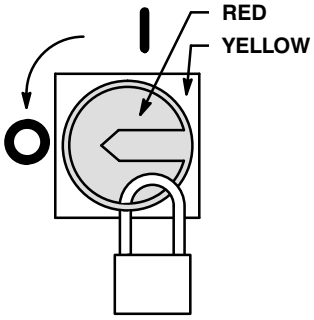
Do Not reach inside guards or covers while machine is running, or contact any moving parts.

Do Not leave machine energized while unattended.

If machine malfunctions during use, stop machine immediately. Notify supervisor immediately.

SAFETY SPECIFICATIONS SHEET

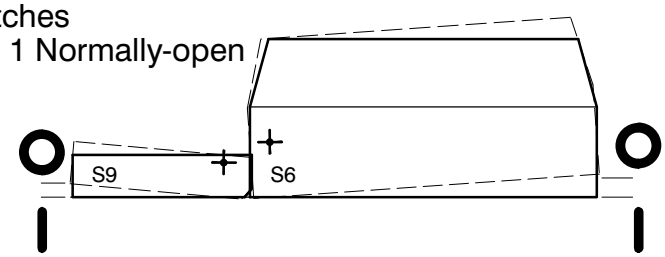
Main Disconnect Switch — Q1



Stork Townsend #: 18733
Manufacturer: Entrelec
Manufacturer's #: 9001002
Contacts: 4 Normally-open
20 A at 600 VAC
4 kW at 220 VAC; 7.5 kW at 380 VAC

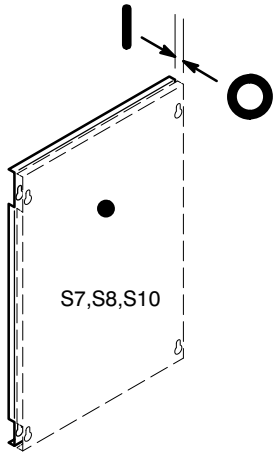
Inlet Guard Interlock Switch — S9

Stork Townsend #: 18563
Manufacturer: Elobau
Manufacturer's #: 120 271
Contacts: magnetic reed switches
1 Normally-closed; 1 Normally-open
150 mA at 1-70 V



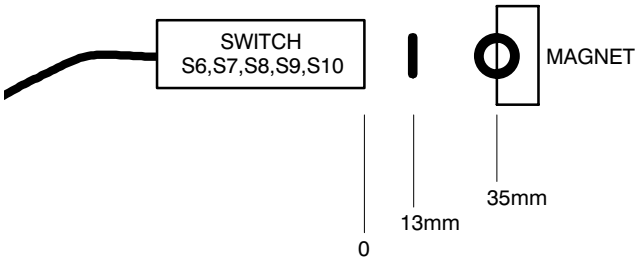
Hood Interlock Switch — S6

Stork Townsend #: 18563
Manufacturer: Elobau
Manufacturer's #: 120 271
Contacts: magnetic reed switches
1 Normally-closed; 1 Normally-open
150 mA at 1-70 V



Side Panel Interlock Switches — S7, S8, S10

Stork Townsend #: 18563
Manufacturer: Elobau
Manufacturer's #: 120 271
Contacts: magnetic reed switches
1 Normally-closed; 1 Normally-open
150 mA at 1-70 V

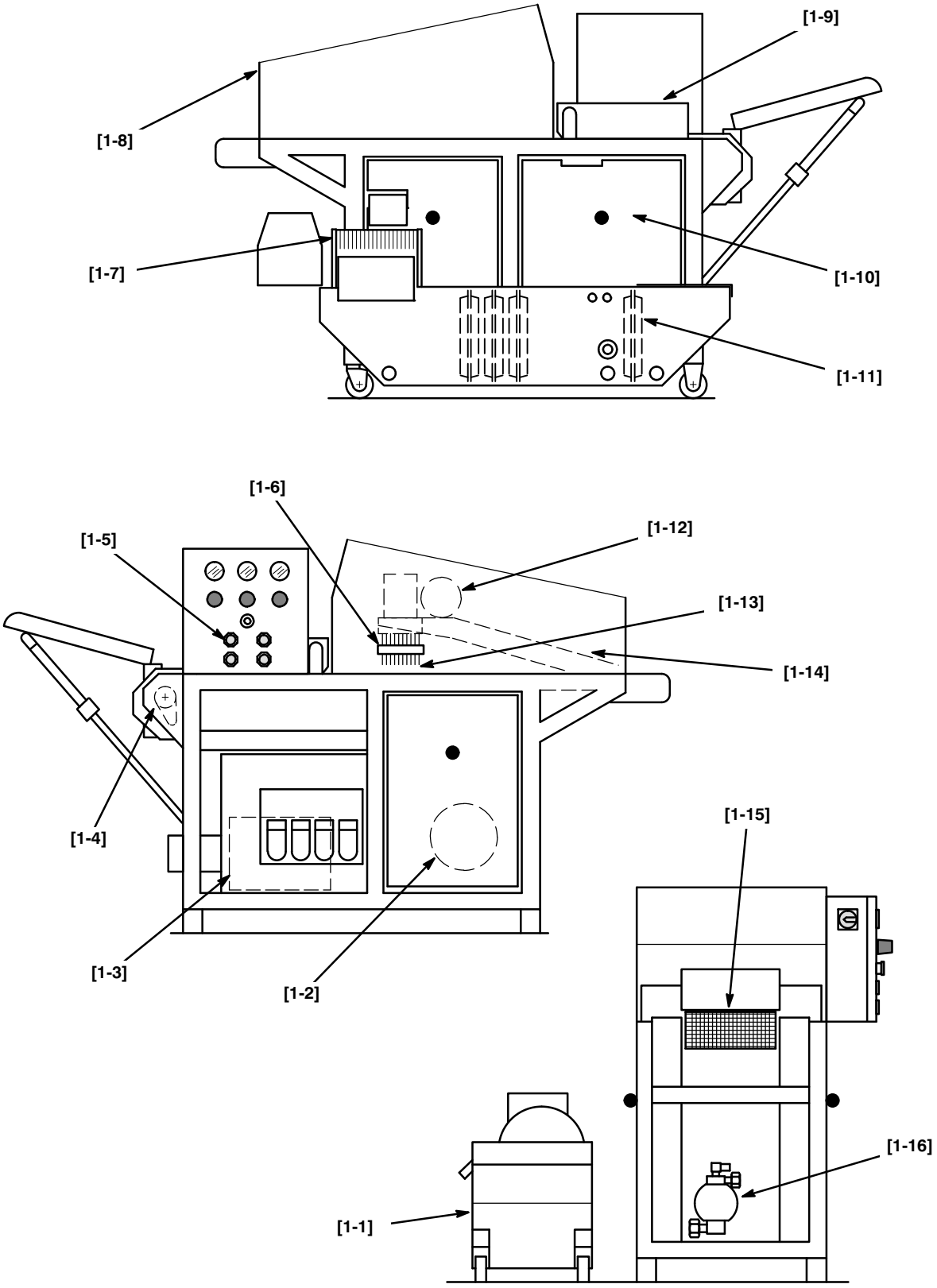


SECTION 2 INSTALLATION

— Contents —

Read instructions and review safety information (pages 5 through 11) before operating machine.

General Description



GENERAL DESCRIPTION

The Model 1450 Injector is designed to inject wide variety of meat products with variety of product-enhancing fluids. Small diameter, closely spaced injecting needles, combined with precision fluid control system provide even and accurate distribution of fluid.

(Note: Illustration callout numbers will appear throughout this manual to coordinate the text to illustrations. The first part of the number is the illustration number, and the second part is the callout sequence within the particular illustration. For example, [1-5] refers to callout number 5 on illustration number 1.)

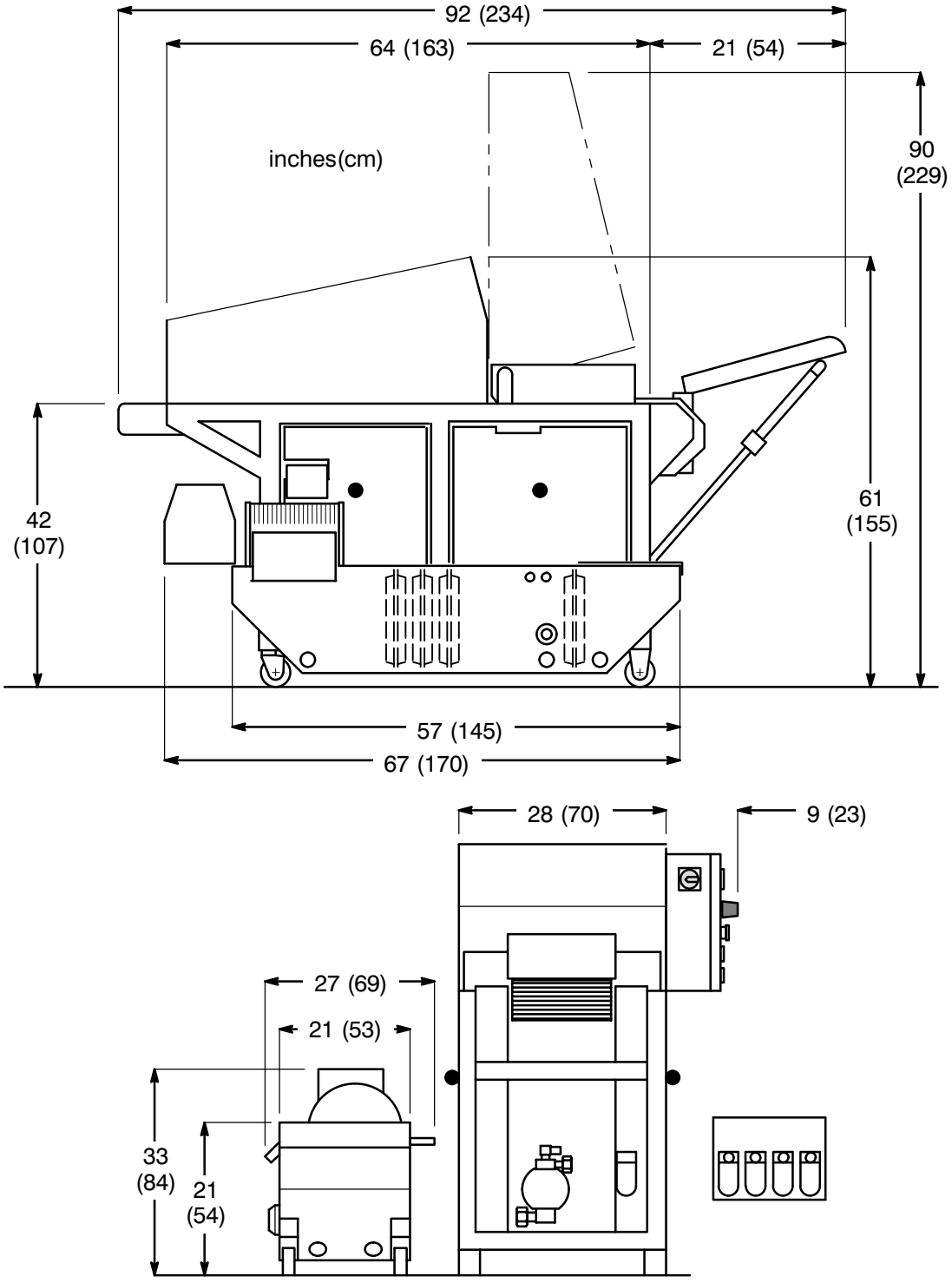
The primary elements of the Model 1450 are the fluid system, the conveyor, and the safety system. Various options are available to customize the machine for special products or for special production arrangements.

The **fluid system** consists of a pump [1-16], a filter unit [1-1], a control valve [1-12], and the injecting needles [1-13]. The pump is driven by a separate pump motor [1-3]. Pump is available in several choices to match injection rate requirements. The filter unit will catch and filter runoff fluid. The filter unit can function as a fluid reservoir, or may be connected to a centralized fluid distribution system. The control valve is linked to a sensing mechanism that meters fluid flow according to product size, providing accuracy of injection percentages, and minimizing fluid waste. The amount of fluid that is delivered thru the needles per stroke is adjustable. The needles are carried by an injecting head that drives needles into the product. Needles are small to prevent product damage, and spacing is close to provide uniform injection. Needles automatically retract when they contact bones.

The **conveyor system** consists of a drive motor [1-2], a conveyor belt [1-15], and a head carriage [1-14]. The head carriage carries the needles to and from the product. A stripper plate [1-6] is built into the head carriage to help control the fluid valve, and to strip product off the needles A clutch [1-4] coordinates conveyor movement with head carriage so that conveyor belt advances while head carriage is up, and stops while head carriage is down. The amount of belt movement per stroke is adjustable.

The **safety system** incorporates a system of guards (hood, inlet guard, and side covers [1-8][1-9][1-10]) that are interlocked electrically to stop conveyor drive when guards are not properly installed. The control circuit is designed so that the drive mechanism will not automatically restart when the guards are put back in place. To restart, the operator must first put all guards back in place, then use the drive start switch [1-5] to run the machine again. The control circuit also incorporates a self-checking feature that will prevent restarting if a control switch has its contacts stuck in the on position. This safety system does not, however, interrupt the pump motor.

Overall Dimensions



Utility Requirements

ELECTRICAL

All wiring and connections for this machine must comply with applicable national and local electrical codes.

Table below lists motor voltage and amperage requirements for the Model 1450. The machine must be properly grounded. Electrical supply must have a disconnect switch. Overload protection for the motor is incorporated into the machine.

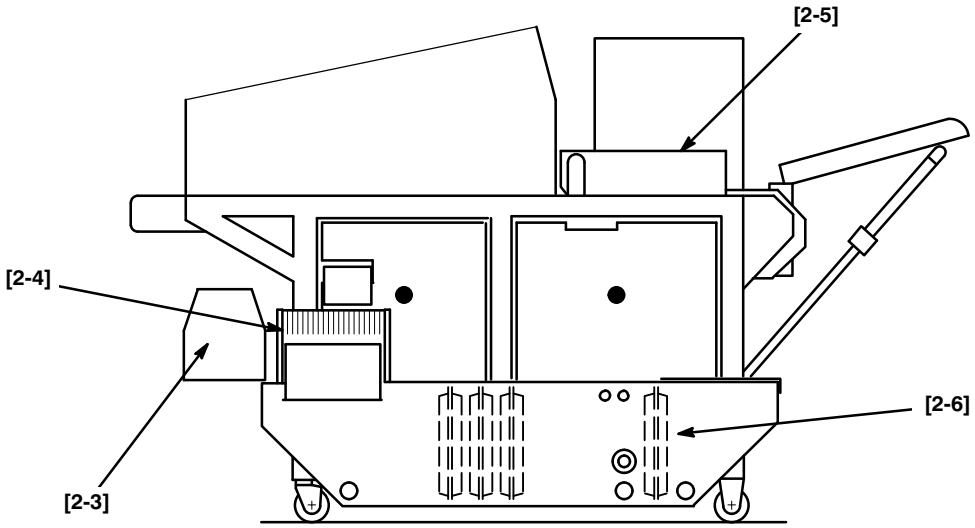
Pump Motor – 3 Phase

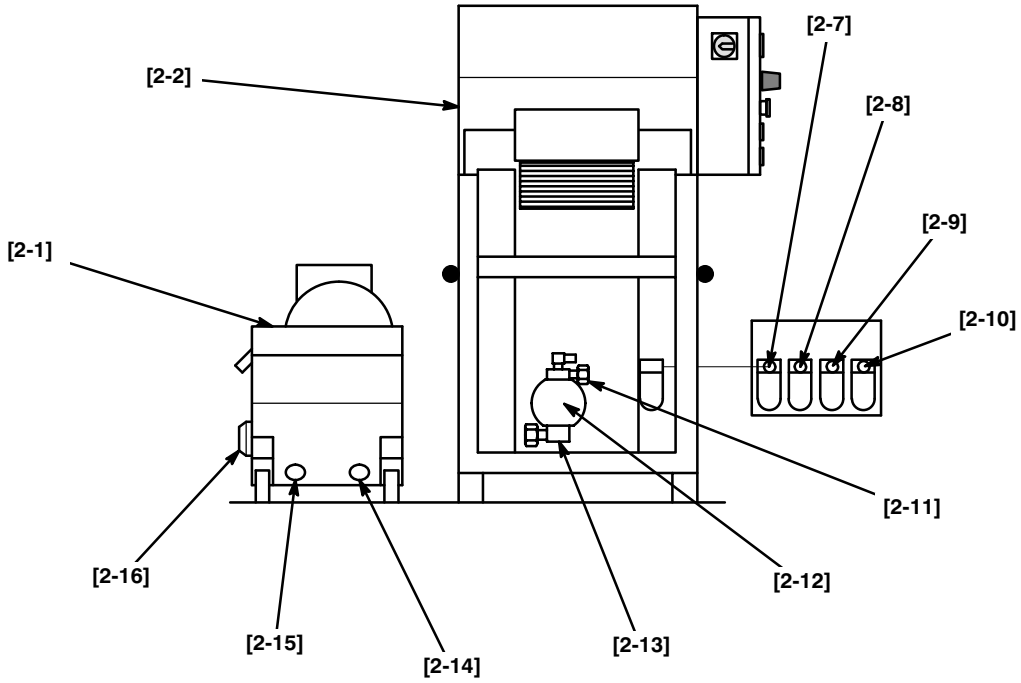
190V–50Hz–5hp————18.5A
200V–50Hz–5hp————17.0A
200V–60Hz–5hp————17.5A
208V–60Hz–5hp————13.9A
220V–50Hz–5hp————14.0A
230V–60Hz–5hp————15.2A
380V–50Hz–5hp————8.1A
380V–60Hz–5hp————8.1A
415V–50Hz–5hp————8.0A
460V–60Hz–5hp————7.6A
575V–60Hz–5hp————6.1A

Conveyor Drive Motor – 3 Phase

190V–50Hz–1-1/2hp————5.5A
200V–50Hz–1-1/2hp————5.2A
200V–60Hz–1-1/2hp————4.5A
208V–60Hz–1-1/2hp————4.2A
220V–50Hz–1-1/2hp————4.2A
230V–60Hz–1-1/2hp————3.8A
380V–50Hz–1-1/2hp————2.5A
380V–60Hz–1-1/2hp————2.5A
415V–50Hz–1-1/2hp————2.3A
460V–60Hz–1-1/2hp————1.9A
575V–60Hz–1-1/2hp————2.0A

Utilities





AIR SUPPLY

Air pressure assists control of three functions of the Model 1450: (1) Air pressure controls fluid pressure to the needles by means of an accumulator feature in the fluid control valve. (2) Air pressure to the stripper controls the amount of force created to strip product off the needles (3) Two air cylinders counterbalance the weight of the head carriage.

Use flexible hose and relieving type quick disconnect fitting to connect air supply to inlet filter [2-10] on right side of cabinet (1/4-18 NPT female thread). Separate filters and pressure regulators supply each air circuit [2-7][2-8][2-9]. Supply pressure should be at least 100 psi (690 kPa). Filters have auto-drain feature to eliminate moisture. Check that moisture is not accumulating. Replace filter elements as needed.

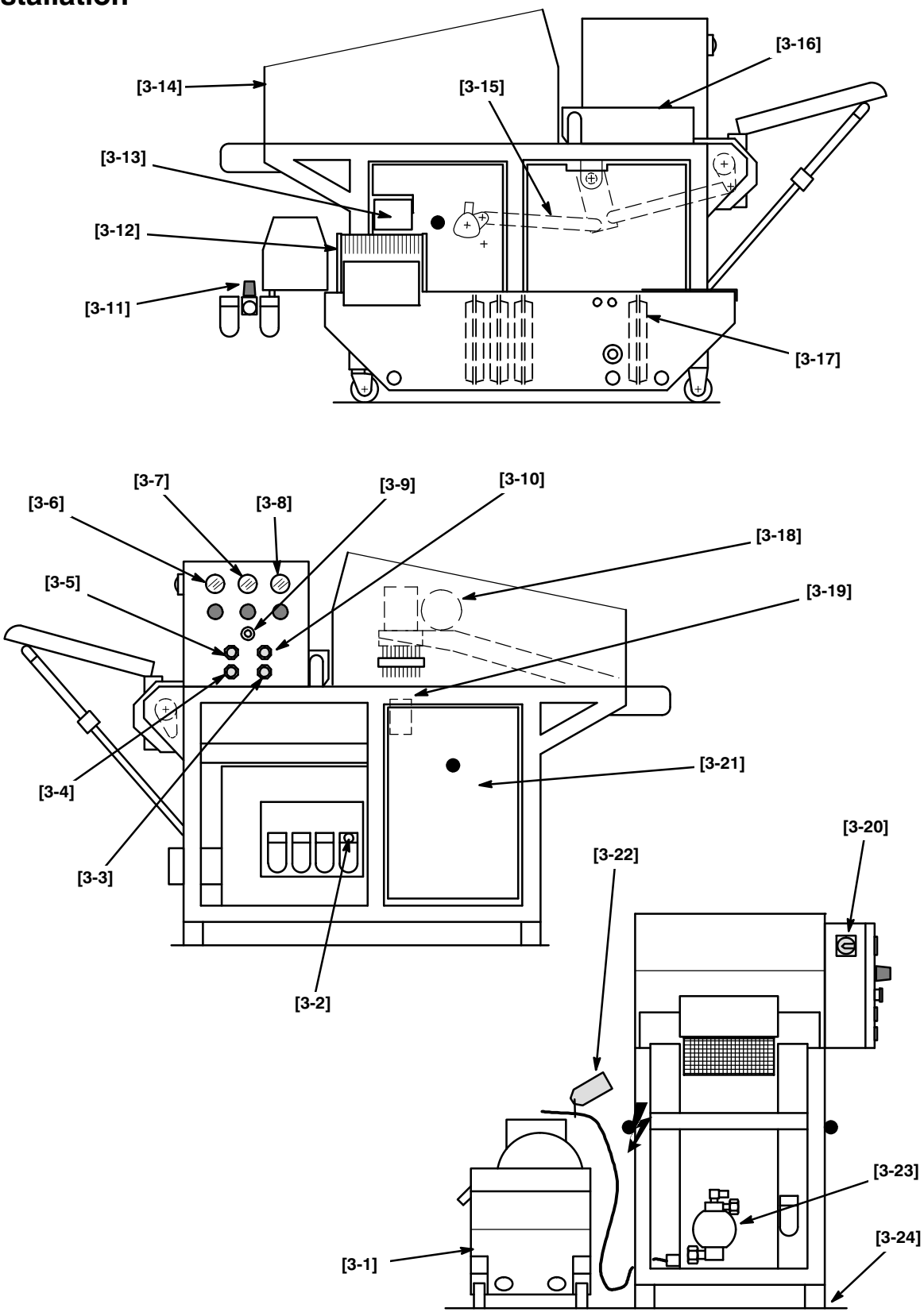
If using with the Model 11 Filter Unit, air consumption is 15—70 CFM (7—33 L/sec), depending on filter drum speed.

FLUID SUPPLY

Replenish fluid supply must meet or exceed actual pump usage — maximum output of RB10 pump is approximately 10 gpm (38 L/min), RB15 is 15 gpm (57 L/min), RB30 is 30 gpm (114 L/min). Supply pressure to Model 11 should not exceed 75 psi (515 kPa). Connect replenish supply line to port [2-16] on side of Model 11 filter unit (3/4-14 female thread).

This is a wet process — provide adequate drainage.

Installation



INSTALLATION

Read instructions and review safety information (pages 5 through 11) before assembling, installing, and operating machine. Do not connect electrical supply until machine is completely assembled.

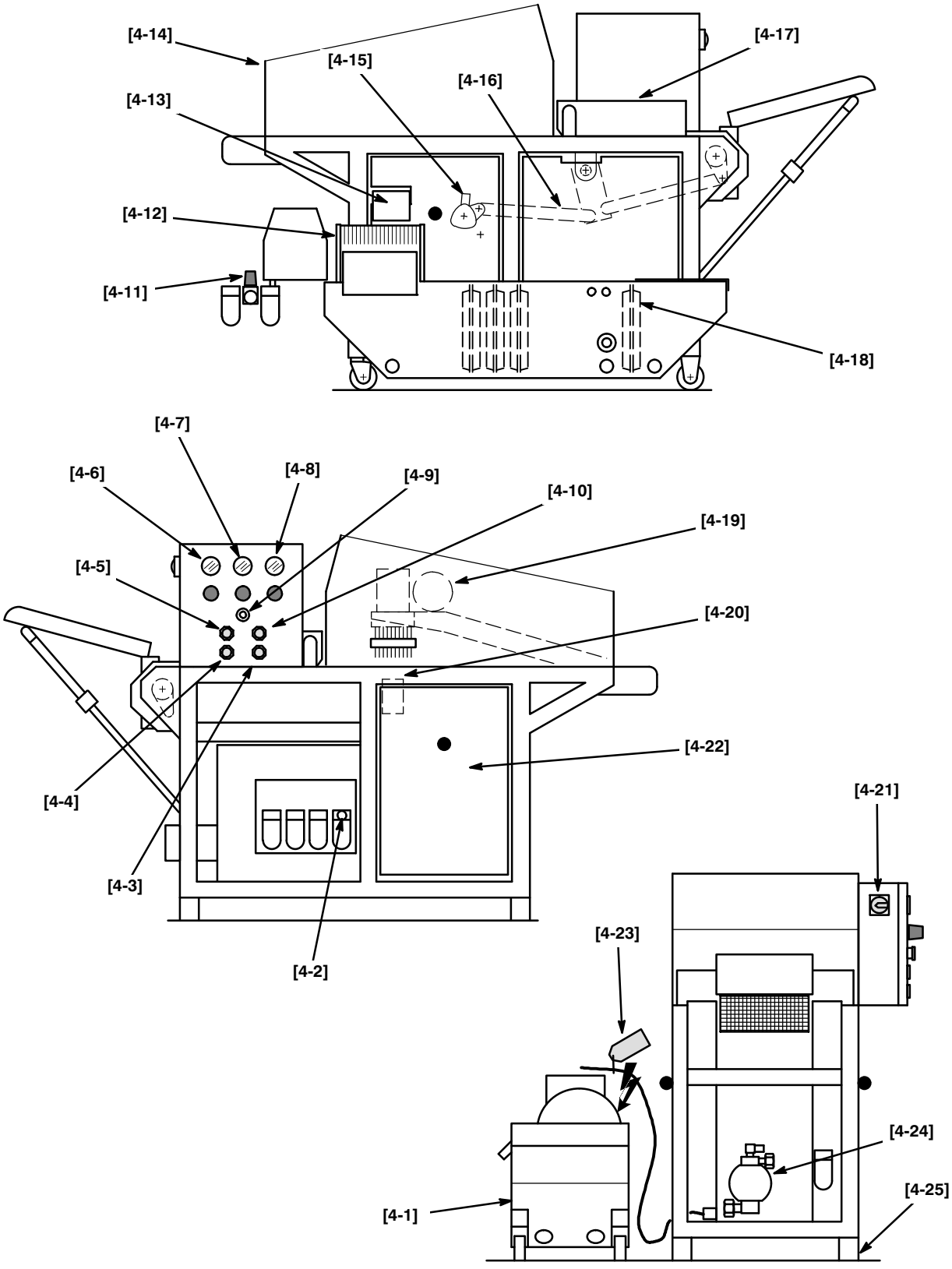
Utility requirements and physical dimensions are given on pages 16 thru 19. Machine is wired for voltage specified in your order. A tag [3-22] attached to power cord identifies voltage and amperage requirements.

Installation

1. With machine in suitable work area, adjust legs [3-24] so machine is stable.
2. Connect fluid hoses — see page 63.
3. Position 11 filter unit [3-1] so rotary strainer [3-12] will catch fluid from runoff trough [3-13]. Adjust filter support screws so tank is stable.
4. Install filter screens [3-17] (see page 65). Fill tank — pump will be damaged if pump is run dry, if fluid is hot, or if granules are not fully dissolved.
5. Make sure fluid control valve [3-18] is properly adjusted (see page 59), and conveyor variable stroke linkage [3-15] is set as desired (see page 57).
6. Make sure all guards and covers [3-14][3-16][3-21] are installed or closed. Remove all loose objects from machine.
7. Connect electrical supply.
8. Turn main disconnect switch [3-20] on. Pull control switch [3-9] on — knob will light. Caution: Light is added as a convenience to indicate power is on — do not depend on absence of light to mean power is off, since light bulb is a consumable item and could be burned out.

To stop machine, push in knob on control switch. Machine will also stop when an interlocked guard is moved, or main disconnect switch is turned off.

Installation



9. Connect air supply and set pressure regulators as follows:

   Fluid System . . . . . [4-6] Varies with product — for example, lower for seafood, higher for red meats. Higher pressure will give higher injection percentages.

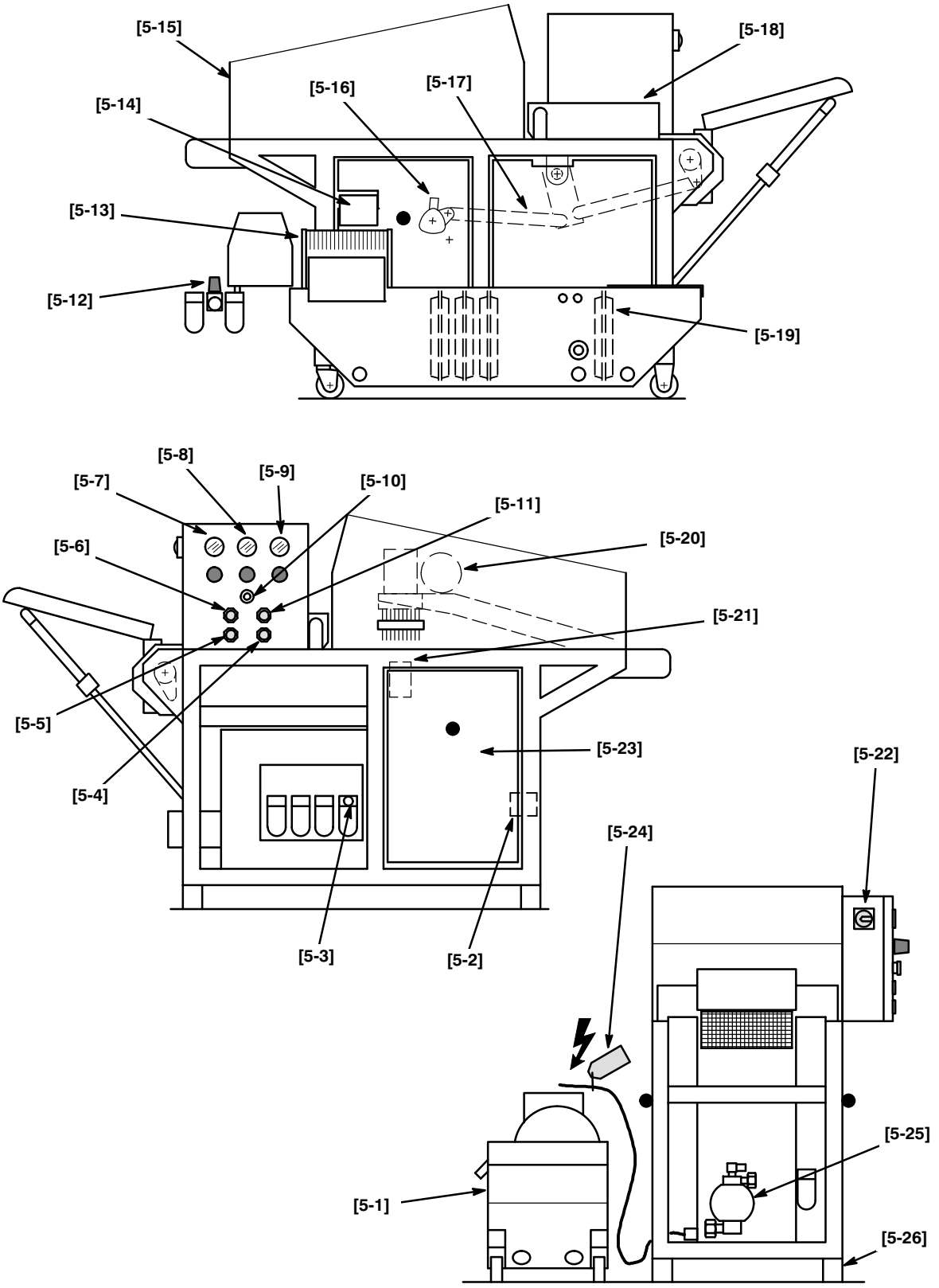
   Stripper Cylinders . . [4-7] Varies with product — set as low as possible while preserving stripping action, that is, machine still pulls product off needles.

   Assist Cylinders . . . . [4-8] 40 psi (275 kPa).

   Air Motor — Model 11 [4-11] Set pressure as low as possible, but high enough to maintain smooth operation and desired speed. Lower pressure will consume less air.

10. Check adjustment of stripper stops [4-20] (optional equipment). If product is delicate, make sure the stripper is stopped above the point where product damage would begin. The left and right stops should be level with each other (see page 61).
11. Press drive start pushbutton [4-5] to run conveyor and head carriage.
12. Check direction of rotation of crank arms [4-15] — labels on machine indicate proper direction. If incorrect, stop machine, lock out electrical supply (see page 8), and switch two leads of main power supply to the machine. Reconnect and recheck drive rotation.

Installation



13. Perform Daily Safety Circuit Test.

Daily Safety Circuit Test

1. With machine running, machine must stop immediately when:
   a. Inlet guard [5-18] is raised.
   b. Hood [5-15] is raised.
   c. Side covers [5-23] are removed.
   d. Control switch [5-10] is pushed in.
   e. Main disconnect switch [5-22] is turned off.
2. Machine must not restart when guards are returned to run position unless motor start buttons are pushed – restarting must only occur by pushing start button after guards are in run positions.

14. To run product, press pump start pushbutton [5-11]. Open bleed valve [5-2] until all air bubbles are eliminated from fluid lines. Close valve.
15. Press drive start pushbutton [5-6]. Lay product on inlet end of conveyor.

Notify supervisor immediately for repair of any problem.

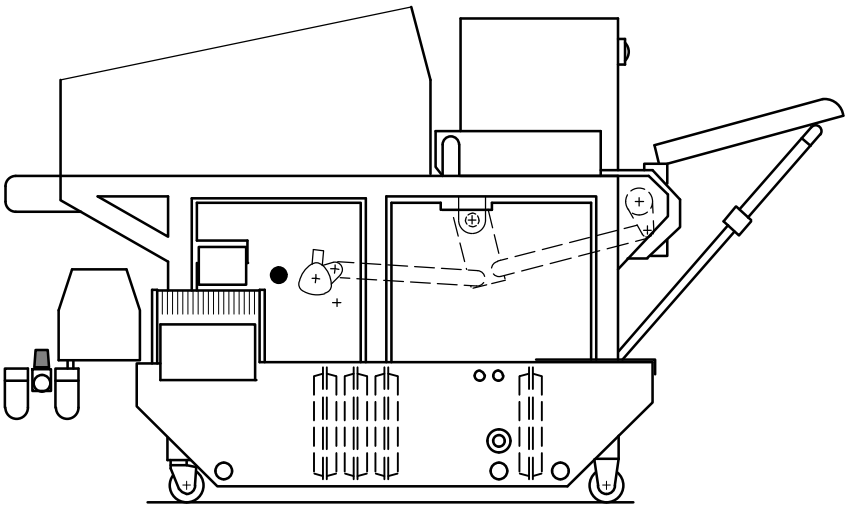
Do not leave machine energized while unattended.

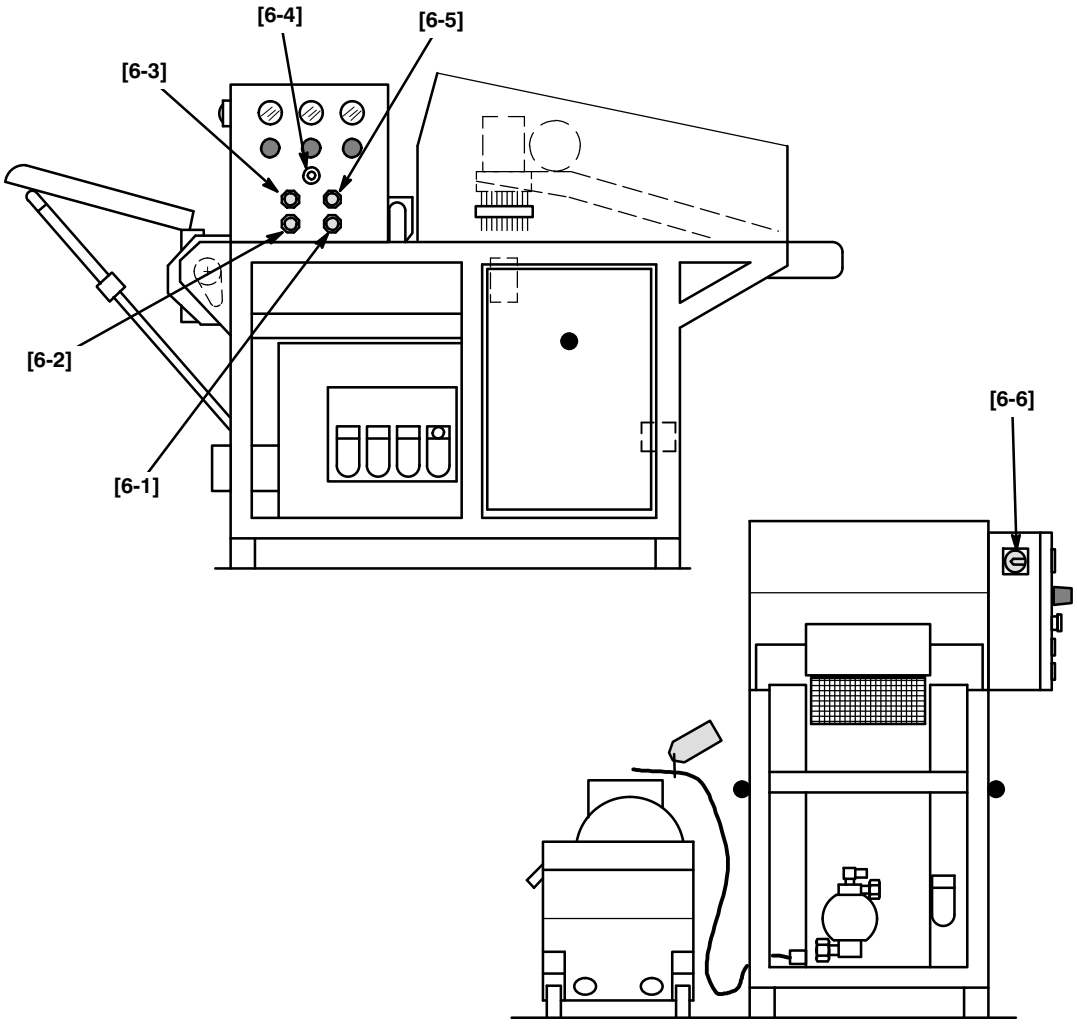
SECTION 3 OPERATION

— Contents —

Read instructions and review safety information (pages 5 through 11) before operating machine.

Machine Controls





OPERATION OF MODEL 1450

Read instructions and review safety information (pages 5 through 11) before operating machine.

Machine Controls

MAIN DISCONNECT SWITCH [6-6]. Rotate to “0” position for off, “1” position for on. Switch controls high voltage to motor contactor and to transformer for 24 volt control circuit. Use this switch to lock out electrical supply during maintenance (see page 8).

CONTROL SWITCH [6-4]. Pull on, push off. Switch turns on 24 volt control circuit. Knob will light when power is on. Caution: Light is added as a convenience to indicate power is on — do not depend on absence of light to indicate power is off, since light bulb is a consumable item and could be burned out.

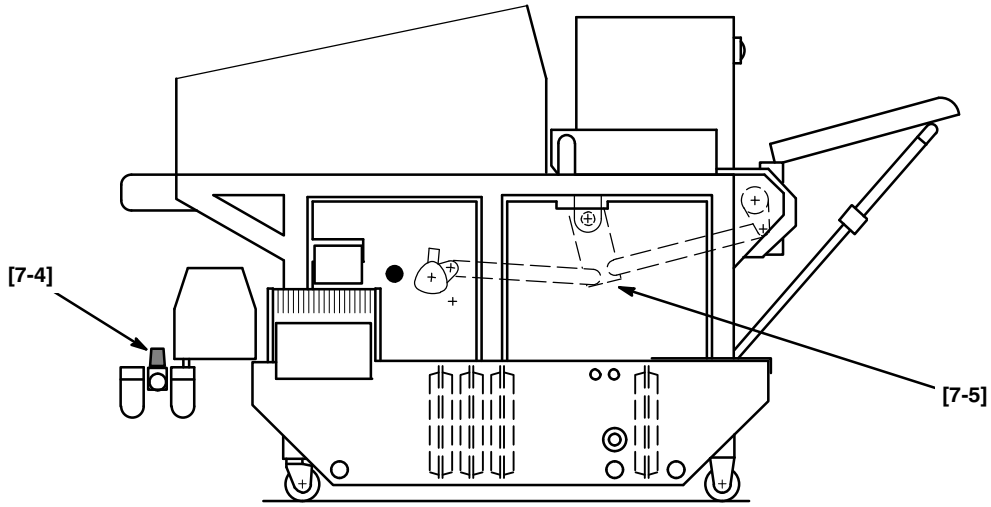
DRIVE START [6-3]. Press pushbutton to start drive motor — motor will continue running.

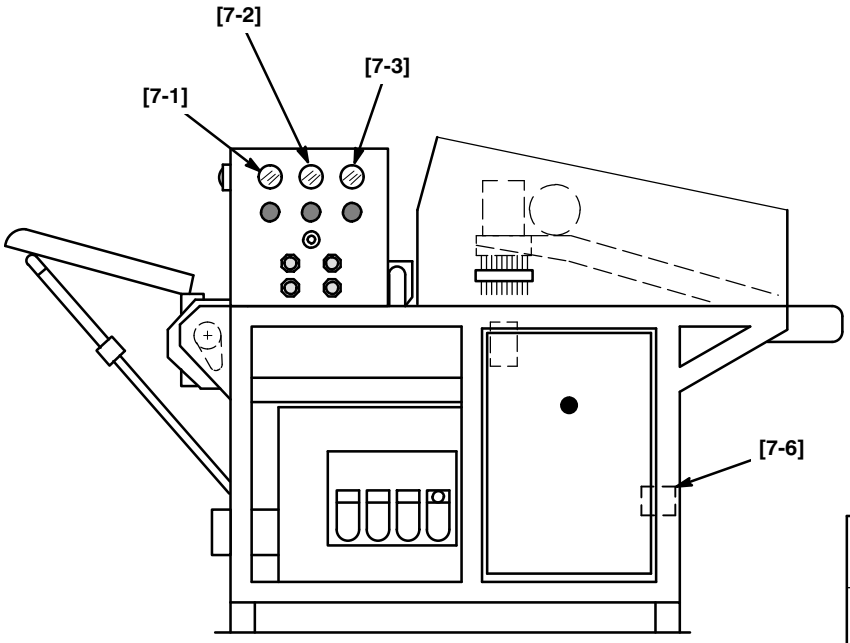
DRIVE STOP [6-2]. Press pushbutton to stop drive motor.

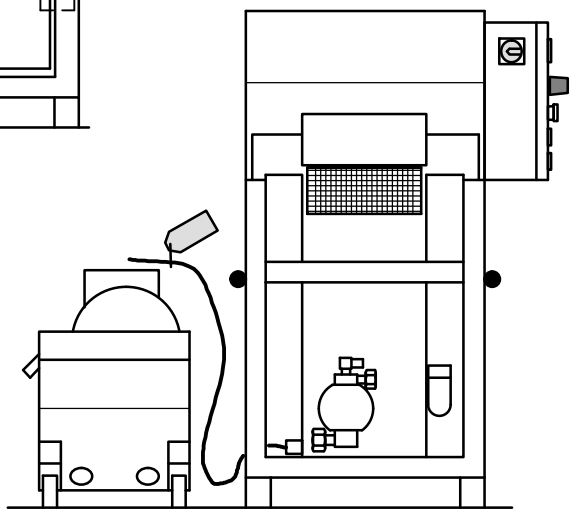
PUMP START [6-5]. Press pushbutton to start pump motor — motor will continue running.

PUMP STOP [6-1]. Press pushbutton to stop pump motor.

Machine Controls







OPERATION OF MODEL 1450

Machine Controls — continued

REGULATOR — FLUID PRESSURE [7-1]. Turn knob clockwise to increase air pressure controlling fluid injection pressure.

REGULATOR — STRIPPER PRESSURE [7-2]. Turn knob clockwise to increase air pressure to stripper cylinders. Adjust for type of product and for target injection percentage — higher pressure = higher injection percentage. Set as low as possible while keeping stripping action, that is, machine still pulls product off needles.

REGULATOR — ASSIST CYLINDERS [7-3]. Turn knob clockwise to increase air pressure to assist cylinders supporting head carriage. Set at approximately 40 psi (275 kPa).

REGULATOR — AIR MOTOR [7-4]. Set pressure as low as possible, but high enough to maintain smooth operation and desired speed. Lower pressure will consume less air.

BLEED VALVE [7-6]. Pull “T” handle out to open valve. Leave open until all air disappears from fluid system — look for air bubbles in transparent hoses. Lock valve closed by positioning handle behind retaining strap.

CONVEYOR STROKE LINKAGE [7-5]. Refer to tag near linkage for choice of connections. Smaller stroke will inject product more times, and result in higher injection percentages.

OPERATING INSTRUCTIONS

Read instructions and review safety information (pages 5 through 11) before operating machine.

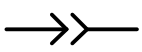
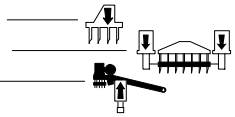
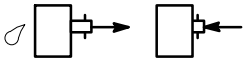
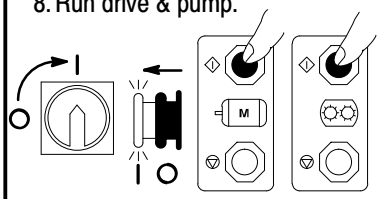
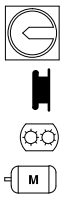
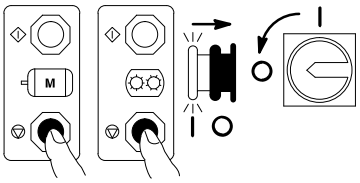
1. Refer to “Installation” (page 21) to prepare machine for operation. Refer to “Machine Controls” (page 29) for description of controls.
2. Make sure all guards, covers, and safety devices are properly installed and in good working order (see page 25 for Daily Safety Circuit Test).
3. Keep immediate area of machine uncluttered. Avoid slippery conditions. Inspect for any damaged or missing parts. Immediately report any problem to supervisor.
4. Make sure filter unit is filled with fluid, all filters are in place, and provision has been made for replenish fluid supply.
5. Provide for adequate drainage.
6. Be sure to bleed fluid system until all air bubbles are removed. Injection rates will not be stable if air is in fluid system. Air bubbles may return if fluid system has a leak.
7. Filter screens may require cleaning during operation. To do this, remove only one pair of screens at a time, starting with pair nearest rotary filter. Clean and replace one pair before removing the next.

8. In addition to operator controls, successful operation is also affected by the following variables:
   a. Temperature. Colder product may absorb less fluid.
   b. Physical Characteristics. Meat, fish and poultry each have distinct physical characteristics (fat content, moisture content, tissue structure, etc.) that will respond to injection differently. Different injection pressures may be required to achieve a specific injection rate.
   c. Trimming and Cutting. Product from different suppliers, or product cut by different individuals can vary in physical characteristics.
   d. Air Pressure. Air pressure settings may not be identical from day to day. Supply pressure may vary during operation, causing momentary fluctuations.
   e. Machine Condition. Normal wear will cause slight changes from day to day, especially in pump efficiency. Such changes may not be noticeable at first, but may suddenly become apparent after change accumulates. Routine adjustment and preventive maintenance will prolong machine life.

Do not leave machine energized while unattended.

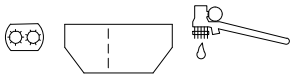
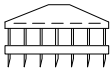
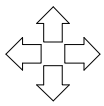
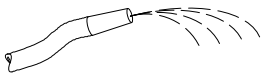
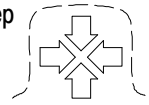
READ & UNDERSTAND SAFETY INSTRUCTIONS IN THE MANUAL BEFORE USING THIS MACHINE.

SAFE OPERATION – MODEL 1450

STEPS	INFORMATION	SAFETY / HEALTH
1. Training. 	Only qualified and trained personnel may operate. Read & understand safety & operating instructions in the manual. Repeat training periodically.	Keep all other people away from the machine. Needles are sharp. Keep hands and clothing away from moving parts.
2. Assemble machine. 	Assemble clean pump. Fluid filters in tank. Variable stroke as desired. Side panels installed. Hood and inlet guard closed. Drain tray in place. Filter unit positioned to catch run-off fluid. Daily lubrication.	Sanitize pump parts before assembly (see step 7). Edible lubricants only in food zone.
3. Connect utilities. 	Air (100psi)(700kPa). Electrical (see name plate for volts and amps). Fluid supply (maximum 75psi)(520kPa); fill filter unit; dissolve solution completely; **never run pump without fluid**.	Electrical connections by qualified electrician.
4. Set air pressures. 	Fluid (higher=more injection). Stripper (higher=more force). Assist (40psi)(275kPa). Filter (higher=faster). 	Injection limits may apply.
5. Bleed fluid system. 	Run pump (see step 8) and open bleed valve. Lock valve closed when all air bubbles disappear.	Provide for drainage. Floors must not be slippery.
6. Provide exit equipment to catch product. 	Variable stroke linkage determines output speed.	
7. Sanitize. 	Sanitize product zone immediately before beginning operation. Follow chemical label directions.	Use only chemicals approved for use with food. Needles are sharp. Edible lubricants only in food zone.
8. Run drive & pump. 	Main disconnect switch: 1=on. Control switch: In=off; out=on. Drive start switch: Push to start drive. Pump start switch: Push to start pump. 	Do not leave machine energized while unattended. Know how to stop before starting: Push control switch knob in, or turn disconnect switch off (0=off). Do Daily Safety Circuit Test–see manual. Keep hands and clothing clear of moving parts.
9. Lay product on infeed conveyor. 	Do not overlap product. Allow conveyor to carry product to needles.	Keep hands and clothing clear of moving parts.
10. Stop. 	Stop drive: Push drive stop button. Stop pump: Push pump stop button. Stop all control: Push control switch knob. All power off: Turn main disconnect switch off (0=off). 	Clean machine soon after stopping operation. To prevent accidental start, lock out main disconnect switch. 

READ & UNDERSTAND SAFETY INSTRUCTIONS IN THE MANUAL BEFORE USING THIS MACHINE.

CLEANING – MODEL 1450

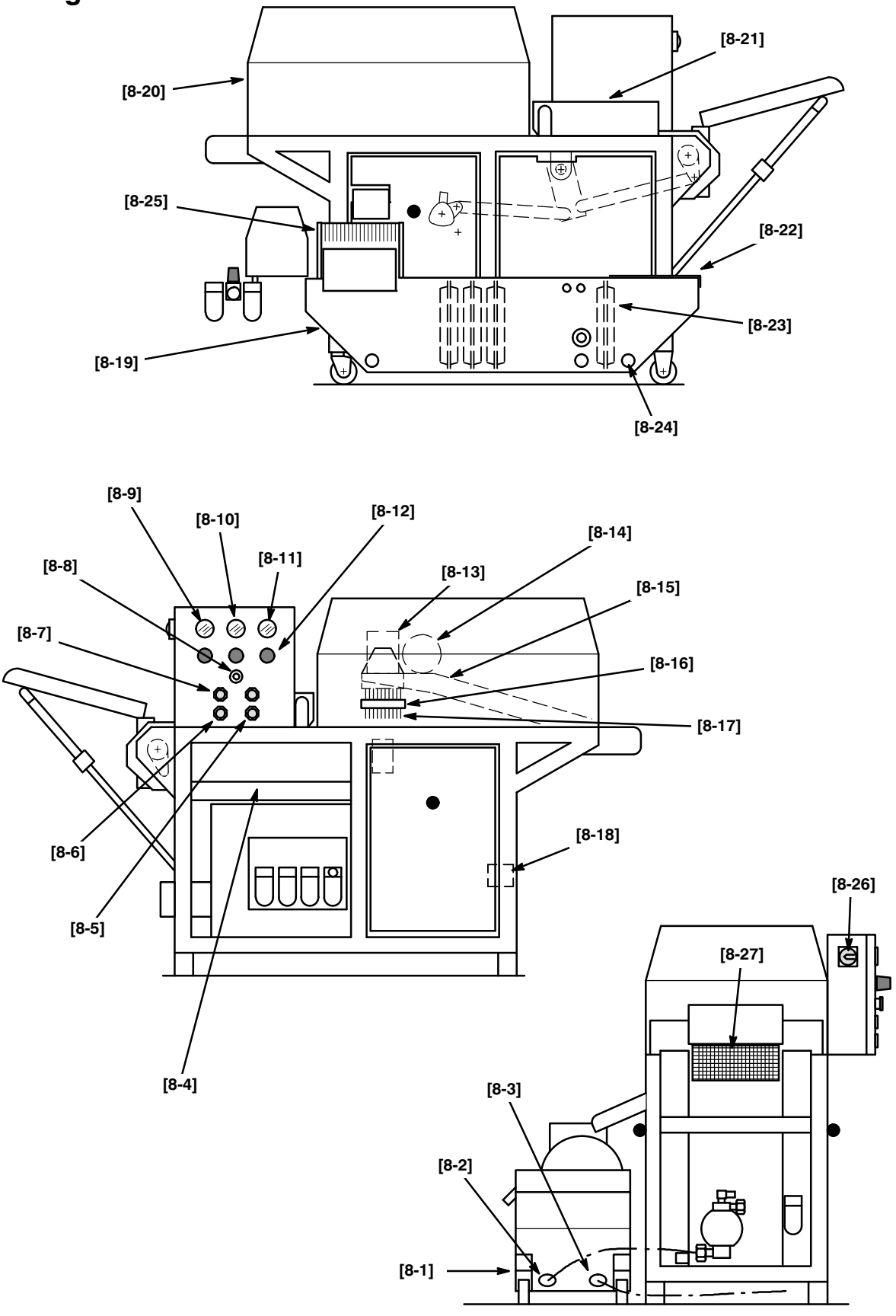
STEPS	INFORMATION	SAFETY / HEALTH
1. Training. 	Only qualified and trained personnel may clean. Read & understand safety & operating instructions in the manual. Repeat training periodically. Clean soon after operation; sanitize just before restarting.	Keep all other people away from the machine. Needles are sharp. Keep hands and clothing away from moving parts. Clean machine soon after operation; sanitize just before restarting.
2. Lock out electrical. 	Lock main disconnect in off position (0=off).	Prevent unexpected start of machine. Prevent electrical shock.
3. Clean fluid system internally. 	Clean filters separately. Drain, rinse & refill tank with approved internal cleaning agent (85°F)(30°C); solution must be completely dissolved. Reinstall last filter. At normal pressure settings run pump with bleed valve open 3 minutes. Close bleed valve, lower fluid pressure setting, run pump 1 minute. Repeat with clean rinse water. **Never run pump without fluid**.	Do not run drive. Never run pump without fluid. Rinse water=drinkable.
4. Clean needles & stripper. 	Low pressure spray (60psi)(400kPa). Large particles by hand. Retract needles if necessary (see manual). Refer to manual for unclogging needles.	Disassemble manifold to clean screen and needles periodically. Dispose of waste properly.
5. Remove loose parts. 	Raise hood & inlet guard. Remove drain tray.	Maintain good footing.
6. Remove loose waste material. 	Rinse with warm water (95°–120°F)(35°–50°C), or remove particles by hand.	Dispose of waste properly.
7. Clean exterior. 	Use alkaline cleaner approved for food equipment. Scrub, soak or low pressure spray (60psi)(400kPa) until clean. Keep fluids out of seals and electrical.	Higher pressure will splash soil into other areas. Make sure to clean all areas.
8. Rinse. 	Low pressure (60psi)(400kPa). Warm water (95°–120°F)(35°–50°C).	Water quality=drinkable.
9. Reassemble. Keep machine clean. 	Store in clean room, or keep covered.	Control corrosion with film of edible oil.
10. Apply sanitizer. 	Immediately before operation sanitize entire food zone.	Use chemical approved for use with food. Follow label directions. Dispose of runoff fluids properly. Needles are sharp.
11. Return to operation. 	Floor must not be slippery.	Reconnect electrical only after everything is ready.

SECTION 4 CLEANING

— Contents —

Read instructions and review safety information (pages 5 through 11) before cleaning machine.

Cleaning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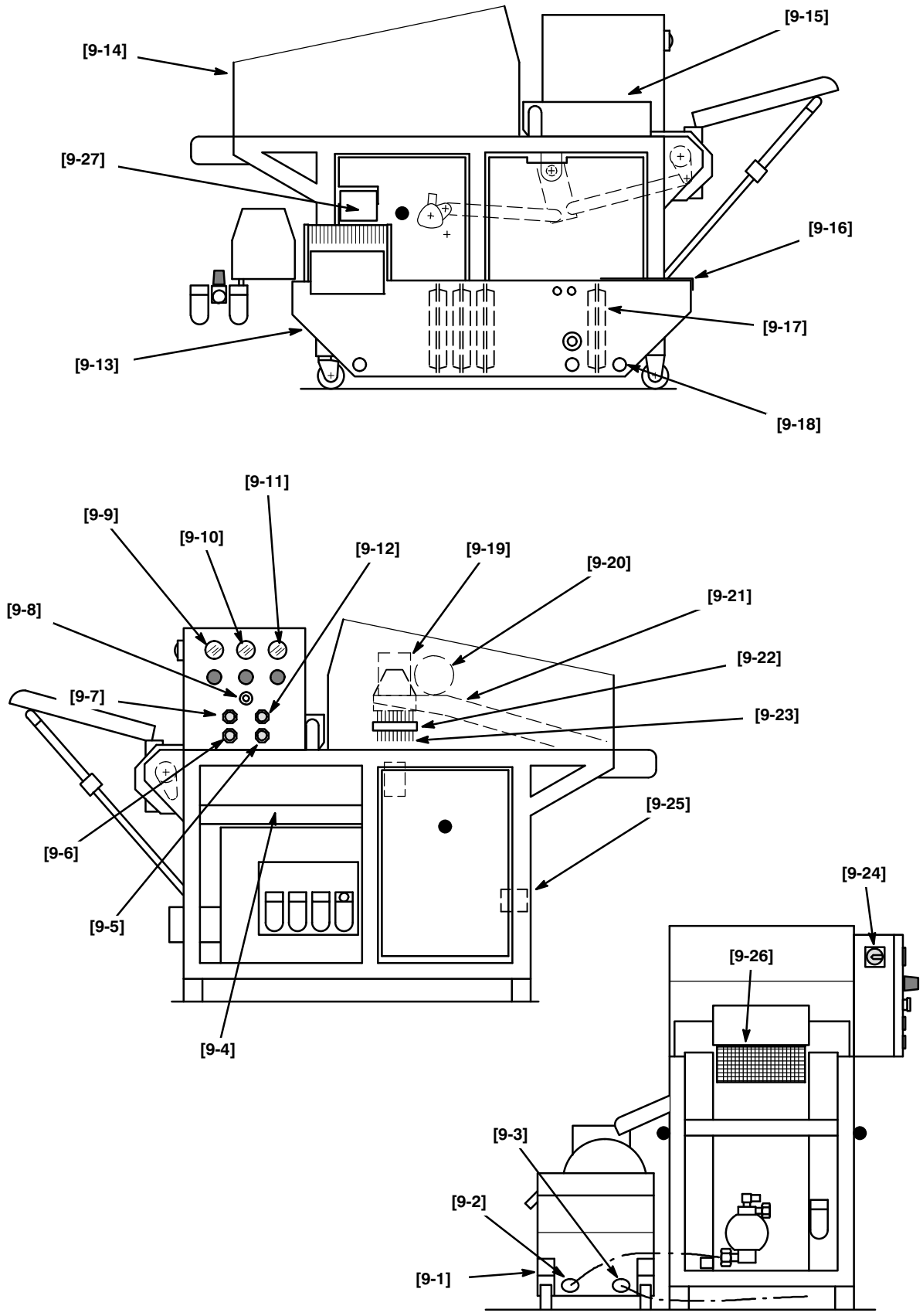
CLEANING THE MODEL 1450

Procedure steps 1 thru 9 (clean) should be done immediately after operation has stopped. Steps 10 thru 12 (sanitize) should be done immediately prior to resuming operation.

1. **Make sure electrical circuit will not turn on:**
   a. Lock out electrical supply to the machine. Do not assume power is off when control switch [8-8] knob is not illuminated — the light bulb is a consumable item and may be burned out.
   b. Make sure control switch is pushed in for “off” position.
2. **Clean fluid system internally:**
   a. Remove plugs [8-24] and drain tank [8-19].
   b. Remove filter screens [8-23]. Rinse clean.
   c. Rinse rotary drum clean, removing particles by hand if necessary.
   d. Rinse out tank with warm water (95º to 120º F.)(35º to 50º C.).
   e. Install plugs, and refill fluid tank with lukewarm (85º F.)(30º C.) cleaning agent suitable for internally cleaning the fluid system. Install filter screen pair.
   f. With fluid [8-9] and assist [8-11] pressures at normal settings, start pump [8-12] and open bleed valve [11-25]. Run at least three minutes to clean needles and manifold.
   g. Lower fluid pressure to zero and close bleed valve. Run pump for one minute to flush control valve and return hose.
   h. Stop pump [8-5], open bleed valve, drain tank. Remove, clean, and reinstall a clean filter screen pair.
   i. Fill tank with lukewarm clean rinse water. Repeat steps f thru g to rinse fluid system.

Note: If you encounter difficulty cleaning the rotary drum, call Stork Townsend for assistance, (515) 265-8181.

Cleaning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3. Clean needles and stripper:

a. Using low pressure spray (60 psi)(400 kPa), remove particles from exterior of needles and stripper [9-22] area.

b. If particles remain lodged in needle [9-23] zone, set stripper pressure [9-10] to zero (assist cylinder pressure at normal setting). Raise head carriage [9-21] and position soft wood or rubber block (2.5 x 5 x 13.5 in) (7 x 13 x 35 cm) under needles (material must not damage needle points).

c. Lower head carriage until block pushes needles up approximately 2-1/2 inches (7 cm). Set stripper pressure back to normal setting and raise head until needles are above stripper.

d. Using low pressure spray (60 psi)(400 kPa), remove any remaining particles. Remove large particles by hand if necessary. Note: Needles will automatically extend to normal position when normal fluid pressure is reapplied.

e. If needles are clogged, remove upper manifold housing [9-19], remove needles with pulling tool (p/n 10080), and clean with cleaning tool (p/n 11691). Note: With manifold open, clogged needles are recognizable by fluid standing in respective needle bores.

4. Open machine for cleaning:

a. Raise hood [9-14] and inlet guard [9-15].

b. Remove drain tray [9-4].

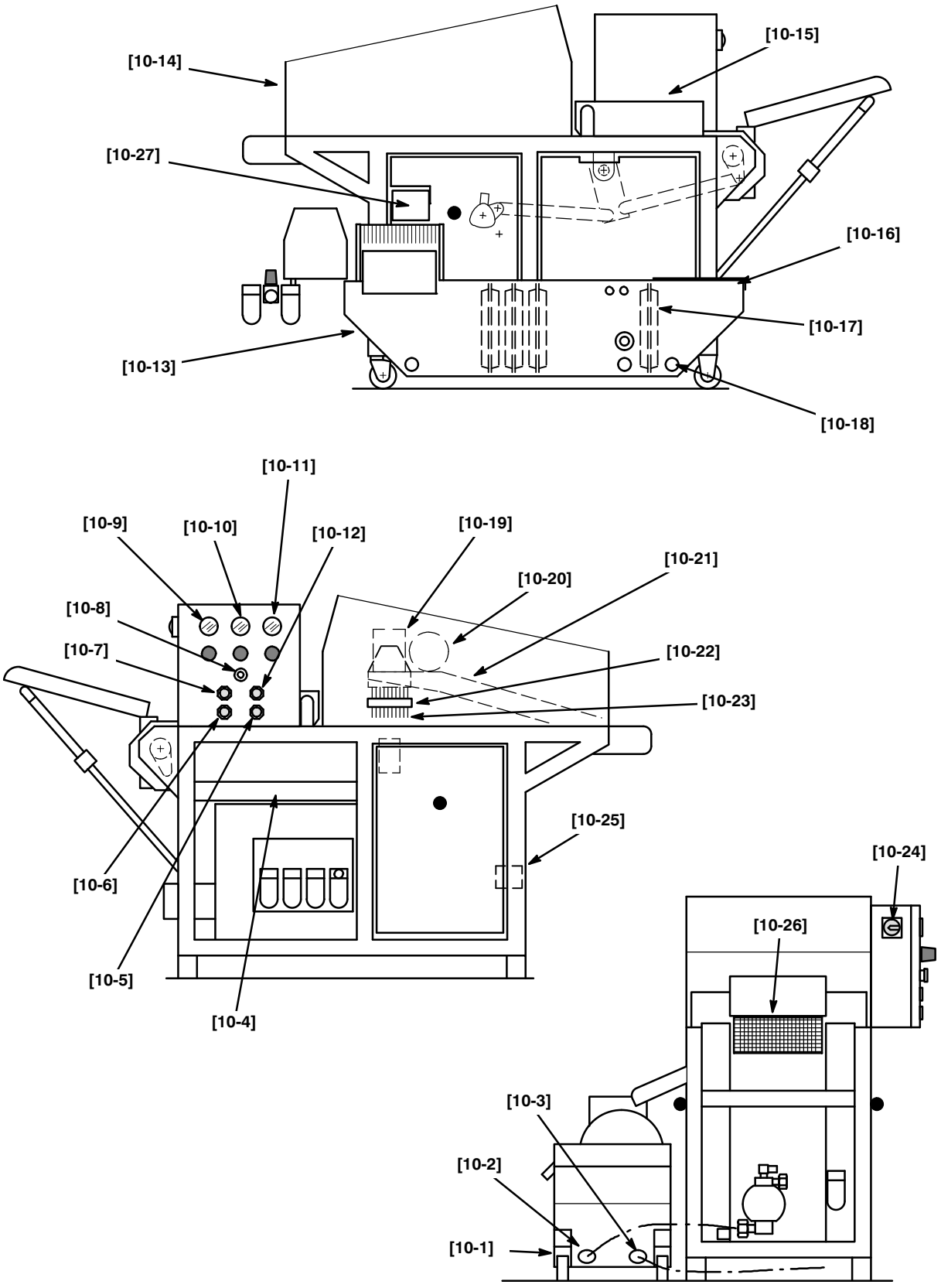
c. Place disassembled parts in suitable wash area or container.

5. Remove loose waste material:

a. Rinse machine and all disassembled parts with warm water (95^{o} to 120^{o} F.)(35^{o} to 50^{o} C.), or otherwise remove debris by hand. Give particular attention to conveyor belt.

b. Dispose of waste material properly.

Cleaning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6. Apply cleaning agent:

a. Coat machine and all disassembled parts with alkaline cleaning agent approved for use on food processing machinery — follow chemical manufacturer's directions completely.

b. Use care when cleaning around electrical components, or near seals so fluids do not penetrate those devices. Use care to prevent damage or removal of labels.

c. Depending on chemical product being used, thorough cleaning will require one or more of the following processes — follow manufacturer's directions:

1. Scrub with nylon brush.
2. Use low pressure spray (60 psi)(400 kPa). Take special care to protect electrical components, seals, and labels when using pressure sprayers.
3. Provide required soak time.

7. Final rinse:

a. Thoroughly rinse the cleaning agent and all waste material off the machine, using low pressure warm water (60 psi at 95 to 120 °F.)(400 kPa at 35 to 50 °C.), and paying special attention to all surfaces and areas in, and directly above, the product zone.

8. Reassemble machine:

a. Install drain tray [10-4].

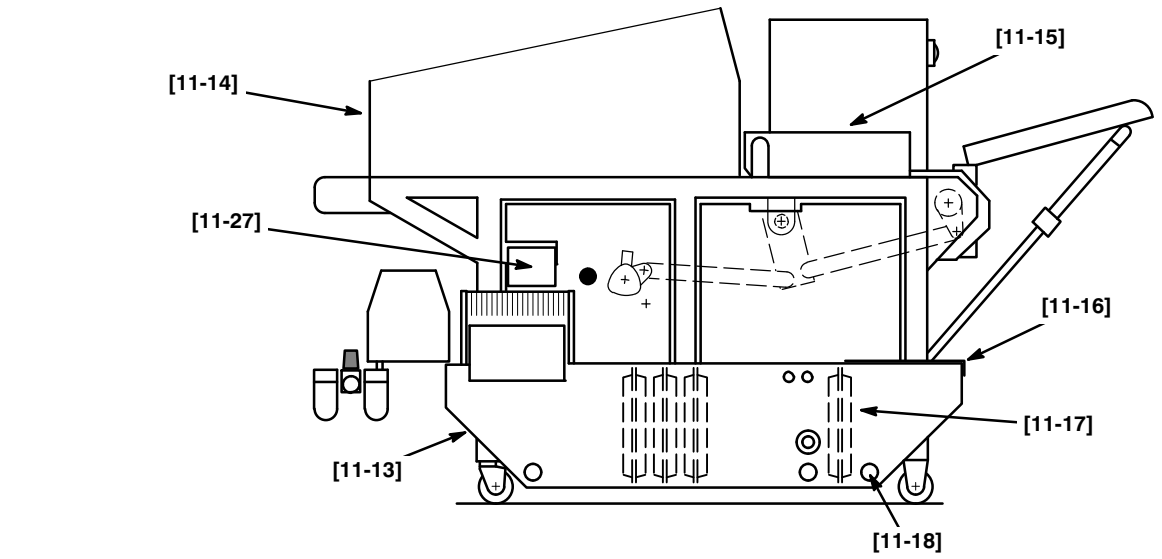
b. Check that hose connections are tight.

c. Close hood [10-14] and inlet guard [10-15].

9. Keep machine clean:

a. Allow machine to air dry in clean environment.

Cleaning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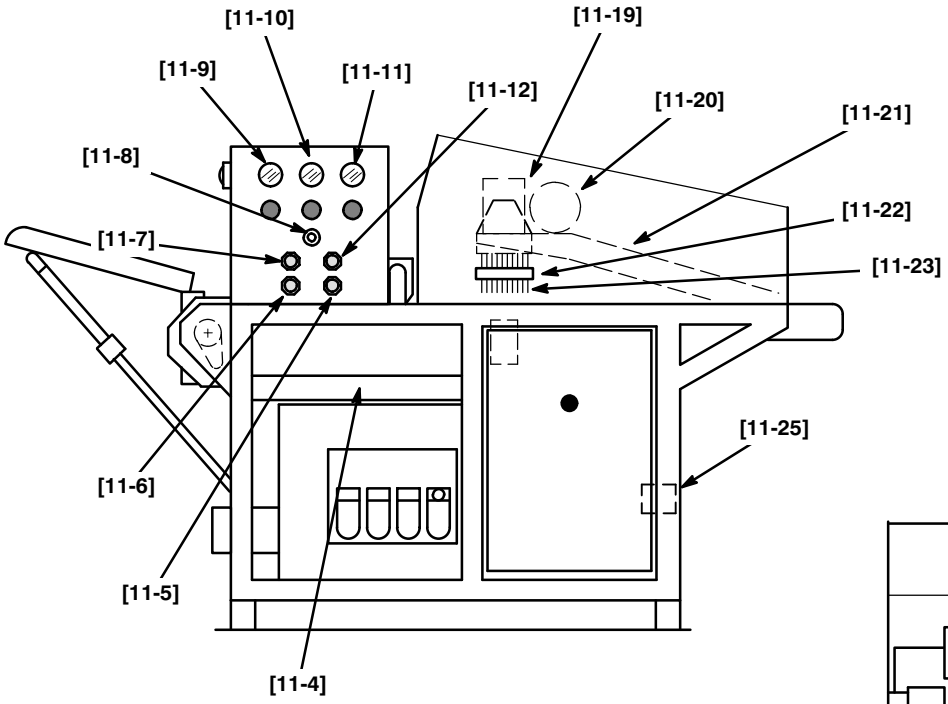
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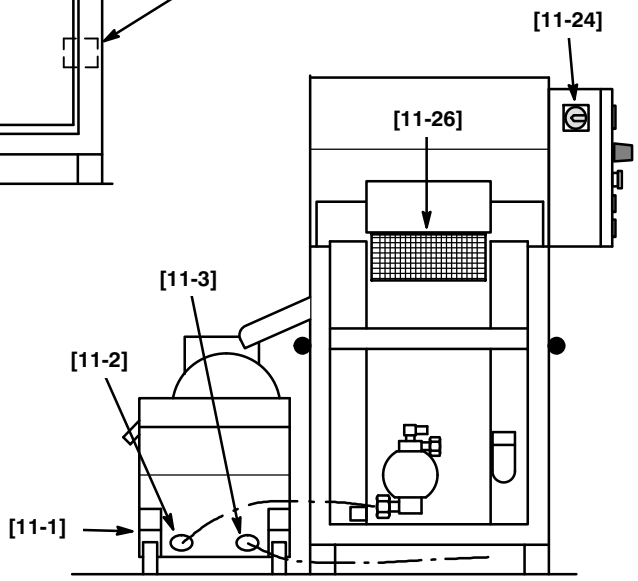
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10. Apply sanitizer (do immediately before operation):

a. Apply sanitizer. Surfaces that cannot be removed and immersed in sanitizer must be coated with type of sanitizer capable of killing germs on contact. Follow manufacturer's recommendations completely. Test kits are available from chemical supplier to assure proper chemical concentrations.

b. The following surfaces must be sanitized:

1. All surfaces of the machine that might contact food product.
2. All surfaces that the operator might contact.
3. Any surrounding areas which fluids, product, or utensils might contact and then move into food-contact or operator-contact areas.

11. Drain sanitizer:

a. Drain off sanitizer thoroughly.

b. Dispose of runoff fluid properly.

12. Return machine to operation:

a. Secure machine in operating position. Make sure surrounding floor is not slippery.

b. Locate filter unit [11-1] beside Model 1450. Align to catch runoff fluid from injector. Connect fluid hoses. Install all required filter screens. Cover replenish compartment with lid [11-16]. Fill tank with premixed fluid.

c. Machine is now ready to re-connect to electrical supply.

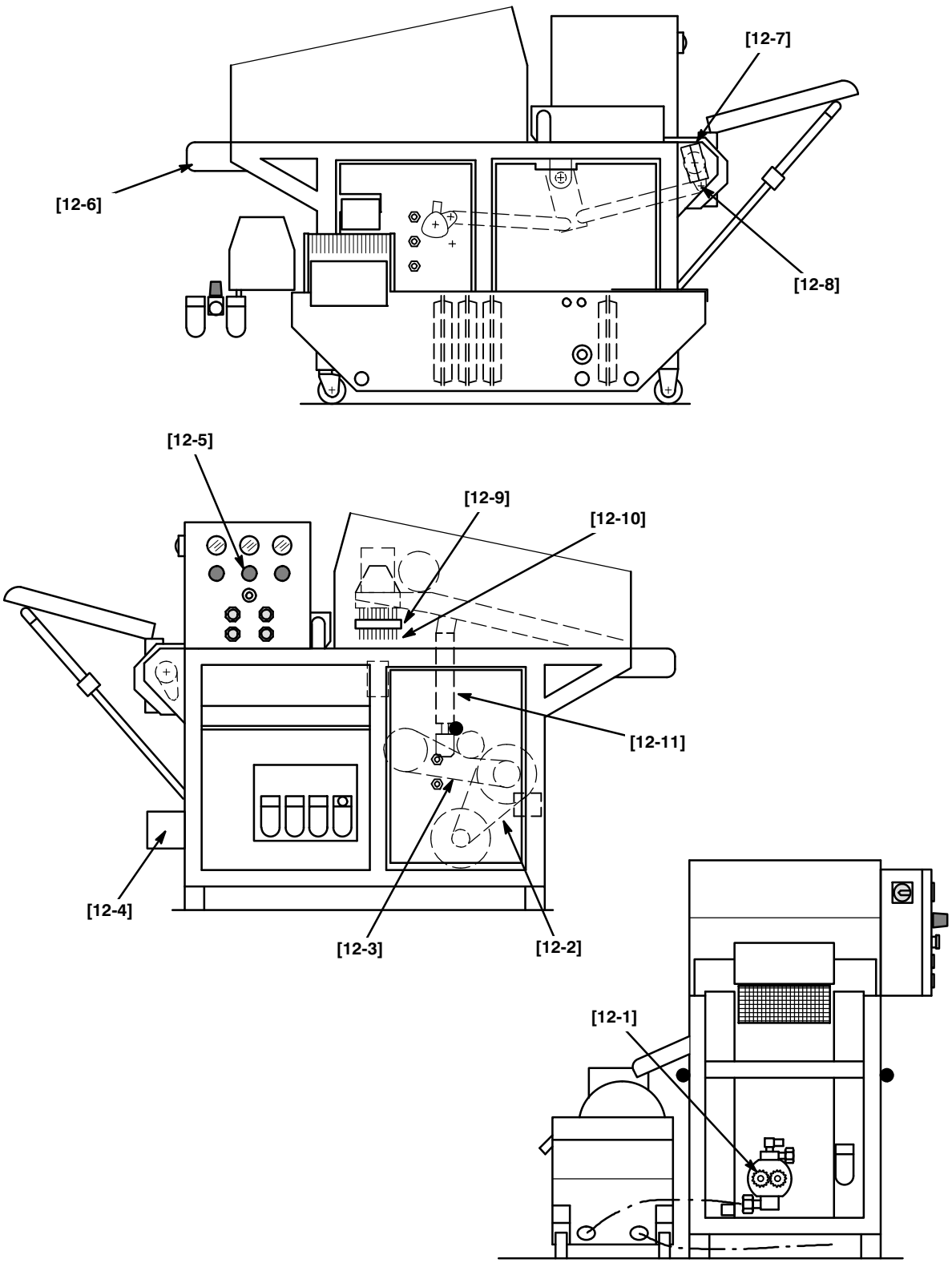
SECTION 5 MAINTENANCE

— Contents —

Read instructions and review safety information (pages 5 through 11) before investigating problems or servicing machine.

Lock out electrical supply and disconnect air supply before performing any maintenance procedure. Re-connect these utilities only if maintenance procedure absolutely requires them.

Preventive Maintenance

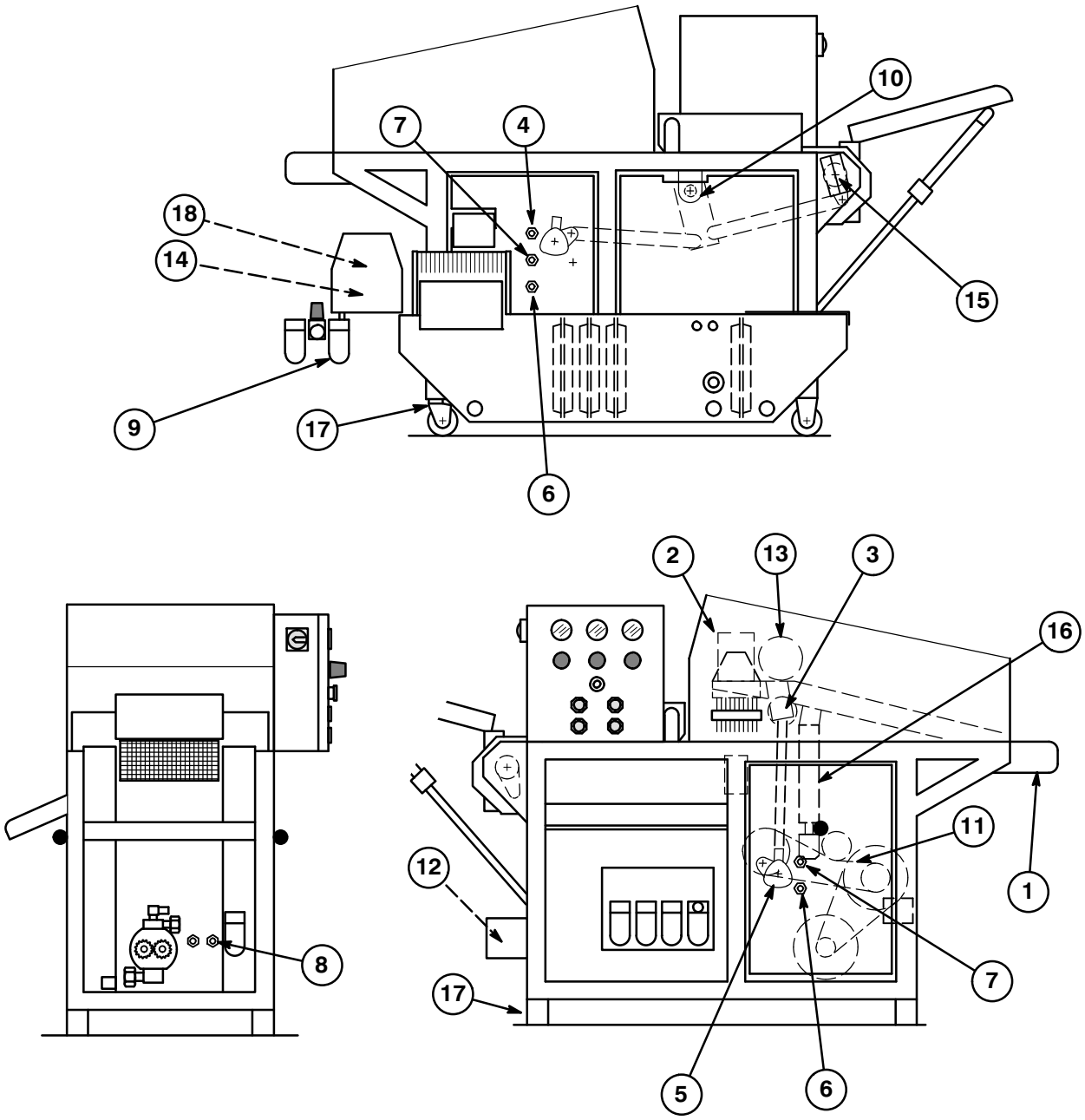


PREVENTIVE MAINTENANCE

The following is a list of checks to be made and when to make them.

PREVENTIVE MAINTENANCE	DAILY	MONTHLY	QUARTERLY
1. Clean & sanitize machine. Perform daily lubrication.	●	●	●
2. With stripper pressure [12-5] set at zero, check for free movement of stripper [12-9], cylinders, and valve linkage.	●	●	●
3. Check conveyor belt tension [12-6].	●	●	●
4. Check conveyor brake [12-7] adjustment.	●	●	●
5. Check needles [12-10] for bent, dull, or clogged condition.	●	●	●
6. Inspect machine for damaged or missing parts or safety devices.	●	●	●
7. Inspect fluid pump seals [12-4] and O-rings.	●	●	●
8. Check operation of all electrical components – see Daily Safety Circuit Test (page 25).	●	●	●
9. Perform monthly lubrication.		●	●
10. Check overall condition of machine, especially guards, covers, and safety devices.		●	●
11. Check condition and adjustment of drive belt [12-2] and chain [12-3].		●	●
12. Inspect bearings, seals and grease lines.		●	●
13. Inspect fluid hoses, air tubing, and fittings.		●	●
14. Disassemble and inspect assist cylinders [12-11]. Lubricate.		●	●
15. Replace fluid pump seals. Inspect pump gears [12-1].		●	●
16. Change grease in conveyor clutch [12-8].		●	●
17. Perform quarterly lubrication.			●
18. Check drive components: motor, bearings, pulleys, belts, keys and keyways, keepers and setscrews.			●
19. Check fluid pump bearing housing assembly for smooth operation.			●
20. Inspect self-lubricating bearings and all moving parts.			●

Lubrication Instructions



Lubrication Supplies

Code	P/N	Description
EG	12080	Edible Grease (13 ounce tube)
RCL	none	Roller chain lubricant (commercially available)
O-10	03094	10W Food Grade Oil (1 quart)
WPG	11861	Waterproof Grease (14 ounce tube)
GO	10603	Gear Oil – EP90 (gallon)
–	12450	Grease gun
–	13722	Flexible Hose (12 inch)

LUBRICATION INSTRUCTIONS

Lubrication is essential for maximum service from the machine. Lubricants that could come in contact with food must be approved by USDA, or comparable government regulatory agency, for use in food zone.

Remove any excess lubricant from the exterior of the equipment.

POINT OF LUBRICATION	LUBRICANT	DAILY	MONTHLY	QUARTERLY
1. Head carriage pivots. Two fittings.	EG	●	●	●
2. Stripper cylinders. Two fittings.	EG	●	●	●
3. Head carriage tie rod (upper end). Two fittings.	EG	●	●	●
4. Drive chain tensioner. One fitting.	WPG	●	●	●
5. Head carriage tie rod (lower end). Two fittings.	WPG	●	●	●
6. Crankshaft. Two fittings.	WPG	●	●	●
7. Countershaft. Two fittings.	WPG	●	●	●
8. Fluid pump bearing housing assembly. Two fittings.	WPG	●	●	●
9. Air motor filter unit. Adjust automatic air line lubricator to one drop/50—75 cfm (23—35 L/sec)	O-10	●	●	●
10. Variable stroke link pivot. One fitting.	EG	●	●	●
11. Coat drive chain.	RCL		●	●
12. Replace fluid pump seals.			●	●
13. Piston in fluid control valve. Clean and apply fresh grease to piston seals and piston bore.	EG		●	●
14. Filter unit spur gears. Coat teeth.	EG		●	●
15. Conveyor drive clutch. Pump full with fresh grease.	EG		●	●
16. Assist cylinders. Disassemble, clean, saturate oiler pads.	O-10			●
17. Threads on feet and jackscrews; caster swivels; wheel axles.	O-10 or EG			●
18. Filter unit gear box. Fill both reservoirs.	GO			●

LUBRICATION — USDA CLASSIFICATIONS

All lubricants used on food processing machines or in a food processing facility must be approved by USDA for this use. USDA has two classifications for lubricants that are approved for food processing applications.

H1 Lubricants as defined by USDA regulation

"These compounds may be used as a lubricant with incidental food contact for use in official establishments operating under the [USA] Federal meat and poultry products inspection program. Such compounds may be used on food processing equipment as a protective anti-rust film, as a release agent on gaskets or seals of tank closures, and as a lubricant for machine parts and equipment in locations in which there is potential exposure of the lubricated part to food. The amount used should be the minimum required to accomplish the desired technical effect on the equipment. If used as an anti-rust film the compounds must be removed from the equipment surface by washing or wiping, as required to leave the surface effectively free of any substance which could be transferred to food being processed."

H2 Lubricants as defined by USDA regulation

"These compounds may be used as a lubricant, release agent, or anti-rust film on equipment and machine parts or in closed system (e.g., hydraulic systems) in locations in which there is no possibility of the lubricant or lubricated part contacting edible products."

Repair Parts and Procedures Using Lubricants

All replacement parts and all repair procedures must utilize only approved lubricants which are appropriate for their specific location. For example, if a permanently lubricated bearing is used in the food zone, its internal lubricant must be classified H1. LIkewise, if a lubricant is used to assemble close fitting parts in the food zone, this lubricant must be classified H1.

Lubricants Available From Stork Townsend

If a lubricant is not classified either H1 or H2 by USDA it must not be used anywhere in a food processing facility, or in or on a food processing machine.

All lubricants offered by Stork Townsend are USDA approved. Make sure, however, that they are used properly. Specifically, if there is a possibility that the lubricant could contact the food product or food zone, then a lubricant classified H1 must be used; lubricants classified H2 must only be used where there is no possibility of contact of the lubricant with the food product or the food zone.

See page 50 for specific instructions for the Model 1450.

Lubrication Supplies

PART NUMBER	USDA CLASS	DESCRIPTION
03094	H1	Oil, SAE10/ISO32, non-detergent (quart)
25424	H1	Gear Oil, SAE90/ISO220
12080	H1	Grease, NLGI-1 (13 ounce tube)
15127	H2	Lenze Oil (gallon)
10603	H2	Gear Oil, SAE90/ISO220 (gallon)
23744	H2	Gear Oil, SAE140/ISO440 (gallon)
11861	H2	Grease, high temp, NLGI-2 (14 ounce tube)
16027	H2	Grease, NLGI-2 (14 ounce tube)
12450	—	Grease gun (with standard small fitting)
13722	—	Flexible Hose (12 inch)(30,5 cm)

OVERHAUL GUIDELINES

General Instructions

ORGANIZE THE WORK

Work in an organized manner, keeping the work area clean. Lay parts out in a disassembly sequence. When fasteners are removed, reinstall them in their respective holes to keep track of where they go.

REPLACE SEALS & BEARINGS

When seals are taken apart, replace them with new seals. Also, because of the time required for most disassembly, it is usually economical to replace bearings with new bearings when disassembly occurs. When installing close fitting parts, lubricate their mating surfaces to prevent damage during installation. Use only USDA type H1 lubricant if the lubricant could come in contact with the food product or the food zone — refer to page 50 for full explanation.

WORN OR DAMAGED PARTS

During disassembly, any parts that appear worn or damaged should be replaced to prevent repeated disassembly at a later time.

SELF-LOCKING FASTENERS

Lock nuts and lock washers should be replaced once they have been removed or loosened — plastic and stainless materials of such fasteners do not retain locking properties for more than one installation.

SANITATION

Because this machine handles food materials, organic matter may be present on the equipment and could be a source of infection. Have the machine cleaned before servicing it. Wear appropriate protective gear. If you get cut, obtain medical treatment immediately. Preserve the sanitary design of the machine.

PRESERVE THE ORIGINAL DESIGN

Repair parts must be Stork Townsend approved spare parts. To preserve maximum operating safety, never alter the original design of the machine. Use the machine only for the purpose for which it was designed and intended. Do not modify the machine in any way without Stork Townsend approval.

LUBRICANTS

All lubricants used in a food processing facility must be approved by USDA for this use — refer to page 50 for full explanation.

OVERHAUL INSTRUCTIONS

Safety Precautions

MACHINE DESIGN

Do not alter the design of the machine — this will compromise the intended safety and hygiene features of the machine. Use only Stork Townsend approved replacement parts.

GUARDS & SAFETY EQUIPMENT

Always install all guards and safety devices on the machine, and verify their correct operation before running the machine.

SHARP EDGES & MOVING PARTS

Take extreme care when working around sharp equipment, or any moving parts. Prevent clothing from getting caught in moving parts. Do not wear jewelry when working on machinery.

CONDITION OF MACHINE & WORKING AREA

Remove lubricants, fat, or liquids from the equipment being repaired — slippery surfaces are more difficult to work on. Keep the working area clean and clear of obstacles or loose parts. The working area should be level, with good footing.

Use the right tool — accidents increase when the wrong tools are used.

ELECTRICAL

High voltage is connected to this machine. Never contact this voltage — electrical shocks can be fatal. To guarantee the machine will not run unexpectedly during maintenance, and to prevent electrical shock, always lock out the electrical supply to the machine, using a lockable switch separate from the machine. The person doing the maintenance work must control this lock.

FOR ASSISTANCE

For assistance with any application or service questions, contact Stork Townsend:

Stork Townsend Inc.
2425 Hubbell Avenue,
Des Moines, IA 50317 USA

N. America: 800 247-8609
Intl. 515 265-8181
Fax: 515 263-3355

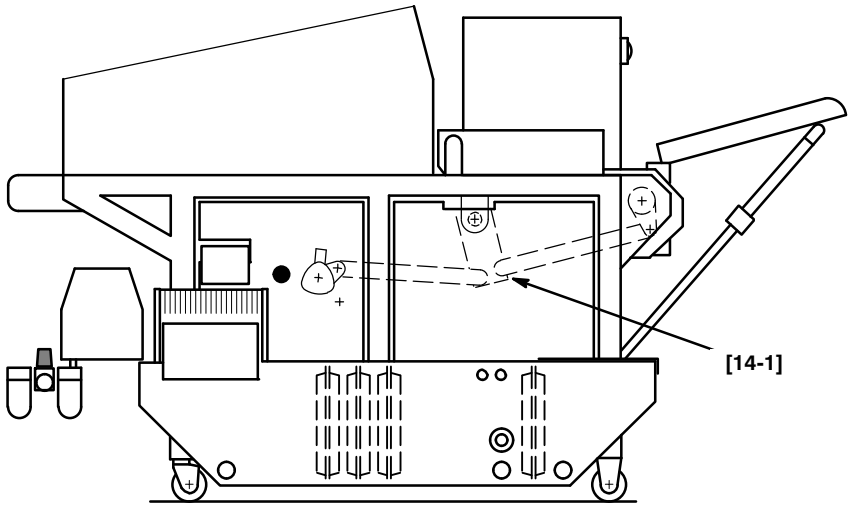
www.townsendeng.com

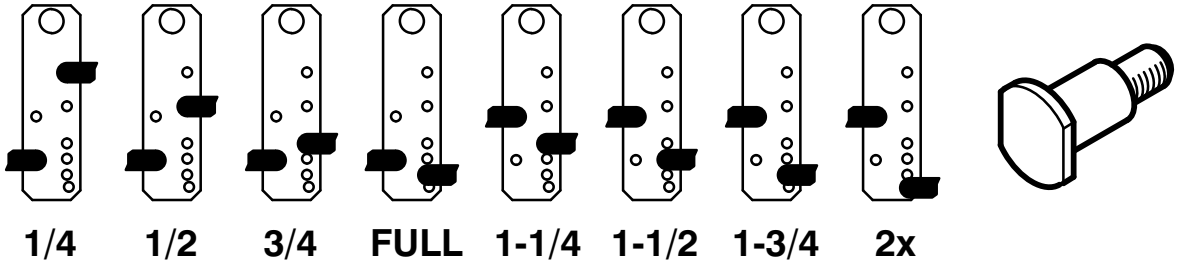
Stork Townsend B.V.
Industrielaan 63 - 5349 AE, Oss, The Netherlands
P.O. Box 292 - 5340 AG, Oss, The Netherlands

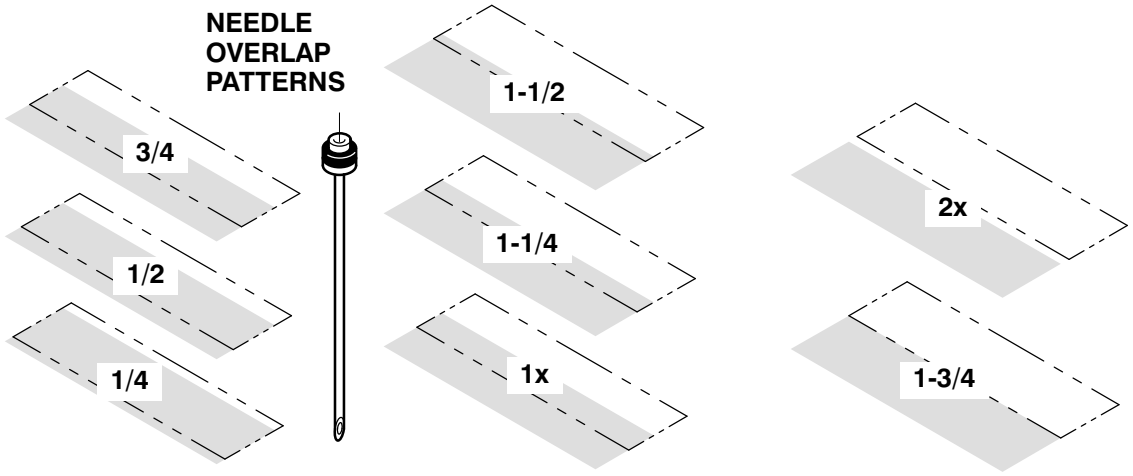
Telephone: +31 (0)412 669 911
Fax: +31 (0)412 669 250

www.townsend.nl

Variable Stroke Linkage







VARIABLE STROKE LINKAGE

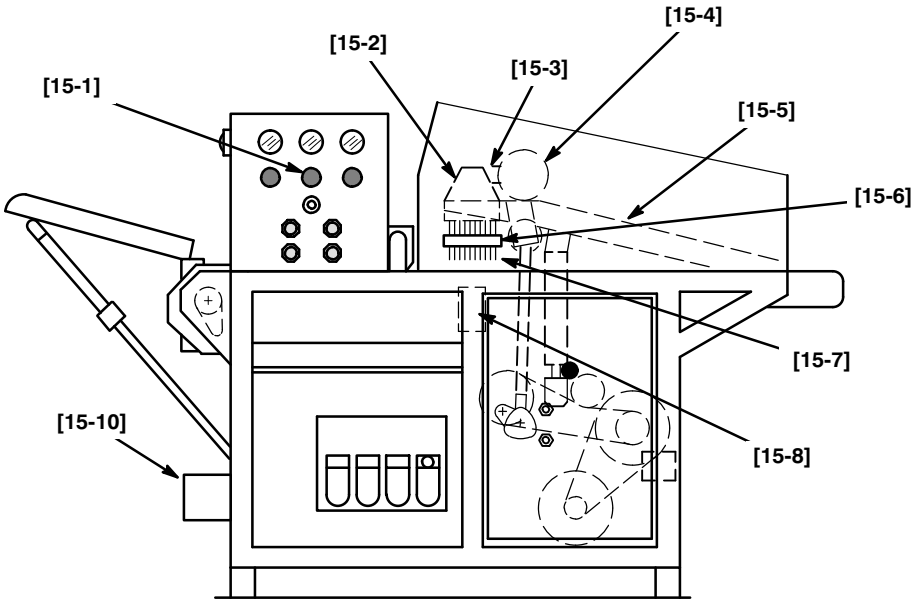
Adjustment

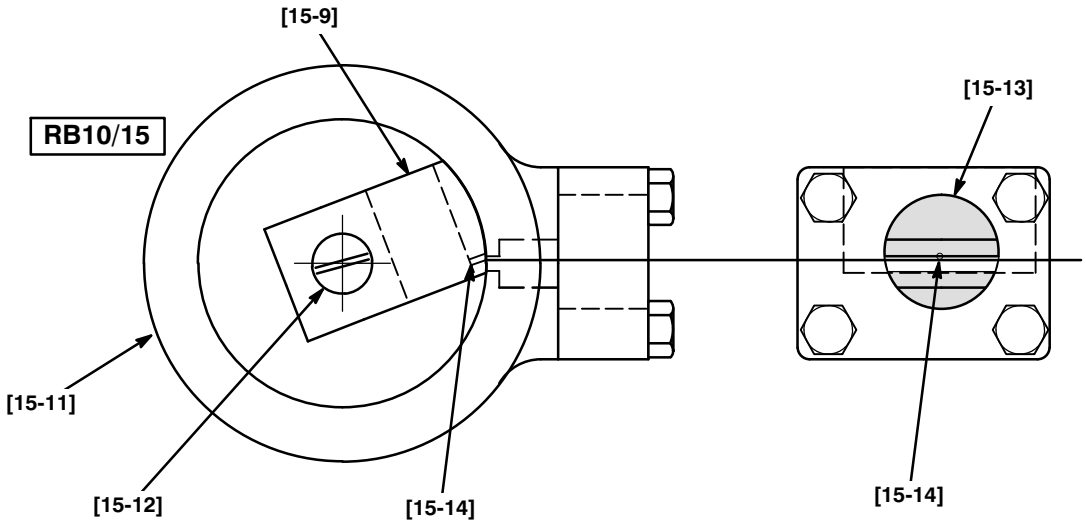
Linkage driving the conveyor belt can be connected in several ways to change the amount of movement of the belt for each cycle of the needles. Using a shorter stroke to drive the belt slows down the belt speed, and will increase the overlap of the needle pattern, increasing the resulting injecting percentage.

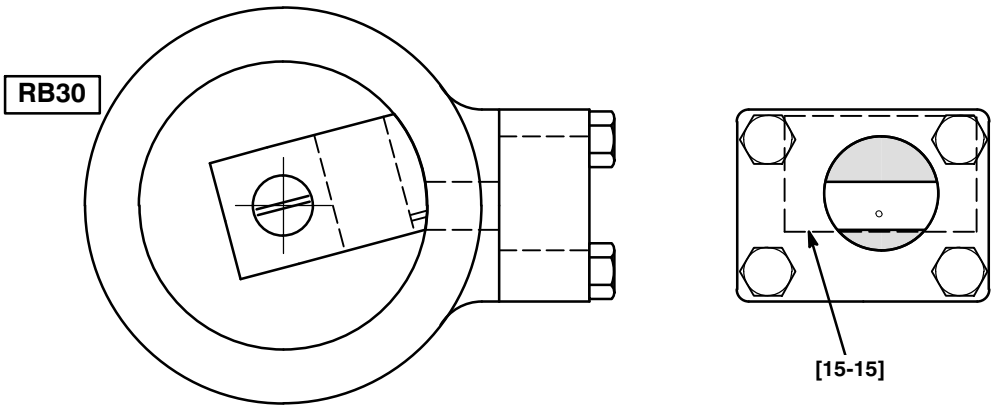
Conveyor Speeds

Conveyor Speeds (with standard drive pulley)		
Linkage	**inches (cm)/stroke**	**feet (meter)/minute**
1/4	0.5 (1,3)	5.5 (1,68)
1/2	1.0 (2,5)	11.3 (3,43)
3/4	1.5 (3,8)	16.5 (5,03)
FULL	2.0 (5,1)	22.0 (6,71)
1-1/4	2.5 (6,4)	26.0 (7,92)
1-1/2	3.0 (7,6)	32.0 (9,75)
1-3/4	3.5 (8,9)	37.0 (11,28)
2x	4.0 (10,2)	44.0 (13,41)

Control Valve







CONTROL VALVE

Adjustment

Adjust the control valve [15-4] only after the head carriage [15-5], needle [15-7] clearance, stripper [15-6], and stripper stops [15-8] are properly adjusted, with the stripper cylinder regulator [15-1] set at normal operating pressure. Check the stripper cylinder bushings and cushions. Check bushings in the linkage connecting the valve to the stripper. Replace worn parts before adjusting the valve.

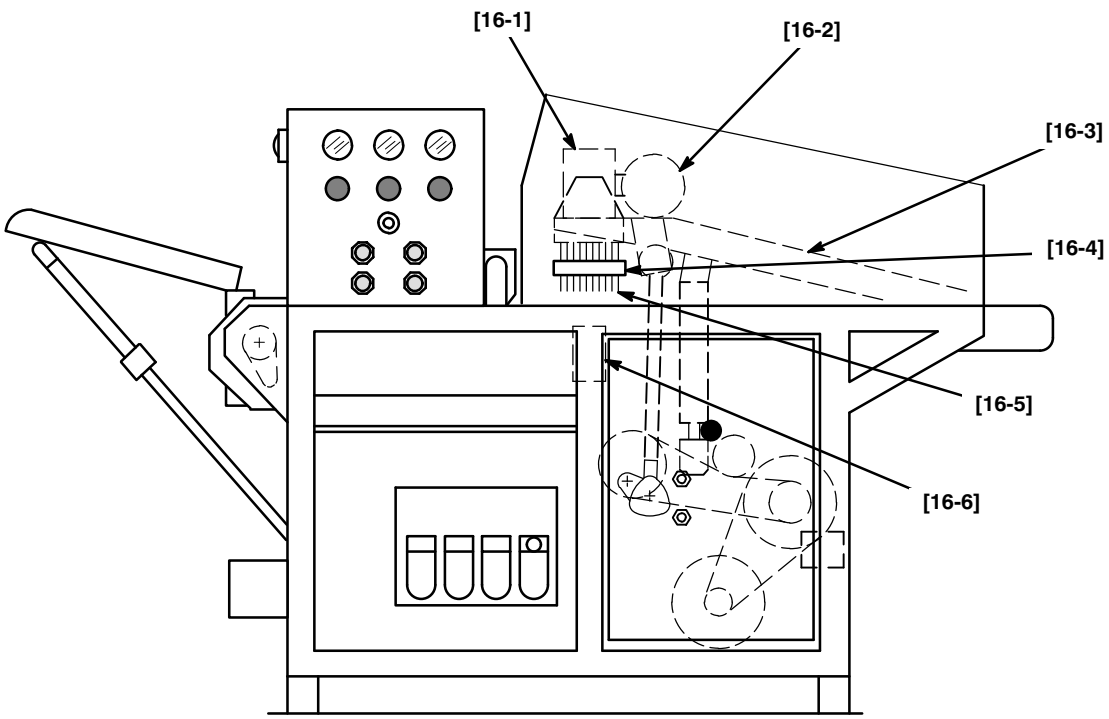
Two valves are available. A small capacity valve is used with RB10 and RB15 pumps [15-10]. A large capacity valve is used with the RB30 pump. Because the opening in the valve body [15-11] of these two valves is different, adjustment procedure is slightly different with each valve.

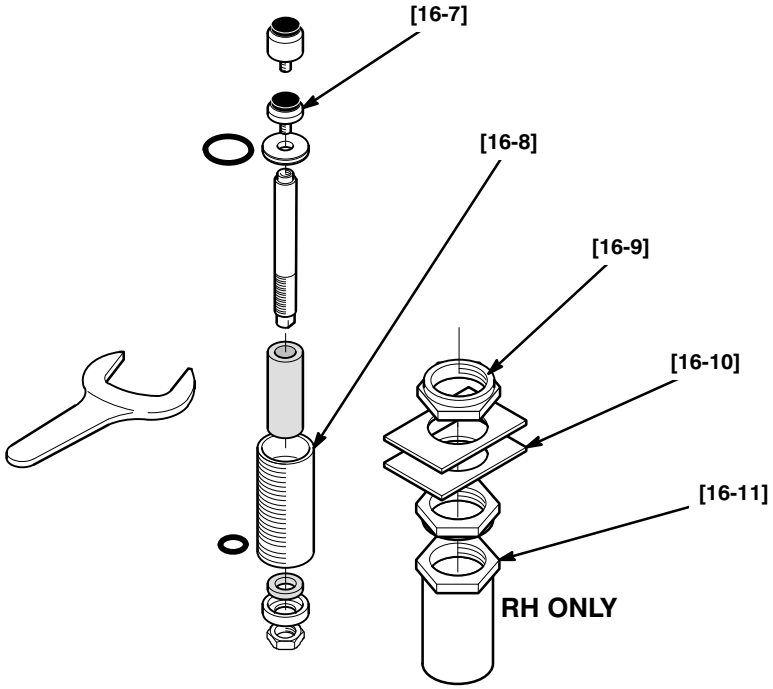
1. Remove fluid manifold [15-2] and cross tube [15-3].
2. Raise head carriage to highest point and block up using wood block between framework.
3. Check position of white plastic insert [15-9] in valve — insert is visible through outlet port [15-13] of valve. **For small capacity valve**, the bleed hole [15-14] should be half-covered along upper edge of slotted opening. **For large capacity valve**, the lower edge [15-15] of insert should just cover the lower edge of slotted opening.
4. To change adjustment, loosen clamp bolts and rotate plastic insert until desired position is obtained (see 3 above). Retighten clamp bolts.

After this initial setup is done, use the following procedure to keep the valve in top operating condition as parts wear.

1. Brace the head carriage up in a middle position.
2. Turn stripper pressure to zero.
3. Loosen clamp screws on valve insert.
4. Using a large flat blade screwdriver, turn valve insert counterclockwise until a steady flow of fluid comes from the needles.
5. Slowly turn valve insert clockwise until the steady flow becomes a constant dripping similar to gentle rainfall.
6. Retighten clamp screws.
7. Confirm that this setup procedure has been done correctly by seeing that a steady, strong stream of fluid will spray from the needles when you raise the stripper plate manually.

Stripper Stops





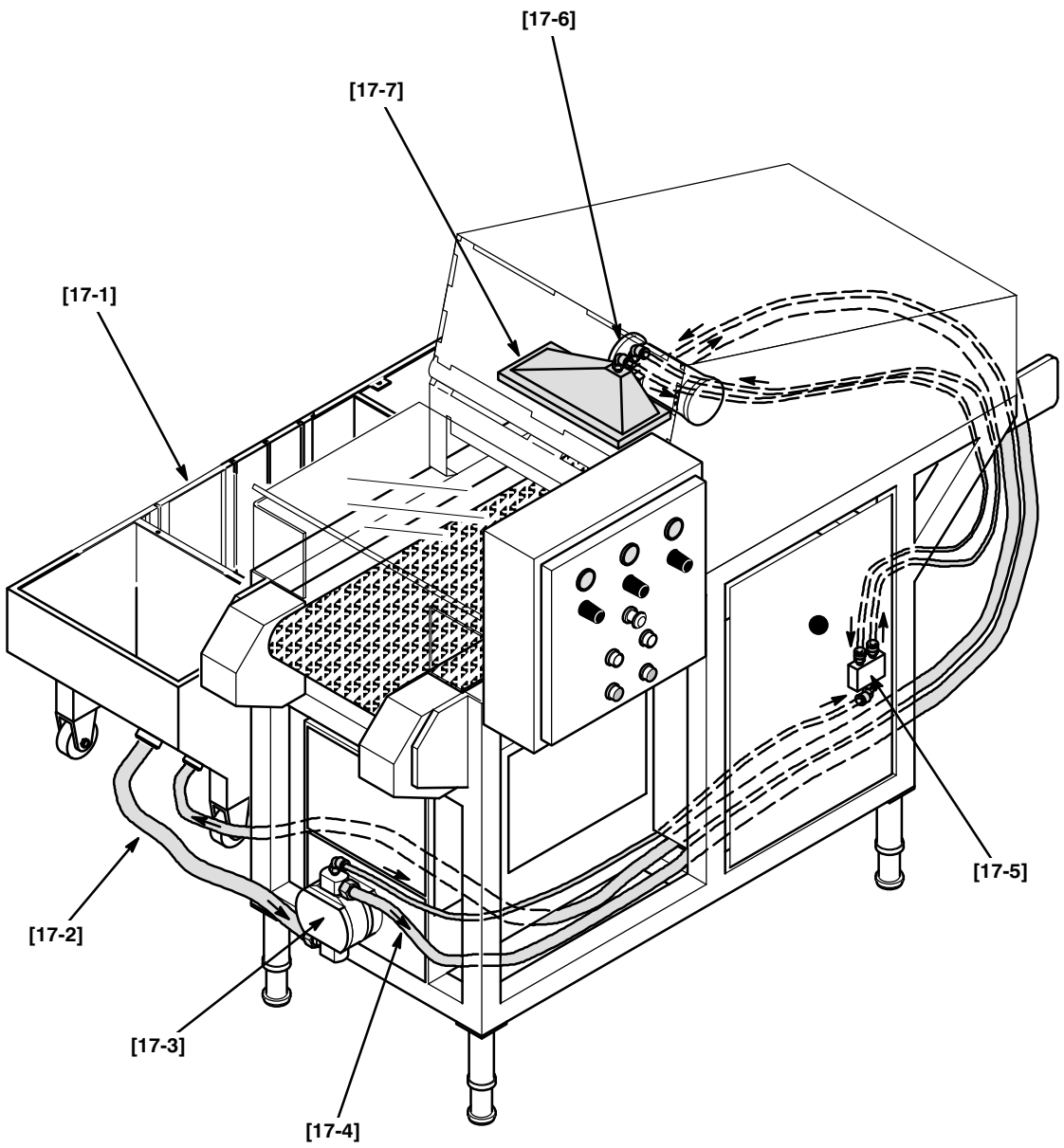
STRIPPER STOPS

Adjustment

If product could be damaged by pressure of stripper [16-4] as needles [16-5] pierce product, install optional stripper stops [16-6] to stop downward movement of stripper before product is crushed. Vertical and horizontal positions are adjustable. Cushions [16-7] should be centered in path of stripper cylinder [16-1]. Left and right stops should be level with each other.

1. Loosen jam nut guard [16-11] on bottom side of large rectangular washers [16-10].
2. If height adjustment is to changed, thread upper lock nut [16-9] up or down along push rod guide [16-8]. The two stripper stops must contact stripper cylinders simultaneously.
3. If side-to-side position is to be changed, slide large rectangular washers until desired position is reached.

Fluid Hoses

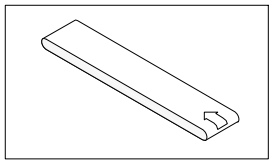


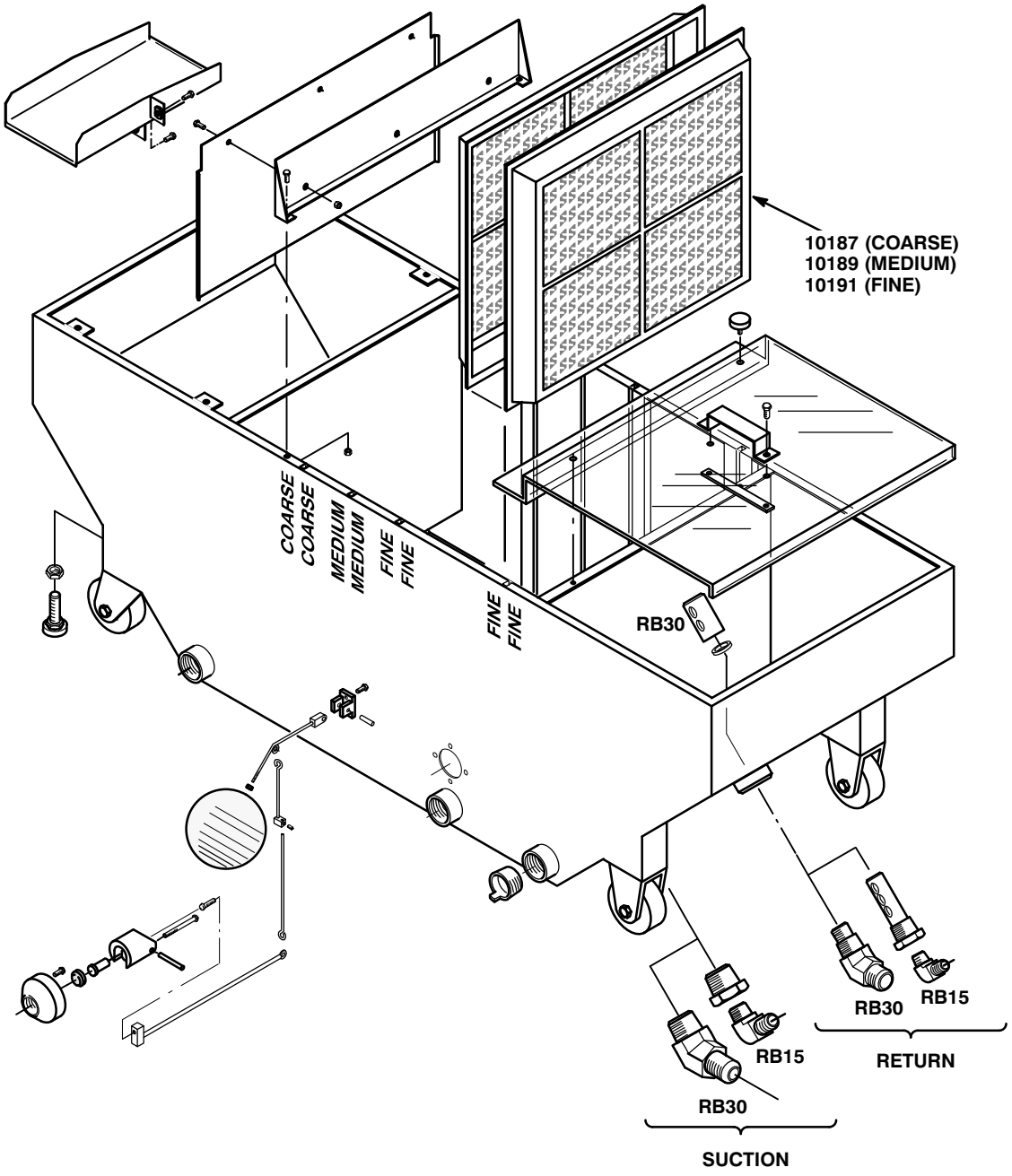
FLUID HOSES

Loose fittings, or cracks in hoses will allow fluid to leak or air to be pulled into the fluid system. Use only hoses supplied by Stork Townsend, and which are approved for application on the Model 1450. Any other hoses may not be approved for use with food handling applications, or for the types of fluids being pumped by the Model 1450.

Choice of two pumps, with differing output capacities, changes sizes of other fluid system components, including hoses.

Filter Screens





FILTER SCREENS

The filter screens remove particles from the fluid. Three pairs of screens filter the runoff fluid so that is can be reused. A fourth pair of screens filter the fresh replenish fluid, combined with the runoff fluid.

Filter screens are available in three choices — fine, medium, and coarse. Select the screens according to the characteristics of the fluid and the product that is being run, in order to maximize effective filtration, and so that filtered particles are spread across the set of screens such that the machine can run the longest interval between cleanups.

Clean the screens as needed — the fluid must never flow around a clogged screen. Clean the screens at least once each shift. The screens must be clean before the fluid system can be cleaned internally (see page 39).

Cleaning While Operating

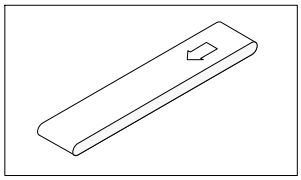
The screens may be cleaned while production continues if done in the following manner.

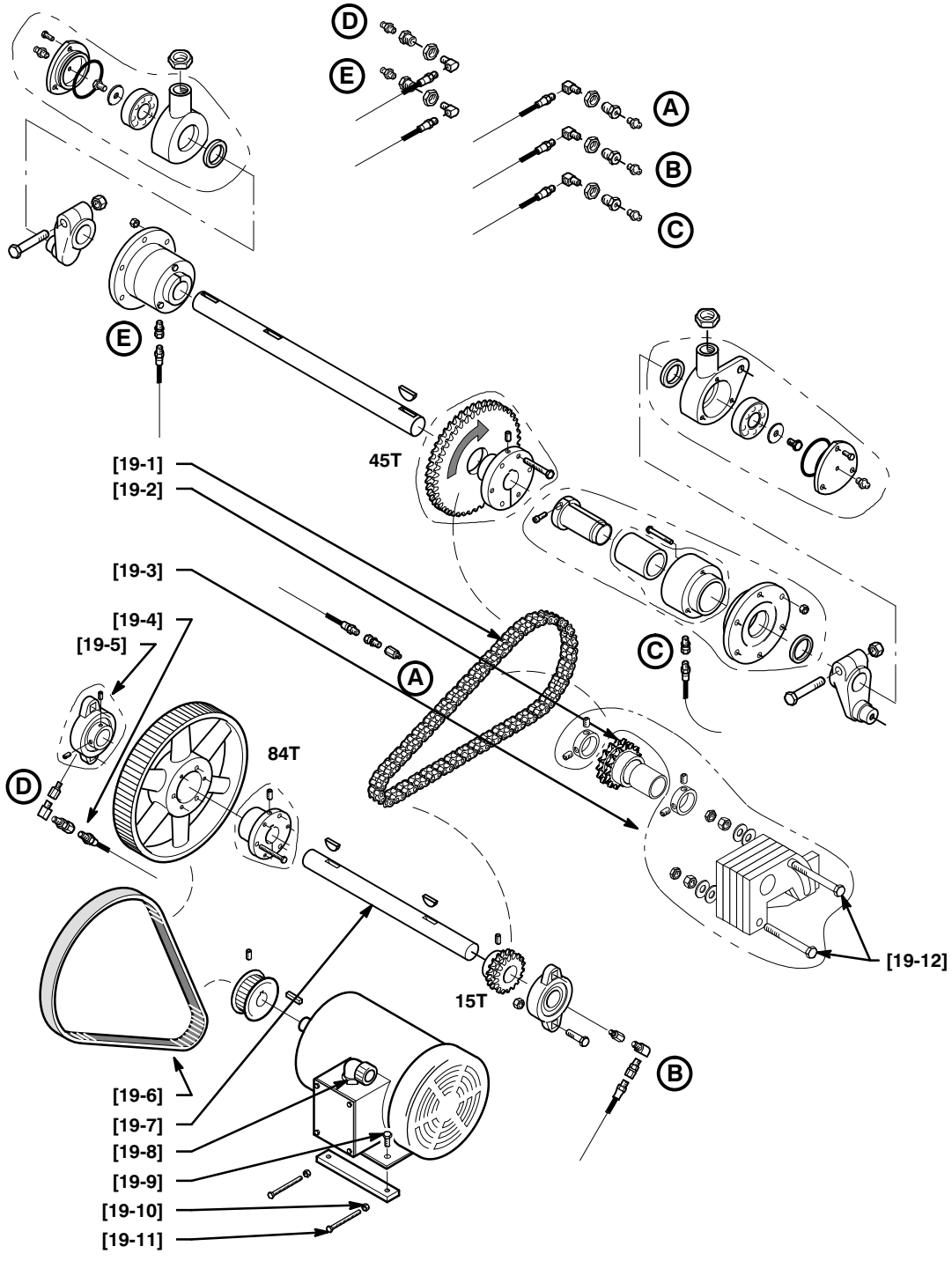
1. When screen blockage is first noticed, remove the first screen of the first pair. Rinse and replace. Remove the second screen of the first pair. Rinse and replace. Continue normal operation.
2. When screen blockage is again noticed, repeat the procedure with the first pair of screens, and then do the same with the second pair of screens. Continue normal operation.
3. When screen blockage occurs again, repeat the procedure with the first pair of screens, and then with the second pair of screens, and then with the third pair of screens. Continue normal operation.
4. When screen blockage occurs a fourth time, shut off the supply of replenish fluid, and continue operating until the fluid level almost reaches the suction port connecting to the pump.
5. Stop the machine. Drain all remaining fluid from the tank. Remove all screens, including the fourth pair of screens. Clean the entire tank, inside and out. Clean all pairs of screens, and replace them in the same positions that they were originally in. Refill the tank and resume normal operation.

Note: Never remove the fourth pair of screens unless the entire tank is going to be cleaned as described in step 5 above. Removal of this pair of screens will allow unfiltered fluid to clog the needles.

Caution: Never install any other filter in the suction line to the pump. This will damage the pump.

Conveyor Drive





CONVEYOR DRIVE

Drive Belt Adjustment

1. Lock out electrical supply.
2. Inspect drive belt [19-6] and check for proper pulley alignment.
3. Loosen motor mount bolts [19-9], and jam nuts [19-10] on jackscrews [19-11].
4. Turn jackscrews until belt is tensioned. Tighten motor mount bolts and jam nuts on jackscrews to retain position.

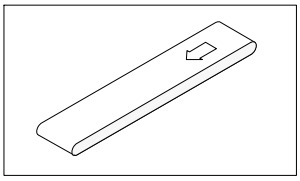
Drive Belt Replacement

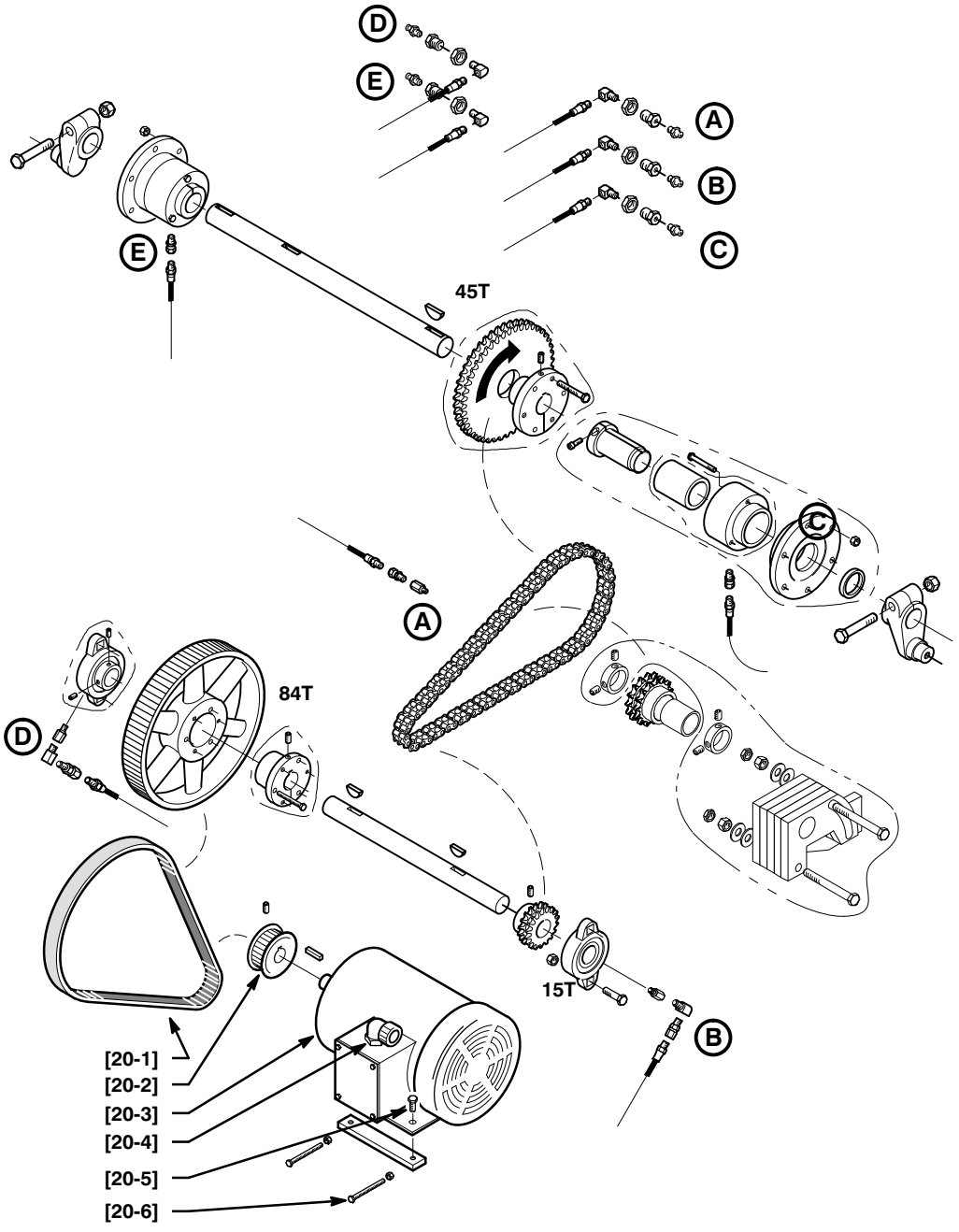
1. Lock out electrical supply.
2. Remove bolts in countershaft [19-7] bearing housing [19-5] nearest drive belt [19-6].
3. Disconnect grease line [19-4] to bearing.
4. Loosen drive tensioner [19-3] to allow counter shaft to move. Insert new belt between bearing and cabinet.
5. Reassemble machine. Adjust drive belt and drive chain [19-1].

Drive Chain

1. Lock out electrical supply.
2. Inspect drive chain [19-1] and idler sprocket [19-2] and check for proper alignment.
3. Loosen bolts [19-12] holding tensioner.
4. Rotate tensioner to adjust drive chain. Chain must have no slack but must not be highly tensioned.
5. Retighten bolts to retain position of tensioner.
6. Lubricate drive chain with commercially available roller chain lubricant.
7. To replace chain, separate chain at connecting link.

Conveyor Drive



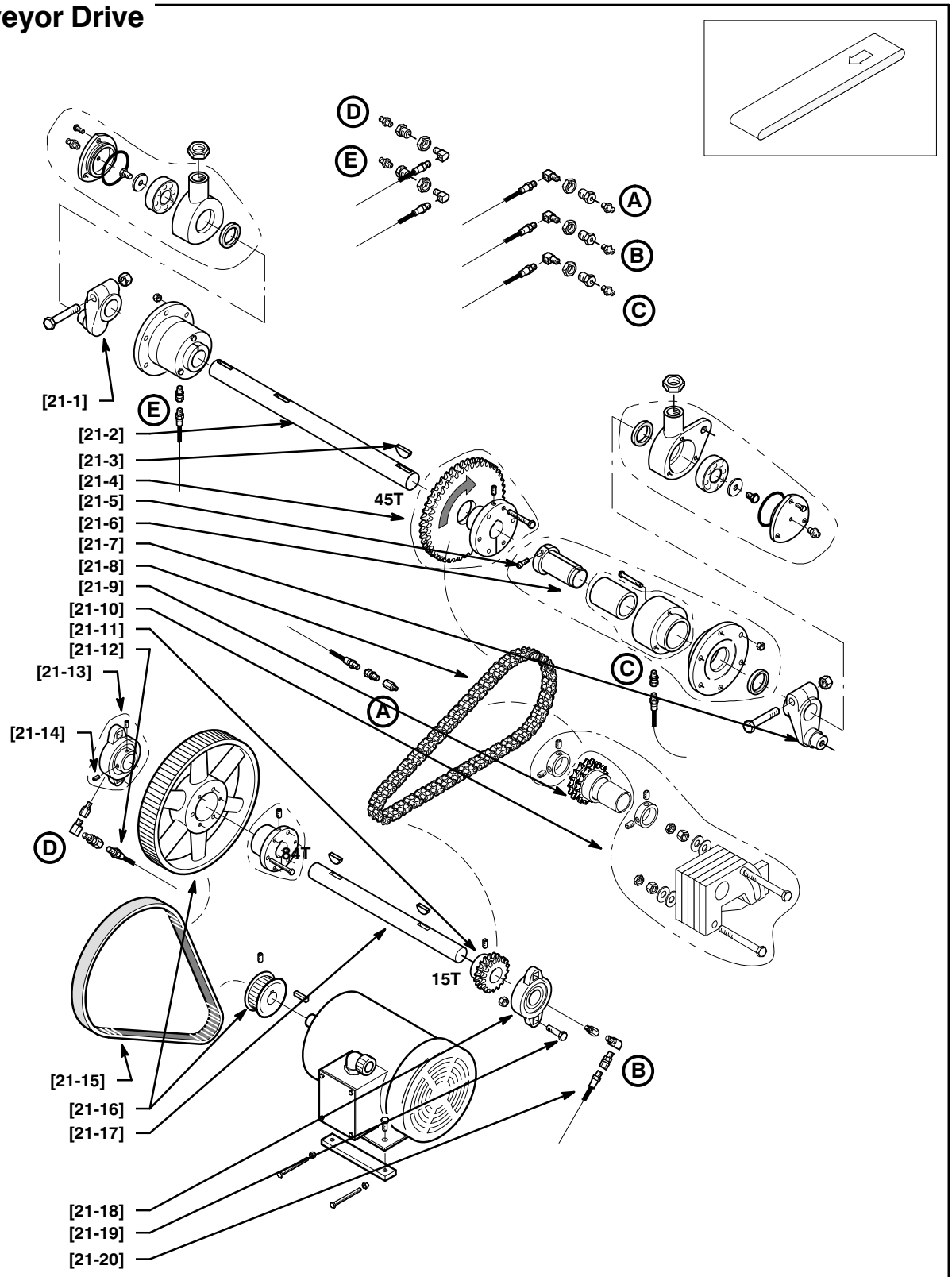


CONVEYOR DRIVE

Drive Motor Replacement

1. Lock out electrical supply.
2. Remove end and bottom panels at rear of machine.
3. Disconnect wiring to motor [20-3].
4. Loosen jackscrews [20-6] and remove motor mounting bolts [20-5].
5. Install new motor, reusing watertight connector [20-4] and pulley [20-2].
6. Install and adjust drive belt[20-1].
7. Check that electrical requirements of new motor are same as old. If amperage is different, it is necessary to change setting of motor protection heater (located inside control panel) to match new rating. If old heater can not be adjusted to match new requirement, replace with proper heater.
8. Check for proper motor rotation. Motor must run counterclockwise when viewed from shaft end. To reverse direction, switch any two leads of power supply to motor.

Conveyor Drive



CONVEYOR DRIVE

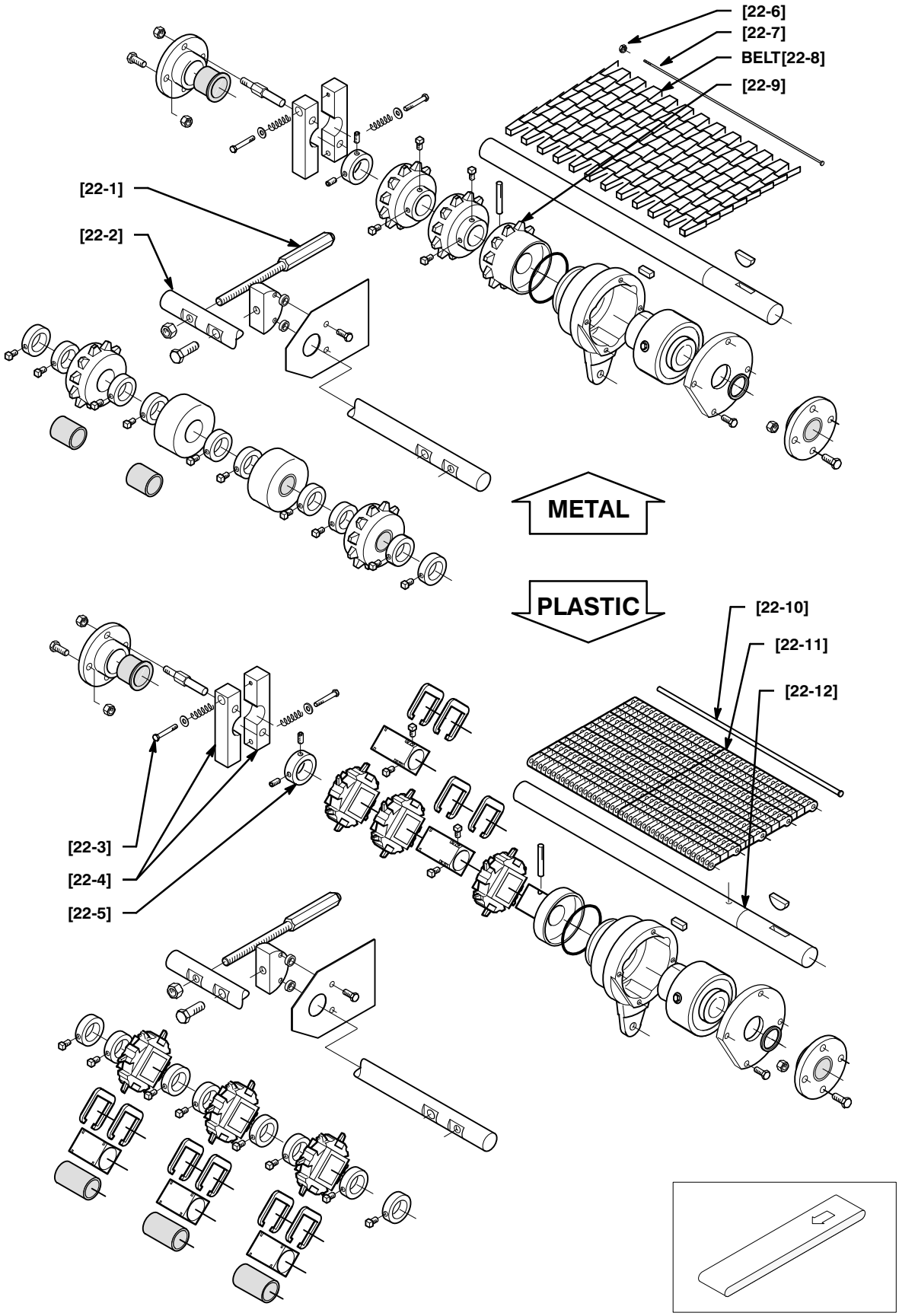
Countershaft Replacement

1. Lock out electrical supply.
2. Disconnect grease lines [21-12][21-20] to countershaft bearings [21-18][21-13].
3. Separate drive chain [21-8] at connecting link.
4. Loosen setscrews [21-14] in bearing inner races.
5. Remove bolts [21-19] holding bearing housings and remove countershaft [21-17] assembly.
6. Reassemble and align sprockets [21-11][21-9][21-4] and pulley [21-16].
7. Install drive chain and adjust chain and drive belt [21-15].
8. Lubricate drive chain.

Crankshaft Replacement

1. Lock out electrical supply.
2. Set head carriage in lowest position.
3. Block head carriage up securely. Do not block under stripper.
4. Remove left and right tie rod/crankarm [21-7][21-1] assemblies.
5. Remove rear access cover and relax tensioner [21-10] on drive chain [21-8].
6. Loosen sprocket [21-4] on crankshaft [21-2].
7. Loosen clamp bolts [21-5] in inner bearing sleeves [21-6].
8. Slide crankshaft [21-2] out while supporting sprocket [21-4].
9. Install new crankshaft, reusing old key [21-3] for sprocket.

Conveyor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BELT[22-8]
[22-9]
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PLASTIC
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[22-11]
[22-12]
[22-3]
[22-4]
[22-5]

CONVEYOR

Conveyor Belt

Adjust conveyor belt [22-8] tension with hex adjustment screws [22-1] in idler shaft [22-2]. Tighten belt to take out slack. Do not overtighten.

To replace conveyor belt, relax tension and separate belt by removing a connecting rod [22-7]. Install new belt using new connecting rod. (Note: Orient metal belts [22-8] so that drive sprocket teeth [22-9] drive against connecting rods [22-7]. Orient plastic belt with milled-off inside surface near to clutch.)

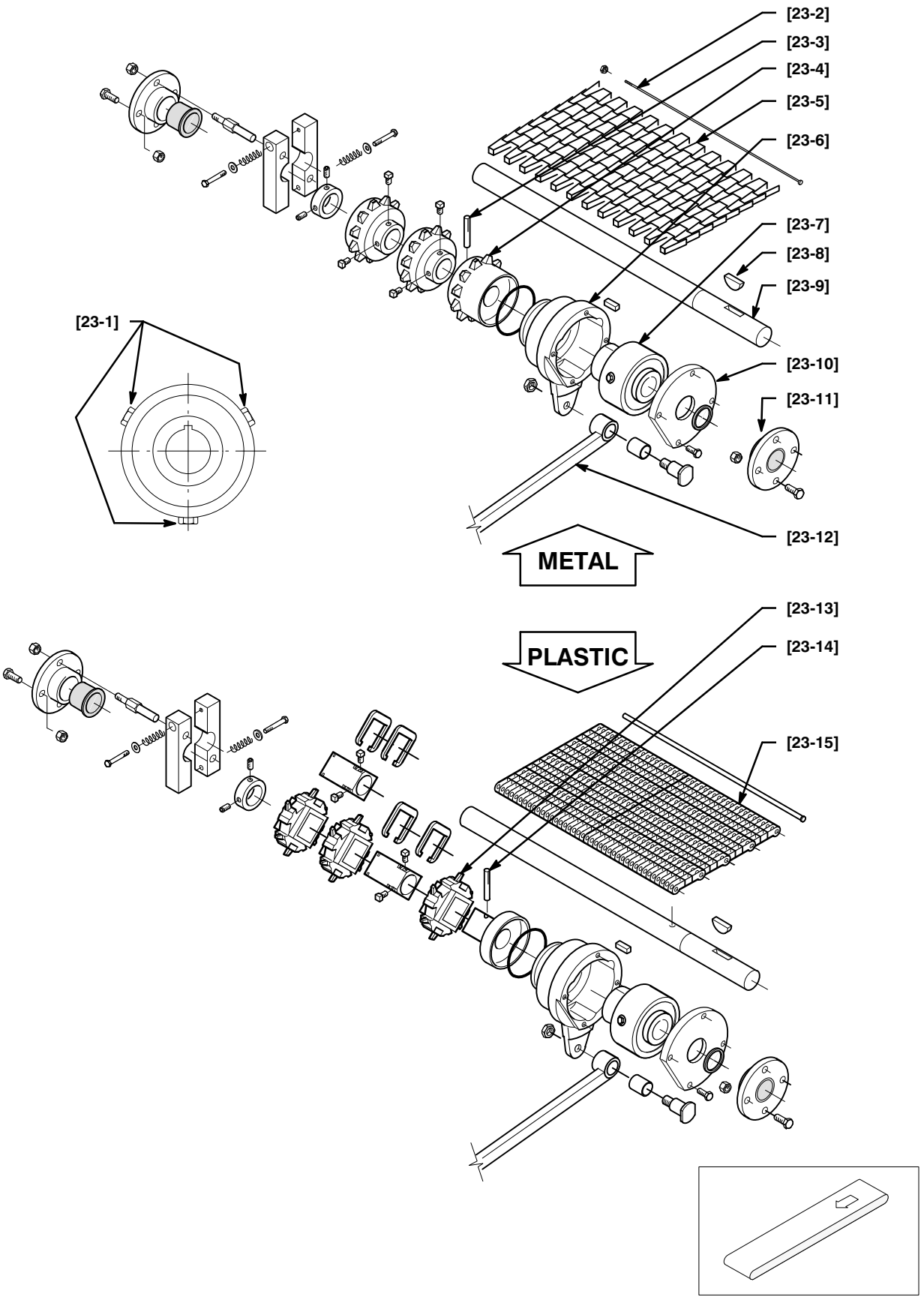
To install connecting rod on metal belts, thread nut [22-6] onto rod then cut off excess thread while deforming thread to secure nut in place. On plastic belts [22-11] retain connecting rods [22-10] by melting end of rod.

Conveyor Brake

Adjust conveyor brake with hex head screws [22-3], one in each brake shoe [22-4]. Tighten brake just enough to prevent conveyor belt from coasting at end of clutch travel. Do not overtighten.

When brake wears and is no longer effective, remove approximately 1/16 inch (1,5 mm) material from mating face of each shoe. Remount brake on conveyor drive shaft [22-12] and adjust set collar [22-5] to take out shaft end play. Set collar must not press too heavily against side of brake.

Conveyor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PLASTIC
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[23-15]

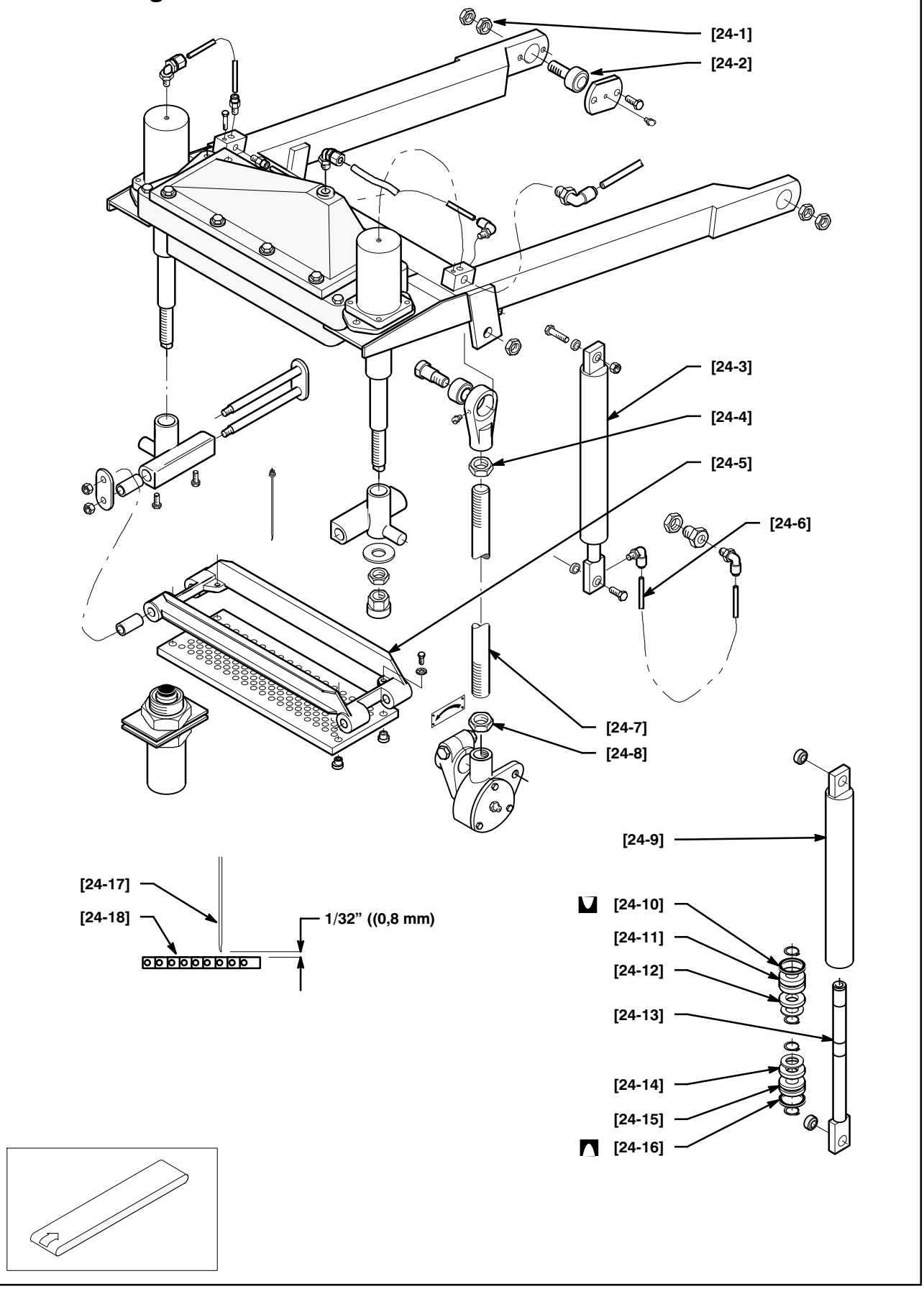
CONVEYOR

Drive Clutch

Proper lubrication is essential for maximum clutch life. Fill clutch [23-7] with fresh grease monthly. Do not, however, disassemble clutch. Clutch can not be repaired or rebuilt in the field.

1. Lock out electrical supply.
2. Relax conveyor belt [23-5] tension. Remove one connecting rod [23-2] to break apart conveyor belt. Unwrap belt from drive shaft [23-9] and sprockets [23-4]. Disconnect clutch drive linkage [23-12]. Unbolt end housings [23-11], then remove conveyor drive shaft assembly.
3. Loosen clutch housing [23-6]: To do this on plastic belt [23-15] machines, slide sprocket [23-13] from housing, then drive out pin [23-14]. On metal belt [23-5] machines, pin [23-3] must be removed before sprocket [23-4] can be separated.
4. Remove housing cover [23-10] and slide housing [23-6] toward center of shaft.
5. If clutch needs to be removed, loosen setscrew in clutch hub and slide clutch assembly toward center of shaft until woodruff key [23-8] can be removed. Slide clutch off shaft.
6. Remove one of the three plugs [23-1]. Replace it with a standard grease fitting.
7. Pump specified type of grease (USDA-approved type H1, Sork Townsend part number 12080 – see page 50) until new grease flows freely from around the shields, purging all old grease. Reinstall original plug and tighten securely. Note: Do not mix different brands of grease; do not substitute oil for grease.
8. Coat outside of clutch with edible grease or edible oil to facilitate assembly.
9. Carefully align parts and reassemble conveyor drive shaft.
10. Install conveyor drive shaft and conveyor belt and reconnect drive linkage. Tension conveyor belt.

Head Carriage



HEAD CARRIAGE

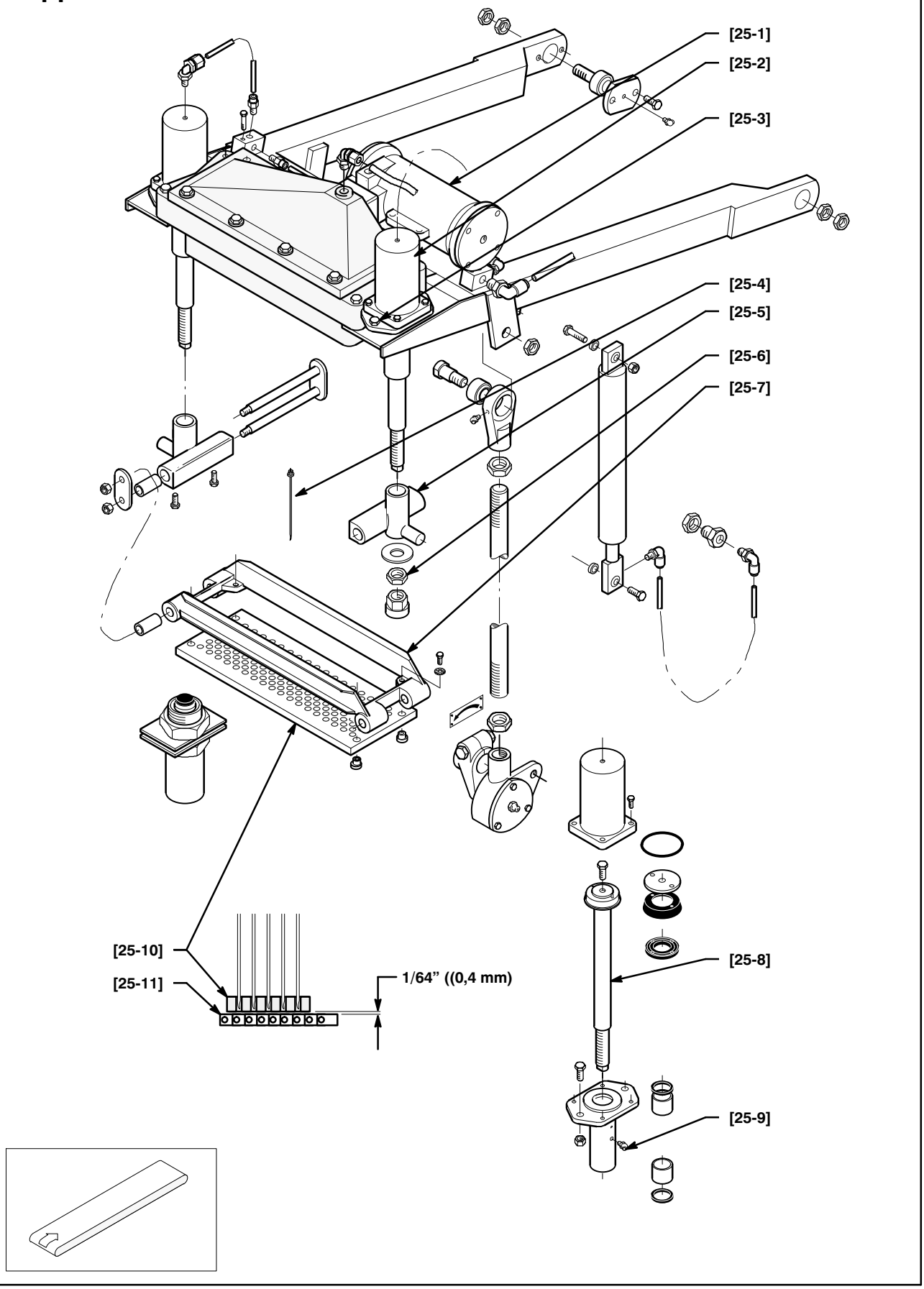
Head Carriage Adjustment

1. Lock out electrical supply.
2. Loosen jam nuts [24-1] on head carriage pivot shafts.
3. Rotate eccentric pivot shafts [24-2] to center head carriage over conveyor belt. Retighten jam nuts securely.
4. With head carriage in lowest position, loosen jam nuts [24-4][24-8] on each end of head carriage tie rods [24-7]. Tie rods have opposite hand threads on each end.
5. Turn tie rods to obtain 1/32 inch (0,8 mm) clearance between needle [24-17] tips and conveyor belt [24-18]. Adjust rods evenly to prevent binding.
6. Tighten jam nuts securely.
7. Adjust stripper [24-5] — see page 79.

Assist Cylinders

1. Lock out electrical supply.
2. With head carriage in lowest position, set assist cylinder pressure to zero.
3. Disconnect air lines [24-6] and remove assist cylinders [24-3].
4. Remove piston rod [24-13] and clean and inspect cylinder [24-9] bore. Hone cylinder to remove scratches.
5. Clean and inspect pistons [24-11][24-15] and felt oiler pads [24-12][24-14].
6. Install new seals [24-10][24-16] as shown. Use only original equipment seals. Use of other seals will cause heat build-up and will damage cylinders and drive train of machine.
7. Saturate oiler pads with 10W edible oil (Stork Townsend part number 03094) and reassemble. Reset assist cylinder pressure to 40 psi (275 kPa) before running.

Stripper

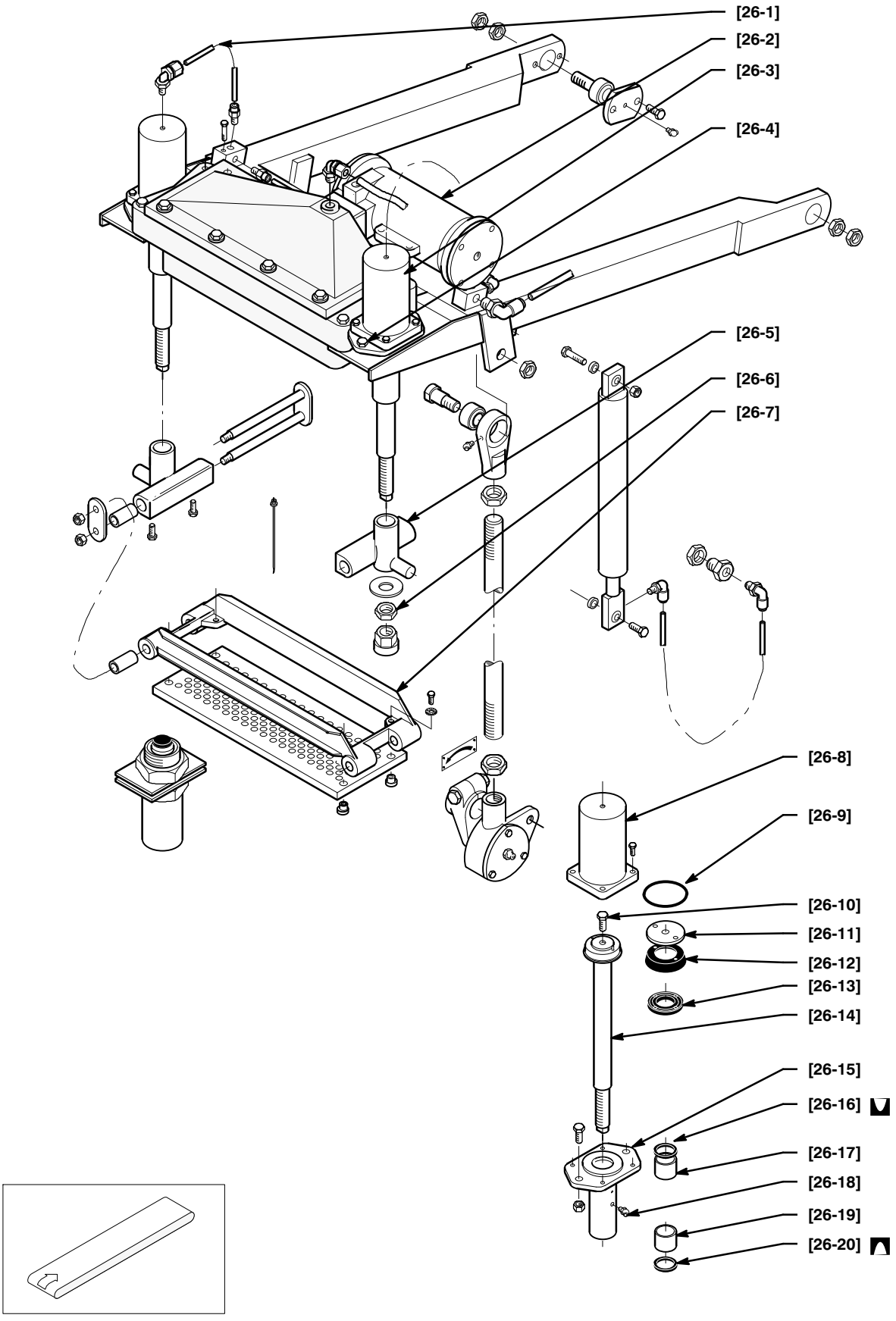


STRIPPER

Stripper Adjustment

1. Lock out electrical supply.
2. Check head carriage adjustment and needle clearance.
3. Set normal stripper pressure — approximately 50 psi (345 kPa).
4. Loosen mounting bolts [25-3] of stripper cylinders [25-2]. Move cylinders to center stripper [25-7] on needles [25-4].
5. Tighten mounting bolts securely. Stripper must have slight amount of end play with cylinders fully extended.
6. Loosen jam nuts [25-6] under each stripper yoke [25-5]. Turn push-rods [25-8] to bring bottom of stripper plate [25-10] to within 1/64 inch (0,4 mm) of conveyor belt. Stripper plate may touch conveyor belt lightly.
7. Tighten jam nuts securely. Recheck adjustment.
8. Lubricate cylinders [25-9] — see Lubrication Instructions (page 50).
9. Check for free movement — see Preventive Maintenance (page 49).
10. Check control valve [25-1] adjustment (see page 59).

Stripper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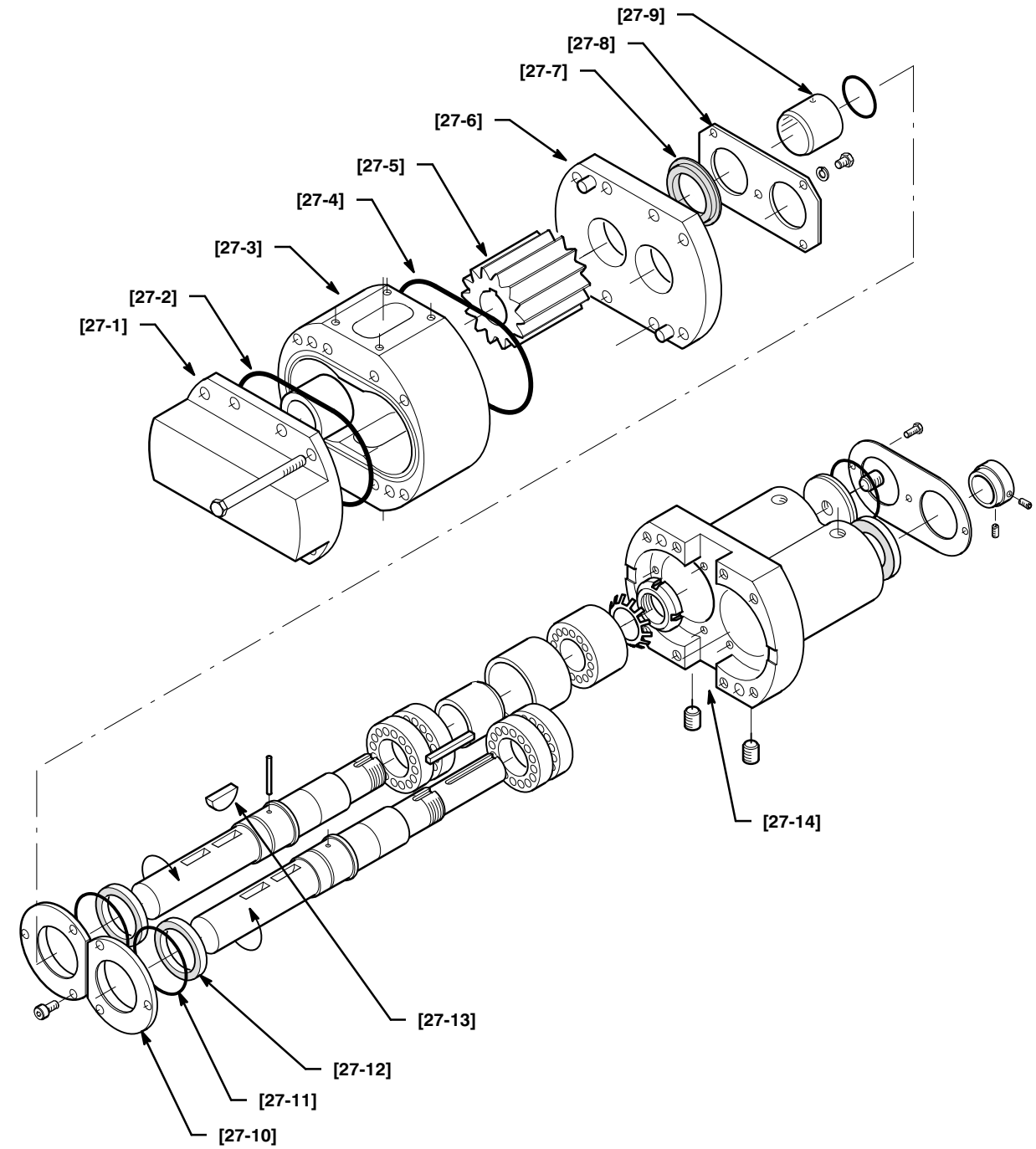
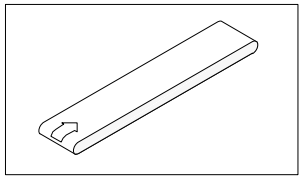
STRIPPER

Stripper Cylinders

1. Lock out electrical supply.
2. Set stripper pressure to zero and disconnect air lines [26-1].
3. Remove grease fitting [26-18] and jam nut [26-6].
4. Unscrew pushrod [26-14] from stripper yoke [26-5], remove mounting bolts [26-4], and remove cylinders [26-3] from machine.
5. Disassemble cover [26-8] from guide housing [26-15].
6. Install new rod seals [26-16][26-20] and bushings [26-17] [26-19] in guide housings [26-15].
7. Install new piston cup [26-12], taking care to align bleed holes in piston cup and washer [26-11] with hole in pushrod piston.
8. Install new cushion [26-13]. Groove in cushion must face piston.
9. Reassemble cylinders using new O-ring [26-9] in cover [26-8]. Install cylinders in machine. Adjust stripper [26-7] as described above.
10. Lubricate cylinders [26-18] — see Lubrication Instructions (page 50).
11. Check for free movement — see Preventive Maintenance (page 49).
12. Check control valve [26-2] adjustment (see page 59).

Pump — Preventive Maintenance





PUMP — PREVENTIVE MAINTENANCE

Normal wear will cause loss in pump efficiency. As pump efficiency decreases, compensate by increasing fluid system pressure to maintain injection percentage. When pump efficiency is too low for satisfactory operation, pump gears must be replaced. Seals should be replaced monthly, or whenever leakage is suspected, whichever comes first. Check weep hole [27-14] daily for fluid leakage.

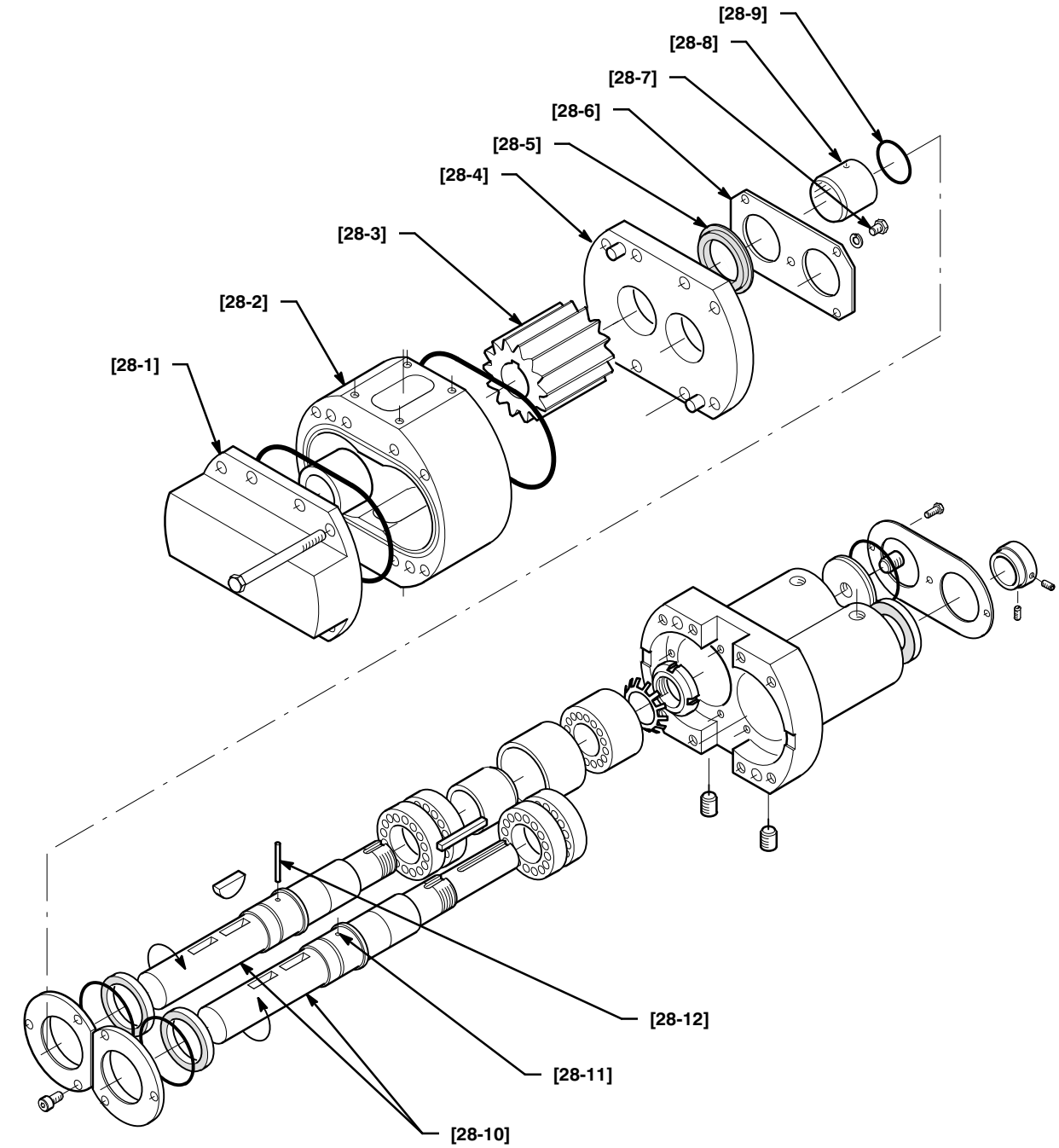
Preventive Maintenance

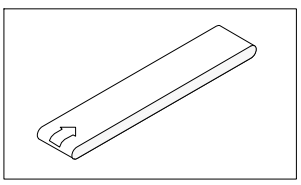
Lubricate daily with recommended waterproof grease (Stork Townsend p/n 11861). Refer to Lubrication Instructions (page 50).

Replacing Pumps Seals

1. Lock out electrical supply.
2. Remove pump cover [27-1], gear housing [27-3], gears [27-5], keys [27-13], and seal plate [27-6] assembly.
3. Remove seal retainer [27-8] from seal plate to replace flanged lip seal [27-7].
4. Remove two glands [27-10] to replace their O-rings [27-11] and lip seals [27-12].
5. Clean surface of seal sleeves [27-9] with non-abrasive cleaner.
6. Install seal gland assemblies.
7. Install seal plate assembly.
8. Install gear housing with new O-rings [27-2][27-4].
9. Install keys, gears, and cover.

Pump Overhaul — Wear Sleeves



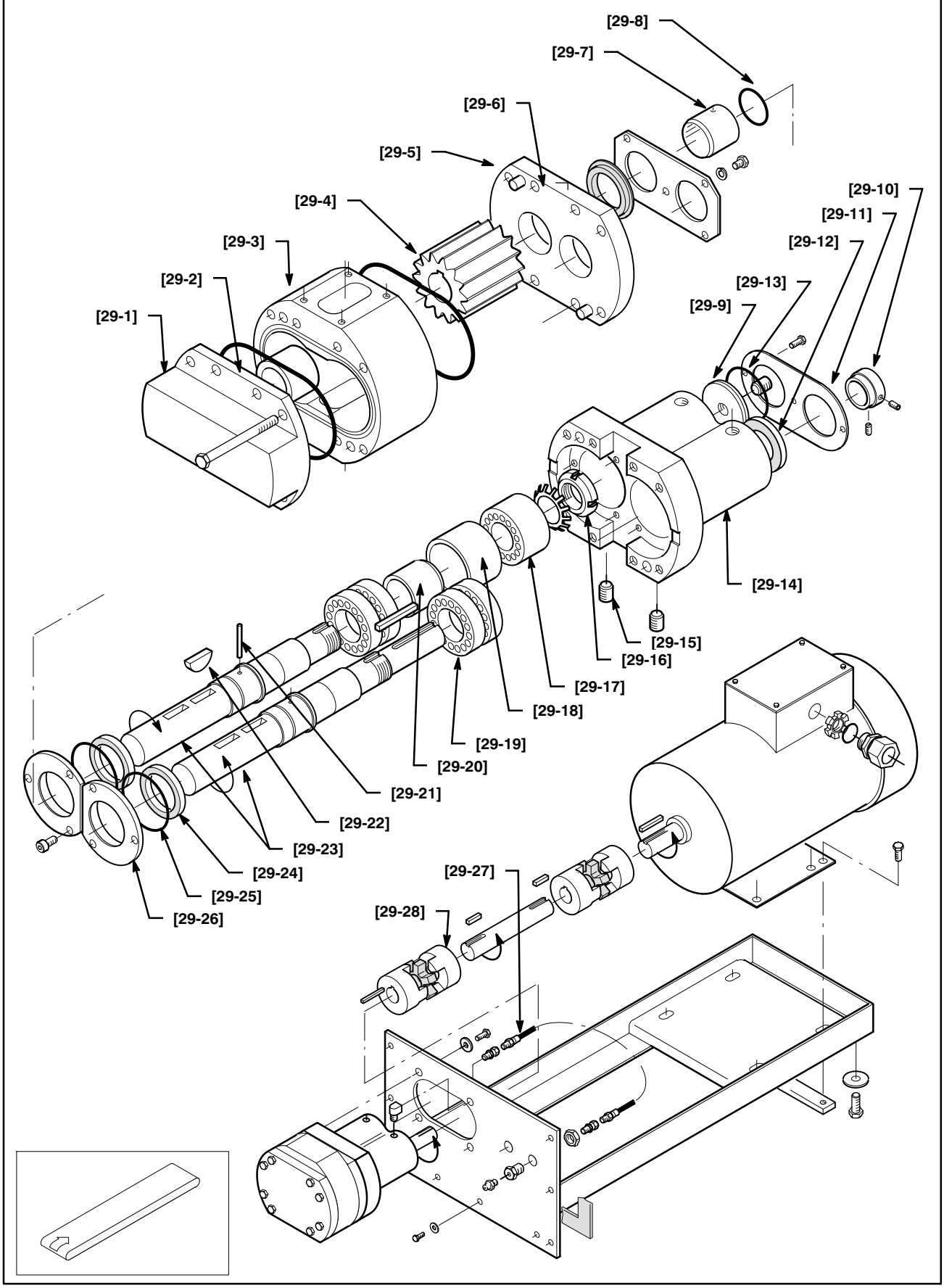


PUMP OVERHAUL — WEAR SLEEVES

Wear Sleeve Replacement

1. Lock out electrical supply.
2. Remove cover [28-1], gear housing [28-2], and gears [28-3].
3. Check shafts [28-10] for play — if bearings are loose, rebuild bearing housing assembly — see page 87.
4. Remove drive pin [28-12], old sleeve [28-8], and O-rings [28-9] from each shaft.
5. Clean shafts and remove any salt accumulations.
6. Coat shafts with edible grease, then install new O-rings [28-9].
7. Apply edible grease to inside of new sleeves and carefully slide sleeves onto each shaft, taking care not to damage O-rings.
8. Line up drive pin holes [28-11] in each sleeve and shaft.
9. Carefully install new drive pin [28-12] from outside each sleeve into the shaft. Do not strike new sleeves with hammer or drift.
10. Cover outside of each sleeve with thin coat of edible grease.
11. Replace lip seals [28-5]. Make sure there are no scratches on seal plate [28-4] bores.
12. Replace seal retainer [28-6]. Do not over-tighten screws [28-7].
13. Reassemble pump.

Pump Overhaul — Bearing Housing

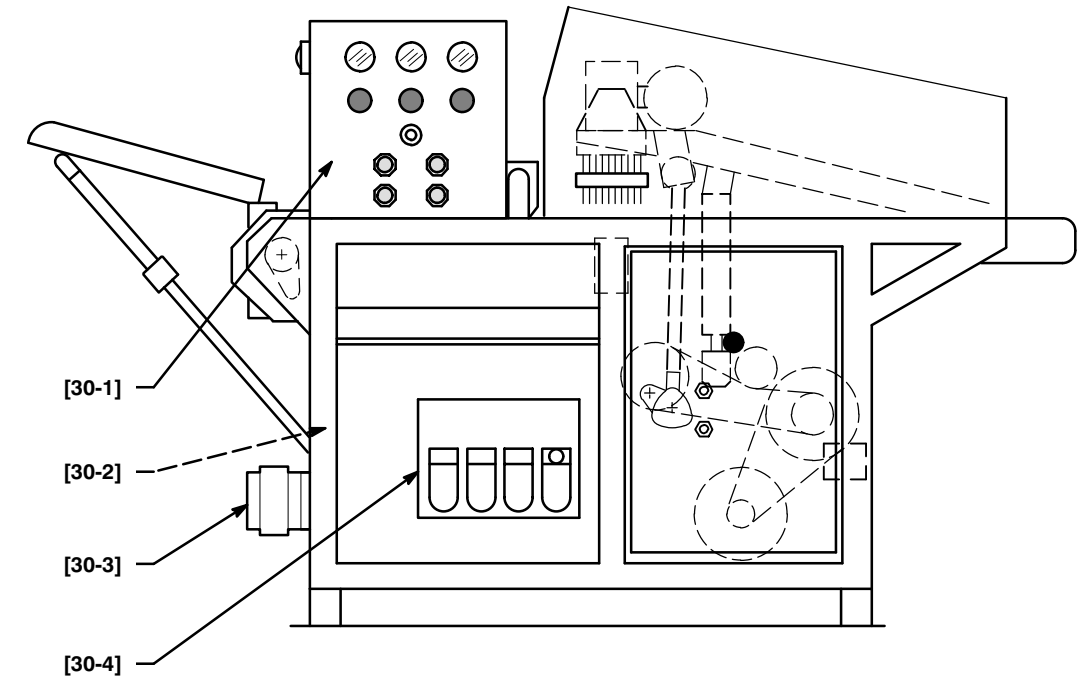


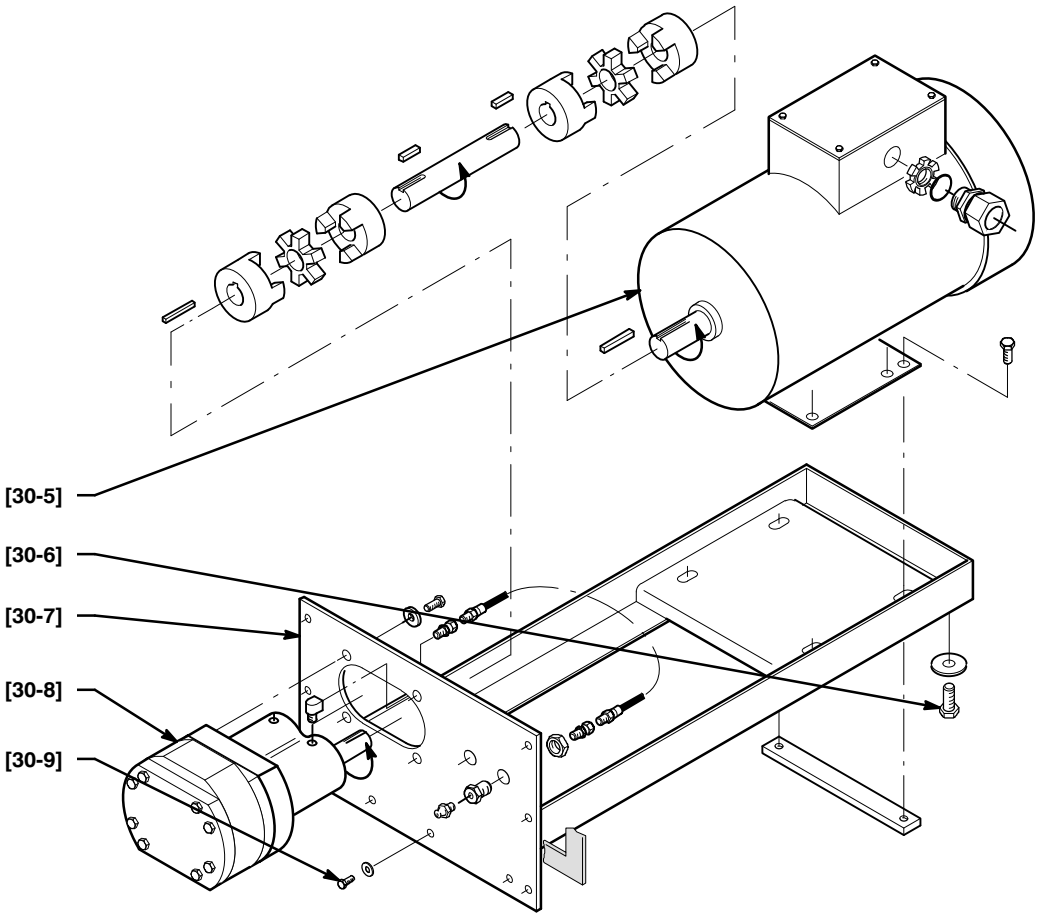
PUMP OVERHAUL — BEARING HOUSING

Bearing Housing Assembly Overhaul

1. Lock out electrical supply.
2. Remove access panel above pump. Disconnect grease lines [29-27] from pump.
3. Remove pump from cabinet.
4. Remove pump cover [29-1], gear housing [29-3], gears [29-4], keys [29-22], and seal plate [29-5] assembly. If RB30 pump, replace bushings [29-2] in cover.
5. Remove shaft coupling [29-28]. Remove rear seal plate [29-11] and sleeve [29-10].
6. Remove glands [29-26] and their O-rings [29-25] and lip seals [29-24].
7. Slide shaft [29-23] assemblies from housing [29-14].
8. Drive pins [29-21] out to remove front seal sleeves [29-7] and O-rings [29-8] under sleeves.
9. Remove bearing lock nuts [29-16], and press large bearings [29-17] off (1 each shaft).
10. Remove outer [29-18] and inner [29-20] spacers, and roller bearings [29-19] (2 each shaft).
11. Remove rear lip seal [29-12], plug [29-9], and O-ring [29-13].
12. Remove grease relief ports [29-15].
13. Replace all bearings and seals. Clean and inspect remaining parts for wear or damage.
14. Pack bearings with waterproof grease (Stork Townsend p/n 11861) before installing on shafts. Tighten bearing lock nuts [29-16] securely.
15. Reassemble and install pump. Note: Alignment mark (V) [29-6] on seal plate must be adjacent to mark on bearing housing.
16. Lubricate according to Lubrication Instructions on page 50.

Pump Motor





PUMP MOTOR

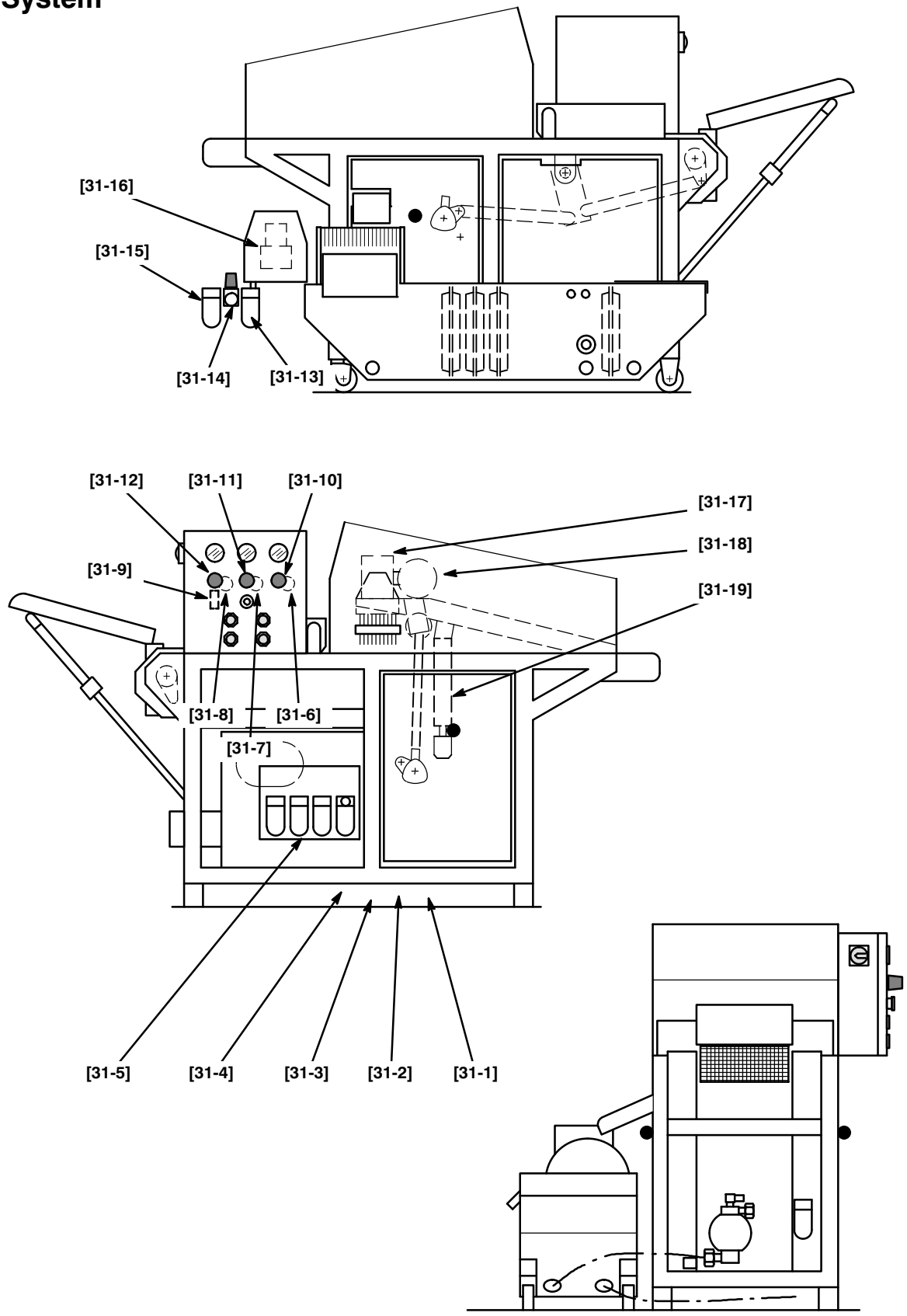
Pump Motor Replacement

1. Lock out electrical supply.
2. Remove air filter panel [30-4] and access panel [30-2] above pump [30-3].
3. Remove end and bottom screws [30-6][30-9] attaching pump drawer [30-7].
4. Remove pump drawer.
5. Install new electrical motor [30-5], aligning with pump [30-8].

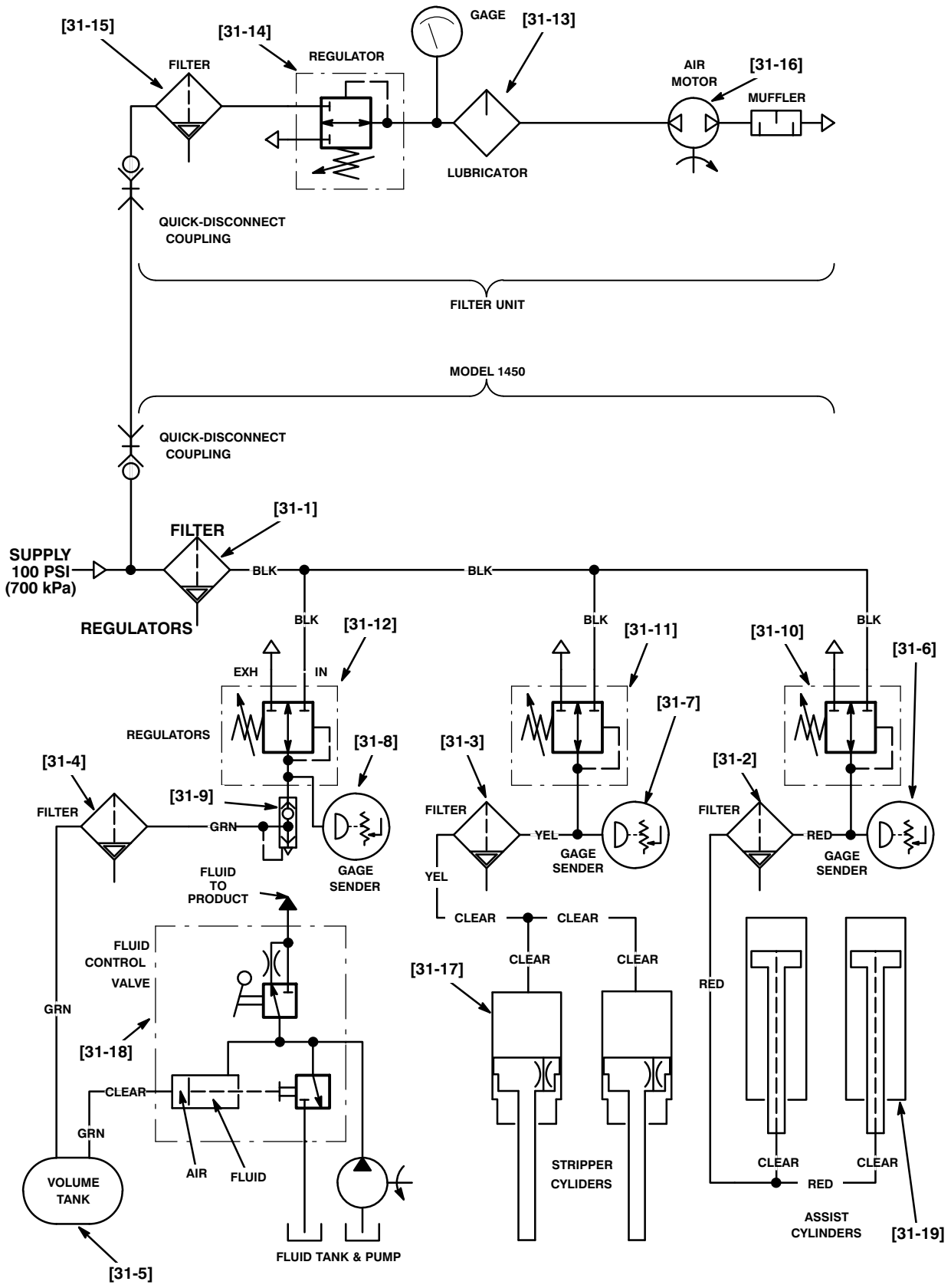
   Note: Connect motor electrical supply so motor runs counterclockwise when viewed from shaft end. Never run pump dry. If new motor has different amperage rating, adjust motor protection overload relay (located inside control panel [30-1]) to 125% of the new full-load rating. If new requirement exceeds range of existing overload relay, replace with correct overload relay .

6. Reassemble machine. Tighten all bolts securely.

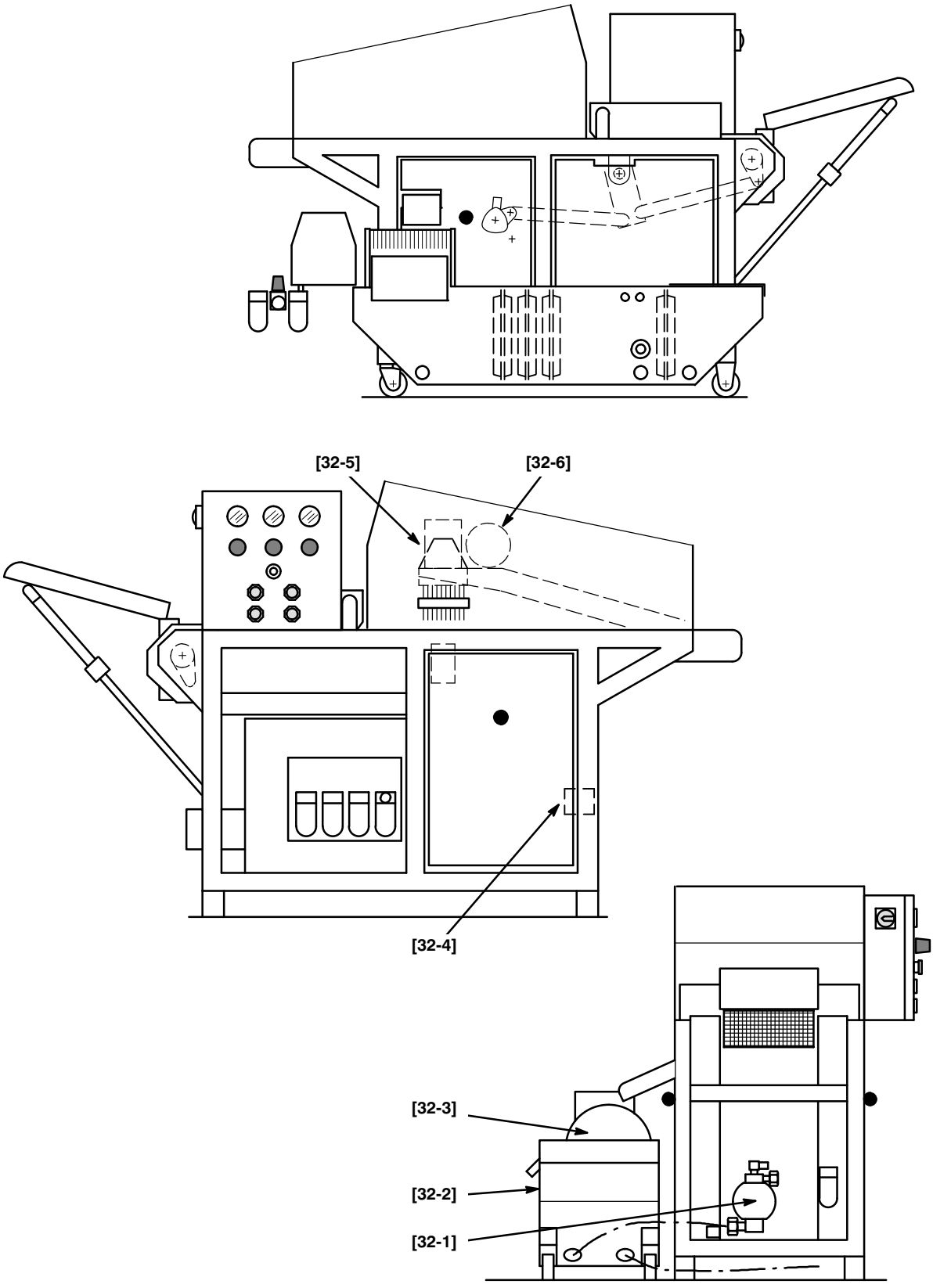
Air System


[31-16]
[31-15]
[31-14]
[31-13]
[31-12]
[31-11]
[31-10]
[31-17]
[31-18]
[31-9]
[31-19]
[31-8]
[31-6]
[31-7]
[31-5]
[31-4]
[31-3]
[31-2]
[31-1]

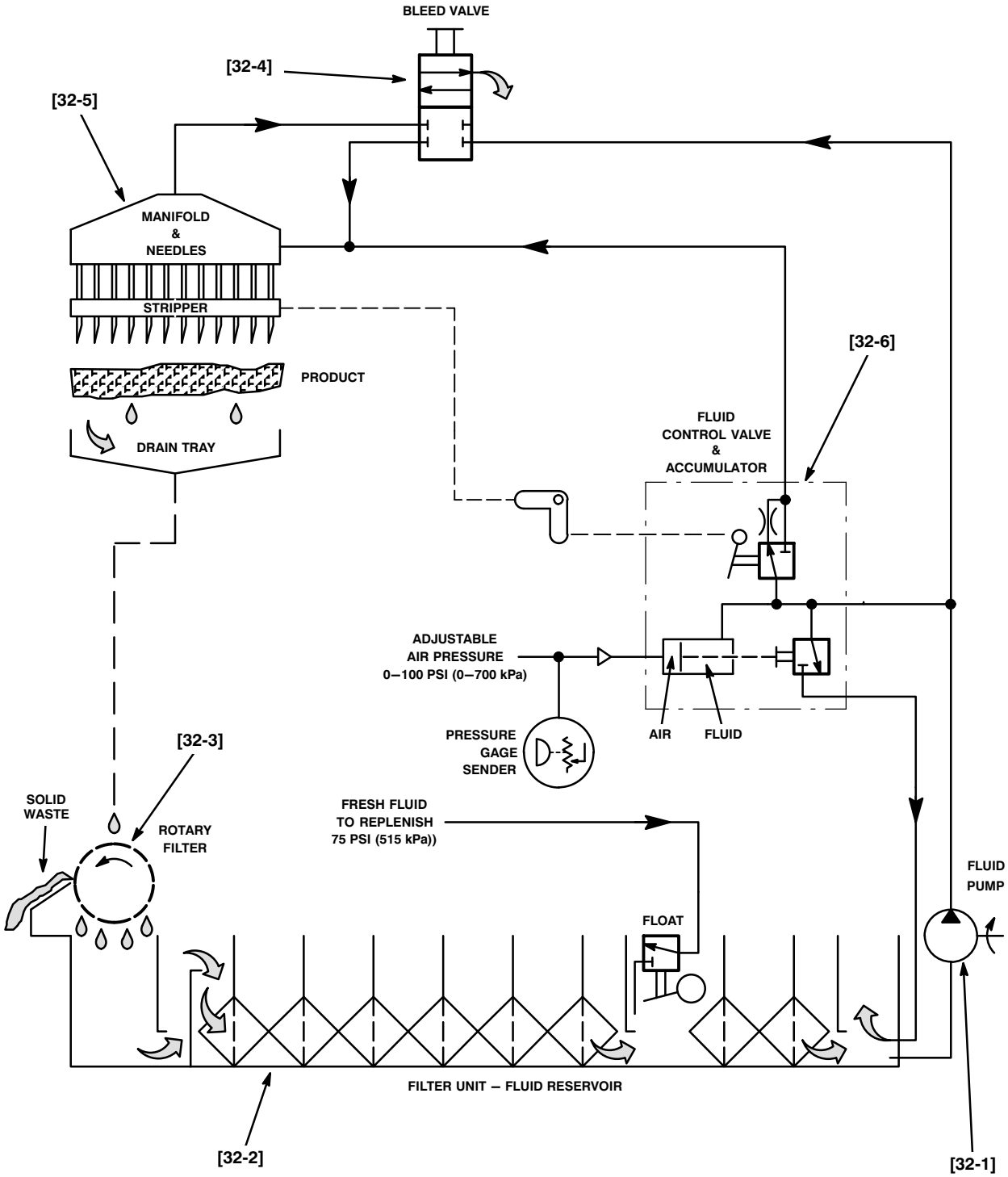
Air System


[31-15]
FILTER
[31-14]
REGULATOR
GAGE
[31-13]
AIR MOTOR
[31-16]
MUFFLER
LUBRICATOR
QUICK-DISCONNECT COUPLING
FILTER UNIT
MODEL 1450
QUICK-DISCONNECT COUPLING
[31-1]
FILTER
SUPPLY 100 PSI (700 kPa)
BLK
REGULATORS
[31-12]
EXH
IN
[31-11]
[31-10]
[31-6]
[31-7]
[31-8]
[31-3]
[31-4]
[31-9]
[31-2]
GRN
YEL
RED
GAGE SENDER
FLUID TO PRODUCT
FLUID CONTROL VALVE
[31-18]
CLEAR
[31-17]
STRIPPER CYLIDERS
[31-5]
VOLUME TANK
AIR
FLUID
FLUID TANK & PUMP
ASSIST CYLINDERS
[31-19]

Fluid System



Fluid System



ELECTRICAL SYSTEM

Electrical diagrams for the 1450 are in the holder at the rear of the manual.

SECTION 6 TROUBLESHOOTING

— Contents —

Read instructions and review safety information (pages 5 through 11) before investigating problems or servicing machine.

Lock out electrical supply and disconnect air supply before performing any maintenance procedure. Re-connect these utilities only if maintenance procedure absolutely requires them.

TROUBLESHOOTING THE MODEL 1450

Several variables affect machine performance. Variations in these may appear to be machine malfunction, but must be fully evaluated before adjusting or repairing machine.

Temperature

Colder product may absorb less fluid.

Physical Characteristics

Meat, fish and poultry each have distinct physical characteristics (fat content, moisture content, tissue structure, etc.) that will respond to injection differently. Different injection pressures may be required to achieve a specific injection rate.

Trimming and Cutting

Product from different suppliers, or cut by different individuals can vary in physical characteristics.

Operating Procedures and Adjustments

Air pressure settings may not be identical from day to day. Supply pressure may vary during operation, causing momentary fluctuations.

Machine Condition

Normal wear will cause slight changes from day to day, especially in pump efficiency. Such changes may not be noticeable at first, but may suddenly become apparent after change accumulates. Routine adjustments and preventive maintenance will prolong machine life.

Problems and Causes

1. **Machine (or pump) will not start, or stops during operation:**
   a. Electrical supply interrupted.
   b. Interlocked guard or cover has moved – once cover has moved, start switch must be pressed again.
   c. Magnet not securely installed on interlocked guard or cover.
   d. Interlock switch is not securely installed, or is not correctly positioned to receive signal from magnet mounted to guard or cover.
   e. Motor overload relay tripped – correct overload condition, then reset relay.
   f. Blown fuse – correct overload condition, then replace fuse.
   g. Control switch contacts stuck (contacts must release in order to reset and restart the control circuit).
2. **Low injection percentage:**
   a. Loss of replenish fluid supply – tank should be over half full.
   b. Plugged needles.
   c. Air in fluid system. To verify, operate with bleed valve open – if percentage increases, problem is probably air. If unchanged, problem is probably mechanical – see other causes under problem 2.
   d. Worn needle seals.
   e. Worn or damaged seals on control valve piston.
   f. Incorrect adjustment of one or more of the following:
      needle clearance;
      stripper plate clearance;
      control valve;
      stripper stops.
   g. Worn or damaged valve linkage parts.
   h. Broken stripper plate frame.
   i. Damaged or worn fluid pump gears or housing.
   j. Kinked or pinched fluid line from tank to pump.
   k. Loose fitting on hose from tank to pump, usually indicated by foaming fluid in tank.
3. **Air in fluid system – inability to bleed:**
   a. Loss of replenish fluid supply – tank should be over half full.
   b. Missing or broken needles.
   c. Damaged or cut needle seals
   d. Loose fluid system fittings.
   e. Hole in fluid lines.
   f. Worn or damaged bleed valve O-rings.
   g. Plugged bleed valve or bleed system lines.
   h. Incorrect control valve adjustment, or plugged bleed hole in control valve.
   i. Damaged or worn cross pipe O-rings.
   j. Damaged or worn manifold O-rings.

4. **Inconsistent injection levels:**
   a. Condition of product.
   b. Adjustment of needle clearance, stripper plate clearance, or control valve.
   c. Worn or damaged linkage connecting valve to stripper.
   d. Stripper stops set too low.
   e. Conveyor not indexing consistently — check clutch; tighten brake.
5. **Unusual noises:**
   a. Intermittent high pitch “chirping” sound from conveyor — brake is dry or salty: rinse with water.
   b. Banging sound and machine sways back and forth — drive chain loose: adjust tension.
   c. Whining sound from pump — tank out of fluid: stop pump immediately, refill tank. Never run pump dry, even for short periods of time.
   d. Assist cylinders damaged or receiving improper air pressure.
6. **Rapid bearing failure:**
   a. Inadequate lubrication.
   b. Incorrect bearing or seal installation.
   c. Damaged or worn seal surfaces or bearing surfaces on shafts.
   d. Misaligned shaft.
7. **Rapid drive belt or chain failure:**
   a. Friction due to incorrect adjustment or alignment.
   b. Worn or damaged bearing and/or bearing surfaces on shafts.
   c. Worn or damaged pulleys or sprockets.
   d. Inadequate lubrication in drive components.
8. **Improper stripping of product from needles:**
   a. Burred needles.
   b. Insufficient stripper pressure.
   c. Adjustment of needle clearance or stripper plate clearance.
   d. Overlapping of product (bellies).

SECTION 7 PARTS LIST

— Contents —

Read instructions and review safety precautions (pages 5 through 11) before investigating problems or servicing machine.

Lock out electrical supply and disconnect air supply before performing any maintenance procedure. Re-connect these utilities only if maintenance procedure absolutely requires them.

How to Use Parts List Section

The following pages show an illustrated parts breakdown of the machine. Exploded view illustrations show all serviceable parts used within a particular assembly. A parts list, listing parts in numerical order, accompanies each illustration to show the complete part name, quantities used, and any other relevant application data.

When a part is used more than once, the item may only be illustrated once, for simplicity. Hardware items are called out on illustrations, but are not itemized on lists. A list of all hardware items is included on page 164.

If a part number is known, find its various applications by referring to the Part Number Cross Reference on the following pages. Parts are listed in numerical order, followed by the pages on which each item is listed.

To Place a Parts Order

When ordering parts, or when communicating about any part of the machine, please include the following information:

1. Model Number of Machine
2. Serial Number of Machine
3. Part Number
4. Part Name in English

Address, Telephone and Fax Information

Stork Townsend Inc.
2425 Hubbell Avenue,
Des Moines, IA 50317 USA

N. America: 800 247-8609
Intl. 515 265-8181
Fax: 515 263-3355

www.townsendeng.com

Stork Townsend B.V.
Industrielaan 63 - 5349 AE, Oss, The Netherlands
P.O. Box 292 - 5340 AG, Oss, The Netherlands

Telephone: +31 (0)412 669 911
Fax: +31 (0)412 669 250

www.townsend.nl

To Order Copies of This Manual

Part number for this manual is: . . . . . 14288-6E-30.

Date for specific version of this manual is: . . . . . 2009-04-17.

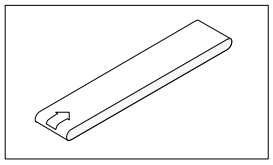
PART NUMBER CROSS REFERENCE

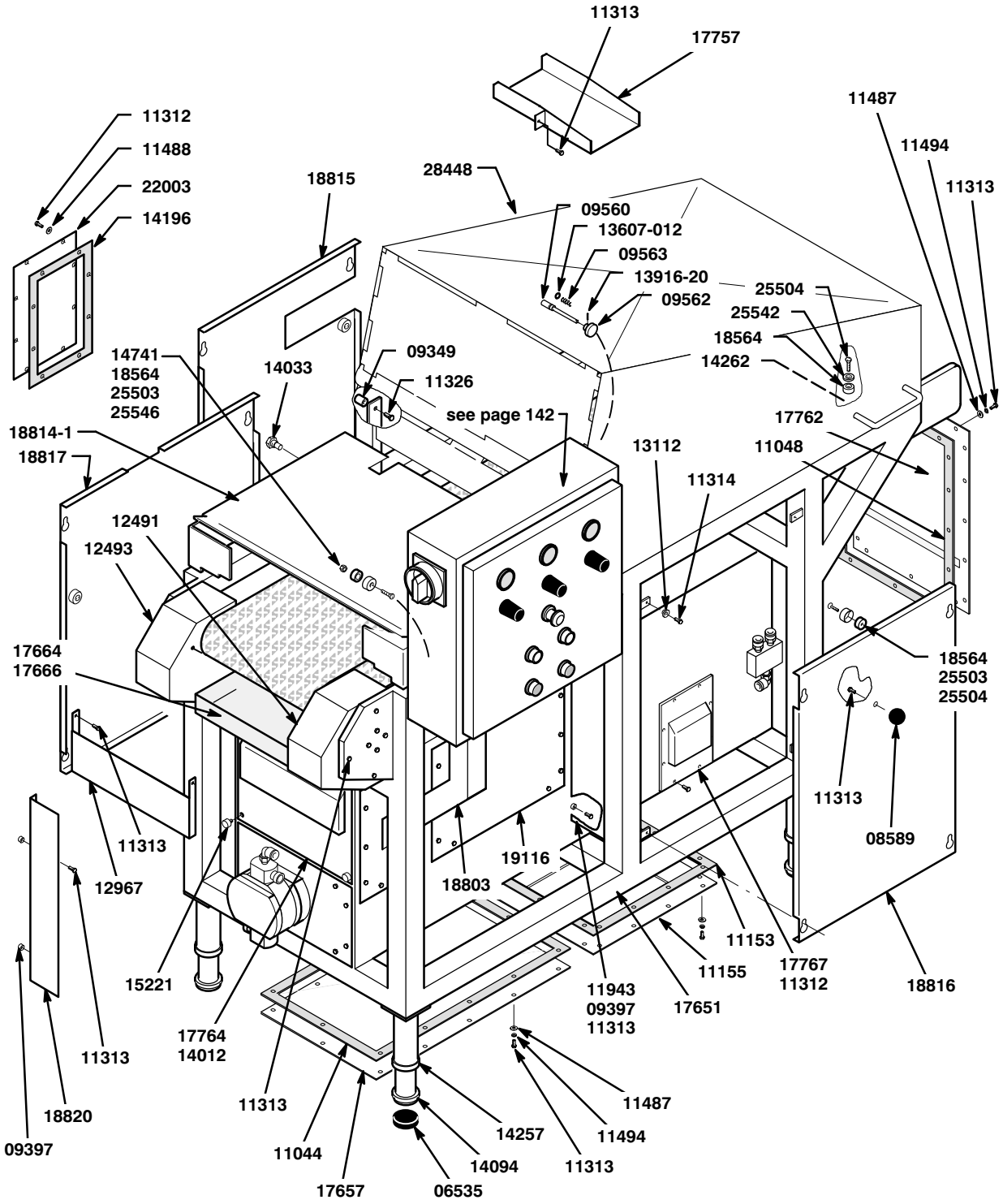
PART NUMBER CROSS REFERENCE

PART NUMBER CROSS REFERENCE

PART NUMBER CROSS REFERENCE

Cabinet — RH Controls

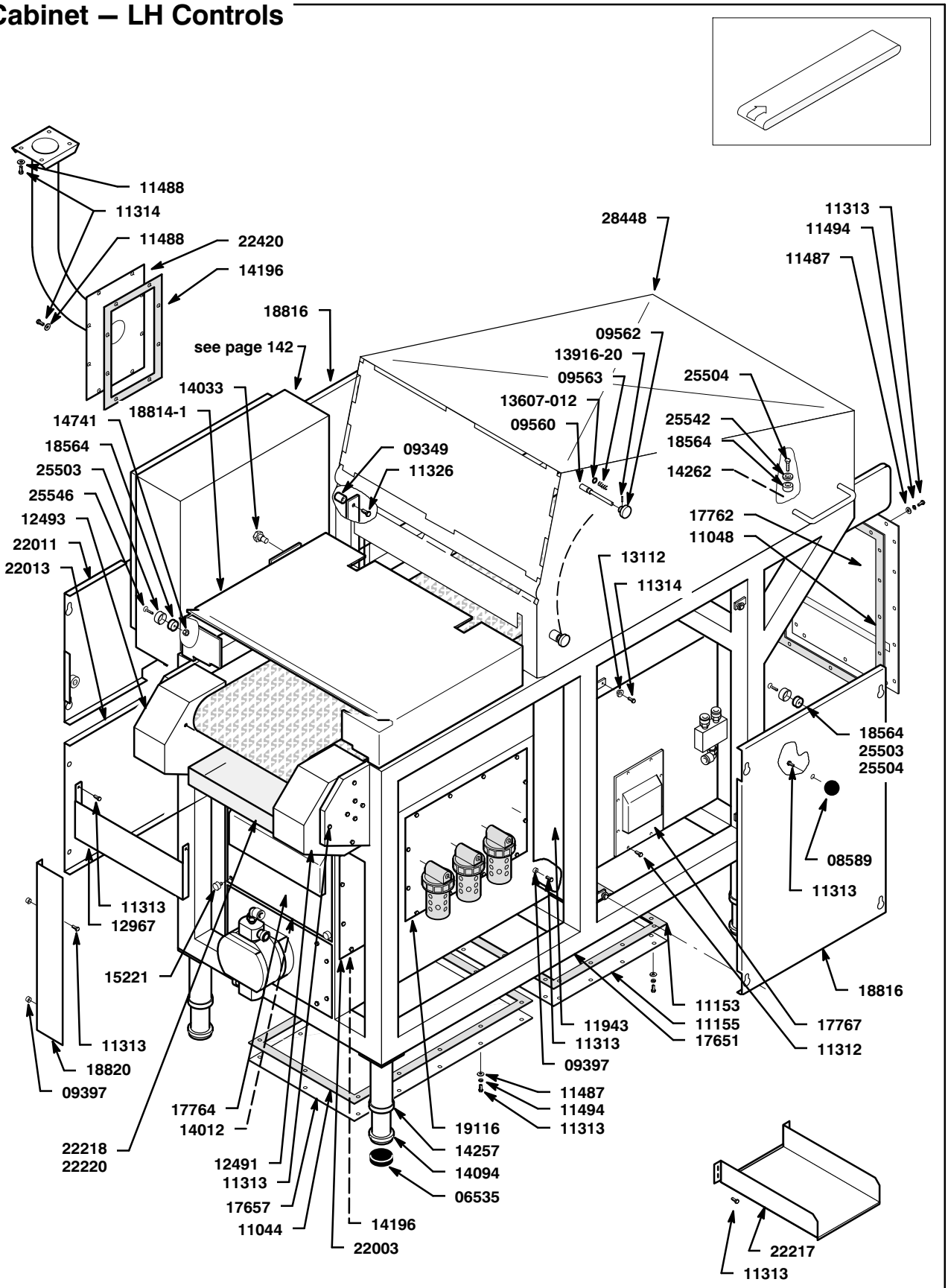




Cabinet — RH Controls

PART NO.	PART NAME
06535	PAD, resilient (4)
08589	KNOB (3)
09349	POST (2)
09397	SPACER (2)
09560	SHAFT (1)
09562	KNOB (1)
09563	SPRING (1)
11044	GASKET set (1)
11048	GASKET set (1)
11153	GASKET set (1)
11155	PANEL, bottom (1)
11312	SCREW, hex head, 1/4-20x1/2
11313	SCREW, hex head, 1/4-20x5/8
11314	SCREW, hex head, 1/4-20x3/4
11326	SCREW, hex head, 5/16-18x5/8
11487	WASHER, flat, 1/4
11488	WASHER, flat, 1/4
11494	WASHER, lock, 1/4
11943	GUARD (1)
12491	GUARD, RH (1)
12493	GUARD, LH (1)
12967	GUARD, front (1)
13112	BOSS (12)
13607-012	O-RING(1)
13916-20	PIN (1)
14012	GASKET (1)
14033	PIVOT (2)
14094	FOOT, adjustable (4)
14196	GASKET, bulk (quantity=feet)
14257	TUBE, jam (4)
14262	SEALANT, 10 oz
14741	NUT, lock, 8-32
15221	KNOB (2)
17651	FRAME(1)
17657	PANEL, bottom (1)
17664	TRAY, drain (1opt)
17666	TRAY, drain, long (1opt)
17757	TROUGH, drain (1)
17762	PANEL, end (1)
17764	COVER (1)
17767	COVER (2)
18564	MAGNET (5)
18803	BRACKET, mounting (1)
18814-1	GUARD, infeed (1)
18815	PANEL, side, LH (1)
18816	PANEL, side, RH (1)
18817	PANEL, side, LH (1)
18820	GUARD, lower infeed (1)
19116	PANEL, air (1)
22003	PLATE, blanking (1)
25503	SHELL (4)
25504	SCREW, flat security, 8-32x5/8 (4)
25542	WASHER (1)
25546	SCREW, flat security, 8-32x1 (1)
28448	HOOD (1)

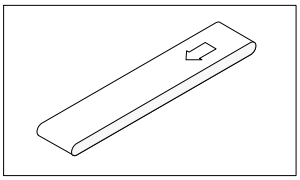
Cabinet — LH Controls



Cabinet — LH Controls

PART NO.	PART NAME
06535	PAD, resilient (4)
08589	KNOB (3)
09349	POST (2)
09397	SPACER (4)
09560	SHAFT (1)
09562	KNOB (1)
09563	SPRING (1)
11044	GASKET set (1)
11048	GASKET set (1)
11153	GASKET set (1)
11155	PANEL, bottom (1)
11312	SCREW, hex head, 1/4-20x1/2
11313	SCREW, hex head, 1/4-20x5/8
11314	SCREW, hex head, 1/4-20x3/4
11326	SCREW, hex head, 5/16-18x5/8
11487	WASHER, flat, 1/4
11488	WASHER, flat, 1/4
11494	WASHER, lock, 1/4
11943	GUARD (1)
12491	GUARD, RH (1)
12493	GUARD, LH (1)
12967	GUARD, front (1)
13112	BOSS (12)
13607-012	O-RING (1)
13916-20	PIN (1)
14012	GASKET (1)
14033	PIVOT (2)
14094	FOOT, adjustable (4)
14196	GASKET, bulk (quantity=feet)
14257	TUBE, jam (4)
14262	SEALANT, 10 oz
14741	NUT, lock, 8-32
15221	KNOB, hand (2)
17651	FRAME (1)
17657	PANEL, bottom (1)
17762	PANEL, end (1)
17764	COVER (1)
17767	COVER (2)
18564	MAGNET (7)
18814-1	GUARD, infeed (1)
18816	PANEL, side, rear (2)
18820	GUARD, lower infeed (1)
19116	PANEL, air (1)
22003	PLATE, blanking (1)
22011	PANEL side, front upper (1)
22013	PANEL, side, front lower (1)
22217	TROUGH, drain (1)
22218	TRAY, drain (1opt)
22220	TRAY, drain, long (1opt)
22420	BRACKET, mounting (1)
25503	SHELL (4)
25504	SCREW, flat security, 8-32x5/8 (4)
25542	WASHER (1)
25546	SCREW, flat security, 8-32x1 (1)
28448	HOOD (1)

Conveyor Drive

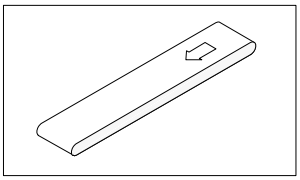


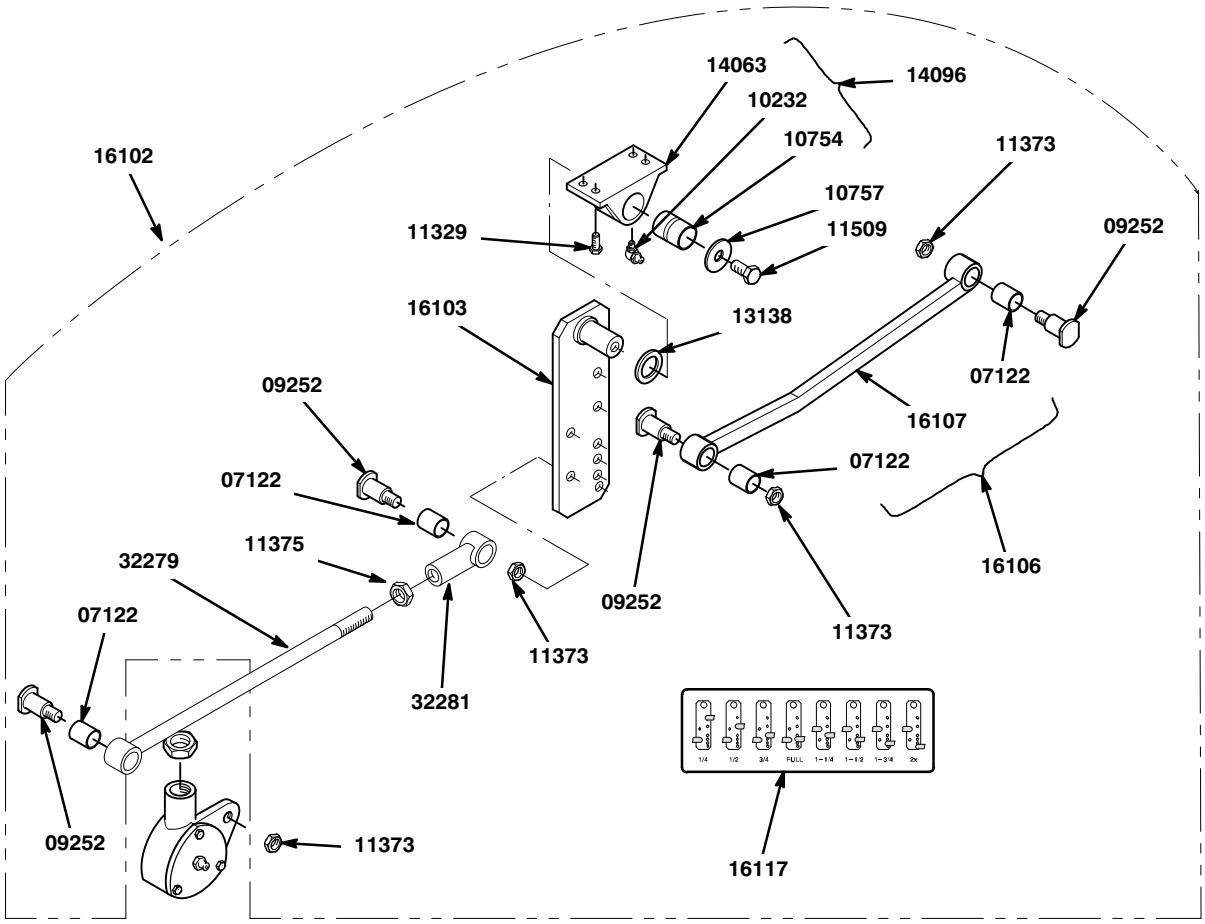
Conveyor Drive

PART NO.	PART NAME
02673	KEY, woodruff (2)
02864	FITTING, 1/4-28x1/8 NPT (3)
03107	KEY, square (1)
04922	WASHER, flat, 3/8 (2)
06400	SEAL (2)
06558	PULLEY, 84T (1)
06559	HUB (1)
06560	BEARING assembly (2)
06566	KEY, woodruff (3)
08673	BELT (1)
09419	FITTING, 90 degree, 1/8 NPT (7)
09450	NUT, jam, 7/8-14 (1)
09463	PULLEY, 18T (1/60Hz)
09965	ADAPTER, bulkhead (5)
10556	FITTING, grease (7)
10622	BEARING, sleeve (1)
10623	SPROCKET, 15T (1)
10624	SPROCKET, 15T (1)
10625	SPROCKET, 45T (1)
10627	BRACKET assembly (1)
10629	HOUSING, bearing (2)
10636	SPROCKET assembly (1)
10901	HOSE assembly (5)
10903	FITTING, swival (5)
10973	ARM, crank (2)
10974	HOUSING, bearing (1)
10975	HOUSING, bearing (1)
10976	CAP (2)
11056	BEARING (2)
11059	CHAIN (1)
11119	HOUSING assembly, bearing (1)
11120	HOUSING assembly, bearing (1)
11121	CRANKSHAFT (1)
11194	COUNTERSHAFT (1)
11209	NUT, bar (2)
11286	MOTOR, 1.5 hp, 575 V (1opt)
11312	SCREW, hex head, 1/4-20x1/2
11313	SCREW, hex head, 1/4-20x5/8
11321	SCREW, hex head, 1/4-20x2-1/4
11329	SCREW, hex head, 5/16-18x1
11339	SCREW, hex head, 3/8-16x1/2
11351	SCREW, hex head, 3/8-16x3-1/2
11358	SCREW, hex head, 1/2-13x2-1/2
11362	NUT, hex, 1/4-20
11363	NUT, hex, 5/16-18
11364	NUT, hex, 3/8-16
11366	NUT, hex, 1/2-13
11371	NUT, hex jam, 3/8-16
11375	NUT, hex, 5/8-11
11429	SETSCREW, socket, 1/2-20x3/8
11435	SETSCREW, socket, 5/16-18x1/2
11491	WASHER, flat, 3/8
11587	SCREW, hex head, 1/4-20x2-1/2
12476	PULLEY, 20T (1opt)
12477	PULLEY, 21T (1opt)
12834	HOUSING assembly, bearing (2)
12835	SEAL (2)
12836	BEARING, sleeve (2)
12837	BEARING assembly (2)
12838	BLOCK, bearing (2)
12839	BUSHING (2)
13145	PULLEY, 22T (1opt)
13607-140	O-RING (2)
14172	SCREW, hex head, 1/4-28x3/4
15368	PULLEY, 14T (1opt)
20888	MOTOR, 1.5 hp, 190-460 V (1opt)
27767	SETSCREW, socket, M8x10 mm
41981	SETCOLLAR (2)
47030	BRACKET (1)

YOU ARE HERE: ▶
CABINET
DRIVE—CONVEYOR
DRIVE—PUMP
CONVEYOR
HEAD
FLUID SYSTEM
ELECTRICAL SYSTEM
AIR SYSTEM
TAGS
MODEL 11
EXTRAS

Conveyor Stroke Linkage

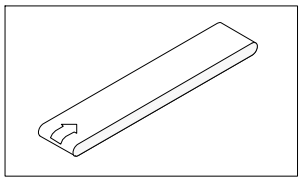


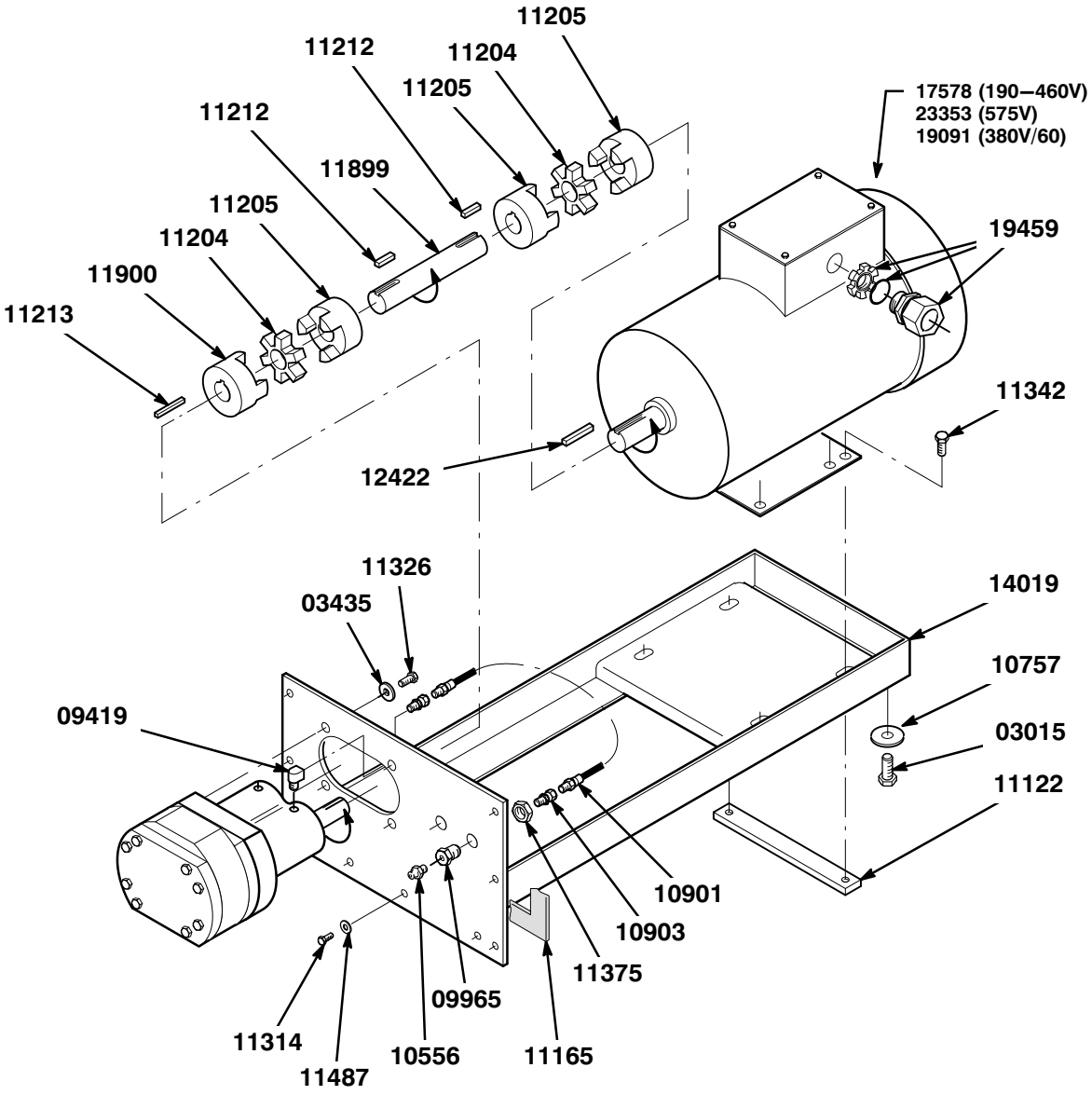


Conveyor Stroke Linkage

PART NO.	PART NAME
07122	BUSHING (4)
09252	SCREW, shoulder (4)
10232	FITTING, grease, 90° (1)
10754	BUSHING (1)
10757	WASHER (1)
13138	WASHER (1)
14063	BRACKET (1)
14096	BRACKET assembly (1)
16102	LINKAGE assembly (1)
16103	PLATE, pivot (1)
16106	ARM & BUSHING assembly (1)
16107	ARM (1)
16117	TAG (1)
32279	ROD (1)
32281	SLEEVE (1)

Pump Drive

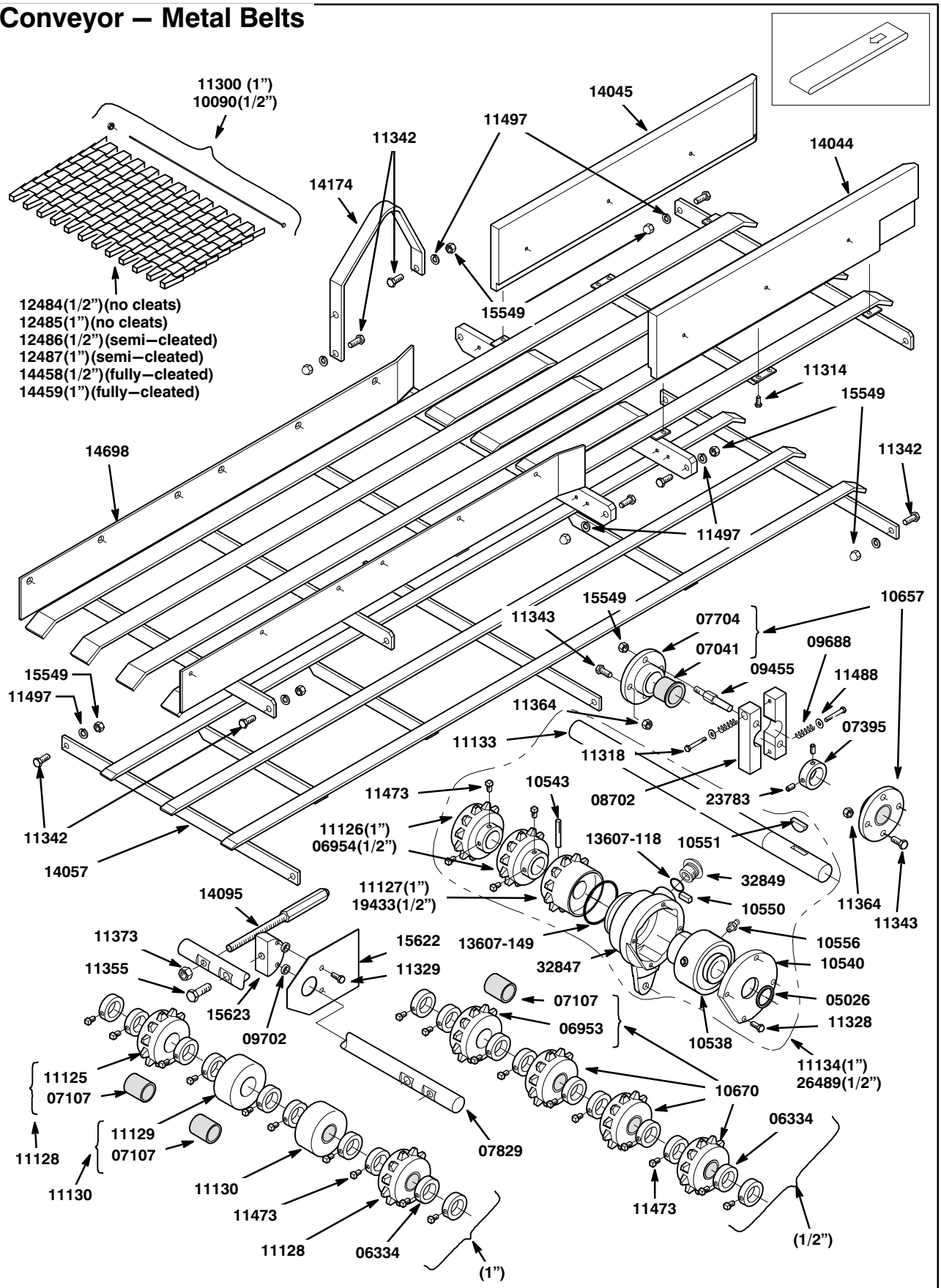



11205
11212
11204
11205
11212
11899
11205
11204
11900
11213
17578 (190–460V)
23353 (575V)
19091 (380V/60)
19459
11342
12422
11326
03435
14019
10757
09419
03015
11122
10901
10903
11375
09965
11314
11487
10556
11165

Pump Drive

PART NO.	PART NAME
03435	WASHER, flat (4)
09419	ELBOW, 90º (2)
09965	ADAPTER, bulkhead (2)
10556	FITTING, grease (2)
10757	WASHER, flat (4)
10901	HOSE assembly (2)
10903	FITTING, swival (4)
11122	NUT, bar (2)
11165	GASKET (1)
11204	SPIDER (2)
11205	COUPLING (3)
11212	KEY, square (2)
11213	KEY, square−sq (1)
11899	SHAFT (1)
11900	COUPLING (1)
12422	KEY, square (1)
14019	BRACKET, mounting, pump (1)
17578	MOTOR, 5 hp, 190-460 v (1opt)
19091	MOTOR, 5 hp, 380 V/60 (1opt)
19459	WATERTIGHT (1)
23353	MOTOR, 5 hp, 575 V (1opt)

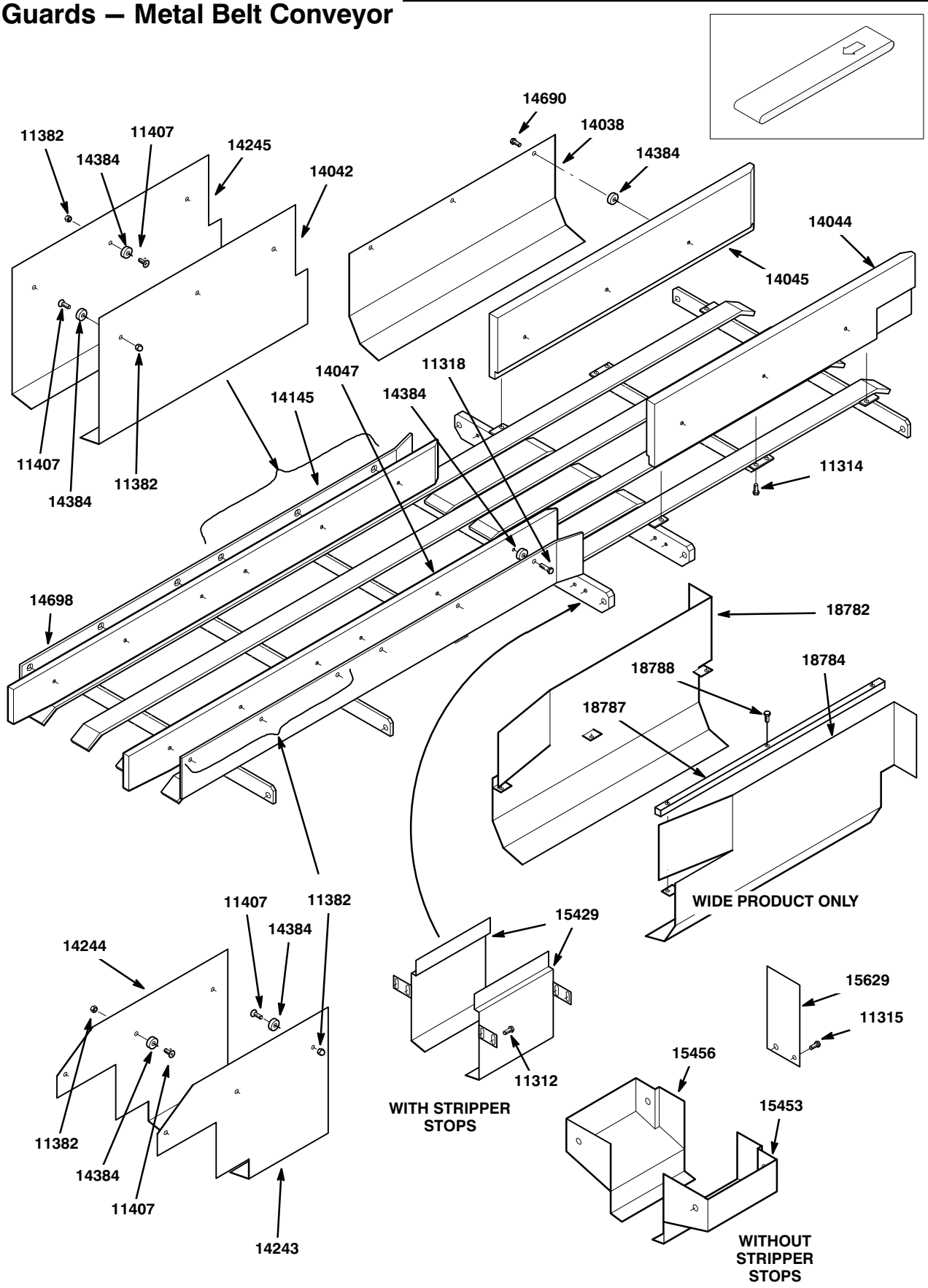
Conveyor — Metal Belts



Conveyor — Metal Belts

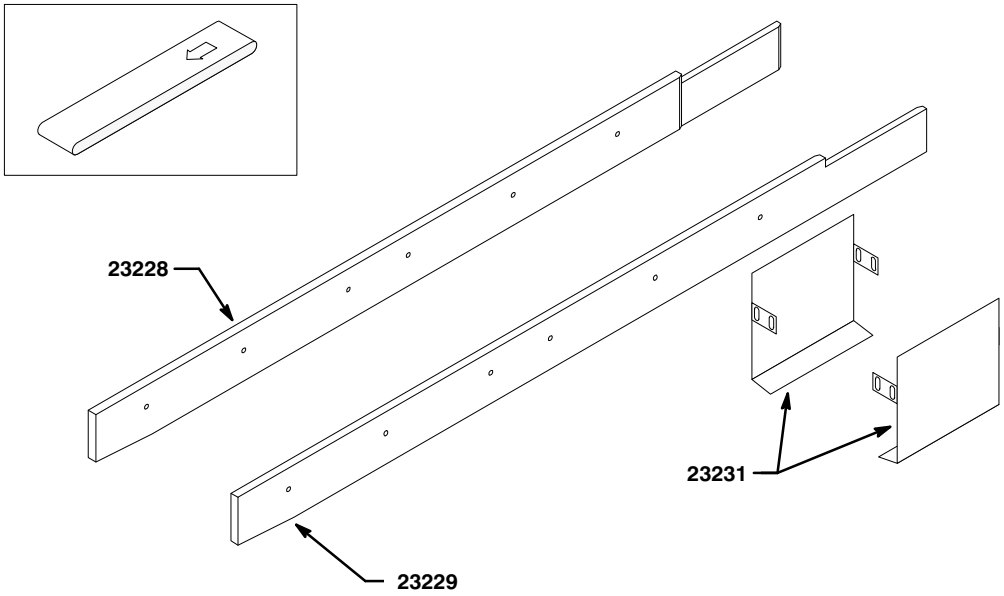
PART NO.	PART NAME
05026	SEAL (1)
06334	SET COLLAR (8)
06953	SPROCKET—½"P (4opt)
06954	SPROCKET—½"P (2opt)
07041	BUSHING (2)
07107	BUSHING (4)
07395	SET COLLAR (1)
07704	FLANGE (2)
07829	IDLER SHAFT (1)
08702	BRAKE BLOCK (2)
09455	STUD (1)
09688	SPRING (2)
09702	SPACER (4)
10090	CONNECTING ROD—½"P (1opt)
10538	CLUTCH (1)
10540	COVER (1)
10543	GROOVE PIN (1)
10550	KEY—SQ (1)
10551	KEY—WOODRUFF (1)
10556	GREASE FITTING (1)
10657	FLANGE BRG ASM (2)
10670	IDLER SPROC ASM—½"P (4opt)
11125	SPROCKET—1"P (2opt)
11126	SPROCKET—1"P (2opt)
11127	SPROCKET—1"P (1opt)
11128	IDLER SPROC ASM—1"P (2opt)
11129	IDLER ROLLER (2opt)
11130	IDLER ROLLER ASM (2opt)
11133	SHAFT—1"P (1opt)
11134	DRIVE SHAFT ASM—1"P (1opt)
11300	CONNECTING ROD—1"P (1opt)
12484-12.75	CONV BELT, ½"P no cleats (1opt)
12485-12.75	CONV BELT, 1"P no cleats (1opt)
12486-12.75	CONV BELT, ½"P semi-cleat (1opt)
12787-12.75	CONV BELT, 1"P semi-cleat (1opt)
13607-118	O-RING (1)
13607-149	O-RING (1)
14044	SIDE RAIL—LH FRONT (1opt)
14045	SIDE RAIL—RH FRONT (1opt)
14057	CONV SUPPORT—LOWER (1)
14095	ADJUSTMENT SCREW (2)
14174	STRAP (2)
14698	CONV SUPPORT—UPPER (1)
14458-12.75	CONV BELT, ½"P full-cleat (1opt)
14459-12.75	CONV BELT, 1"P full-cleat (1opt)
15622	GUARD (2)
15623	MTG BLOCK (2)
19433	SPROCKET—½"P (1opt)
26489	DRIVE SHAFT ASM—½"P (1opt)
32847	HSG (1)
32849	CAP, CLUTCH HSG (1)

Guards — Metal Belt Conveyor

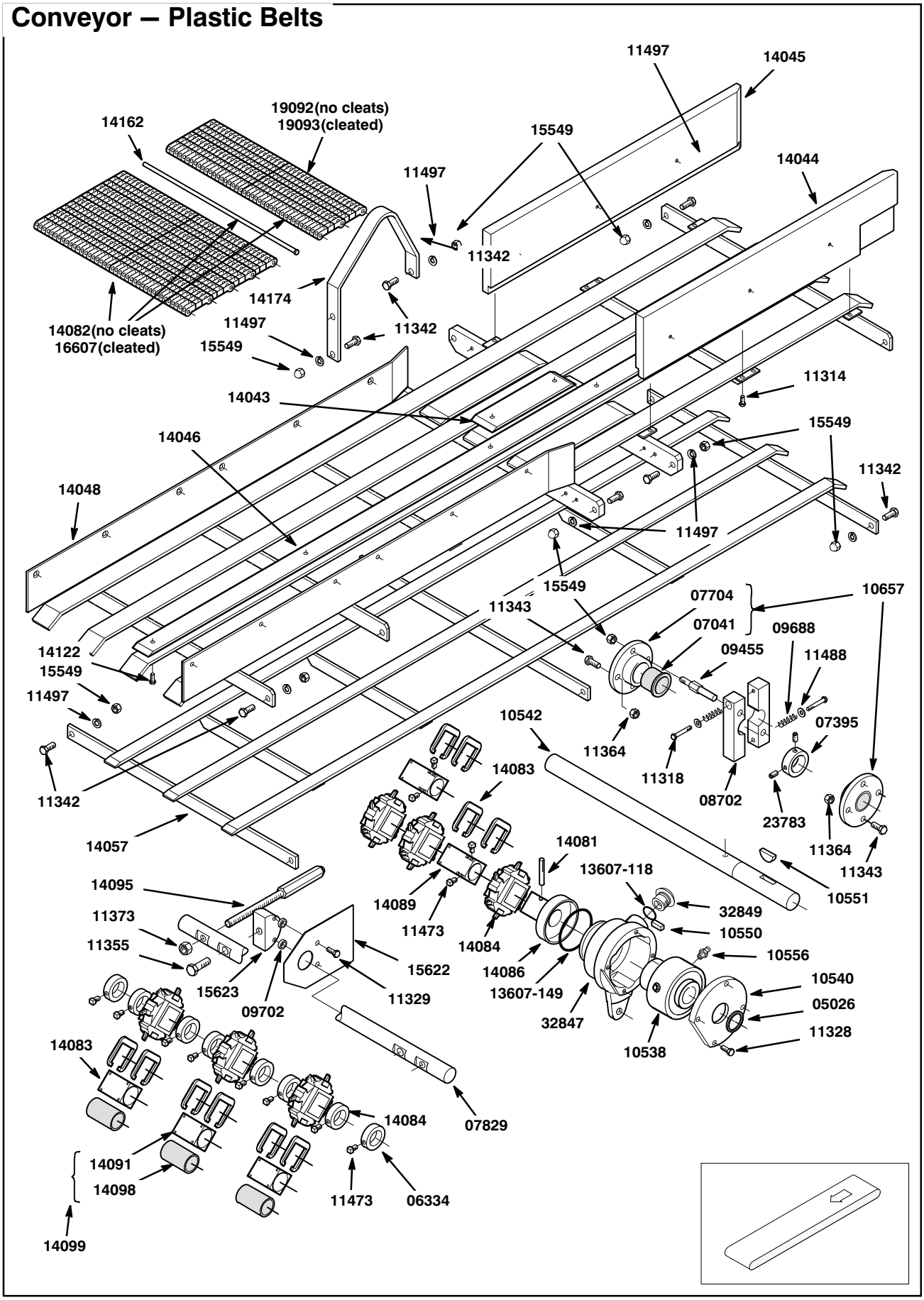


Guards — Metal Belt Conveyor

PART NO.	PART NAME	PART NO.	PART NAME
14038	FRONT CONV GUARD (2opt)	15429	GUARD—W/ STOPS (2opt)
14042	REAR CONV GUARD—LH (1)	15453	GUARD—LH—W/O STOPS (1opt)
14044	SIDE RAIL—LH FRONT (1opt)	15456	GUARD—RH—W/O STOPS (1opt)
14045	SIDE RAIL—RH FRONT (1opt)	15629	GUARD (1)
14047	SIDE RAIL—LH REAR (1opt)	18782	FRONT GUARD—RH (1opt)
14145	SIDE RAIL—RH REAR (1opt)	18784	FRONT GUARD—LH (1opt)
14243	GUARD—LH (1)	18787	SPACER (2opt)
14244	GUARD—RH (1)	18788	HX HD SCR, 1/4-20x7/8 (6opt)
14245	REAR CONV GUARD—RH (1)	23228	SIDE RAIL, RH rear (1 /23231)
14384	SPACER (12+6opt)	23229	SIDE RAIL, LH rear (1 /23231)
14698	CONV SUPPORT—UPPER (1)	23231	GUARD, w/stops (2 /23228,23229)



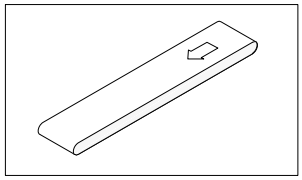
Conveyor — Plastic Belts

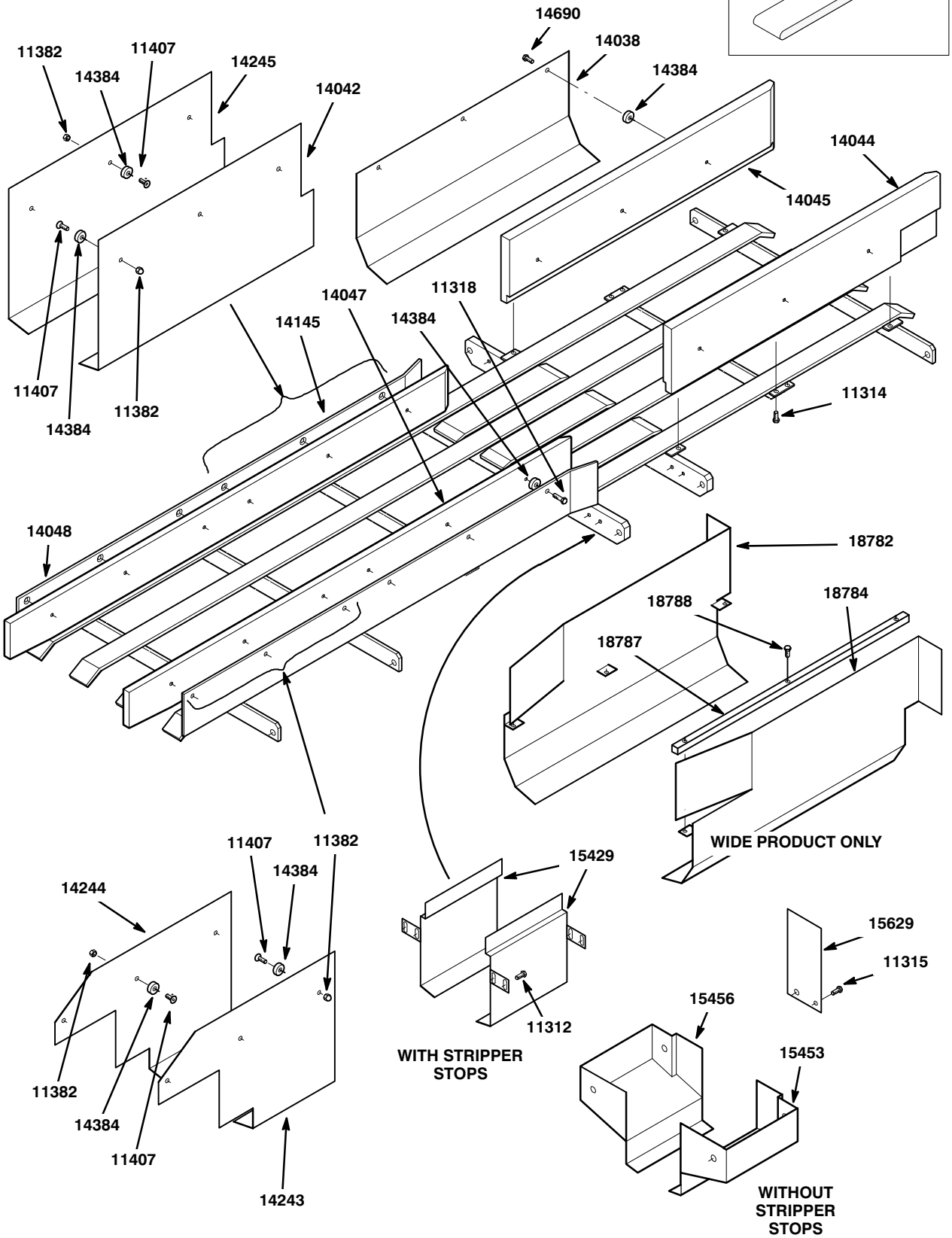


Conveyor — Plastic Belts

PART NO.	PART NAME
05026	SEAL (1)
06334	SET COLLAR (8)
07041	BUSHING (2)
07395	SET COLLAR (1)
07704	FLANGE (2)
07829	IDLER SHAFT (1)
08702	BRAKE BLOCK (2)
09455	STUD (1)
09688	SPRING (2)
09702	SPACER (4)
10538	CLUTCH—CLUTCH (1)
10540	COVER (1)
10542	SHAFT (1)
10550	KEY—SQ (1)
10551	KEY—WOODRUFF (1)
10556	GREASE FITTING (1)
10657	FLANGE BRG ASM (2)
13607-118	O-RING (1)
13607-149	O-RING (1)
14043	SKID PLATE (3)
14044	SIDE RAIL—LH FRONT (1)
14045	SIDE RAIL—RH FRONT (1)
14046	SKID RAIL (4)
14048	CONV SUPPORT—UPPER (1)
14057	CONV SUPPORT—LOWER (1)
14081	PIN—GROOVE (1)
14082	CONV BELT ASM—NON CLEATED (1opt)
14083	RETAINING RING (10)
14084	SPROCKET—PLASTIC (6)
14086	HUB—DRIVE SPROCKET (1)
14089	HUB—FIXED (2)
14091	HUB—IDLER SPROCKET (3)
14095	ADJUSTMENT SCREW (2)
14098	BUSHING (3)
14099	HUB ASM—IDLER SPROCKET (3)
14122	NYLON BOLT (26)
14162	HINGE ROD (1)
14174	STRAP (2)
15622	GUARD (2)
15623	MTG BLOCK (2)
16607	CONV BELT ASM—CLEATED (1opt)
19092	CONV BELT MODULE—NON CLEATED (1opt)
19093	CONV BELT MODULE—CLEATED (1opt)
32847	HSG (1)
32849	CAP, CLUTCH HSG (1)

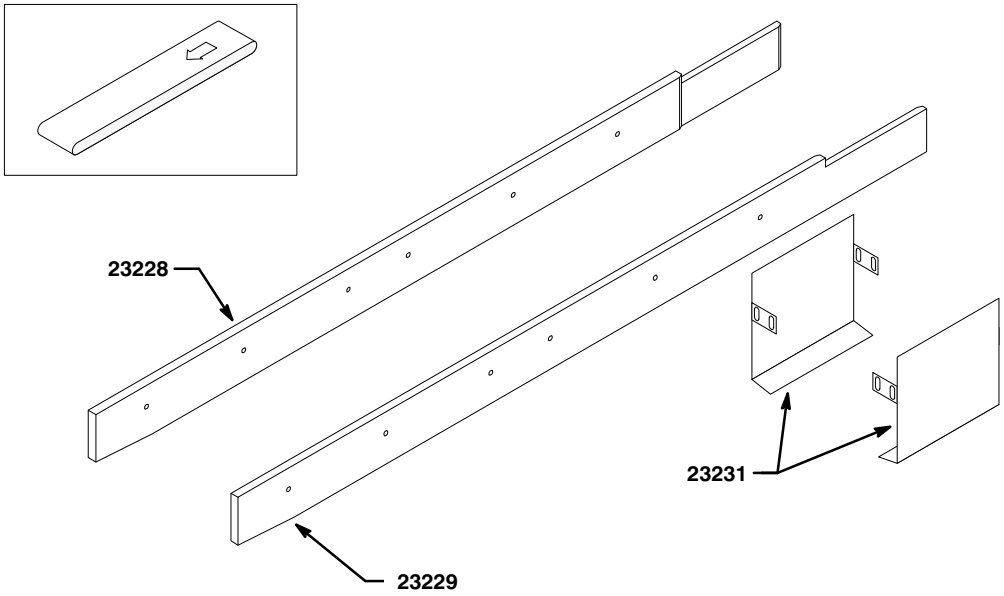
Guards — Plastic Belt Conveyor



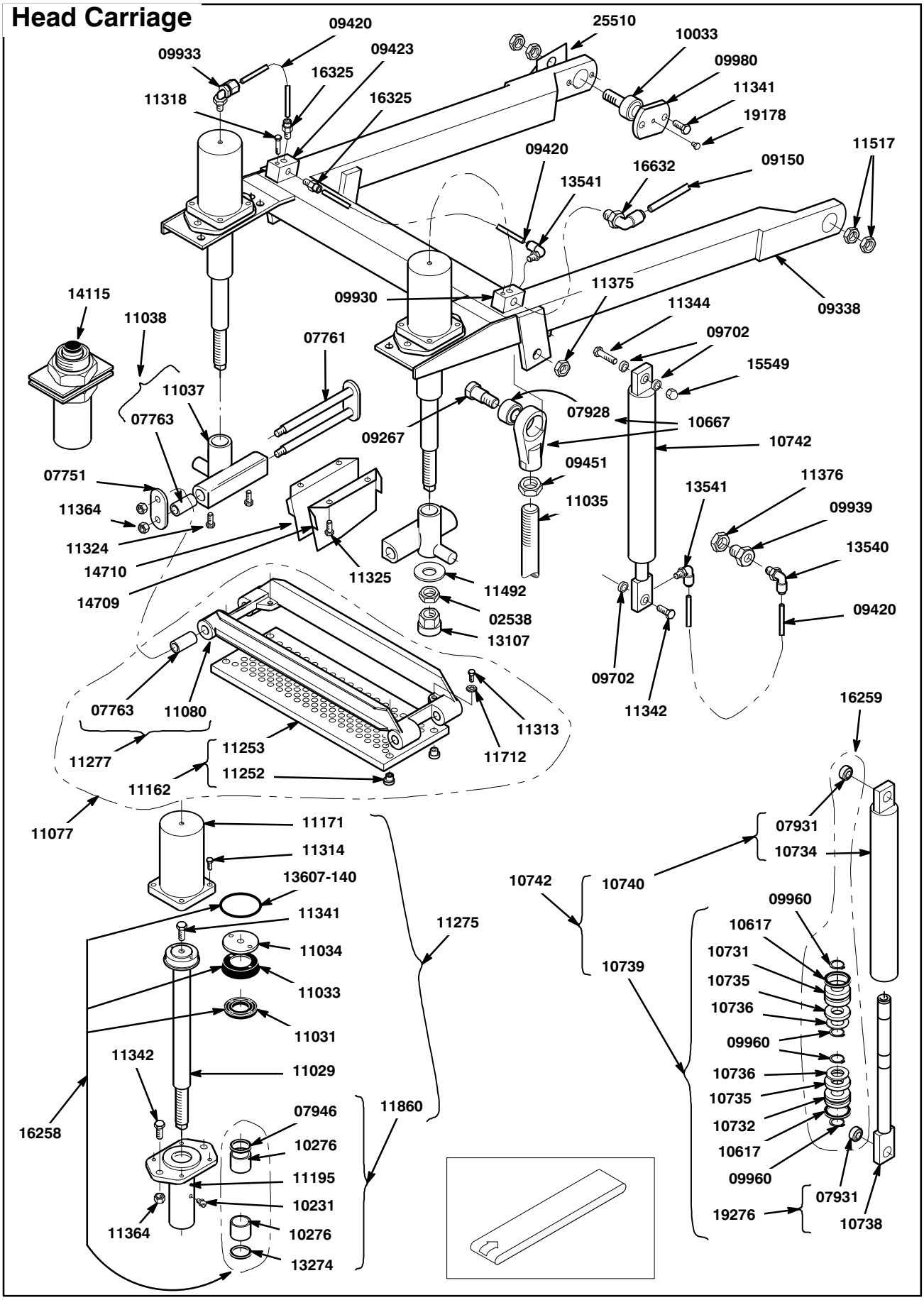


Guards — Plastic Belt Conveyor

PART NO.	PART NAME	PART NO.	PART NAME
14038	FRONT CONV GUARD (2)	15429	GUARD, w/stops (2 /14047, 14145)
14042	REAR CONV GUARD–LH (1)	15453	GUARD–LH–W/O STOPS (1opt)
14044	SIDE RAIL–LH FRONT (1)	15456	GUARD–RH–W/O STOPS (1opt)
14045	SIDE RAIL–RH FRONT (1)	15629	GUARD (1)
14047	SIDE RAIL–LH REAR (1opt)	18782	GUARD–RH FRONT (1opt)
14048	CONV SUPPORT–UPPER (1)	18784	GUARD–LH FRONT (1opt)
14145	SIDE RAIL–RH REAR (1opt)	18787	SPACER (2opt)
14243	GUARD–LH (1)	18788	HX HD SCR, 1/4-20x7/8 (6opt)
14244	GUARD–RH (1)	23228	SIDE RAIL, RH rear (1 /23231)
14245	REAR CONV GUARD–RH (1)	23229	SIDE RAIL, LH rear (1 /23231)
14384	SPACER (16+12opt)	23231	GUARD, w/stops (2 /23228, 23229)



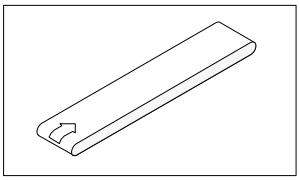
Head Carriage



Head Carriage

PART NO.	PART NAME	PART NO.	PART NAME
07751	LINK (2)	11029	PUSH ROD (2)
07761	PIVOT LINK (2)	11031	CUSHION (2)
07763	BUSHING (8)	11033	PISTON CUP (2)
07928	BRG (2)	11034	WASHER (2)
07931	BRG (4)	11035	TIE ROD (2)
07946	SEAL (2)	11037	YOKE (2)
09150	TUBE, clear, 3/8" (quantity=feet)	11038	STPR YOKE ASM (2)
09267	SHOULDER BOLT (2)	11077	STPR ASM (1)
09338	FRAME–HEAD CARRIAGE (1)	11080	FRAME–STPR (1)
09420	TUBE, clear, 1/4" (quantity=feet)	11162	STPR PLATE ASM (1)
09423	BLOCK (1)	11171	COVER (2)
09451	NUT–LH (2)	11195	GUIDE (2)
09702	SPACER (6)	11252	NUT (4)
09930	BLOCK (1)	11253	PLATE–STPR (1)
09931	CONNECTOR (3)	11275	CYL–STPR (2)
09933	ELBOW (2)	11277	FRAME ASM–STPR (1)
09939	ADAPTER–BULKHEAD (2)	11860	CYL HSG ASM (2)
09960	SNAP RING (8)	13107	IMPACT PAD (2opt)
09980	CAP (2)	13274	ROD WIPER (2)
10033	PIVOT SHAFT (2)	13540	ELBOW–90°–1/4"NPT (2)
10276	BUSHING (4)	13541	ELBOW–90°–1/8"NPT (3)
10617	SEAL (4)	13607-140	O-RING (2)
10667	ROD END ASM (2)	14115	STPR STOP ASM (2opt)
10731	PISTON–UPPER (4)	14709	STPR GUARD–RH (1opt)
10732	PISTON–LOWER (2)	14710	STPR GUARD–LH (1opt)
10734	CYL ASM (2)	16258	REPAIR KIT–STPR CYL (1opt)
10735	OILER PAD (4)	16259	REPAIR KIT–ASSIST CYL (1opt)
10736	WASHER (4)	16325	FITTING–1/8"NPT (3)
10738	PISTON ROD (2)	16632	ELBOW–90°–1/4"NPT (1)
10739	PISTON ROD ASM (2)	19178	PLUG (2)
10740	CYL HSG ASM (2)	19276	ROD & BRG ASM (2)
10742	ASSIST CYL (2)	25510	GUIDE (1)

Head & Valve — RB10/15

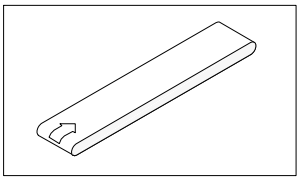


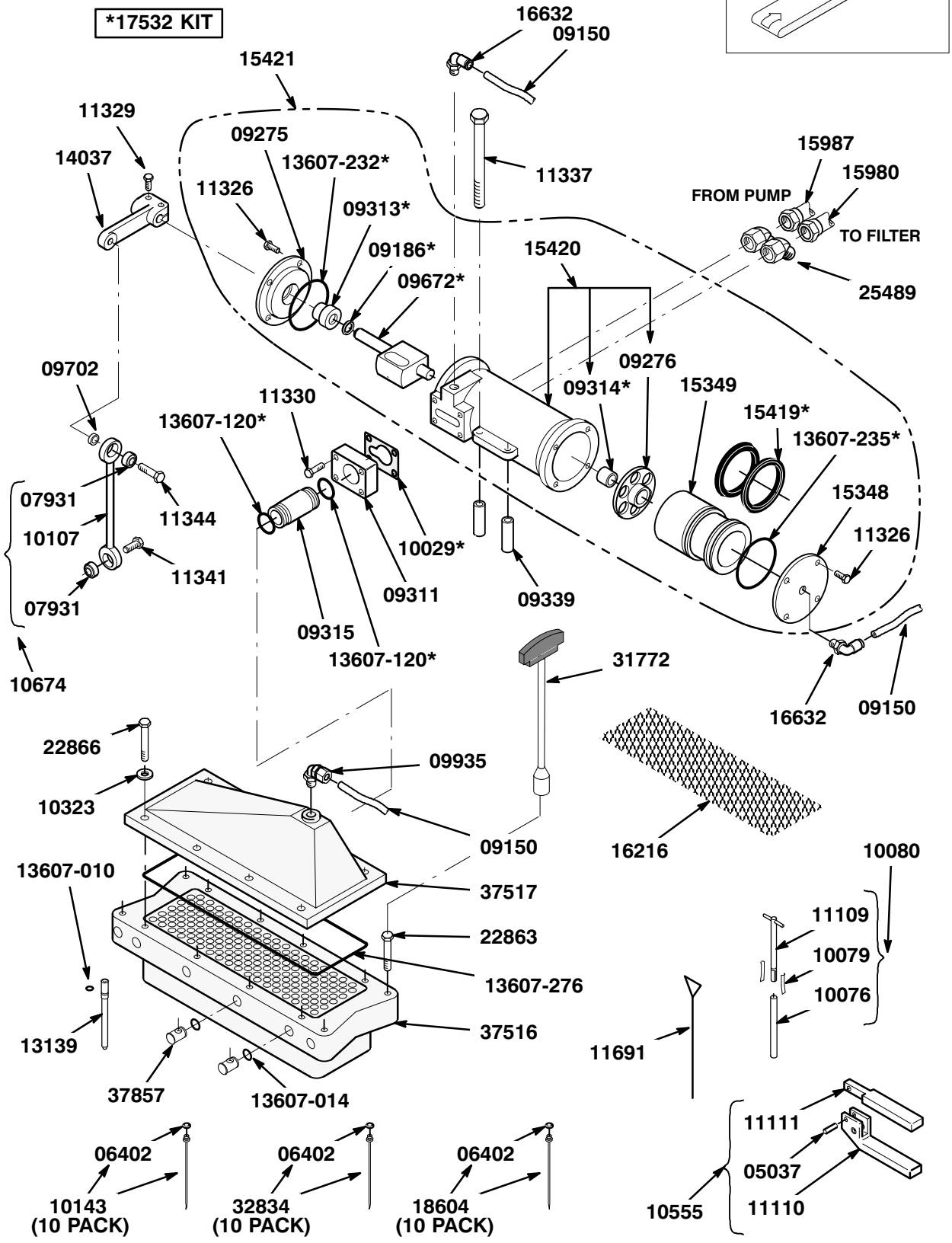
Head & Valve — RB10/15

PART NO.	PART NAME
05037	PIN (1)
06402	SEAL (175)
07376	CONNECTOR (2)
07931	BRG (2)
08685	SEAL (2)
09150	TUBE, 3/8" (quantity=feet)
09186	QUAD RING (1)
09275	CAP (1)
09276	PLATE (1)
09311	OUTLET FLANGE (1)
09312	PISTON (1)
09313	BUSHING (1)
09314	BUSHING (1)
09315	CROSS PIPE (1)
09325	COVER (1)
09339	SPACER (2)
09672	VALVE INSERT (1)
09702	SPACER (1)
09935	ELBOW (1)
10029	GASKET (1)
10076	TUBE (1)
10079	WIRE (2)
10080	NEEDLE PULLER ASM
10107	CONNECTING LINK (1)
10143	NEEDLE ASM, HYPO, .025 WALL, 10 PACK (opt)
10177	HOSE assembly (1)
10323	WASHER (8)
10555	NEEDLE STAIGHTENER (1)
10674	CONNECTING LINK ASM (1)
11081	VALVE BODY (1)
11109	STEM (1)
11110	HANDLE (1)
11111	LEVER (1)
11184	VALVE BODY ASM (1)
11185	CONTROL VALVE ASM (1)
11326	HX HD SCR, 5/16-18 x 5/8 (8)
11329	HX HD SCR, 5/16-18 x 1 (2)
11330	HX HD SCR, 5/16-18 x 1-1/4 (4)
11337	HX HD SCR, 5/16-18 x 3-1/4 (2)
11341	HX HD SCR, 3/8-16 x 3/4 (1)
11344	HX HD SCR, 3/8-16 x 1-1/2 (1)
11691	NEEDLE CLEANER (1)
13139	NEEDLE PLUG (opt—as req'd)
13607-010	O-RING (opt—as req'd)
13607-014	O-RING (12)
13607-120	O-RING (2)
13607-232	O-RING (1)
13607-233	O-RING (1)
13607-276	O-RING (1)
14037	CRANK ARM (1)
14123	HOSE assembly (1)
16216	SCREEN (1opt)
16632	ELBOW—90°—1/4"NPT (2)
17531	KIT—RB10/15 VALVE
18604	NEEDLE ASM, SIDE PORT, 10 PACK (opt)
22863	HX HD SCR, M10 x 25mm (4)
22866	HX HD SCR, M10 x 40mm (8)
25488	ELBOW—45°—SWIVEL (2)
31772	WRENCH, "T" HANDLE (1)
32834	NEEDLE ASM, HYPO, .020 WALL, 10 PACK (opt)
37516	INJECTOR HEAD (1)
37517	MANIFOLD (1)
37857	CROSS PIN, HEAD (12)

YOU ARE HERE: ▶
CABINET
DRIVE—CONVEYOR
DRIVE—PUMP
CONVEYOR
HEAD
FLUID SYSTEM
ELECTRICAL SYSTEM
AIR SYSTEM
TAGS
MODEL 11
EXTRAS

Head & Valve — RB30

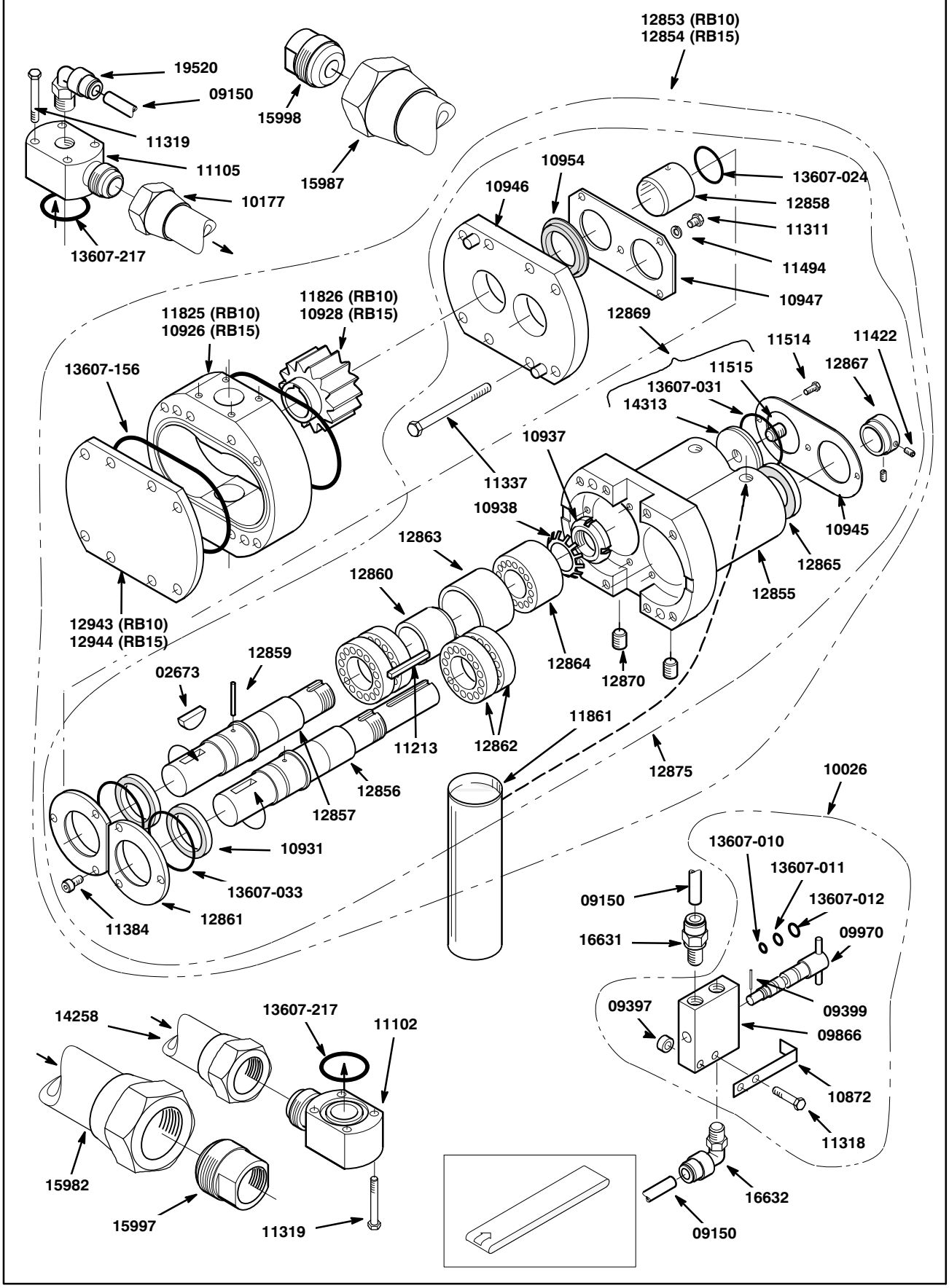




Head & Valve — RB30

PART NO.	PART NAME
05037	PIN (1)
06402	SEAL (175)
07931	BRG (2)
09150	TUBING—3/8" (specify quantity in feet)
09186	QUAD RING (1)
09275	CAP (1)
09276	PLATE (1)
09311	OUTLET FLANGE (1)
09313	BUSHING (1)
09314	BUSHING (1)
09315	CROSS PIPE (1)
09339	SPACER (2)
09672	VALVE INSERT (1)
09702	SPACER (1)
09935	ELBOW (1)
10029	GASKET (1)
10076	TUBE (1)
10079	WIRE (2)
10080	NEEDLE PULLER ASM
10107	CONNECTING LINK (1)
10143	NEEDLE ASM, HYPO, .025 WALL, 10 PACK (opt)
10323	WASHER (8)
10555	NEEDLE STAIGHTENER (1)
10674	CONNECTING LINK ASM (1)
11109	STEM (1)
11110	HANDLE (1)
11111	LEVER (1)
11326	HX HD SCR, 5/16-18 x 5/8 (8)
11329	HX HD SCR, 5/16-18 x 1 (2)
11330	HX HD SCR, 5/16-18 x 1-1/4 (4)
11337	HX HD SCR, 5/16-18 x 3-1/4 (2)
11341	HX HD SCR, 3/8-16 x 3/4 (1)
11344	HX HD SCR, 3/8-16 x 1-1/2 (1)
11691	NEEDLE CLEANER (1)
13139	NEEDLE PLUG (opt—as req'd)
13607-010	O-RING (opt—as req'd)
13607-014	O-RING (12)
13607-120	O-RING (2)
13607-232	O-RING (1)
13607-235	O-RING (1)
13607-276	O-RING (1)
14037	CRANK ARM (1)
15348	COVER (1)
15349	PISTON (1)
15419	SEAL (2)
15420	VALVE BODY ASM (1)
15421	CONTROL VALVE ASM (1)
15980	HOSE assembly (1)
15987	HOSE assembly (1)
16216	SCREEN (1opt)
16632	ELBOW—90°—1/4"NPT (2)
17532	KIT—RB30 VALVE
18604	NEEDLE ASM, SIDE PORT, 10 PACK (opt)
22863	HX HD SCR, M10 x 25mm (4)
22866	HX HD SCR, M10 x 40mm (8)
25489	ELBOW—45°—SWIVEL (2)
31772	WRENCH, "T" HANDLE (1)
32834	NEEDLE ASM, HYPO, .020 WALL, 10 PACK (opt)
37516	INJECTOR HEAD (1)
37517	MANIFOLD (1)
37857	CROSS PIN, HEAD (12)

Pump – RB10/15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12854 (RB15)
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11494
10947
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10928 (RB15)
11825 (RB10)
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13607-156
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13607-031
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11337
10938
10945
12863
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12860
12855
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12944 (RB15)
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02673
12864
12870
11861
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12875
10026
12856
12857
10931
13607-033
11384
12861
13607-010
13607-011
13607-012
09150
16631
09970
09397
09399
09866
10872
11318
14258
13607-217
11102
15982
15997
11319
16632
09150

Pump – RB10/15

PART NO.	PART NAME
02673	KEY–WOODRUFF (2)
09150	TUBING–3/8" (specify quantity in feet)
09397	SPACER (2)
09399	PIN (1)
09866	VALVE BODY (1)
09970	VALVE STEM (1)
10026	BLEED VALVE ASM (1)
10177	HOSE assembly (1opt)
10872	STOP (1)
10926	HSG–GEAR–RB15 (1opt)
10928	GEAR–RB15 (2opt)
10931	SEAL (2)
10937	LOCK NUT (2)
10938	LOCK WASHER (2)
10945	SEAL PLATE (1)
10946	SEAL PLATE ASM (1)
10947	SEAL CAP (1)
10954	SEAL (2)
11102	INLET (1)
11105	OUTLET (1)
11213	KEY–SQ (1)
11515	PIPE PLUG (1)
11825	HSG–GEAR–RB10 (1opt)
11826	GEAR–RB10 (2opt)
11861	GREASE–12 OZ TUBE
12853	PUMP ASM–RB10 (1opt)
12854	PUMP ASM–RB15 (1opt)
12855	HSG–DRIVE (1)
12856	DRIVE SHAFT (1)
12857	IDLER SHAFT (1)
12858	SEAL SLEEVE (2)
12859	PIN (2)
12860	INNER SPACER (2)
12861	GLAND (2)
12862	ROLLER BRG (4)
12863	OUTER SPACER (2)
12864	ROLLER BRG (2)
12865	SEAL (1)
12867	SLEEVE (1)
12869	PLUG ASM (1)
12870	RELIEF PORT (2)
12875	BRG HSG ASM (1)
12943	COVER–RB10 (1opt)
12944	COVER–RB15 (1opt)
13607-010	O-RING (1)
13607-011	O-RING (1)
13607-012	O-RING (1)
13607-024	O-RING (2)
13607-031	O-RING (1)
13607-033	O-RING (2)
13607-156	O-RING (2)
13607-217	O-RING (2)
14258	HOSE assembly (1opt)
14313	PLUG DETAIL (1)
15982	HOSE assembly (1opt)
15987	HOSE assembly (1opt)
15997	ADAPTER (1opt)
15998	ADAPTER (1opt)
16631	FITTING (2)
16632	ELBOW (1)
19520	ELBOW (1)

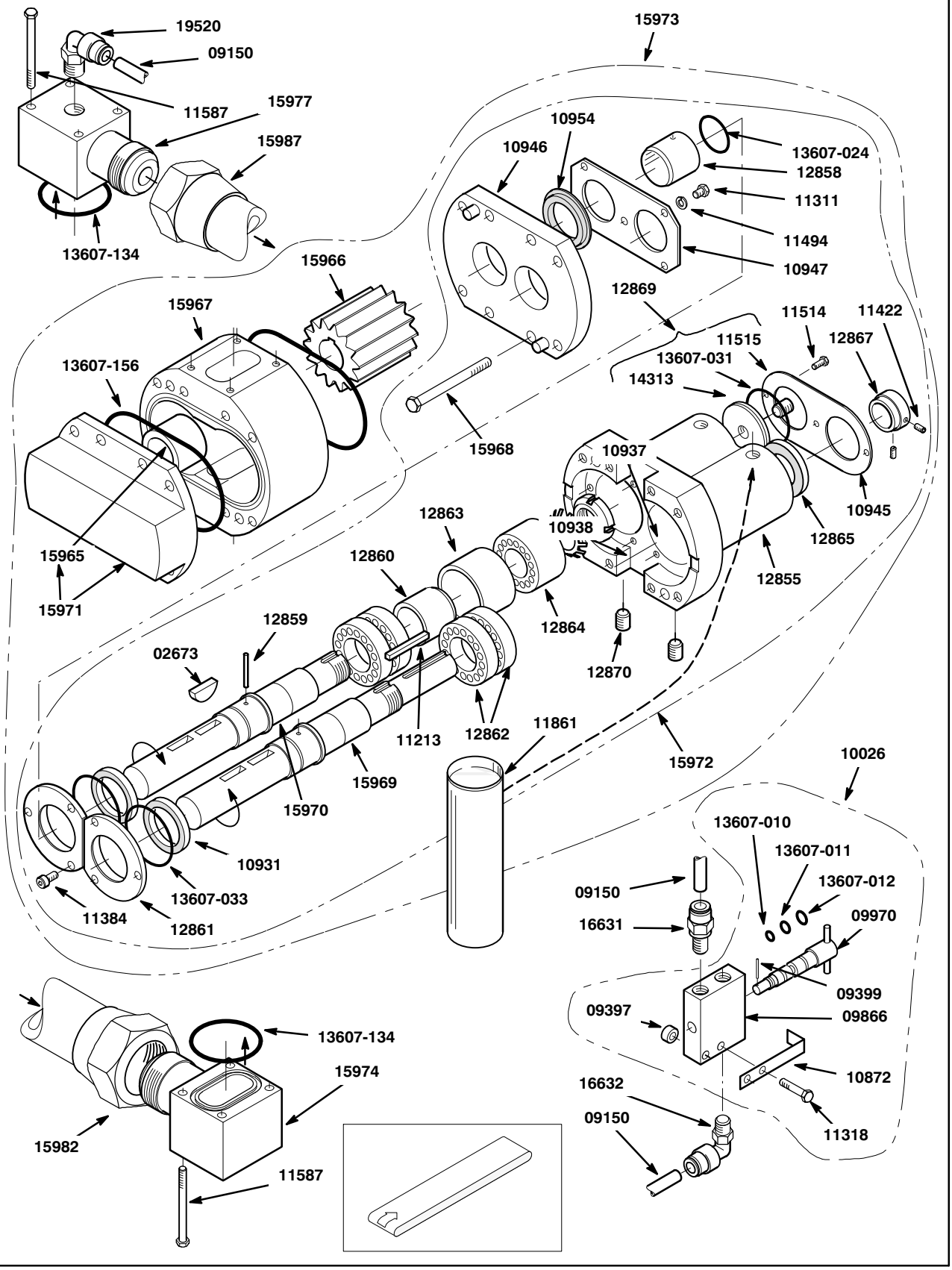
12877-10 OR 12877-15 PUMP OVERHAUL KIT (includes the following)

10928	GEAR–RB15 (2opt)
10931	SEAL (2)
10954	SEAL (2)
11826	GEAR–RB10 (2opt)
12858	SEAL SLEEVE (2)
12859	PIN (2)
12862	ROLLER BRG (4)
12864	ROLLER BRG (2)
12865	SEAL (1)
12867	SLEEVE (1)
13607-024	O-RING (2)
13607-031	O-RING (1)
13607-033	O-RING (2)
13607-156	O-RING (2)

15923 SEAL KIT – PUMP & VALVE (includes the following)

08685	SEAL (2)
09186	QUAD RING (1)
10954	SEAL (2)
13607-010	O-RING (1)
13607-011	O-RING (1)
13607-012	O-RING (1)
13607-024	O-RING (2)
13607-031	O-RING (1)
13607-033	O-RING (2)
13607-120	O-RING (2)
13607-156	O-RING (2)
13607-217	O-RING (2)
13607-232	O-RING (1)
13607-233	O-RING (1)
13607-276	O-RING (1)

Pump – RB30


19520
09150
11587
15977
15987
13607-134
15973
10954
10946
13607-024
12858
11311
11494
10947
15966
15967
13607-156
12869
11514
11422
11515
12867
13607-031
14313
15968
10937
10945
12865
12863
10938
12860
12855
15965
15971
12859
02673
12864
12870
11213
12862
11861
15972
10026
15969
15970
10931
13607-033
11384
12861
13607-010
13607-011
13607-012
09150
09970
16631
09399
09397
09866
10872
16632
09150
11318
13607-134
15974
15982
11587

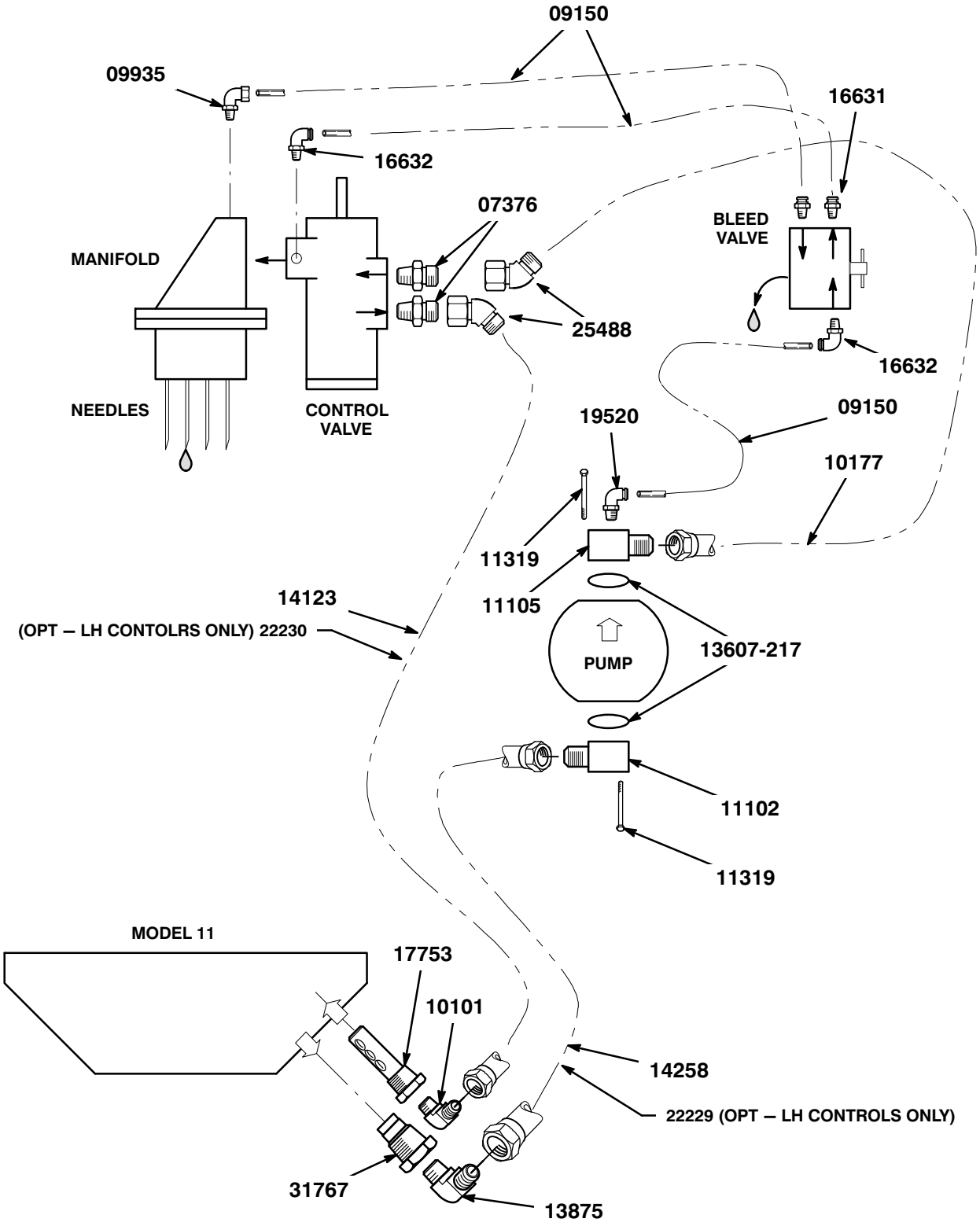
Pump – RB30

PART NO.	PART NAME
02673	KEY–WOODRUFF (2)
09150	TUBING–3/8" (specify quantity in feet)
09397	SPACER (2)
09399	PIN (1)
09866	VALVE BODY (1)
09970	VALVE STEM (1)
10026	BLEED VALVE ASM (1)
10872	STOP (1)
10931	SEAL (2)
10937	LOCK NUT (2)
10938	LOCK WASHER (2)
10945	SEAL PLATE (1)
10946	SEAL PLATE ASM (1)
10947	SEAL CAP (1)
10954	SEAL (2)
11213	KEY–SQ (1)
11515	PIPE PLUG (1)
11861	GREASE–12 OZ TUBE
12855	DRIVE HSG (1)
12858	SEAL SLEEVE (2)
12859	PIN (2)
12860	INNER SPACER (2)
12861	GLAND (2)
12862	ROLLER BRG (4)
12863	OUTER SPACER (2)
12864	ROLLER BRG (2)
12865	SEAL (1)
12867	SLEEVE (1)
12869	PLUG ASM (1)
12870	RELIEF PORT (2)
13607-010	O-RING (1)
13607-011	O-RING (1)
13607-012	O-RING (1)
13607-024	O-RING (2)
13607-031	O-RING (1)
13607-033	O-RING (2)
13607-134	O-RING (2)
13607-156	O-RING (2)
14313	PLUG DETAIL (1)
15965	BUSHING (2)
15966	GEAR (2)
15967	HSG–GEAR (1)
15968	HX HD SCR (8)
15969	DRIVE SHAFT (1)
15970	IDLER SHAFT (1)
15971	PUMP COVER ASM (1)
15972	BRG HSG ASM (1)
15973	PUMP ASM (1)
15974	INLET (1)
15977	OUTLET (1)
15982	HOSE assembly (1)
15987	HOSE assembly (1)
16631	FITTING (2)
16632	ELBOW (1)
19520	ELBOW (1)

12877	PUMP OVERHAUL KIT (includes the following)
10931	SEAL (2)
10954	SEAL (2)
12858	SEAL SLEEVE (2)
12859	PIN (2)
12862	ROLLER BRG (4)
12864	ROLLER BRG (2)
12865	SEAL (1)
12867	SLEEVE (1)
13607-024	O-RING (2)
13607-031	O-RING (1)
13607-033	O-RING (2)
13607-156	O-RING (2)
15965	BUSHING (2)
15966	GEAR (2)

YOU ARE HERE: ▶
CABINET
DRIVE–CONVEYOR
DRIVE–PUMP
CONVEYOR
HEAD
FLUID SYSTEM
ELECTRICAL SYSTEM
AIR SYSTEM
TAGS
MODEL 11
EXTRAS

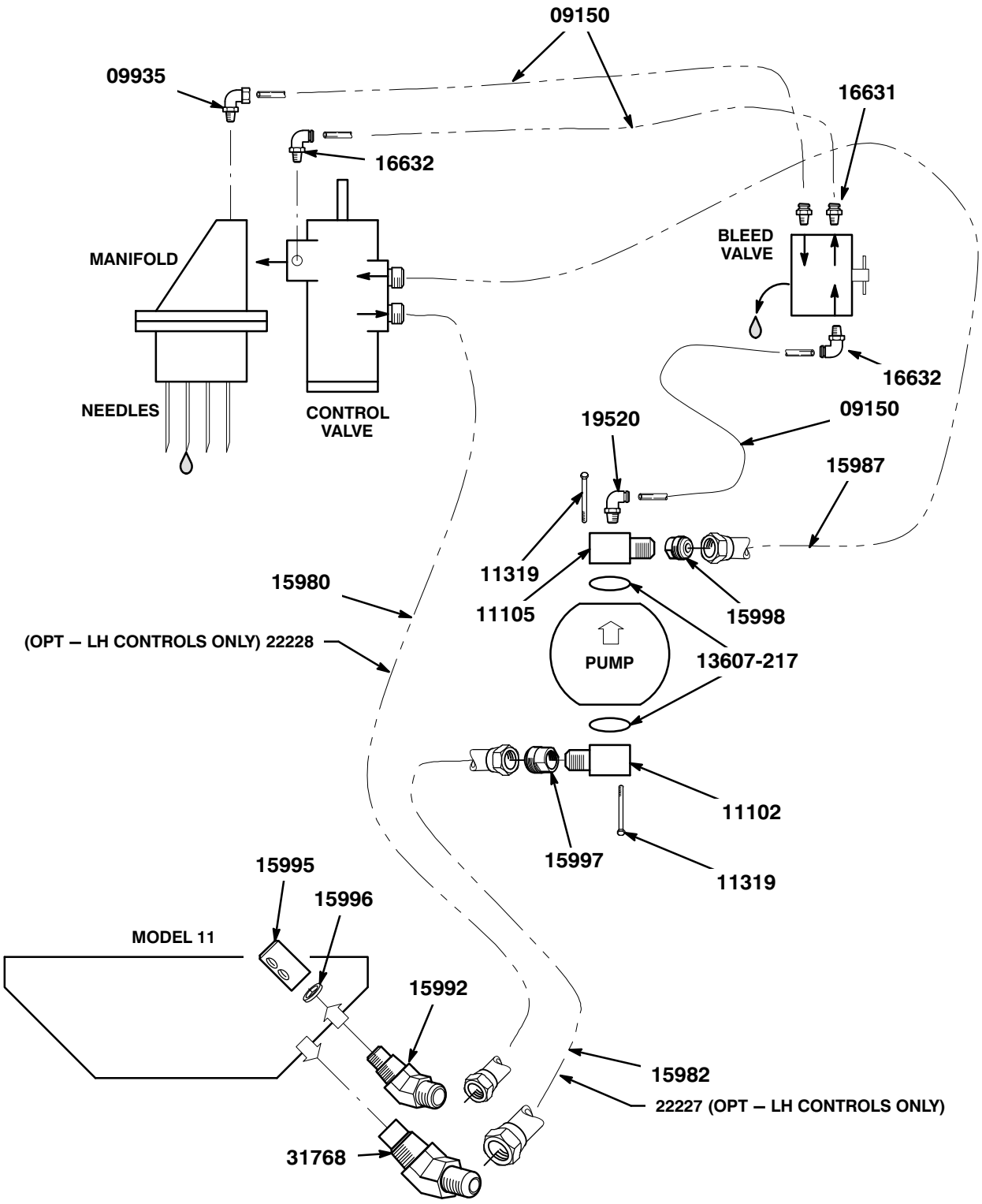
Fluid Hoses — RB10/15 with small hoses



Fluid Hoses — RB10/15 with small hoses

PART NO.	PART NAME
07376	FITTING (2)
09150	TUBING, plastic (quantity=feet)
09935	ELBOW–90^{O} (1)
10101	ELBOW–90^{O} (1)
10177	HOSE–3/4”x120” (1)
11102	INLET (1)
11105	OUTLET (1)
13607-217	O-RING (2)
13875	ELBOW–90^{O} (1)
14123	HOSE assembly (1/RH controls)
14258	HOSE assembly (1/RH controls)
16631	FITTING (2)
16632	ELBOW–90^{O} (2)
17753	BAFFLE (1)
19520	ELBOW–90^{O} (1)
22229	HOSE assembly (1/LH controls)
22230	HOSE assembly (1/LH controls)
25488	ELBOW–45^{O}–SWIVEL (2)
31767	REDUCER, EXTENDED (1)

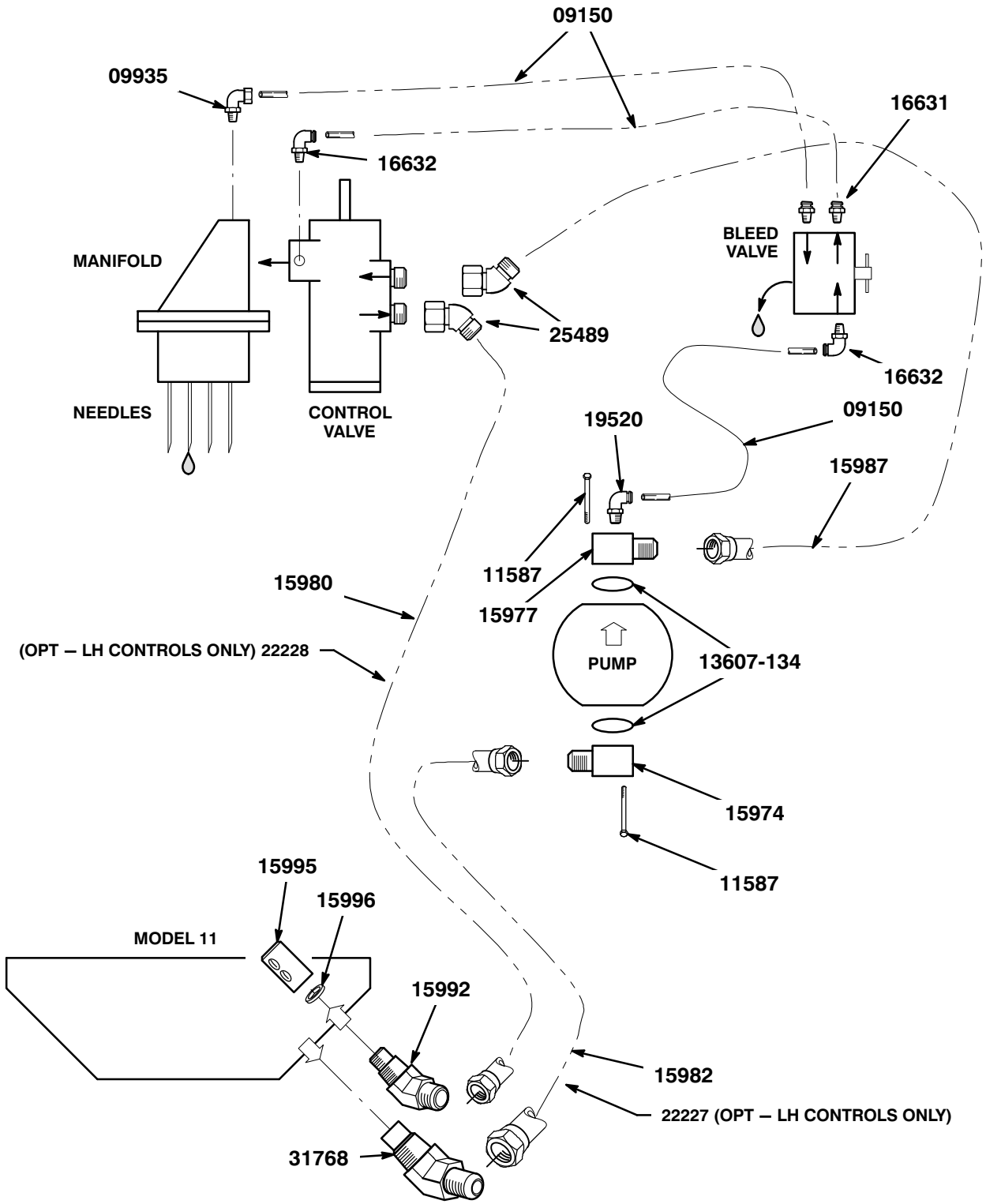
Fluid Hoses — RB10/15 with large hoses



Fluid Hoses — RB10/15 with large hoses

PART NO.	PART NAME
09150	TUBING—PLASTIC (specify quantity in feet)
09935	ELBOW—90° (1)
11102	INLET (1)
11105	OUTLET (1)
13607-217	O-RING (2)
15980	HOSE assembly (1/RH controls)
15982	HOSE assembly (1/RH controls)
15987	HOSE assembly (1)
15992	ELBOW—45° (1)
15995	BAFFLE (1)
15996	SEAL (1)
15997	ADAPTER (1)
15998	ADAPTER (1)
16631	FITTING (2)
16632	ELBOW—90° (2)
19520	ELBOW—90° (1)
22227	HOSE assembly (1/LH controls)
22228	HOSE assembly (1/LH controls)
31768	ELBOW, EXTENDED—45° (1)

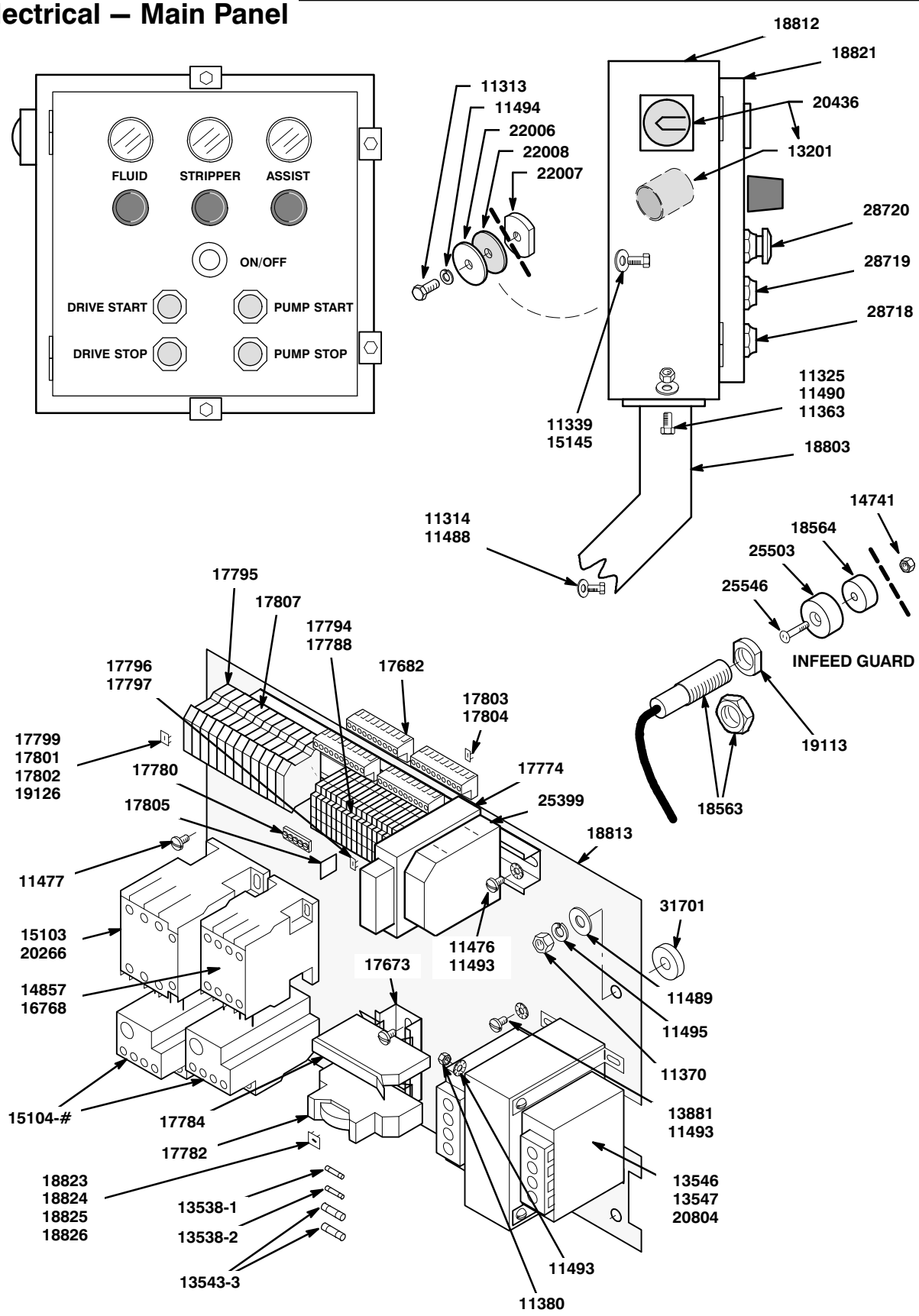
Fluid Hoses — RB30



Fluid Hoses — RB30

PART NO.	PART NAME	PART NO.	PART NAME
09150	TUBING, plastic (quantity=feet)	15995	BAFFLE (1)
09935	ELBOW–90^{O} (1)	15996	SEAL (1)
13607-134	O-RING	16631	FITTING (2)
15974	INLET (1)	16632	ELBOW–90^{O}
15977	OUTLET (1)	19520	ELBOW–90^{O}
15980	HOSE assembly (1/RH controls)	22227	HOSE assembly (1/LH controls)
15982	HOSE assembly (1/RH controls)	22228	HOSE assembly (1/LH controls)
15987	HOSE assembly (1)	25489	ELBOW–45^{O}–SWIVEL (2)
15992	ELBOW–45^{O} (1)	31768	ELBOW, EXTENDED–45^{O} (1)

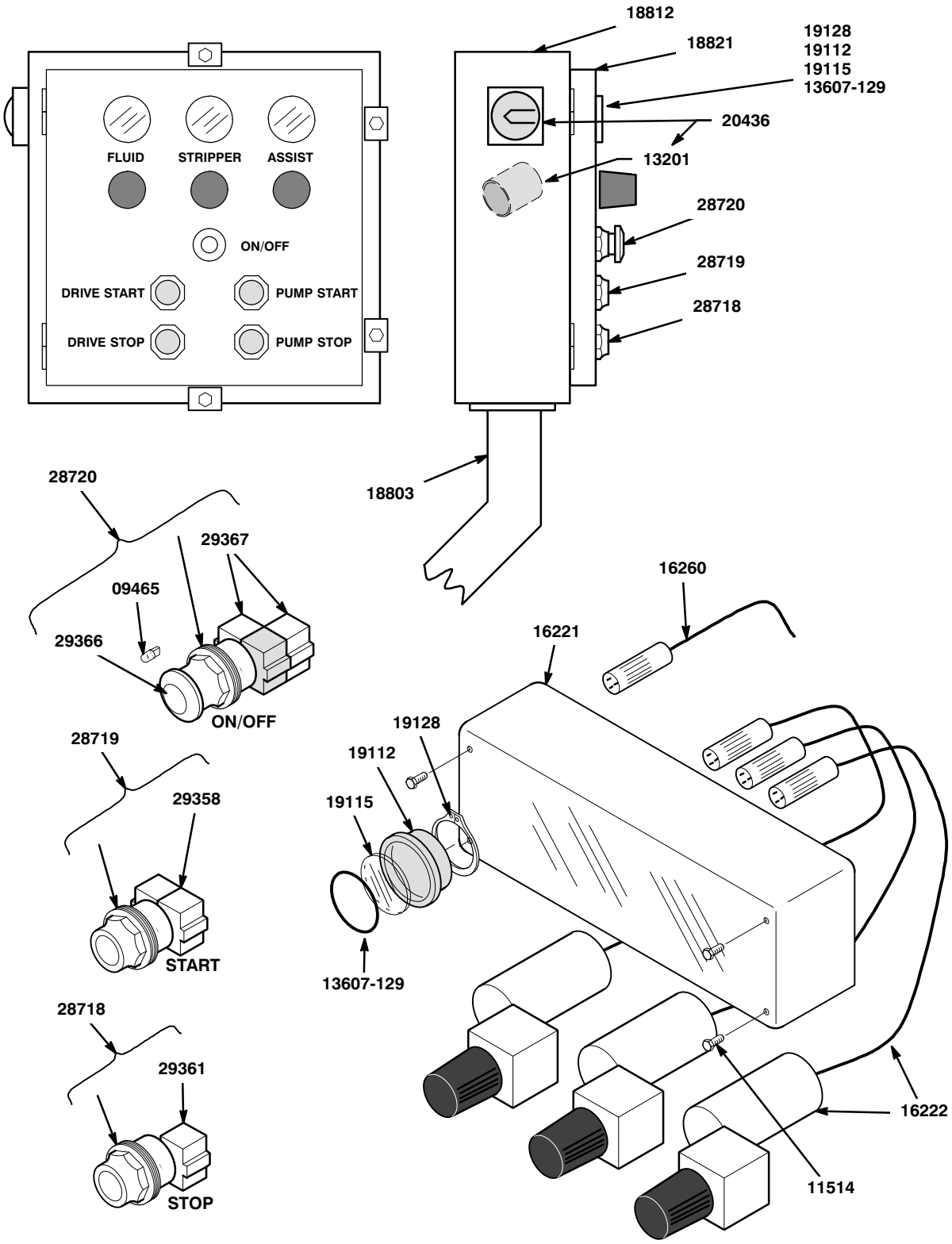
Electrical — Main Panel



Electrical — Main Panel

PART NO.	PART NAME
11313	SCREW, hex head, 1/4-20x5/8
11314	SCREW, hex head, 1/4-20x3/4
11325	SCREW, hex head, 5/16-18x3/4
11339	SCREW, hex head, 3/8-16x1/2
11363	NUT, hex, 5/16-18
11370	NUT, jam, 5/16x18
11380	NUT, hex, 10-24
11476	SCREW, binder head, 8-32x3/8
11477	SCREW, binder head, 8-32x1/2
11488	WASHER, flat, 9/32
11489	WASHER, flat, 11/32
11490	WASHER, flat, 11/32
11493	WASHER, lock, internal tooth, #10
11494	WASHER, lock, 1/4
11495	WASHER, lock, 5/16
15145	WASHER, flat, 3/8
13201	COVER (1)
13538-1	FUSE, 1 A (1)
13538-2	FUSE, 2 A (1)
13543-3	FUSE, 3 A (2)
13546	TRANSFORMER, 200-380 V (1opt)
13547	TRANSFORMER, 415-575 V (1opt)
13881	SCREW, slotted, 10-32x3/8
14741	NUT, lock, 8-32
14857	CONTACTOR, 12 A 60 Hz (1opt)
15103	CONTACTOR, 32 A 60 Hz (1opt)
15104-1	RELAY, overload, 2.5-4 A (1opt)
15104-2	RELAY, overload, 4-6a (1opt)
15104-3	RELAY, overload, 5.5-8 A (1opt)
15104-4	RELAY, overload, 7-10 A (1opt)
15104-5	REALY, overload, 9-13 A (1opt)
15104-6	RELAY, overload, 12-18 A (1opt)
16768	CONTACTOR, 12 A 50 Hz (1opt)
17673	RAIL, mounting (quantity=feet)
17682	CONNECTOR (4)
17774	MODULE, control (1)
17780	BRIDGE (2)
17782	FUSEHOLDER (2)
17784	FUSEHOLDER (2)
17788	END (1)
17794	BLOCK, terminal (20)
17795	BLOCK, earth (3)
17796	LABEL, 1-10 (1)
17797	LABEL, 11-20 (1)
17799	LABEL, PE, N, L1... (1)
17801	LABEL, 1-10 (1)
17802	LABEL, 11-20 (1)
17803	LABEL, 1-10 (1)
17804	LABEL, 11-20 (1)
17805	PLATE (1)
17807	BLOCK, terminal (9)
18563	SWITCH, magnetic (1)
18564	MAGNET (1)
18803	BRACKET, mounting (1)
18812	ENCLOSURE (1)
18813	PANEL (1)
18821	DOOR (1)
18823	LABEL, F1 (1)
18824	LABEL, F2 (1)
18825	LABEL, F3 (1)
18826	LABEL, F4 (1)
19113	NUT, tapered (1)
19126	LABEL, U1, U2... (1)
20266	CONTACtOR, 32 A 50 Hz (1opt)
20436	SWITCH assembly, disconnect (1)
20804	TRANSFORMER, 380/400/410 V (1opt)
22006	WASHER, flat (1)
22007	NUT (1)
22008	GASKET (1)
25399	POWER SUPPLY, DC (1)
25503	SHELL (1)
25546	SCREW, 8-32x1 (1)
28718	SWITCH, red pushbutton (2)
28719	SWITCH, green pushbutton (2)
28720	SWITCH, clear push/pull (1)
31701	SPACER (4)

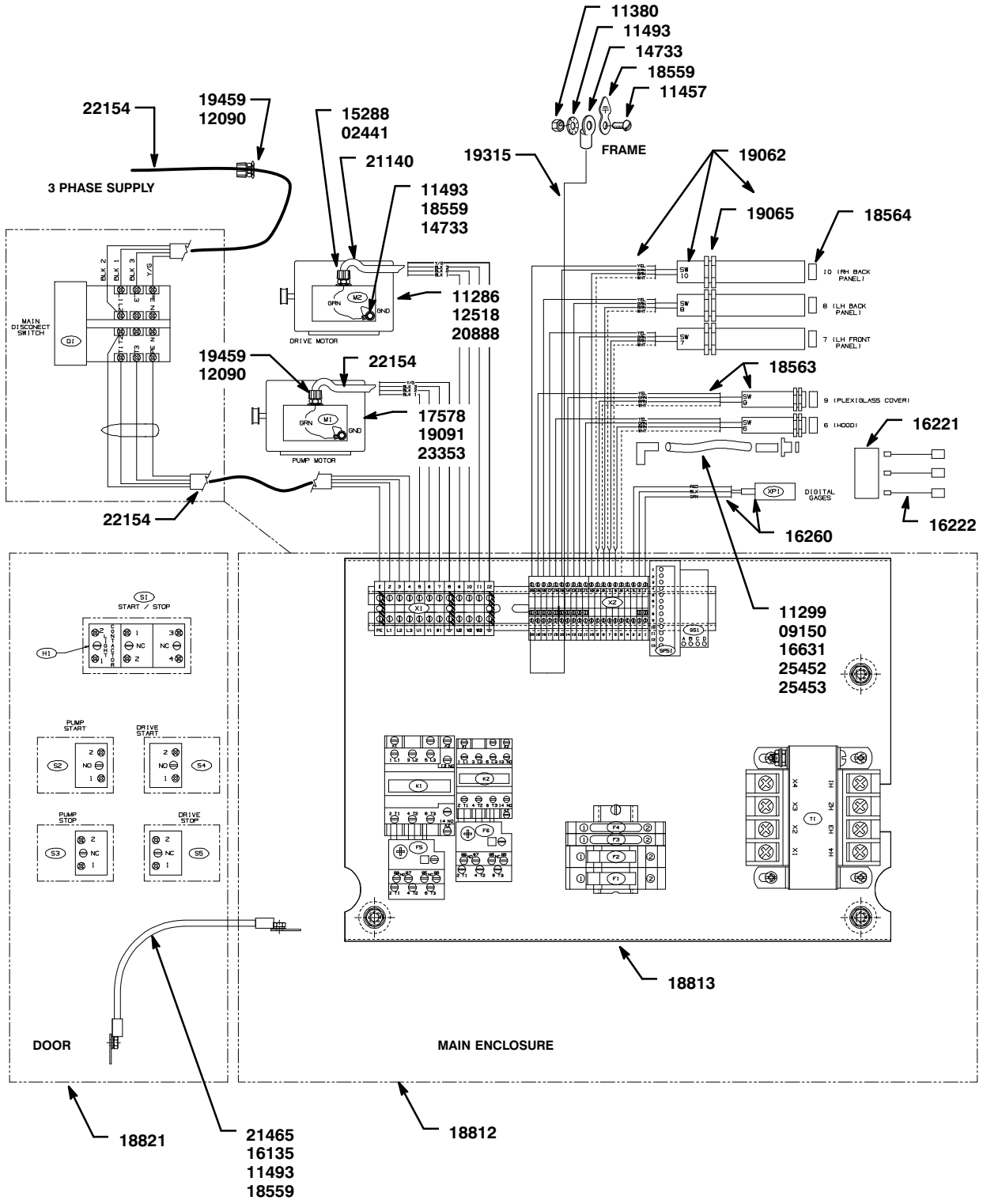
Electrical — Door Mounted



Electrical — Door Mounted

PART NO.	PART NAME
09465	LAMP, 24 V (1)
11514	SCREW, hex head, 10-24x3/8
13201	COVER (1)
13607-129	O-RING (3)
16221	MODULE, digital gauges (1)
16222	TRANSDUCER and plug assembly (3)
16260	CORD and plug assembly (1)
18803	BRACKET, mounting (1)
18812	BOX (1)
18821	DOOR (1)
19112	HOUSING, lens (3)
19115	LENS (3)
19128	RING, retaining (3)
20436	SWITCH, disconnect (1)
28718	SWITCH, red pushbutton (2)
28719	SWITCH, green pushbutton (2)
28720	SWITCH, clear push/pull (1)
29358	CONTACT BLOCK (2)
29361	CONTACT BLOCK (2)
29366	KNOB, clear (1)
29367	CONTACT BLOCK (4)

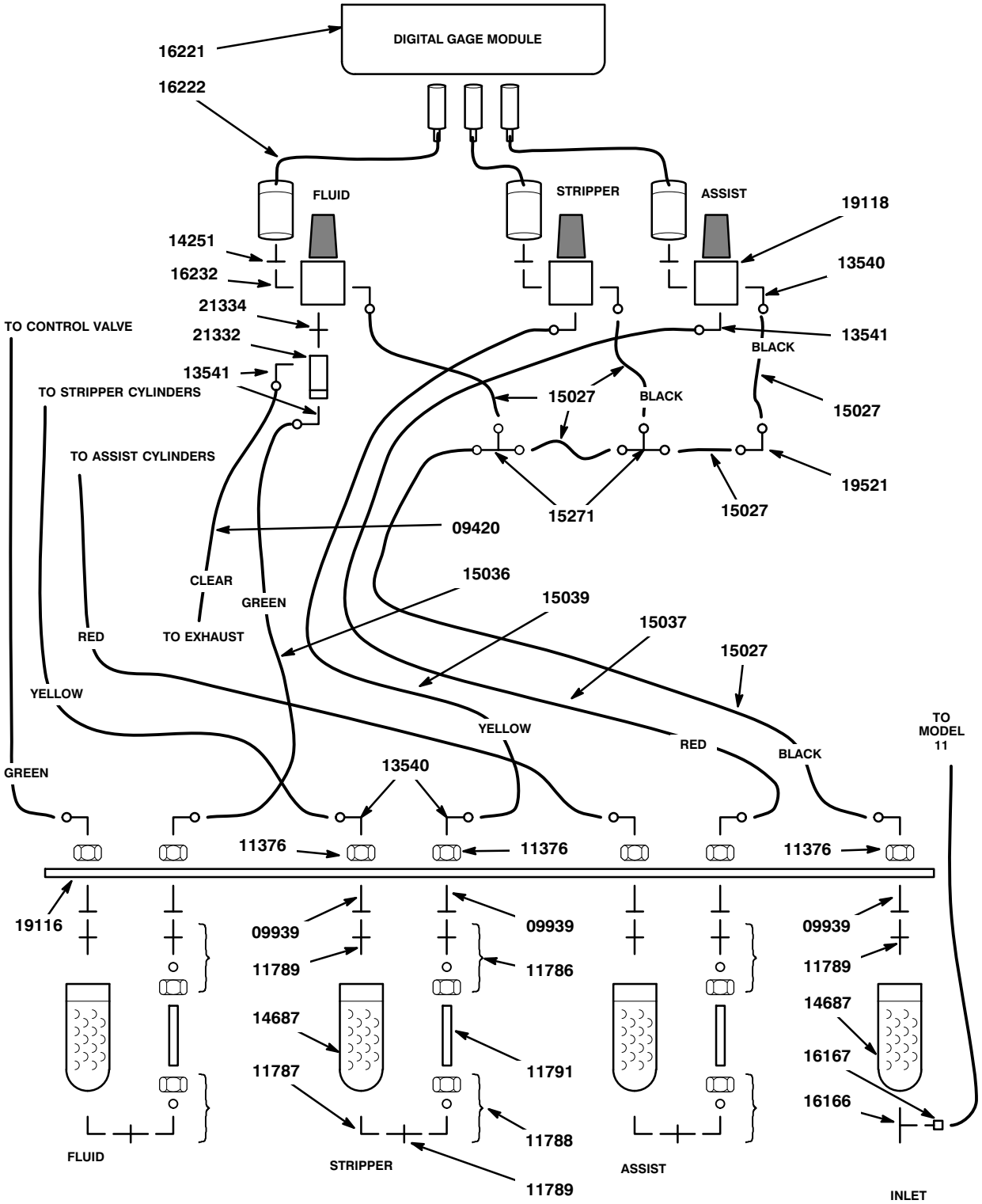
Electrical Cords & Connectors



Electrical Cords & Connectors

PART NO.	PART NAME
02441	NUT (1)
09150	TUBING, plastic, 3/8 (quantity=feet)
11286	MOTOR, 1.5 hp, 575 V (1opt)
11299	FITTING, 90°, 3/8 tube x 3/8 NPT (1)
11380	NUT, hex, 10-24
11457	SCREW, slotted round, 10-24x3/4
11493	WASHER, lock, internal tooth, #10
12090	NUT (2)
12518	MOTOR, 1.5 hp, 415 V (opt)
14733	EYELET (3)
15288	WATERTIGHT (1)
16135	NUT, hex, 10-32
16221	MODULE, digital gauges (1)
16222	TRANSDUCER and plug assembly (3)
16260	CORD and plug assembly (1)
16631	FITTING, straight, 3/8 tube x 1/4 NPT (1)
17578	MOTOR, 5 hp, 190-460 V (1opt)
18559	TAG, earth (5)
18563	SWITCH assembly (2)
18564	MAGNET (5)
18812	BOX (1)
18813	PANEL (1)
18821	DOOR (1)
19062	SWITCH, magnetic (3)
19065	NUT (6)
19091	MOTOR, 5 hp, 380 V/60 (1opt)
19315	WIRE, earth, 12 ga (quantity= feet)
19459	WATERTIGHT (2)
20888	MOTOR, 1.5 hp, 190-460 V (1opt)
21140	CABLE, 14/4 (quantity=feet)
21465	WIRE, earth, 10 ga (quantity=feet)
22154	CABLE, 12/4 (quantity=feet)
23353	MOTOR, 5 hp 575 V (1opt)
25452	NUT (1)
25453	GASKET (1)

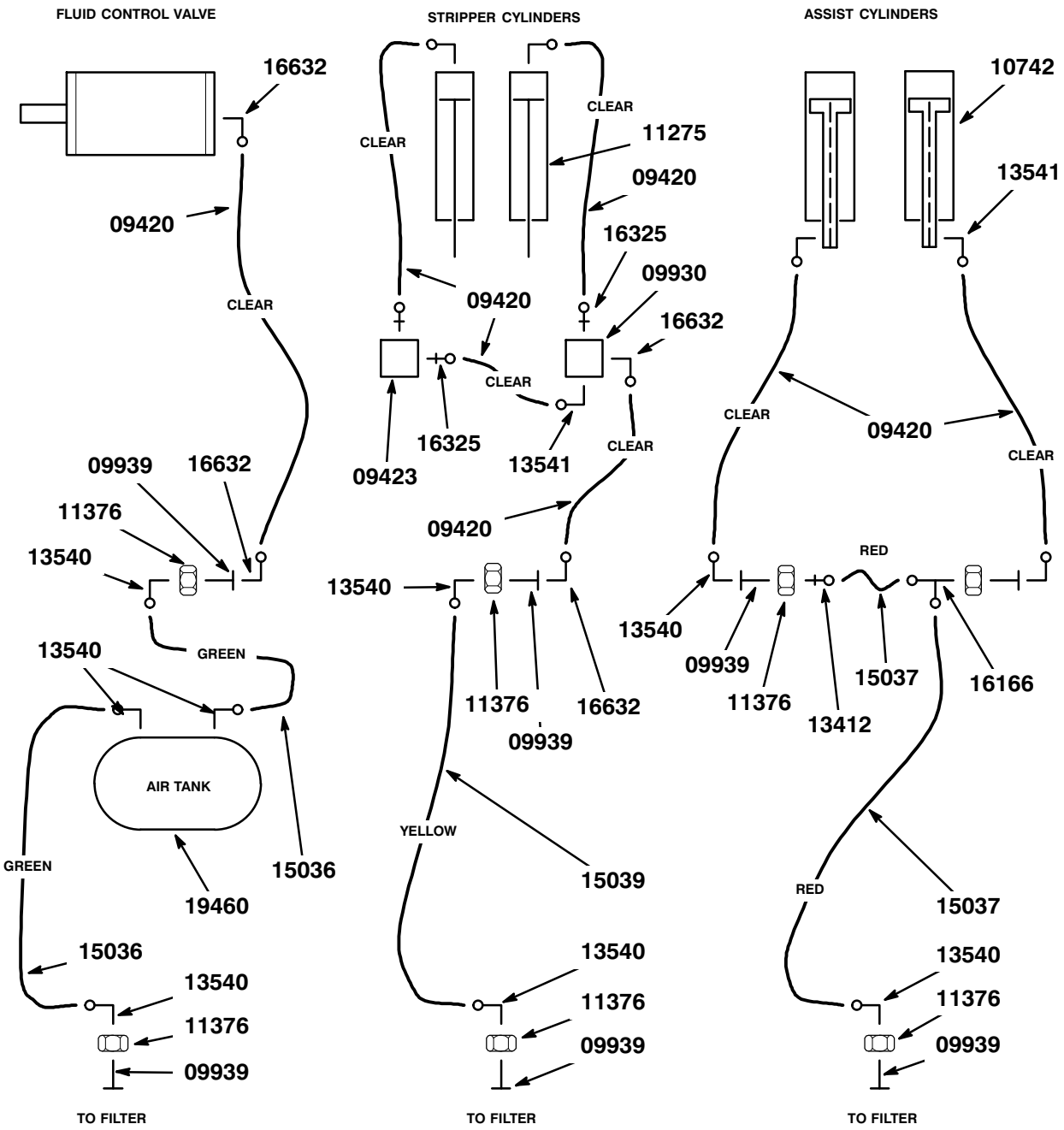
Air System — Supply



Air System — Supply

PART NO.	PART NAME
09420	TUBE, plastic, clear (quantity=feet)
09939	ADAPTER, straight (7)
11376	NUT, hex jam, 3/4-10 (7)
11786	FITTING assembly, straight (3)
11787	FITTING, 90° (3)
11788	FITTING assembly, 90° (3)
11789	ADAPTER, straight (10)
11791	TUBING — STAINLESS (3)
13540	FITTING, 90° (10)
13541	FITTING, 90° (4)
14251	ADAPTER, straight (3)
14687	FILTER assembly (4)
15027	TUBE, plastic, black (quantity=feet)
15036	TUBE, plastic, green (quantity=feet)
15037	TUBE, plastic, red (quantity=feet)
15039	TUBE, plastic, yellow (quantity=feet)
15271	TEE (2)
16166	TEE (1)
16167	ADAPTER, quick disconnect (1)
16221	MODULE, digital gauges (1)
16222	TRANSDUCER & plug assembly (1)
16232	FITTING—90° (3)
19116	PANEL (1)
19118	REGULATOR, pressure (3)
19521	ELBOW (1)
21332	VALVE, quick exhaust (1)
21334	FITTING, straight (1)

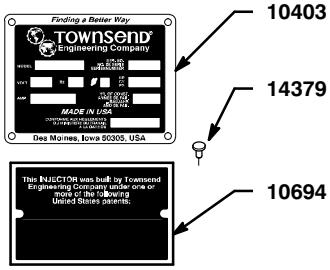
Air system – Circuits

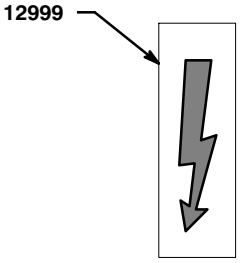


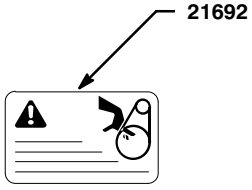
Air system — Circuits

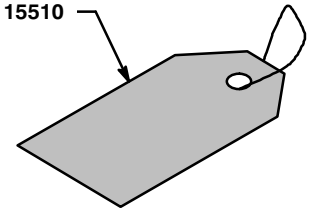
PART NO.	PART NAME	PART NO.	PART NAME
09420	TUBE, plastic, clear (quantity=feet)	13541	FITTING, 90º (3)
09423	BLOCK (1)	15036	TUBE, plastic, green (quantity=feet)
09930	BLOCK (1)	15037	TUBE, plastic, red (quantity=feet)
09939	FITTING, straight (9)	15039	TUBE, plastic, yellow (quantity=feet)
10742	CYLINDER, assist (2)	16166	TEE (1)
11275	CYLINDER, stripper (2)	16325	FITTING, straight (3)
13412	FITTING, straight (1)	16632	FITTING, 90º (4)
13540	FITTING, 90º (7)	19460	TANK (1)

Tags


10403
14379
10694
Finding a Better Way
Townsend
Engineering Company
MADE IN USA
Des Moines, Iowa 50305, USA
This INJECTOR was built by Townsend Engineering Company under one or more of the following United States patents:


12999

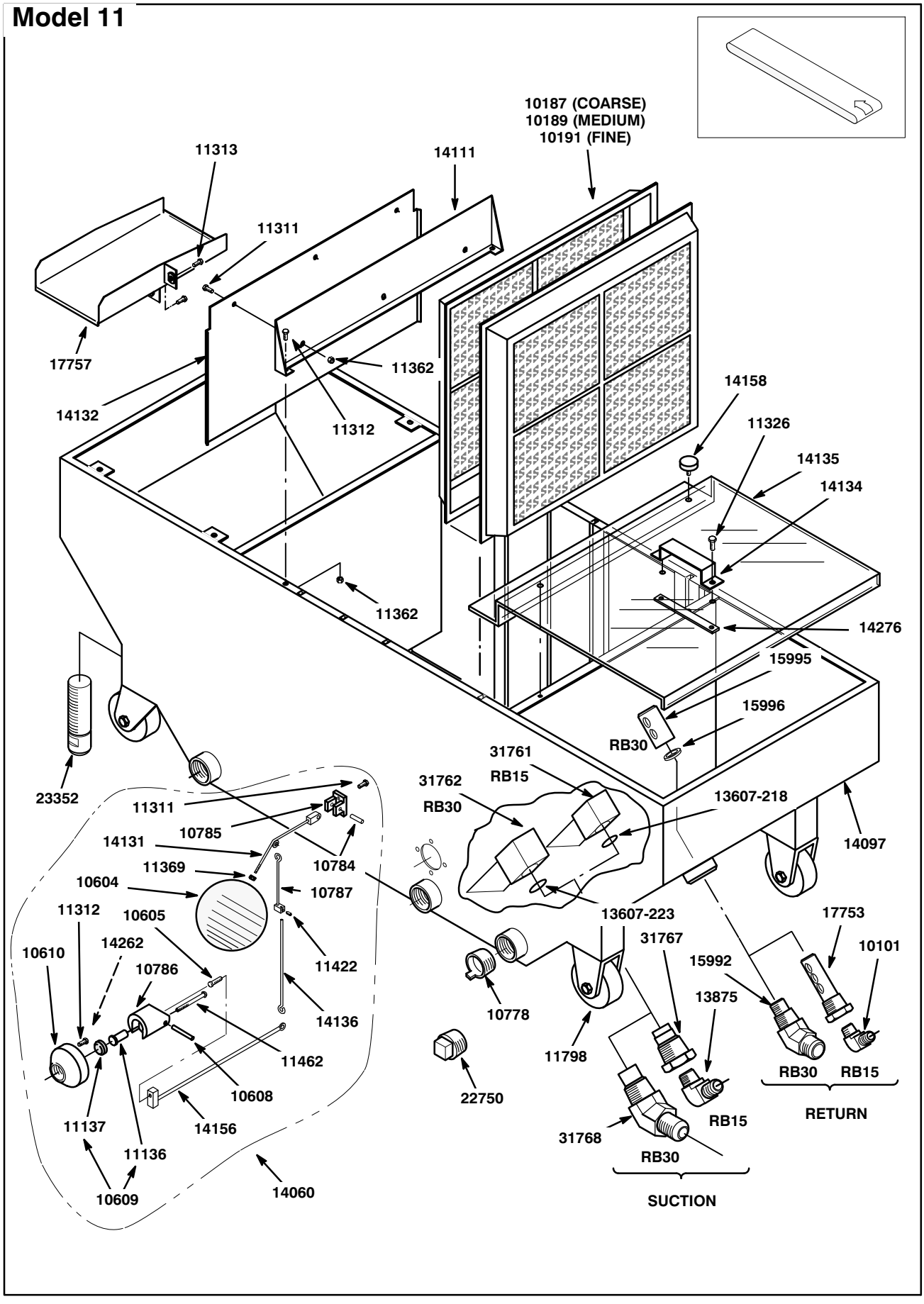

21692


15510

Tags

PART NO.	PART NAME	PART NO.	PART NAME
10403	TAG–MODEL/SER (1)	14379	RIVET–3/8”GRIP (6)
10694	TAG–PATENT (1)	15510	TAG–ELEC RQMTS (1)
12999	TAG–HIGH VOLT (2)	21692	TAG–REPLACE GUARDS (3)

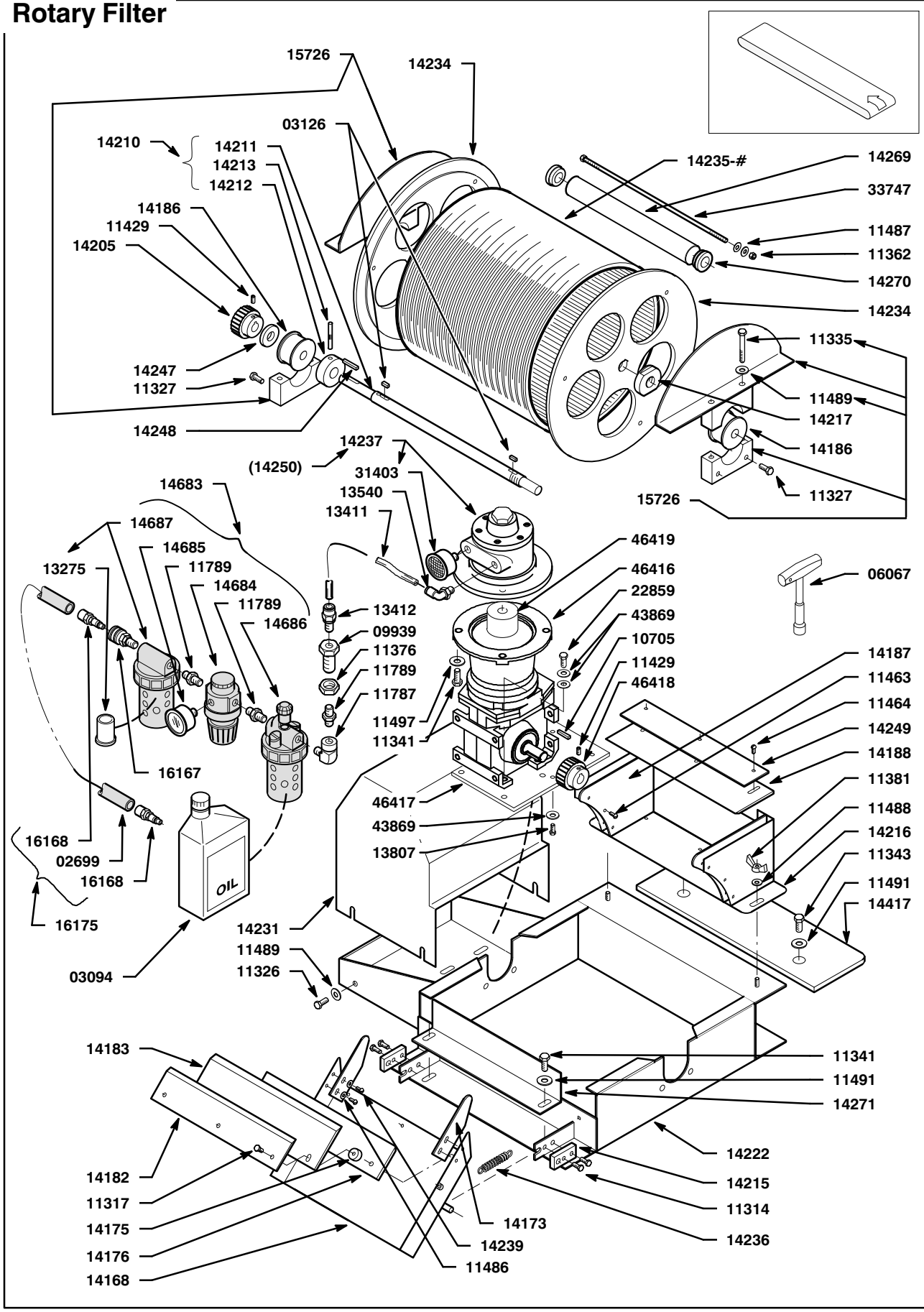
Model 11


10187 (COARSE)
10189 (MEDIUM)
10191 (FINE)
11313
14111
11311
17757
11362
14132
11312
14158
11326
14135
14134
11362
14276
15995
15996
RB30
23352
31761
RB15
31762
RB30
13607-218
14097
11311
10785
14131
10784
11369
10787
10604
11312
10605
14262
10610
10786
11422
14136
11462
10608
11137
14156
11136
10609
14060
13607-223
17753
31767
10101
15992
13875
10778
11798
22750
RB30
RB15
RETURN
RB15
31768
RB30
SUCTION

Model 11

PART NO.	PART NAME
10101	ELBOW (1opt)
10187	SCREEN, 10 mesh (1)
10189	SCREEN, 20 mesh (1)
10191	SCREEN, 30 mesh (6)
10604	FLOAT (1)
10605	SCREW, adjustment (1)
10608	PIN (1)
10609	POPPET assembly (1)
10610	FLANGE (1)
10778	STOPPER (3opt)
10784	PIN (1)
10785	CLEVIS (1)
10786	HOUSING, valve (1)
10787	ROD (1)
11136	STEM (1)
11137	CAP (1)
11311	SCREW, hex head, 1/4-20x3/8
11312	SCREW, hex head, 1/4-20x1/2
11313	SCREW, hex head, 1/4-20x5/8
11326	SCREW, hex head, 5/16-18x5/8
11362	NUT, hex, 1/4-20
11369	NUT, jam, 1/4-20
11422	SETSCREW, socket, 10-24x3/16
11462	SCREW, slotted round, 10-24x1/2
11798	REPLACEMENT WHEEL (4)
13607-218	O-RING (1opt)
13607-223	O-RING (1opt)
13875	ELBOW (1opt)
14060	FLOAT ASM (1)
14097	TANK (1)
14111	BRACKET, mounting (1)
14131	ROD (1)
14132	PANEL (1)
14134	HANDLE (1)
14135	COVER (1)
14136	ROD (1)
14156	LEVER (1)
14158	KNOB (2)
14262	SEALANT, clear
14276	NUT BAR (1)
15992	FITTING, elbow (1opt)
15995	BAFFLE (1opt)
15996	SEAL (1opt)
17753	FITTING, baffle (1opt)
17757	TROUGH (1)
22750	PLUG (3opt)
23352	FOOT (2)
31761	EXTENSION, (1 /RB15)
31762	EXTENSION, (1 /RB30)
31767	FITTING, reducer, (1 /RB15)
31768	FITTING, elbow, (1 /RB30)

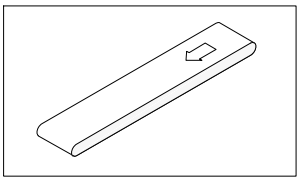
Rotary Filter

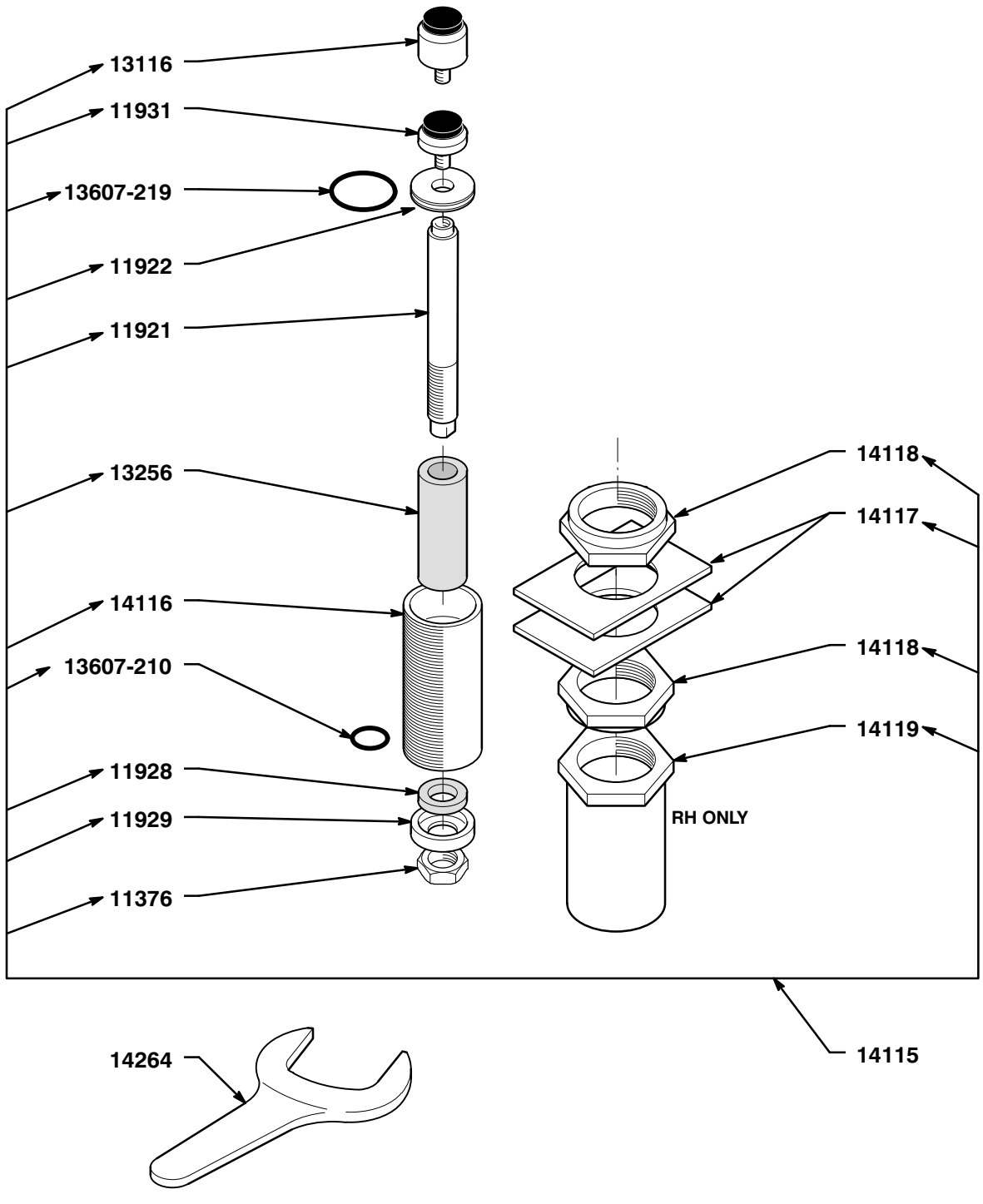


Rotary Filter

PART NO.	PART NAME
02699	HOSE (quantity=feet)
03094	OIL, quart (1)
03126	KEY, square (2)
06067	WRENCH (1)
09939	FITTING (1)
10705	KEY, square (1)
11314	SCREW, hex head, 1/4-20x3/4
11317	SCREW, hex head, 1/4-20x1-1/4
11327	SCREW, hex head, 5/16-18x3/4
11335	SCREW, hex head, 5/16-18x2-1/2 (4)
11341	SCREW, hex head, 3/8-16x3/4 (4)
11343	SCREW, hex head, 3/8-16x1-1/4
11362	NUT, hex, 1/4-20
11376	NUT, hex, 3/4-10
11381	NUT, wing, 1/4-20
11429	SETSCREW, socket, 1/4-20x3/8 (1)
11463	SCREW, slotted round, 10-32x1/4
11464	SCREW, slotted round, 10-32x1/2
11486	WASHER, flat, 1/4
11487	WASHER, flat, 1/4
11488	WASHER, flat, 9/32
11489	WASHER, flat, 11/32 (4)
11491	WASHER, flat, 3/8
11497	WASHER, lock, 3/8 (4)
11787	FITTING, 90 degree (1)
11789	CONNECTOR (1)
13275	ELEMENT, filter (1)
13411	TUBING, clear (quantity=feet)
13412	FITTING (1)
13540	ELBOW (1)
13807	SCREW, hex head, M6x10 mm (4)
14168	TRAY, pivot (1)
14173	PLATE, end (2)
14175	SPACER (3)
14176	BLADE, wiper, seal (1)
14182	backup plate
14183	BLADE, wiper, scrapper (1)
14186	BEARING (2)
14187	PLATE, end (2)
14188	BLADE, wiper, seal (1)
14205	GEAR (1)
14210	SHAFT assembly (1)
14211	SHAFT (1)
14212	COLLAR (1)
14213	PIN (1)
14215	BLOCK (2)
14216	PAN (1)
14217	NUT (1)
14222	BASE, frame (1)
14231	COVER (1)
14234	PLATE, end (2)
14235-10	FILTER DRUM (.010 inch gap)(1std)
14235-20	FILTER DRUM (.020 inch gap)(1opt)
14235-25	FILTER DRUM (.025 inch gap)(1opt)
14236	SPRING (2)
14237	MOTOR, air (1)
14238	GEARBOX (1)
14239	SCREW, slotted round, 10-32x5/16
14247	SPACER (1)
14248	KEY, square (1)
14249	PLATE, backup (1)
14250	KIT, repair ki, air motor
14269	TUBE (1)
14270	END, tube (2)
14271	ANGLE (1)
14417	BUMPER (1)
14683	FILTER/regulator/lubricator assembly (1)
14684	REGULATOR (1)
14685	GAUGE (1)
14686	LUBRICATOR (1)
14687	FILTER assembly (1)
15726	CAP, bearing (2)
16167	SOCKET, quick disconnect (1)
16168	PLUG, quick disconnect (2)
16175	HOSE assembly (1)
22859	SCREW, hex head, M8x20 mm (4)
31403	MUFFLER (1)
33747	ROD (3)
43869	WASHER, flat, 8 mm (12)
46416	GEARBOX (1)
46417	PLATE (1)
46418	GEAR, 22T (1)
46419	COUPLING (1)

Stripper Stops

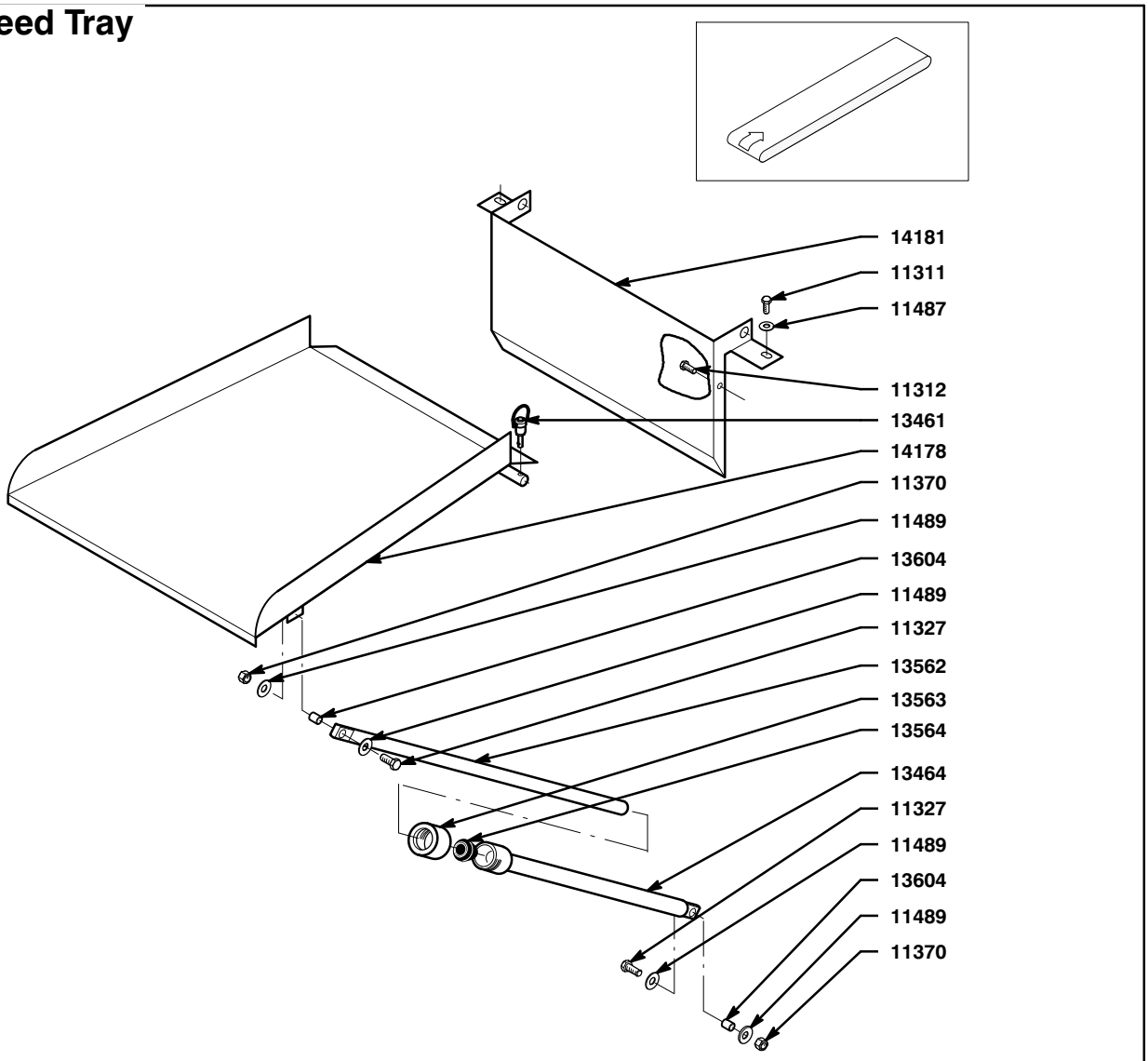




Stripper Stops

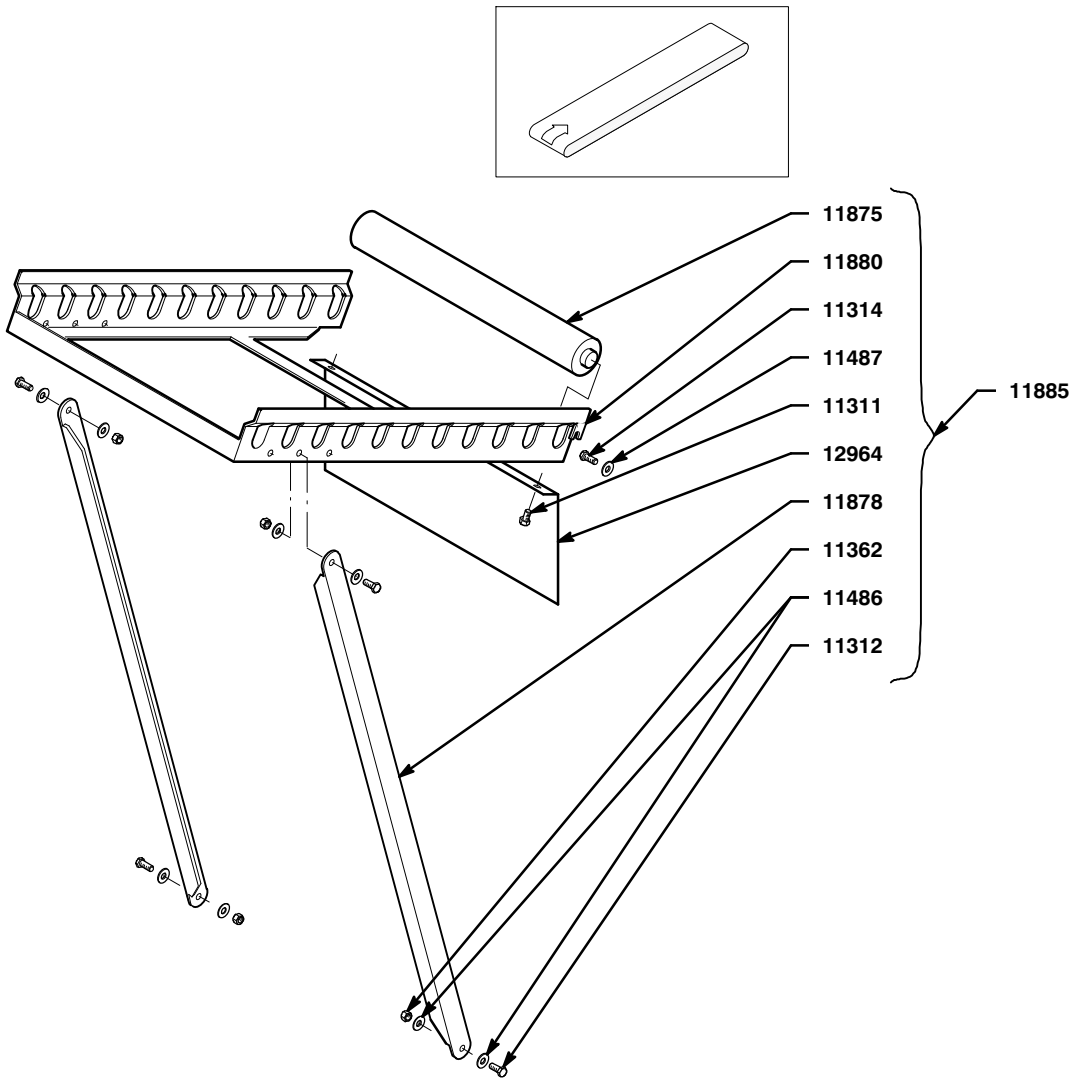
PART NO.	PART NAME	PART NO.	PART NAME
14115	**STRIPPER STOP ASM (2opt) (includes the following items)**		
11921	RUSH ROD (1)	13607-210	O-RING (1)
11922	PISTON (1)	13607-219	O-RING (1)
11928	RUBBER WASHER (1)	14116	PUSH ROD GUIDE (1)
11929	CUSHION HOLDER–BOTTOM (1)	14117	WASHER (2)
11931	CUSHION ASM–7/16”(1)	14118	LOCK NUT (2)
13116	CUSHION ASM–1 1/8” (1)	14119	GUARD / JAM NUT (1 RH only)
13256	RUBBER SLEEVE (1)	14264	WRENCH (1)

Infeed Tray



PART NO.	PART NAME	PART NO.	PART NAME
13461	PIN–QUICK RELEASE (2)	13564	BUSHING (2)
13464	TUBE WELDMENT (2)	13604	SPACER (4)
13562	ROD (2)	14178	INFEED TRAY ASM (opt)
13563	CAP (2)	14181	SUPPORT (1)

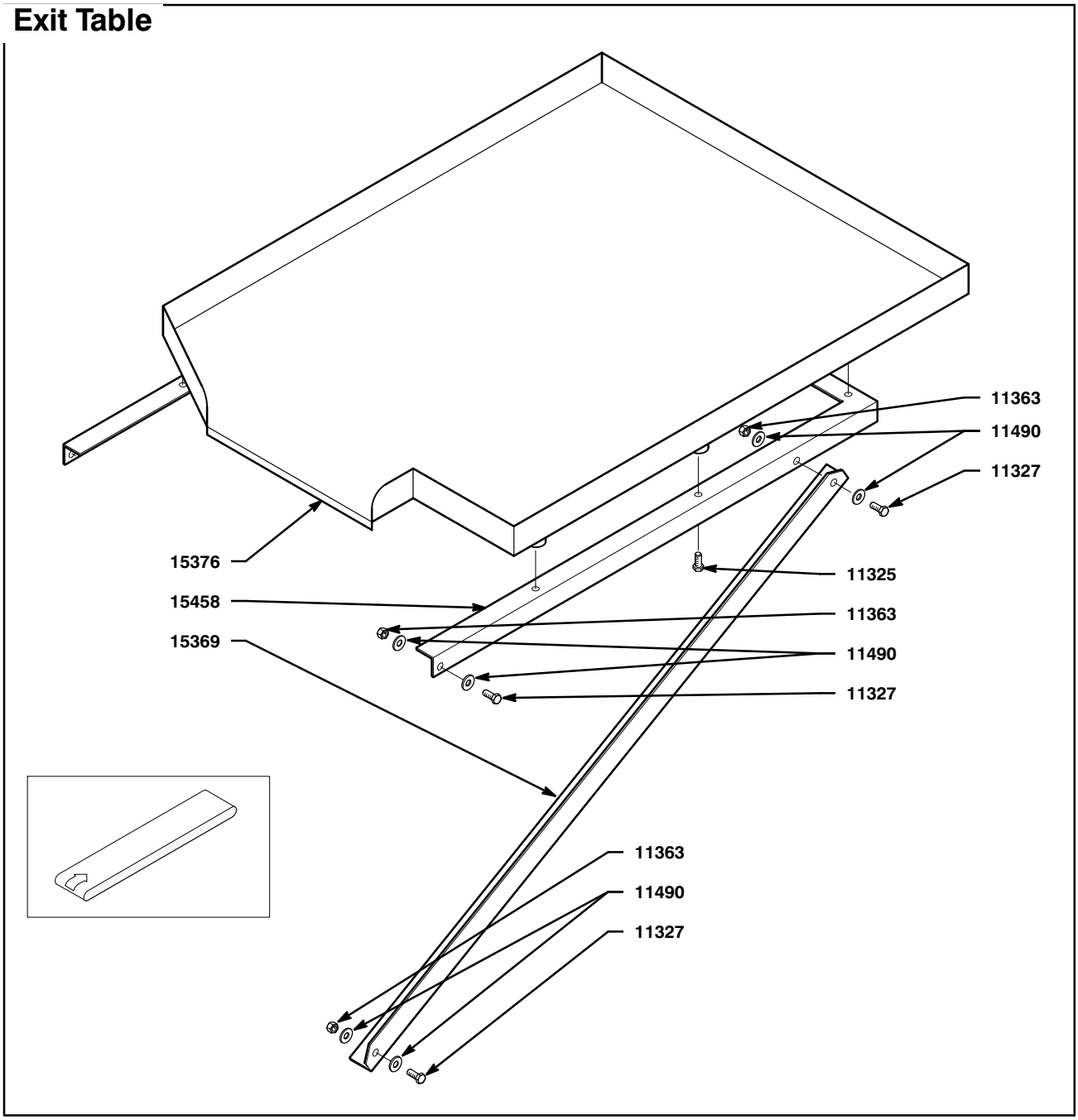
Infeed Rollers



PART NO.	PART NAME	PART NO.	PART NAME
11875	ROLLER (11)	11885	INFEED ROLLER ASM (1)
11878	SUPPORT ANGLE (2)	12964	GUARD (1)
11880	FRAME (1)		

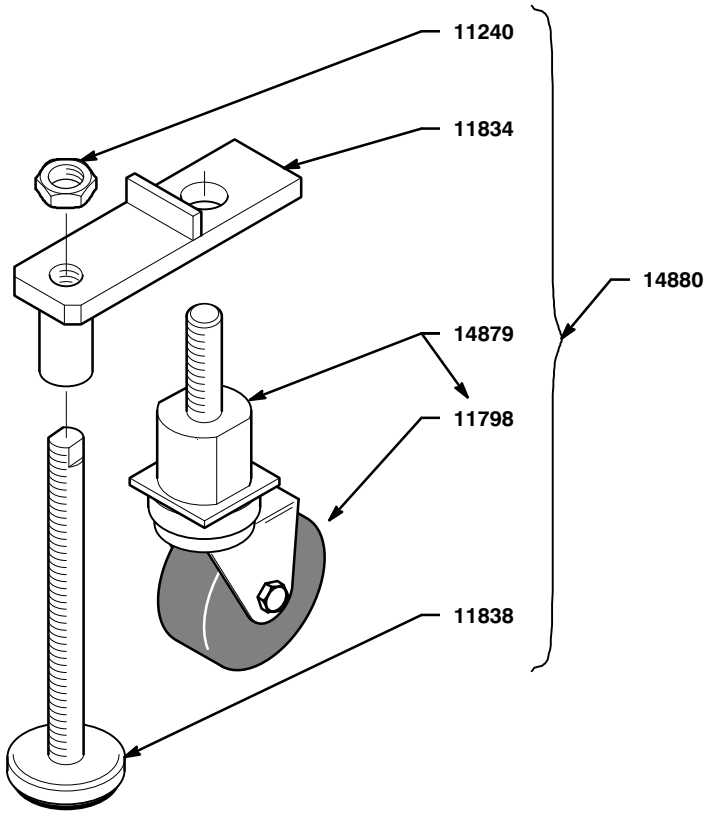
YOU ARE HERE: ▶
CABINET
DRIVE–CONVEYOR
DRIVE–PUMP
CONVEYOR
HEAD
FLUID SYSTEM
ELECTRICAL SYSTEM
AIR SYSTEM
TAGS
MODEL 11
EXTRAS

Exit Table



PART NO.	PART NAME	PART NO.	PART NAME
15369	SUPPORT ANGLE (2)	15458	FRAME (1)
15376	HANDLING TRAY (1)		

Casters



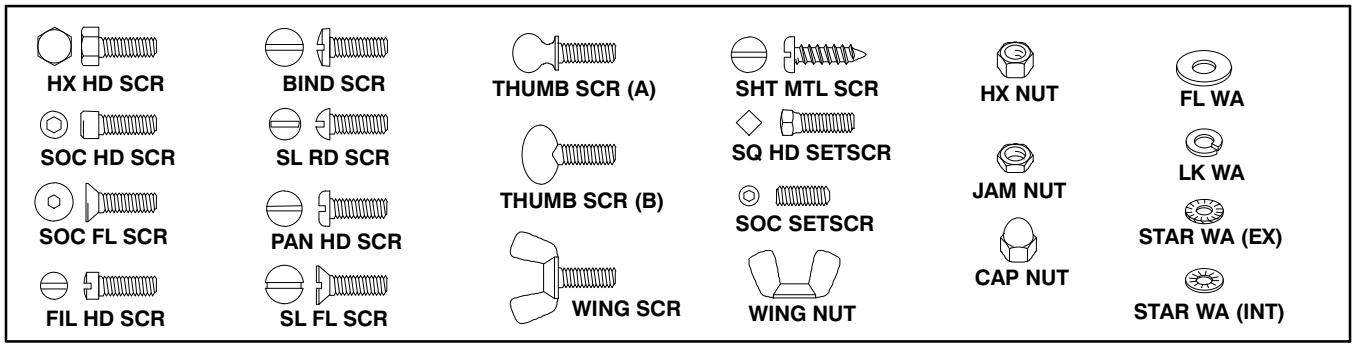
PART NO.	PART NAME	PART NO.	PART NAME
11240	HEX NUT (1)	11838	JACKSCREW (1)
11798	REPLACEMENT WHEEL	14879	CASTER (1)
11834	SUPPORT—JACKSCREW (1)	14880	CASTER ASM (4opt)

HARDWARE ITEMS

PART NO.	DESCRIPTION
02114	HX NUT, 5/8-11
02538	JAM NUT, 3/4-16
02878	JAM NUT, 3/4-16 (LH)
03015	HX HD SCR, 1/2-13x3-1/8
03016	SOC HD SCR, 1/2-13x2-1/2
04069	FL WA, 3/8
04922	FL WA, 5/16 (HEAVY)
05445	HX HD SCR, 5/8-11x2 (FULL)
06154	HX HD SCR, 7/16-14x1-1/2 (GD 8)
06223	GRD 8 SCR, 7/16-14x1-1/4
09450	JAM NUT, 7/8-14
09451	JAM NUT, 7/8-14 (LH)
09847	CAP NUT, 7/16-14
10340	SOC HD SCR, 3/8-16x5/8 (GD 5)
10639	HX HD SCR, 5/16-18x3-3/4
10911	HX HD SCR, 1/2-20x1-1/2
11240	HX NUT, 3/4-10
11305	THUMB SCR, 1/4-20x5/8 (A)
11310	HX HD SCR, #6-32x1
11311	HX HD SCR, 1/4-20x3/8
11312	HX HD SCR, 1/4-20x1/2
11313	HX HD SCR, 1/4-20x5/8
11314	HX HD SCR, 1/4-20x3/4
11315	HX HD SCR, 1/4-20x7/8
11316	HX HD SCR, 1/4-20x1
11317	HX HD SCR, 1/4-20x1-1/4
11318	HX HD SCR, 1/4-20x1-1/2
11319	HX HD SCR, 1/4-20x1-3/4
11320	HX HD SCR, 1/4-20x2
11321	HX HD SCR, 1/4-20x2-1/4
11322	HX HD SCR, 1/4-20x2-1/2
11323	HX HD SCR, 1/4-20x4
11324	HX HD SCR, 5/16-18x3/8
11325	HX HD SCR, 5/16-18x1/2
11326	HX HD SCR, 5/16-18x5/8
11327	HX HD SCR, 5/16-18x3/4
11328	HX HD SCR, 5/16-18x7/8
11329	HX HD SCR, 5/16-18x1
11330	HX HD SCR, 5/16-18x1-1/4
11331	HX HD SCR, 5/16-18x1-1/2
11332	HX HD SCR, 5/16-18x1-3/4
11333	HX HD SCR, 5/16-18x2
11334	HX HD SCR, 5/16-18x2-1/4
11335	HX HD SCR, 5/16-18x2-1/2
11336	HX HD SCR, 5/16-18x2-3/4
11337	HX HD SCR, 5/16-18x3-1/4
11338	HX HD SCR, 5/16-18x3-1/2
11339	HX HD SCR, 3/8-16x1/2
11340	HX HD SCR, 3/8-16x5/8
11341	HX HD SCR, 3/8-16x3/4
11342	HX HD SCR, 3/8-16x1
11343	HX HD SCR, 3/8-16x1-1/4
11344	HX HD SCR, 3/8-16x1-1/2
11345	HX HD SCR, 3/8-16x1-3/4
11346	HX HD SCR, 3/8-16x2
11347	HX HD SCR, 3/8-16x2-1/4
11348	HX HD SCR, 3/8-16x2-1/2
11349	HX HD SCR, 3/8-16x2-3/4
11350	HX HD SCR, 3/8-16x3
11351	HX HD SCR, 3/8-16x3-1/2
11352	HX HD SCR, 7/16-20x1-1/2
11353	HX HD SCR, 7/16-14x2
11354	HX HD SCR, 1/2-13x1
11355	HX HD SCR, 1/2-13x1-1/4
11356	HX HD SCR, 1/2-13x1-1/2
11357	HX HD SCR, 1/2-13x1-3/4
11358	HX HD SCR, 1/2-13x2-1/2
11359	HX HD SCR, 5/8-11x2
11360	HX HD SCR, 5/16-18x2-3/4 (FULL)
11361	HX HD SCR, #6-32x1-1/2
11362	HX NUT, 1/4-20
11363	HX NUT, 5/16-18
11364	HX NUT, 3/8-16
11365	HX NUT, 7/16-14
11366	HX NUT, 1/2-13
11368	HX NUT, 5/8-11
11369	JAM NUT, 1/4-20
11370	JAM NUT, 5/16-18
11371	JAM NUT, 3/8-16
11372	JAM NUT, 7/16-14
11373	JAM NUT, 1/2-13
11374	JAM NUT, 1/2-20
11375	JAM NUT, 5/8-11
11376	JAM NUT, 3/4-10
11377	HX NUT, #10-24 (BRASS)
11378	HX NUT, #6-32
11379	HX NUT, #8-32
11380	HX NUT, #10-24
11381	WING NUT, 1/4-20
11382	CAP NUT, 1/4-20
11383	CAP NUT, 5/16-18
11384	SOC HD SCR, 1/4-20x1/2
11385	SOC HD SCR, 1/4-20x5/8
11386	SOC HD SCR, 1/4-20x3/4
11387	SOC HD SCR, 1/4-20x1
11388	SOC HD SCR, 1/4-20x1-1/4
11389	SOC HD SCR, 5/16-18x1/2
11390	SOC HD SCR, 5/16-18x5/8
11391	SOC HD SCR, 5/16-18x3/4
11392	SOC HD SCR, 5/16-18x1
11393	SOC HD SCR, 5/16-18x1-1/4
11394	SOC HD SCR, 5/16-18x1-1/2
11395	SOC HD SCR, 5/16-18x1-3/4
11396	SOC HD SCR, 3/8-16x5/8
11397	SOC HD SCR, 3/8-16x3/4
11398	SOC HD SCR, 3/8-16x1
11399	SOC HD SCR, 3/8-16x1-1/4
11400	SOC HD SCR, 3/8-16x1-1/2
11401	SOC HD SCR, 1/2-13x3/4
11403	SOC HD SCR, #10-24x1/2
11404	SOC HD SCR, #10-24x5/8
11405	SOC FL SCR, 1/4-20x1/2
11406	SOC FL SCR, 1/4-20x5/8
11407	SOC FL SCR, 1/4-20x3/4
11408	SOC FL SCR, 1/4-20x1
11409	SOC FL SCR, 1/4-20x1-3/4
11410	SOC FL SCR, 5/16-18x5/8
11411	SOC FL SCR, 5/16-18x1

HARDWARE ITEMS

PART NO.	DESCRIPTION	PART NO.	DESCRIPTION	PART NO.	DESCRIPTION
11412	SOC FL SCR, 5/16-18x1-1/4	11442	SOC SETSCR, 3/8-16x5/8	11472	SL RD SCR, 5/16-18x1/2
11413	SOC FL SCR, 5/16-18x1-1/2	11443	SOC SETSCR, 3/8-16x1	11473	SQ SETSCR, 5/16-18x1/2
11414	SL FL SCR, #6-32x3/8	11444	SOC SETSCR, 3/8-16x1-1/4	11474	SQ SETSCR, 5/16-18x5/8
11415	SL FL SCR,# 8-32x1/4	11445	SOC SETSCR, 1/2-13x3/4	11475	SQ SETSCR, 3/8-16x1/2
11416	SL FL SCR, #8-32x5/16	11446	SL RD SCR, #6-32x1/4	11476	BIND SCR, #8-32x3/8
11417	SL FL SCR, #8-32x3/8	11447	SL RD SCR, #6-32x3/8	11477	BIND SCR, #8-32x1/2
11418	SL FL SCR, #10-24x1/2	11448	SL RD SCR, #6-32x3/4	11478	BIND SCR, #8-32x3/4
11419	SL FL SCR, #10-24x5/8	11449	SL RD SCR, #6-32x1-1/2	11479	BIND SCR, #10-32x1/2
11420	SL FL SCR, #10-24x3/4	11450	SL RD SCR, #8-32x1/4	11480	BIND SCR, #10-32x3/4
11421	SOC SETSCR, #10-24x1/8	11451	SL RD SCR, #8-32x3/8	11481	SL PAN SCR, #10-32x1/2
11422	SOC SETSCR, #10-24x3/16	11452	SL RD SCR, #10-24x3/16	11482	FL WA, 1/2
11423	SOC SETSCR, #10-24x1/4	11453	SL RD SCR, #10-24x1/4	11483	SL RD SCR, #10-24x3/8
11424	SOC SETSCR, #10-24x5/16	11454	SL RD SCR, #10-24x5/16	11484	SHT MTL SCR, #8x3/8
11425	SOC SETSCR, #10-24x3/8	11455	SL RD SCR, #10-24x1/2	11485	FL WA #8
11426	SOC SETSCR, #10-24x5/8	11456	SL RD SCR, #10-24x5/8	11486	FL WA #10
11427	SOC SETSCR, 1/4-20x1/4	11457	SL RD SCR, #10-24x3/4	11487	FL WA, 1/4
11428	SOC SETSCR, 1/4-20x5/16	11458	SL RD SCR, #10-24x7/8	11488	FL WA, 1/4
11429	SOC SETSCR, 1/4-20x3/8	11459	SL RD SCR, #10-24x1	11489	FL WA, 5/16
11430	SOC SETSCR, 1/4-20x1/2	11460	SL RD SCR, #10-24x1-1/2	11490	FL WA, 5/16
11431	SOC SETSCR, 1/4-20x3/4	11461	SL RD SCR, #10-24x2	11491	FL WA, 3/8
11432	SOC SETSCR, 1/4-20x1	11462	SL RD SCR, #10-24x2-1/2	11492	FL WA, 3/4
11433	SOC SETSCR, 5/16-20x5/16	11463	SL RD SCR, #10-32x1/4	11493	STAR WA, #10
11434	SOC SETSCR, 5/16-18x3/8	11464	SL RD SCR, #10-32x1/2	11494	LK WA, 1/4
11435	SOC SETSCR, 5/16-18x1/2	11465	SL RD SCR, #10-32x3/4	11495	LK WA, 5/16 (REG)
11436	SOC SETSCR, 5/16-18x5/8	11466	SL RD SCR, 1/4-20x1/2	11496	LK WA, 5/16 (LT)
11437	SOC SETSCR, 5/16-18x3/4	11467	SL RD SCR, 1/4-20x5/8	11497	LK WA, 3/8
11438	SOC SETSCR, 5/16-18x1-1/2	11468	SL RD SCR, 1/4-20x3/4	11498	LK WA, 1/2
11439	SOC SETSCR, 3/8-16x1/4	11469	SL RD SCR, 1/4-20x1	11499	LK WA, 5/8
11440	SOC SETSCR, 3/8-16x5/16	11470	SL RD SCR, 1/4-20-1-1/2	11500	LK WA, 3/4
11441	SOC SETSCR, 3/8-16x3/8	11471	SL RD SCR, 1/4-20x1-3/4	11501	LK WA, #10

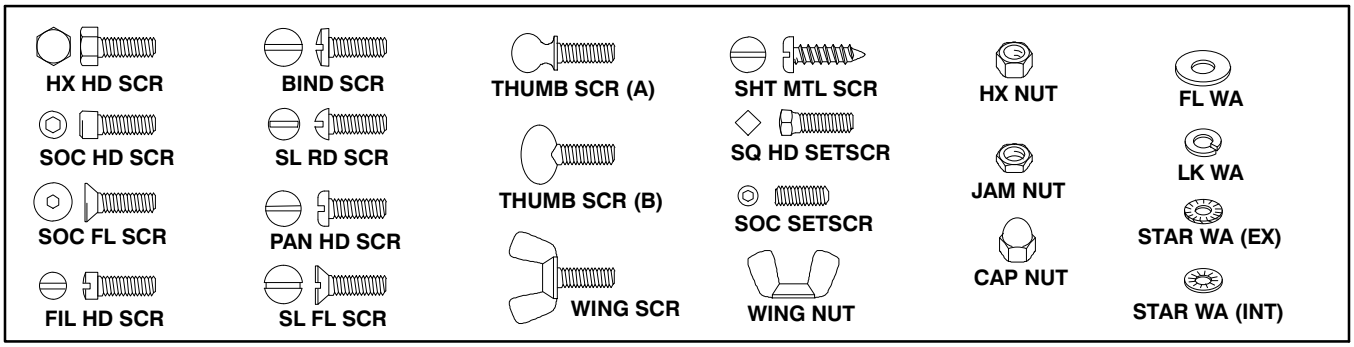


HARDWARE ITEMS

PART NO.	DESCRIPTION
11502	SOC SETSCR, 1/4-20x1/4
11503	SOC SETSCR, 1/4-20x1/4 (BLK)
11504	SOC SETSCR, 5/16-18x1/4
11505	SOC SETSCR, 5/16-18x3/8
11506	SOC SETSCR, 3/8-16x1-1/2
11507	HX HD SCR, #10-24x2-1/2
11508	SQ SETSCR, 5/16-18x3/8
11509	HX HD SCR, 1/2-13x3/4
11510	HX HD SCR, #6-32x1-3/4
11511	STAR WA, #6
11512	SL PAN SCR, 1/4-20x3/8
11514	HX HD SCR, #10-24x3/8
11516	SL PAN SCR, #8-32x1/2
11517	JAM NUT, 5/8-18
11519	SHT MTL SCR, #8x1/2
11520	SHT MTL SCR, #8x5/8
11521	SHT MTL SCR, #10x1
11522	SL RD SCR, #6-32x1
11523	FL WA. #6
11524	HX HD SCR, #10-24x5/8
11525	HX HD SCR, #10-24x1
11526	SL PAN SCR, #10-24x1/4
11527	SL PAN SCR, #10-24x1/2
11528	FL WA, 3/4
11530	SL FL SCR, 1/4-20x1/2
11542	SOC HD SCR, 3/8-24x1
11575	SOC HD SCR, #10-24x7/8
11587	HX HD SCR, 1/4-20x2-1/2 (FULL)
11588	THUMB SCR, 1/4-20x1/2 (B)
11660	SOC SETSCR, #10-24x1/2
11693	SL RD SCR, #6-32x2
11694	SL RD SCR, #6-32x1-3/4
11712	STAR WA, 1/4
11792	SOC SETSCR, #10-32x1/4
11980	SOC HD SCR, #6-32x1/2
12029	SOC HD SCR, #6-32x1/4 (FULL)
12033	HX HD SCR, #10-24x1-1/4
12055	SHT MTL SCR, #10x3/8
12081	HX HD SCR, 1/4-20x3
12443	HX HD SCR, 1/4-20x2-3/4
12627	SL RD SCR, #3-48x1/2
12628	FL WA, #3
12629	LK WA, #3
12817	SQ SETSCR, 5/16-18x3/4
12820	STAR WA, #8
12880	HX NUT, #3-48
12920	HX HD SCR, 3/8-16x2-1/4 (FULL)
12922	HX HD SCR, #10-32x7/8
13005	SOC SETSCR, 3/8-24x1/2
13028	LK NUT, 1/2-20
13074	SOC SETSCR, 5/16-18x3/8 (BLK)
13076	SL RD SCR, #6-32x1-3/4 (ZINC)
13077	SL RD SCR, #6-32x2 (ZINC)
13078	SOC SETSCR, 1/4-20x5/16 (BLK)
13079	SOC SETSCR, 1/4-20x3/8 (BLK)
13080	SOC SETSCR, #10-24x3/8 (BLK)
13081	HX NUT, #6-32
13233	SOC FL SCR, #10-24x3/4
13285	THUMB SCR, 1/4-20x3/8 (A)
13385	LK NUT, 1/4-20
13406	JAM NUT, 5/16-24
13427	SL RD SCR, #4-40x1
13433	SOC SETSCR, 1/4-20x1/8
13451	SOC HD SCR, #10-32x1-1/2 (BLK)
13542	SL RD SCR, #10-24x1-1/4
13557	SOC SETSCR, 5/16-24x1/2
13566	BUT HD SCR, #10-24x3/4
13597	SOC SETSCR, 1/4-20x5/16 (LK)
13608	SOC HD SCR, #10-32x1-3/8
13677	SOC HD SCR, #8-32x3/8
13807	HX HD SCR, M6x1x10mm
13855	FILL HD SCR, 1/4-20x2
13881	SL PAN SCR, #10-32x3/8
13909	HX HD SCR, #10-24x3/4
14021	SOC SETSCR, #8-32x5/16
14125	SL RD SCR, #4-40x3/16
14127	SL FL SCR, #10-24x3/8
14130	SL FL SCR, #6-32x3/16
14172	SOC HD SCR, 1/4-28x3/4
14239	SL RD SCR, #10-32x5/16
14302	FL WA, #6 (BRASS)
14303	FL WA, 1/2
14335	SL RD SCR, #10-24x1-1/4
14525	SOC FL HD SCR, #8-32x3/4
14526	SOC FL SCR, 1/4-20x7/8
14528	BUT HD SCR, #8-32x1-1/8
14529	BIND HD SCR, #8-32x5/8
14690	HX HD SCR, 1/4-20x1-1/8
14735	BUT HD SCR, #8-32x1-1/4
14736	SOC SETSCR, 1/4-20x3/16 (BLK)
14737	SOC SETSCR, 5/16-18x1/4 (BLK)
14738	SOC SETSCR, 3/8-16x1-1/4 (BLK)
14739	HX HD SCR, #10-24x1/2
14740	LK NUT, #10-32
14741	LK NUT, #8-32
14742	FL WA, #10
14743	BUT HD SCR, #8-32x3/4
14761	SOC SETSCR, 1/4-20x3/16
14777	SOC FL SCR, #10-24x7/8
14843	SOC SETSCR, #6-32x1/4
14881	HX HD SCR, 1/4-20x1-3/8
15116	LK WA, 7/16
15117	FL, WA, 7/16
15138	HX HD SCR, M6x1x12mm
15144	SOC HD SCR, M6x1x20mm
15145	FL WA, 3/8
15157	HX HD SCR, 7/16-14x1-1/2
15193	BIND SCR, #8-32x1-1/4
15201	FL WA, 5/8
15230	SOC SETSCR, M10x1.5x80mm
15231	SOC HD SCR, M10x1.5x70mm (BLK)
15311	SOC HD SCR, #10-32x3/4
15312	SOC HD SCR, #8-32x5/8
15338	HX HD SCR, M8x1.25x35mm
15340	SOC SETSCR, 5/16-18x5/16 (LK)
15341	SOC SETSCR, #8-32x3/8
15342	SOC SETSCR, 1/4-20x5/16 (BLK)

HARDWARE ITEMS

PART NO.	DESCRIPTION
15343	SOC SETSCR, 1/4-20x3/8 (BLK)
15344	SOC HD SCR, 1/4-20x3/8
15345	HX HD SCR, 5/16-18x3
15346	HX HD SCR, M8x1.25x40mm (FULL)
15388	FL WA, 5/8
15393	SL RD SCR, #8-32x1
15395	SOC FL SCR, #8-32x1/2
15409	SOC HD SCR, #4-40x1/4
15460	SOC SETSCR, 5/16-18x1/2 (BLK)
15481	BIND SCR, #10-32x3/8
15482	BUT HD SCR, #10-24x1
15483	SOC HD SCR, #6-32x5/8 (BLK)
15484	HX HD SCR, 3/8-16x2-1/4 (FULL)
15549	CAP NUT, 3/8-16
15554	HX NUT, M8x1.25
15555	HX HD SCR, M8x1.25x30mm
15586	HX HD SCR, 3/8-16x1-3/4 (FULL)
15600	LK NUT, 5/16-18
15635	SL RD SCR, #6-32x2-1/4
15636	SOC FL SCR, #8-32x1/4
15641	SOC HD SCR, M10x1.5x40mm
15677	BIND SCR, #8-32x5/16
15690	SOC HD SCR, 1/2-13x3
15725	BIND SCR, #8-32x11/16
15749	HX HD SCR, 1/2-13x5-3/4
15791	HX HD SCR, M8x1.25x16mm
15792	SOC HD SCR, M6x1x12mm
15890	SOC SETSCR, 1/4-20x5/16 (LK)
15968	HX HD SCR, 5/16-18x4
16125	CAP NUT, 5/16-18
16126	HX HD SCR, 3/8-16x7/8
16127	SOC FL SCR, 5/16-18x3/4
16128	HX HD SCR, 1/4-28x3/8
16129	HX HD SCR, 5/16-18x2-1/8
16130	SOC SETSCR, 1/4-20x1/2 (BLK)
16131	LK NUT, M6x1 (BLK)
16132	SOC SETSCR, M6x1x45mm (BLK)
16133	SOC SETSCR, 3/8-16x1-1/8
16134	SOC HD SCR, #8-32x3/4
16135	HX NUT, #10-32
16164	SOC HD SCR, 1/4-20x1/4
16292	SOC FL SCR, 3/8-24x1
16301	SOC HD SCR, 5/16-18x2
16338	HX HD SCR, M8x35mm
16343	FL WA, 13/64
16393	HX HD SCR, 3/8-24x1
16394	HX HD SCR, 5/16-24x3/4
16405	HX HD SCR, 5/16-24x1/2
16410	SL FL SCR, #10-32x1/4
16413	SOC HD SCR, 7/16-20x1
16617	FILL HD SCR, 5/16-18x3/8
16645	SOC HD SCR, #10-32x1
16725	SL FL SCR, 1/4-20x7/8
16914	HX HD SCR, 5/16-24x1-3/4
16915	HX HD SCR, 1/4-28x1
16920	HX HD SCR, #10-32x1-1/2
16930	SL PAN SCR, #8-32x1/2
17072	HX HD SCR, 3/8-16x5-1/2
17343	SOC HD SCR, #8-32x1-1/4
17467	SL FL SCR, #10-32x7/8
17468	SOC HD SCR, #10-32x1/2
17481	SQ HD SETSCR,3/8-16x1
17636	SL FL SCR, #10-32x1
17729	HX HD SCR, 5/16-18x5-1/2
17883	HX HD SCR, 5/16-24x7/8
17899	HX HD SCR, 3/8-24x1-3/4
17901	HX HD SCR, 5/16-24x1
17908	HX HD SCR, 3/8-24x7/8
17913	SOC FL SCR, 1/4-28x5/8
17919	HX HD SCR, 3/8-24x1
17993	SOC SETSCR, 1/4-20x5/16(nyltip)
18025	HX HD SCR, 3/8-24x2-1/4
18027	HX HD SCR, 1/4-28x3/4
18052	HX HD SCR, 5/16-24x1/2
18067	HX HD SCR, 1/4-28x1-3/4
18075	HX HD SCR, 1/4-28x1-1/4
18084	HX HD SCR, 3/8-24x1-1/4
18091	HX HD SCR, 3/8-24x3/4
18111	LK NUT, 7/16-20
18114	HX NUT, 1-3/4-20
18125	HX HD SCR, 1/4-28x7/8
18132	HX HD SCR, 1/4-28x1/2
18143	HX HD SCR, 1/4-28x5/8
18209	SL FL SCR, 3/8-16x1
18218	SL FL SCR, #10-32x1/2
18331	SOC FL SCR, 3/8-16x1
18473	SOC FL SCR, #8-32x3/8
18539	HX HD SCR, 1/2-20x1-1/2
18557	BIND SCR, #8-32x1-1/2
18640	HX HD SCR, 5/16-24x5/8

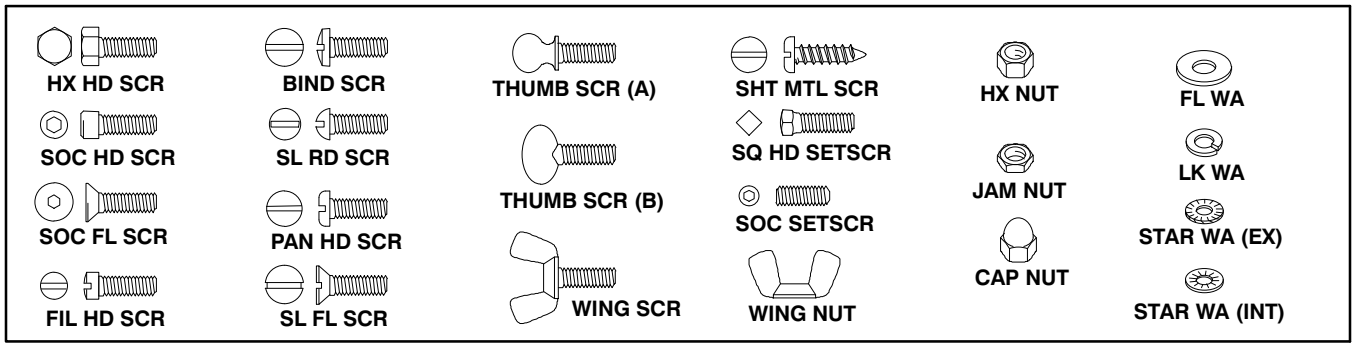


HARDWARE ITEMS

PART NO.	DESCRIPTION
18646	HX HD SCR, #10-32x3/8
18647	SOC HD SCR, 3/8-24x3/4
18648	SL FL SCR, #8-36x5/8
18661	SL FL SCR, 1/4-28x5/8
18666	HX HD SCR, 1/4-28x2-1/4
18773	HX HD SCR, 3/8-24x5/8
18791	SL FL SCR, #8-32x1-3/4
18793	HX NUT, 18mm
18819	SL FL SCR, #8-32x5/8
18917	HX HD SCR, 10-32x1/2
20031	HX HD SCR, 1/2-13x4
18936	HX HD SCR, M4x0.7x8mm
19140	SOC HD SCR, #4-40x3/8
19253	HX HD SCR, 3/8-24x1-1/2
19316	SOC SETSCR, 1/4-28x1/4
19398	HX HD SCR, 3/8-24x1-3/8
19399	SOC HD SCR, 1/4-28x1/2
19403	PAN HD SCR, M4x0,7x10mm
19595	HX HD SCR, 5/16-24x1-1/4
19814	HX HD SCR, 5/16-24x2-1/4
20388	PAN HD SCR, 8-32x1-1/2
20722	HX HD SCR, 1/2-20x1-1/2 Grade 8
21168	HX NUT, 3/8-16 (LK)
21260	SL FL SCR, #10-32x3-1/4
21261	SL FL SCR, #10-32x1-1/2
21657	SL RD SCR, #4-40x1/2
22088	SOC HD SCR, M4x0.7x20mm
20781	SOC HD SCR, M6x1.0x30mm
22491	SOC HD SCR, 8-32x1
22533	HX HD SCR, M6x1.0x6mm
22534	BIND HD SCR, M3x0.5x6mm
22763	BIND SCR, M5x0.8x10mm
22767	HX HD SCR, M8x1.25x45mm
22768	HX HD SCR, M6x1.0x8mm
22769	SL FL SCR, M6x1.0x20mm
22774	PAN HD SCR, M6x1.0x16mm
22775	WING SCR, M6x1.0x12mm
22776	WING SCR, M6x1.0x30mm
22777	SOC HD SCR, M6x1.0x30mm
22794	SOC SETSCR, M6x1.0x8mm
22847	HX HD SCR, M5x0.8x8mm
22848	HX HD SCR, M5x0.8x10mm
22849	HX HD SCR, M5x0.8x12mm
22850	HX HD SCR, M5x0.8x14mm
22851	HX HD SCR, M5x0.8x16mm
22852	HX HD SCR, M5x0.8x18mm
22853	HX HD SCR, M6x1.0x14mm
22854	HX HD SCR, M6x1.0x16mm
22855	HX HD SCR, M6x1.0x20mm
22856	HX HD SCR, M6x1.0x25mm
22857	HX HD SCR, M8x1.25x12mm
22858	HX HD SCR, M8x1.25x14mm
22859	HX HD SCR, M8x1.25x20mm
22860	HX HD SCR, M8x1.25x25mm
22861	HX HD SCR, M10x1.5x16mm
22862	HX HD SCR, M10x1.5x20mm
22863	HX HD SCR, M10x1.5x25mm
22864	HX HD SCR, M10x1.5x30mm
22865	HX HD SCR, M10x1.5x35mm
22866	HX HD SCR, M10x1.5x40mm
22867	HX HD SCR, M12x1.75x16mm
22868	HX HD SCR, M12x1.75x20mm
22869	HX HD SCR, M12x1.75x25mm
22870	HX HD SCR, M12x1.75x30mm
22871	HX HD SCR, M12x1.75x35mm
22872	HX HD SCR, M12x1.75x40mm
22873	HX HD SCR, M14x2x25mm
22874	HX HD SCR, M14x2x30mm
22875	HX HD SCR, M14x2x35mm
22876	HX HD SCR, M14x2x40mm
22877	HX HD SCR, M14x2x45mm
22878	HX HD SCR, M14x2x50mm
22879	HX HD SCR, M16x2x25mm
22880	HX HD SCR, M16x2x30mm
22881	HX HD SCR, M16x2x35mm
22882	HX HD SCR, M16x2x40mm
22883	HX HD SCR, M16x2x50mm
22884	HX HD SCR, M16x2x60mm
22885	HX NUT, M6x1.0
22886	HEX NUT, M5x0.8
22887	HEX NUT, M10x1.5
22888	HEX NUT, M12x1.75
22889	HEX NUT, M14x2
22890	HEX NUT, M16x2
22891	SL FL SCR, M5x16mm
22915	SOC HD SCR, 3/8-18x3-1/4
22923	HX NUT, 1/2-13 (NYLOK)
22956	PAN HD SCR, M4x0,7x6mm
22977	HX HD SCR, 1/2-13x2
23384	PAN HD SCR, M5x0.8x16mm
23432	SOC HD SCR, M6x1.0x45mm
23433	HX HD SCR, M6x1.0x30mm
23481	WING SCR, M6x1.0x20mm
23554	HX HD SCR, M6x1.0x35mm
23906	FL WA, 5/16
24283	SOC SETSCR, M6 x 30mm
24284	SOC SETSCR, M6 x 6mm
24289	SL FL SCR, M8 x 16mm
24471	SL FL SCR, M6 x 12mm
24629	CAP NUT, M8
25431	CAP NUT, M12
25433	SOC HD SCR, M10 x 20mm
25448	SL SETSCR, M6 x 12mm
25616	CAP NUT, M6
25638	HX HD SCR, M6 x 50mm
25720	CAP NUT, M4
25874	JAM NUT, 7/16-20
25945	SL FL SCR, M6 x 16mm
26163	SOC HD SCR, M8 x 30mm
26165	SL FL SCR, M4 x 12mm
26188	HX HD SCR, M8 x 70mm
26212	SL FL SCR, M10 x 40mm
26213	CAP NUT, M10
26431	HX HD SCR, M10 x 70mm
26432	LK NUT, M10
26433	HX NUT, M4
26503	SOC HD SCR, 1/4-20 x 1-1/2
26504	SOC HD SCR, M8 x 16mm

HARDWARE ITEMS

PART NO.	DESCRIPTION	PART NO.	DESCRIPTION	PART NO.	DESCRIPTION
26540	SOC FL SCR, M8 x 16mm				



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