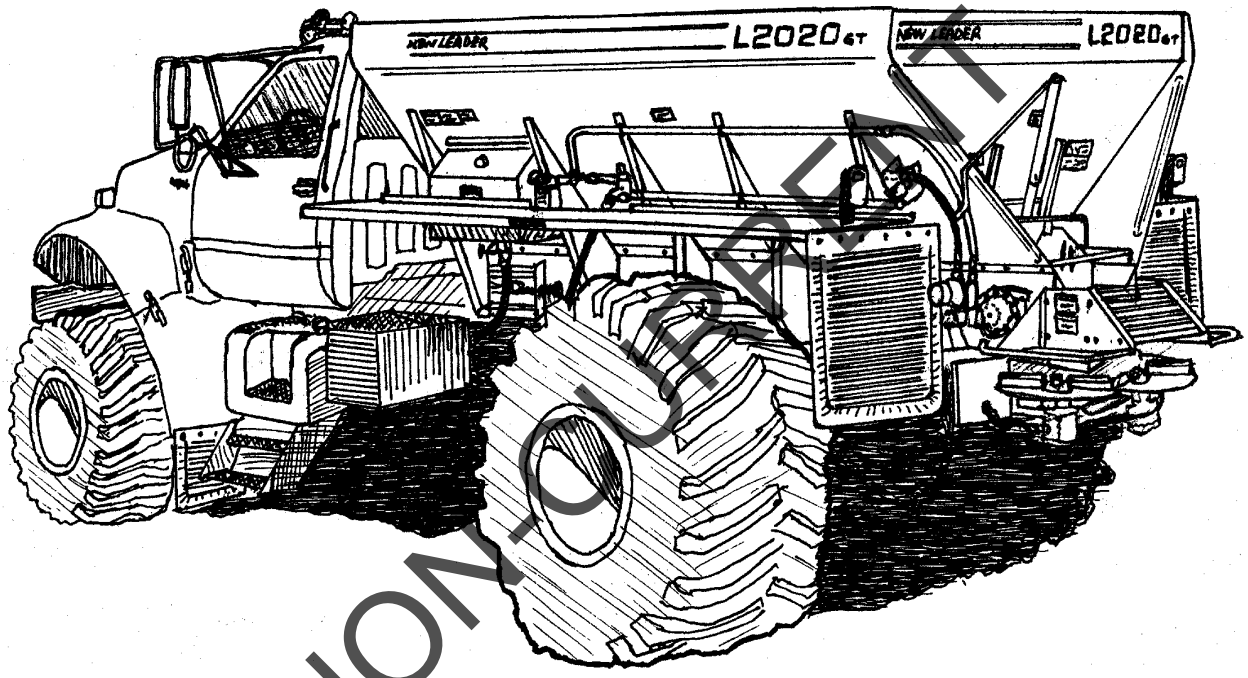
NEW LEADER *HIGHWAY EQUIPMENT COMPANY*

GENERAL MANUAL FOR MODEL

L2020GT



NON-CURRENT

SAFETY GUIDELINES
ASSEMBLY
OPERATION
TROUBLESHOOTING
PARTS LIST

This machine may have been built with SPECIAL FEATURES. When ordering parts, furnish SERIAL NUMBER listed below.

SERIAL _____

DEALER _____

IMPORTANT: READ THE SAFETY GUIDELINES AND ALL INSTRUCTIONS CAREFULLY BEFORE OPERATING

HIGHWAY EQUIPMENT COMPANY - NEW LEADER DIVISION
1330 76TH AVE SW, CEDAR RAPIDS, IOWA 52404-7052
PH. (319) 363-8281 www.highwayequipment.com FAX (319) 632-3081

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NEW LEADER

MODEL L2020GT

NON-CURRENT

UNIT SERIAL NUMBER_____

MANUAL NUMBER: 81102-F

EFFECTIVE 3/2000

HIGHWAY EQUIPMENT COMPANY
1330 76TH AVE SW
CEDAR RAPIDS, IOWA 52404-7052

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TABLE OF CONTENTS

NON-CURRENT

TABLE OF CONTENTS CONT'D

NON-CURRENT

PREFACE

PLEASE ! ALWAYS THINK SAFETY FIRST !!

The purpose of this manual is to familiarize the person (or persons) using this unit with the information necessary to properly install, operate, and maintain this system. These instructions cannot replace the following: the fundamental knowledge that must be possessed by the installer or operator, the knowledge of a qualified person, or clear thinking necessary to install and operate this equipment. Since the life of any machine depends largely upon the care it is given, we suggest that this manual be read thoroughly and referred to frequently. If for any reason you do not understand the instructions, please call your authorized dealer or our Cedar Rapids, Iowa, Service Department at (319) 363-8281.

It has been our experience that by following these installation instructions, and by observing the operation of the spreader, you will have sufficient understanding of the machine enabling you to troubleshoot and correct all normal problems that you may encounter. Again, we urge you to call your authorized dealer or our Cedar Rapids Service Department if you find the spreader is not operating properly, or if you are having trouble with repairs, installation, or removal of this machine.

We urge you to protect your investment by using genuine HECO parts and our authorized dealers for all work other than routine care and adjustments.

Highway Equipment Company reserves the right to make alterations or modifications to this equipment at any time. The manufacturer shall not be obligated to make such changes to machines already in the field.

When this manual was originally supplied, it was accompanied by the Highway Equipment Company *Operating and Maintenance Safety Manual*. The Safety Manual should be read thoroughly and referred to frequently. If you do not have the Safety Manual, we recommend that you obtain one from your dealer or from Highway Equipment Company before any installation, operation or maintenance of the spreader is attempted.

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ACCIDENTS HURT !!!

ACCIDENTS COST !!!

ACCIDENTS CAN BE AVOIDED !!!

SAFETY

TAKE NOTE! THIS SAFETY ALERT SYMBOL FOUND THROUGHOUT THIS MANUAL IS USED TO CALL YOUR ATTENTION TO INSTRUCTIONS INVOLVING YOUR PERSONAL SAFETY AND THAT OF OTHERS. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN INJURY OR DEATH.

In this manual and on the safety signs placed on the unit, the words "DANGER," "WARNING," "CAUTION," and "IMPORTANT" are used to indicate the following:

DANGER! — Indicates an imminently hazardous situation that, if not avoided, WILL result in death or serious injury. This signal word is to be limited to the most extreme situations and typically for machine components that, for functional purposes, cannot be guarded.

WARNING! — Indicates a potentially hazardous situation that, if not avoided, COULD result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

CAUTION! — Indicates a potentially hazardous situation that, if not avoided, MAY result in minor or moderate injury. It may also be used to alert against unsafe practices.

IMPORTANT! — Is used for informational purposes in areas which may involve damage or deterioration to equipment but generally would not involve the potential for personal injury.

NON-CURRENT

The need for safety cannot be stressed strongly enough in this manual. At Highway Equipment Company, we urge you to make safety your top priority when operating any equipment. We firmly advise that anyone allowed to operate this machine be thoroughly trained and tested, to prove they understand the fundamentals of safe operation.

The following guidelines are intended to cover general usage and to assist you in avoiding accidents. There will be times when you will run into situations that are not covered in this section. At those times the best standard to use is common sense. If, at any time, you have a question concerning these guidelines, please call your authorized dealer or our factory at (319) 363-8281.

SAFETY

AVOID ACCIDENTS

Most accidents, whether they occur in industry, on the farm, at home, or on the highway, are caused by the failure of some individual to follow simple and fundamental safety rules or precautions. For this reason, most accidents can be prevented by recognizing the real cause and doing something about it before the accident occurs.

Regardless of the care used in the design and construction of any type of equipment, there are many conditions that cannot be completely safeguarded against without interfering with reasonable accessibility and efficient operation.

A CAREFUL OPERATOR IS THE BEST INSURANCE AGAINST AN ACCIDENT. THE COMPLETE OBSERVANCE OF ONE SIMPLE RULE WOULD PREVENT MANY THOUSAND SERIOUS INJURIES EACH YEAR. THAT RULE IS:

NEVER ATTEMPT TO CLEAN, OIL OR ADJUST A MACHINE WHILE IT IS IN MOTION.

NON-CURRENT

CAUTION! If spreader is used to transport chemicals, check with your chemical supplier regarding DOT (Department of Transportation) requirements.

SAFETY DECALS

MAINTENANCE INSTRUCTIONS

1. Keep safety decals and signs clean and legible at all times.
2. Replace safety decals and signs that are missing or have become illegible.
3. Replaced parts that displayed a safety sign should also display the current sign.
4. Safety decals or signs are available from your dealer's Parts Department or our Cedar Rapids factory.

INSTALLATION INSTRUCTIONS

1. Clean Surface
   Wash the installation surface with a synthetic, free rinsing detergent. Avoid washing the surface with a soap containing creams or lotion. Allow to dry.
2. Position Safety Decal
   Decide on the exact position before application. Application marks may be made on the top or side edge of the substrate with a lead pencil, marking pen, or small pieces of masking tape.
   NOTE: Do not use chalk line, china marker, or grease pencil. Safety decals will not adhere to these.
3. Remove the Liner
   A small bend at the corner or edge will cause the liner to separate from the decal. Pull the liner away in a continuous motion at a 180 degree angle. If the liner is scored, bend at score and remove.
4. Apply Safety Decal
   a. Tack decal in place with thumb pressure in upper corners.
   b. Using firm initial squeegee pressure, begin at the center of the decal and work outward in all directions with overlapping strokes.
      NOTE: Keep squeegee blade even, nicked edges will leave application bubbles.
   c. Pull up tack points before squeegeeing over them to avoid wrinkles.
5. Remove Premask
   If safety decal has a premask cover remove it at this time by pulling it away from the decal at an 18 degree angle. NOTE: It is important that the premask covering is removed before the decal is exposed to sunlight to avoid the premask from permanently adhering to the decal.
6. Remove Air Pockets
   Inspect the decal in the flat areas for bubbles. To eliminate the bubbles, puncture the decal at one end of the bubble with a pin (never a razor blade) and press out entrapped air with thumb moving toward the puncture.
7. Re-Squeegee All Edges

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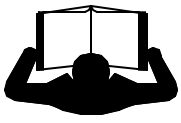
SAFETY DECALS

CAUTION



TO AVOID INJURY OR MACHINE DAMAGE
- Do not operate or work on this machine without reading and understanding the operators manual
- Keep hands, feet, hair and clothing away from moving parts.
- Do not allow riders on machine
- Avoid unsafe operation or maintenance.
- Disengage power takeoff and shut off engine before removing guards, servicing or unclogging machine.
- Keep unauthorized people away from machine
- Keep all guards in place when machine is in use
- If manual is missing, contact dealer for replacement

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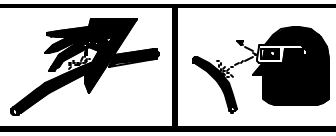
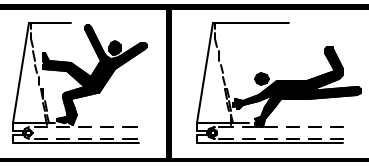
WARNING



HIGH PRESSURE FLUID HAZARD
To prevent death or serious injury:
- Relieve pressure on system before repairing, adjusting, or disconnecting.
- Keep all lines, fittings and couplers tight and free of leaks.
- Wear proper hand and eye protection when searching for leaks. Use wood or cardboard instead of hands.
- Do not use hydraulic lines for hand holds or steps
- Components may be hot.

39138

DANGER



MOVING PART HAZARD
To prevent death or serious injury:
- Stay out of box while conveyor is moving.
- Disconnect and lockout power source before adjusting or servicing.
- Do not ride on spreader

364

CAUTION

HAZARDOUS MATERIALS
To avoid injury or machine damage.
- Materials to be spread can be dangerous.
- Improper selection, application, use or handling may be a hazard to persons, animals, crops or other property.
- Follow instructions and precautions given by the material manufacturer.

321

IMPORTANT

Spinner assembly and material flow divider have NOT been adjusted at the factory. Before assembling machine, read and follow assembly instructions in the operation and maintenance manual for this machine.

Before spreading material, spread pattern tests must be conducted to properly adjust the spread pattern. Refer to the operation & maintenance manual for adjustment instructions. A spread pattern test kit, part number 70889, is available for this purpose. THE MANUFACTURER OF THIS SPREADER WILL NOT BE LIABLE FOR MISAPPLIED MATERIAL DUE TO AN IMPROPERLY ADJUSTED SPREADER

It is recommended that spread pattern tests be conducted prior to each spreading season, after any spreader maintenance, and periodically during the spreading season. Spread pattern tests must be conducted whenever a new product is to be applied.

71526

DANGER

FLYING MATERIAL & ROTATING SPINNER HAZARD
To prevent death or serious injury:
- Wear eye protection.
- Stop machine before servicing or adjusting.
- Keep bystanders at least 60 feet away.

366

WARNING

FALLING HAZARD
To prevent death, serious injury or machine damage.
- Do not stand or climb on guard.

55630

IMPORTANT

Spinner assembly and material flow divider have NOT been adjusted at the factory. Before assembling machine, read and follow assembly instructions in the operation and maintenance manual for this machine.

Before spreading material, spread pattern tests must be conducted to properly adjust the spread pattern. Refer to the operation & maintenance manual for adjustment instructions. A spread pattern test kit, part number 70889, is available for this purpose. THE MANUFACTURER OF THIS SPREADER WILL NOT BE LIABLE FOR MISAPPLIED MATERIAL DUE TO AN IMPROPERLY ADJUSTED SPREADER.

It is recommended that spread pattern tests be conducted prior to each spreading season, after any spreader maintenance, and periodically during the spreading season. Spread pattern tests must be conducted whenever a new product is to be applied.

71527

WARNING

MOVING PART HAZARD
To prevent death or serious injury:
- Close and secure guards before starting.
- Do not stand or climb on machine.
- Disconnect and lockout power source before adjusting or servicing.
- Keep hands, feet and hair away from moving parts.

55631

NON-CURRENT

GENERAL DESCRIPTION

The Model L2020 Generation Two is a hopper-type spreader intended for spreading free-flowing granular agricultural materials, such as chemical fertilizers, agricultural limestone and gypsum. It is intended for truck chassis or flotation vehicle mounting. It also may be incorporated into a towed trailer unit.

The unit is powered hydraulically and provides independent variable speed control for the spinner and full automatic ground speed coordinated control for the conveyor by means of the Synco-Matic® Mark III control system. The hydraulic pump, which provides the hydraulic power, is a gear-type pump that is driven by means of a transmission PTO.

The conveyor runs the full length of the hopper bottom to deliver material to the spinners through an adjustable metering gate at the rear of the hopper body. It is driven by an orbital type hydraulic motor integrally mounted to a 6 to 1 ratio spur gear box. The standard conveyor is a number five straight belt on ten foot through thirteen foot units and a number four Belt-over-chain on fourteen foot through sixteen foot units.

The distributor spinner assembly has two 24 inch diameter discs canted upward at the outer edges by 5°. Each disc has three formed and heat treated fins. Each fin's angle can be adjusted. Spinners are fed through an adjustable material flow divider.

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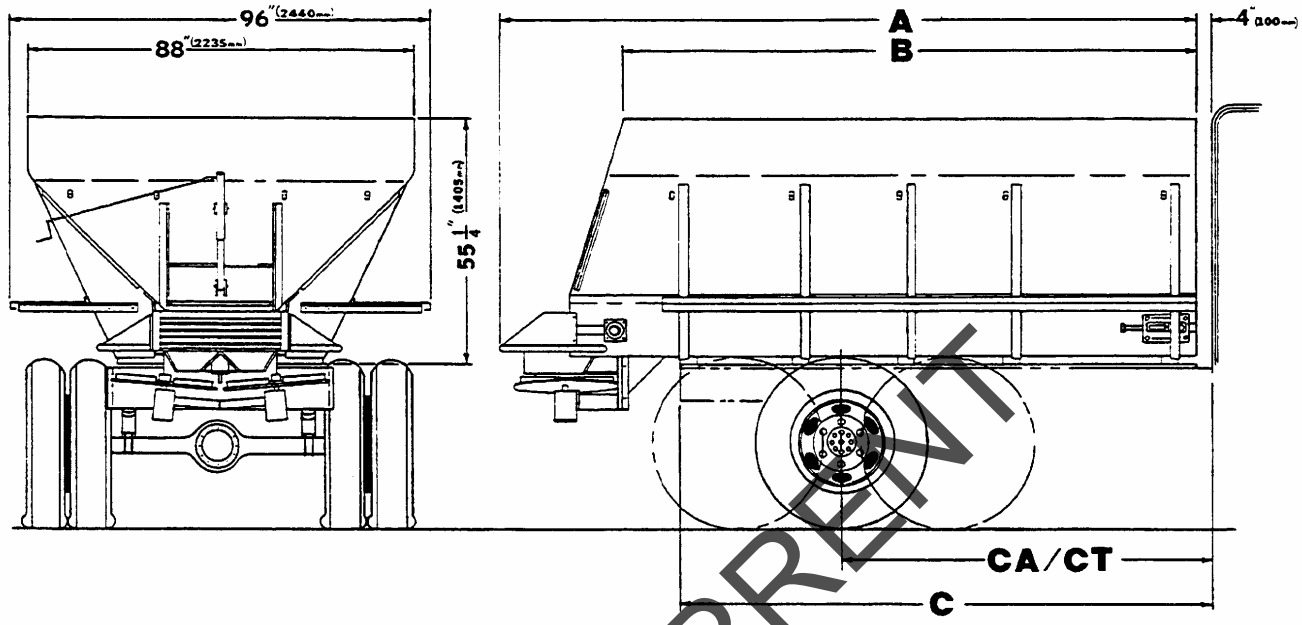
DIMENSIONS & CAPACITIES



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Weights and Dimensions				
Body Length	Over-All A	Inside B	Frame C	Cab to Axle C.A.
10’	148” (3760 mm)	120” (3050 mm)	111” (2820 mm)	84” (2135 mm)
11’	160” (4065 mm)	132” (3355 mm)	123” (3125 mm)	84” (2135 mm)
12’	172” (4370 mm)	144” (3660 mm)	135” (3430 mm)	102” (2590 mm)
13’	184” (4675 mm)	156” (3960 mm)	147” (3735 mm)	102-108” (2590-2745 mm)
14’	196” (4980 mm)	168” (4265 mm)	159” (4040 mm)	120” (3050 mm)
15’	208” (5285 mm)	180” (4570 mm)	171” (4345 mm)	120” (3050 mm)
16’	220” (5590 mm)	192” (4875 mm)	183” (4650 mm)	138” (3505 mm)

Capacities-Struck — Cubic Yards (Meters^3) Cubic Feet		
Body Length	Standard	Basic Spreader Weight-Approx.
10’	7.3 (5.6) 195	2735 lbs. (1241 kg)
11’	7.9 (6.1) 214	2940 lbs. (1334 kg)
12’	8.7 (6.7) 234	3045 lbs. (1382 kg)
13’	9.4 (7.2) 253	3151 lbs. (1430 kg)
14’	10.2 (7.8) 273	3256 lbs. (1477 kg)
15’	10.9 (8.4) 292	3461 lbs. (1570 kg)
16’	11.6 (8.9) 312	3666 lbs. (1663 kg)

INSTALLATION INSTRUCTIONS

SELECTION OF PUMP AND PTO

Since the amount of material per acre to be spread depends upon the match between rear tire size, pump size, pump speed (which depends upon engine speed and PTO percent), conveyor delivery rate and feedgate opening, it is essential that a correct match between these factors be made. This matching is called "sizing."

SIZING DATA REQUIRED

1. Correct sizing requires accurate and complete information.
   A. PTO Data
      1. Make and model of PTO.
      2. PTO percentage of engine RPM.
      3. Direction of PTO Rotation (Engine direction or opposite of engine direction).
   B. Engine RPM range while spreading. For popular medium duty V-8 engines, the recommended operating range would be 2800 to 3200 engine RPM.

IMPORTANT!	Excessive engine speed will cause more hydraulic oil to be pumped than is required to drive spinners and conveyor and may result in overheating the oil. Too low an engine speed may not provide sufficient hydraulic oil flow to maintain spread width or to keep the conveyor running at the speed required to deliver the desired quantity of material being spread.

NOTE: With lower speed engines, such as diesels and heavy duty gasoline engines, it may be necessary to select a higher percentage PTO or a larger pump than standard. Consult your dealer in such cases. It is desirable to install a tachometer in order to maintain proper engine speeds.

2. Pump PTO Selection:
   Some important facts to remember are:
   A. Correct pump delivery range for the L2020GT hydraulic system is 25 to 28 GPM (Gallons Per Minute).
   B. Hydraulic pump should not exceed 2000 RPM (Revolutions Per Minute).

   The following chart shows the low and high range of oil delivery in GPM versus pump RPM:

HECO Pump Part No. Driveline/Direct Mount	Pump GPM	Pump RPM
22394/31231	25 28	1575 1750
22395/30168	25 28	1300 1450
22396/31232	25 28	1150 1300
22397/36847	25 28	1050 1150
22398/31233	25 28	900 1000

NON-CURRENT

INSTALLATION INSTRUCTIONS CONT'D

To determine PTO (Power Take-Off) percentage:
(PTO RPM ÷ OPTIMAL TRUCK ENGINE RPM) x 100 = PTO%

To determine Engine RPM:
PTO RPM ÷ (PTO% ÷ 100) = Engine RPM

For example: If the optimal truck engine RPM is 3600, using the standard pump part no. 22397,
the maximum PTO% is (1700 ÷ 3600) x 100 = 47%.
the minimum PTO% is (1500 ÷ 3600) x 100 = 42%.

Suppose a 46% PTO is selected, the truck engine operating RPM range is:
1700 ÷ (46% ÷ 100) = 3695 Engine RPM.
1500 ÷ (46% ÷ 100) = 3260 Engine RPM.

Operating between 3260 and 3695 RPM would assure adequate flow in the hydraulic system to keep both spinners and conveyor running at peak performance.

IMPORTANT!	Do not select a PTO% and an engine RPM resulting in more than 2000 PTO RPM. Driving the pumps (referenced above) at speeds greater than 2000 RPM will result in premature failure of the pump and other hydraulic components.

NON-CURRENT

GENERAL INSTALLATION INSTRUCTIONS

In mounting the L2020GT spreader on a truck, the following major questions must be considered:

1. Is the CA (Cab to Axle) dimension of the truck correct for the length of the spreader?

   To answer this question the following chart will assist in matching spreader to truck:

Spreader Inside Body Length (Feet)	Single Rear Axle Truck CA Dimension (Inches)	Tandem Rear Axle Truck CA (CT) Dimension (Inches)
10 - 11	84	
12	102	102
13	108	102
14		120
15		120
16		138

2. Is the truck's GAWR (Gross Axle Weight Rating) and the GVWR (Gross Vehicle Weight Rating) adequate to carry the fully loaded spreader?

   To answer this question, refer to your New Leader dealer. He knows where to find the GAWR and GVWR for most trucks, and how to calculate the weight distribution on each axle and total loaded vehicle weight.

INSTALLATION INSTRUCTIONS CONT'D

Recommended sequence of installation is as follows:

1. Mounting of pump and pump drive.
2. Installation of radar (if applicable).
3. Mounting of spreader.
4. Installation of cab pressure gauge Mark III control box (if applicable).
5. Installation of hydraulic hose and electrical wiring.
6. Installation of optional attachments.
7. Filling hydraulic tanks and lubrication.
8. Checking for leaks and proper functioning.

HYDRAULIC PUMP INSTALLATION

A mounting bracket for the hydraulic pump is shipped with the spreader. It may be necessary to modify this bracket to fit your truck since many variable factors, such as PTO make and model, muffler position, transmission make and model, etc., all affect the mounting position. DO NOT WELD THE BRACKET TO THE TRUCK FRAME, to do so may void the truck manufacturer's warranty.

Position the mounting bracket so that the pump drive shaft will be as straight as possible. In no case may the angle at any universal joint exceed 15°. The pump shaft and PTO shaft should be parallel. (Figure 1)

HYDRAULIC PUMP DRIVE SHAFT INSTALLATION

The pump drive shaft included may be too long for some installations. It may be cut and redrilled as necessary. When redrilling the shaft, be sure that universal joints are properly "timed," as shown in Figure 1.

Install the slip joint at the end of the pump drive shaft. Failure to install the slip joint will result in bearing failure in pump, PTO or both.

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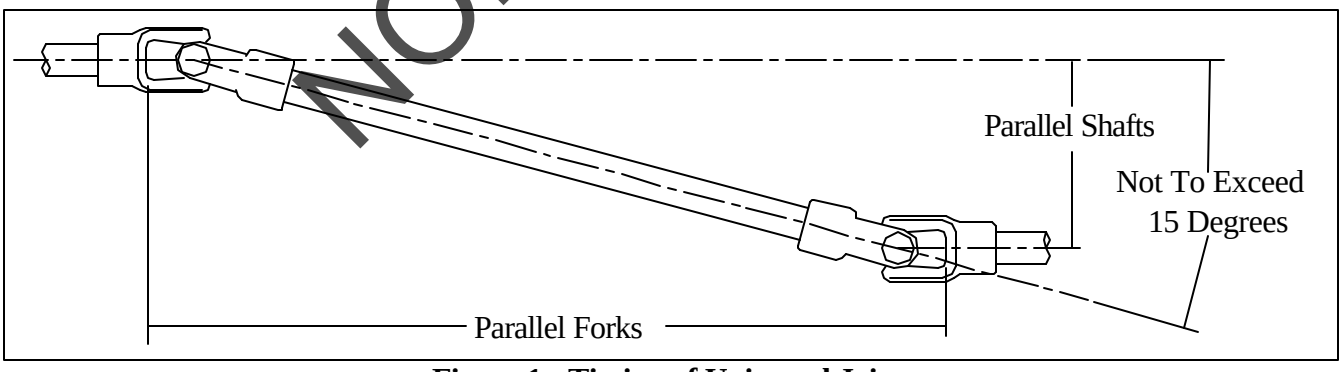

Figure 1 - Timing of Universal Joints

CAUTION! All holes in the truck cab walls, floor and firewall for control wires, hoses and cables are to be grommeted, plugged and sealed to prevent entrance of engine fumes, dust, dirt, water and noise.

See Mark III Assembly, Operation & Maintenance Manual for installation instructions of the Radar, Control Box and Cable Routing.

INSTALLATION INSTRUCTIONS CONT'D

MOUNTING OF SPREADER BODY

Truck Frame Length

In many cases with a new truck, the truck frame must be shortened. The length from the rear of the cab to the rear end of the frame should be approximately as shown on the Dimensions and Capacity Chart on Page 9 under "C".

Wood Filler Strips

Hardwood filler strips (not supplied with spreader) 1" by 3" must be installed the length of the frame behind the truck cab. Cut the filler strip to length and place on top of the truck frame rails. With a heavy hammer strike directly above each rivet head to mark the position of the rivet, if frame has rivets in top flange. Remove the filler strips and counterbore for rivet head clearance. Replace the filler strips and hold them in place by bending anchor clips as shown in Figure 2. If the truck frame has fishplates on the top flange, it will be necessary to provide a level top surface by adding steel shim bars or strips of the same thickness as the fishplates and as wide as the frame channel top flange. These shim bars or strips must be drilled out clear any rivet or bolt heads. DO NOT WELD these bars or strips the truck frame. Place the wood filler strips on top of them and secure both steel shims and wood strips by means of bending the anchor clips around them and the frame top flange as shown in Figure 2. Each steel shim bar or strip and each separate wood filler strip should have three anchor clips. Locate anchor clips between spreader body cross sills. Secure each anchor clip by driving 1/4" sheet metal screw through clip into wood filler strip as shown in Figure 2.

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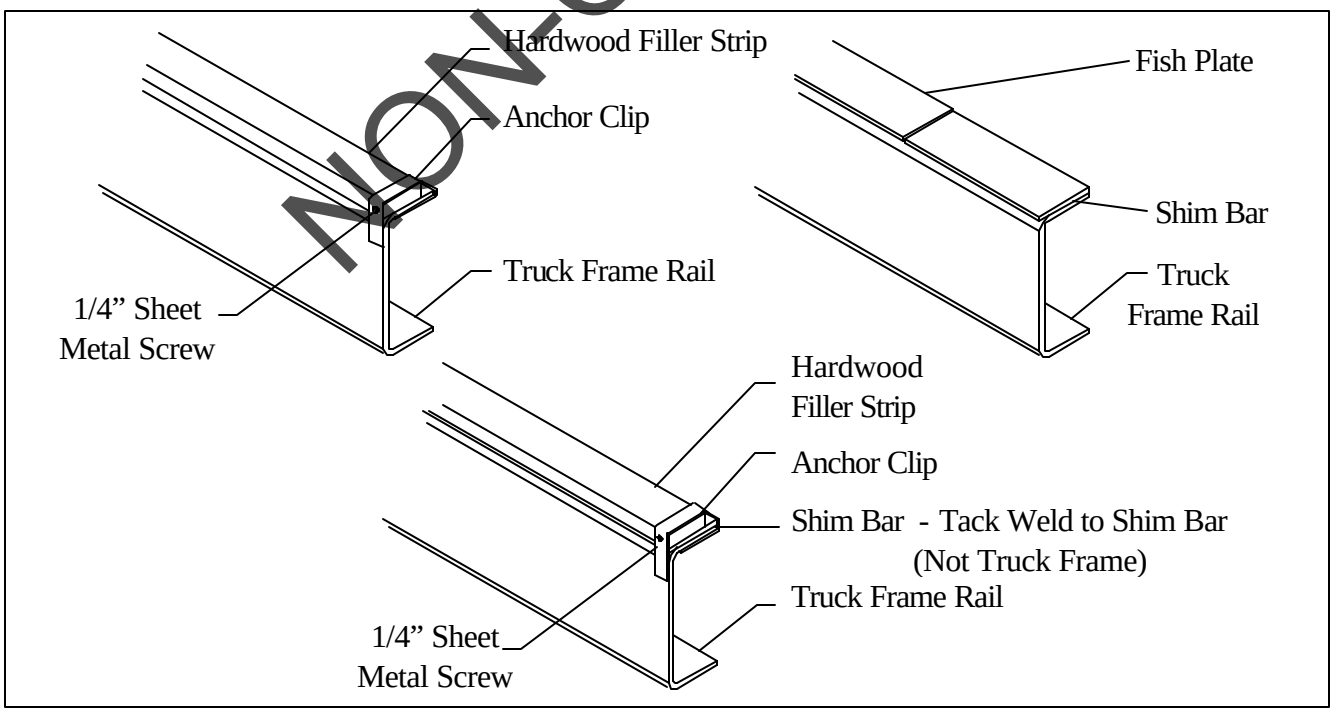

Figure 2 - Wood Filler Strips & Anchor Clips

INSTALLATION INSTRUCTIONS CONT'D

Positioning Body

Using a suitable lifting device with a 6000 pound minimum lifting capacity, lift the empty spreader body onto the truck frame. Position body centrally with respect to the truck frame rails and approximately 4" to the rear of the cab. Check the position of the spreader at the rear to insure that the rear mounting angle can be installed on truck frame and centered on rear cross tube.

CAUTION! Never lift equipment over people. Use only lifting devices rated for 6000 pounds or more. Loads may shift or fall if improperly supported, causing injury.

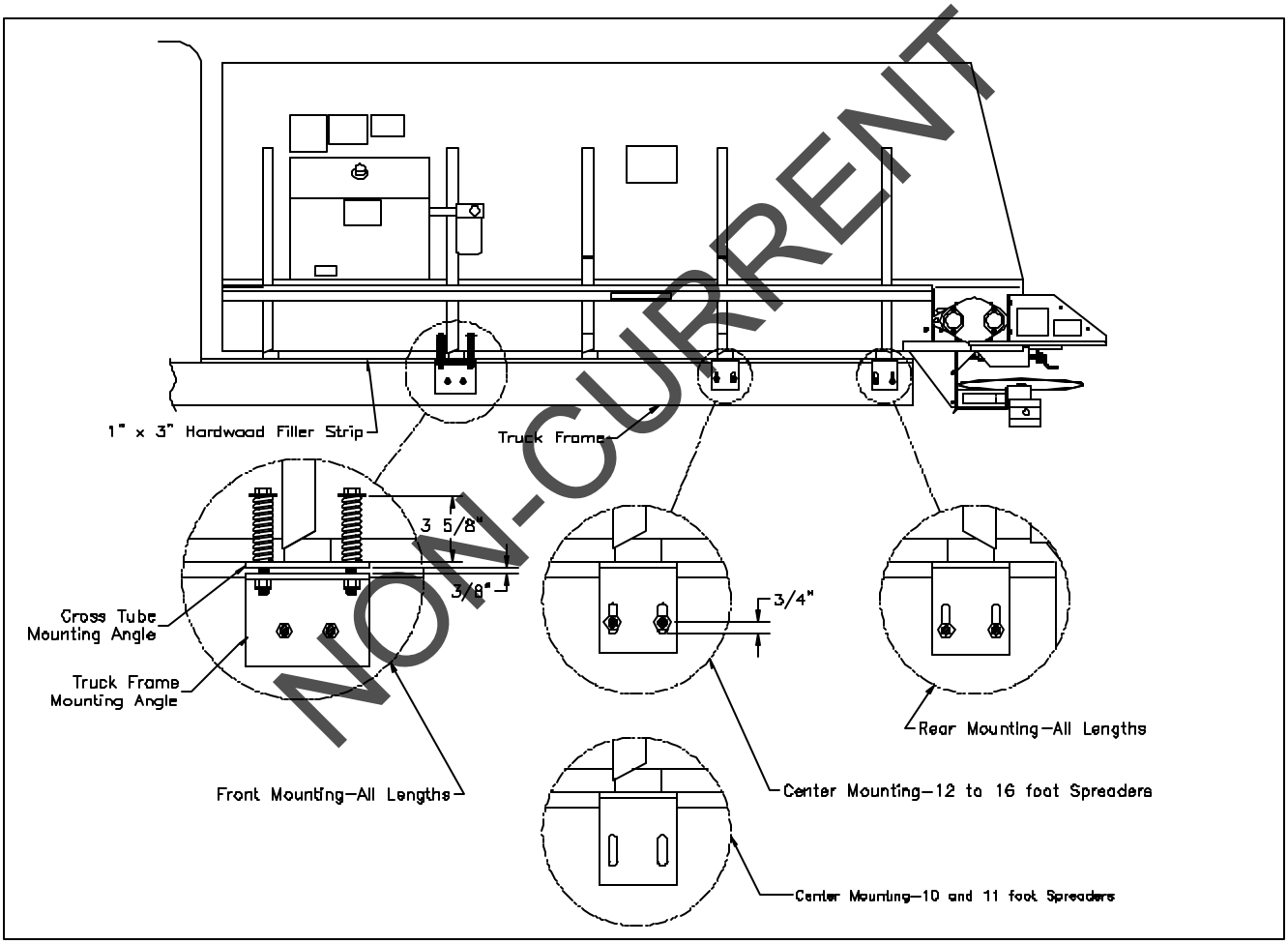

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Figure 3 - Mounting Angle Installation

INSTALLATION INSTRUCTIONS CONT'D

Installing Front Mounting Angles

Position the two front mounting plates on the second cross tube from the front of the spreader. Assemble the two front mounting angle springs and hardware as shown in Figure 3. Mark the location of the holes on the truck frame. Drill two 9/16" diameter holes through the truck frame. Install hardware and torque according to torque chart.

NOTE: On some vehicles it may be necessary to mount the front mounting angle springs on the first cross tube due to obstructions, such as spring shackles, etc.

IMPORTANT!	DO NOT PUT HOLES INTO TOP OR BOTTOM FLANGES—to do so may void truck manufacturer's warranty. When drilling holes in frame member, drill only through vertical web portions.

Installing Center Mounting Angles (10 Foot and 11 Foot Bodies only)

Position the center mounting angles at a convenient cross tube near the center of the body with the slotted faces against the truck frame. (Figure 3) Do not install hardware, these mounting angles are used for side to side support only.

Installing Center Mounting Angles (12 Foot through 16 Foot Bodies only)

Position the center mounting angles at a convenient location near the center of the body with the slotted faces against the truck frame and mark the location of the slots on the truck frame. Drill two 9/16" diameter holes through the truck frame approximately 3/4" from the bottom of the slot. (Figure 3) Install hardware and torque according to torque chart.
NOTE: The position of the center mounting angles will vary from truck to truck due to obstruction, such as spring shackles, etc.

Installing Rear Mounting Angles

Position the rear mounting angles with the slotted faces against the side of the truck frame and centered on the rear cross tube. Mark the location of the slots on the truck frame. Drill two 9/16" diameter holes through the truck frame at the bottom end of the slots. (Figure 3) Install hardware and torque according to torque chart.

IMPORTANT!	DO NOT WELD ON VEHICLE FRAME! Such welding can lead to fatigue cracking and must be avoided.

CAUTION!	When drilling holes, make sure that the drill will not puncture the gas tank or harm any other obstruction!

NON-CURRENT

INSTALLATION INSTRUCTIONS CONT'D

Securing Spreader Body to Frame

Install the mounting angles and tighten the mounting bolts according to the torque chart. Position the angles as described in the steps listed above. Weld the mounting angles to the spreader cross tubes by welding on the front, outer and rear sides. (Figure 4) Be sure welds between mounting bars or mounting angles and spreader cross tubes are sound full fillet welds. Center mounting angles so good fillet welds can be made on three sides, an edge bead weld is not a satisfactory weld for this service. Use dry E6013 or E7018 rod for mild steel spreaders. On stainless steel spreaders, use type 308 welding rod.

Check for vehicle visibility, especially toward the rear. Reposition or add mirrors so adequate rearward visibility is maintained. Check installation completely to be sure all fasteners are secure and that nothing has been left undone.

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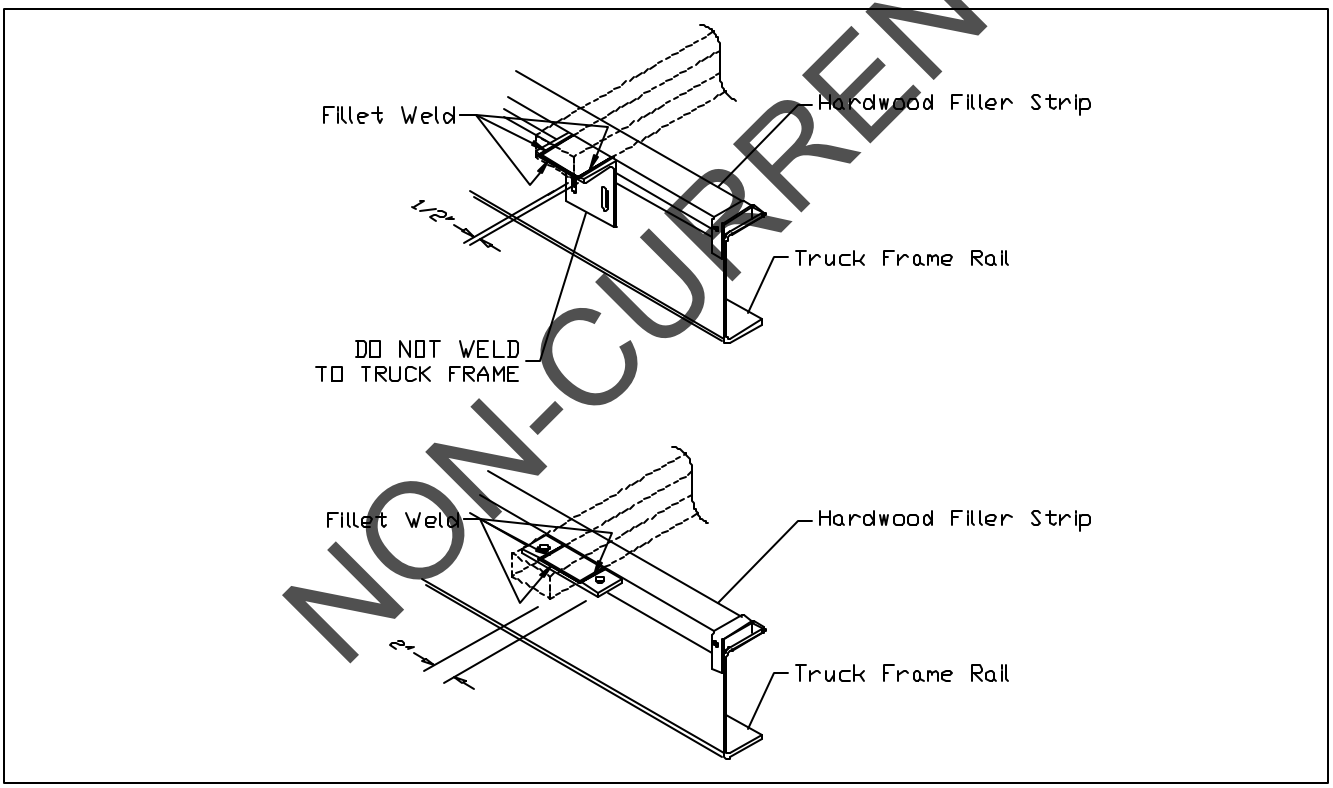


Figure 4 - Welding Instructions

IMPORTANT!	If at anytime, an arc welder is used on the vehicle or anything connected to the vehicle, be sure to connect the welders ground directly to one of the two items being welded. Disconnect power cable from the Mark III processor box! Failure to do so can result in damage to components on both the vehicle and spreader in which case, the warranty will be null and void by manufacturer of same.

INSTALLATION INSTRUCTIONS CONT'D

ELECTRIC DUMP VALVE CONTROL INSTALLATION

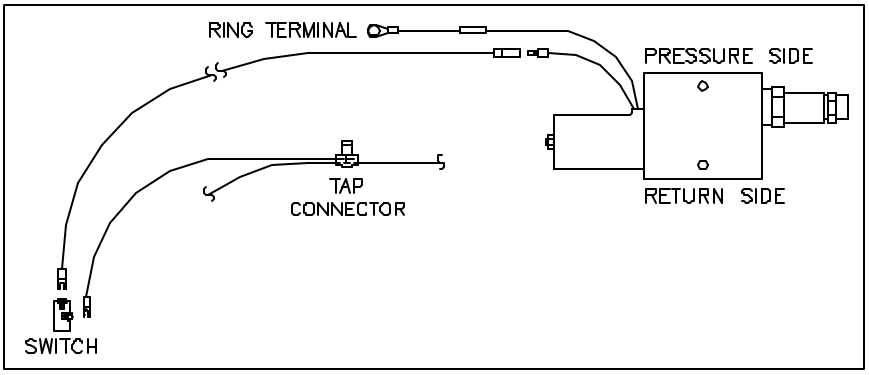


Figure 5 - Electric Dump Valve Control

Splice wire from switch into a wire that is fused with a two amp to four amp fuse using a tap connector. (See location of tap connector in Figure 5.) Ground ring terminal to chain shield hardware. Mount switch in dash or control panel in a location that is easily accessible while operating vehicle.

FENDER INSTALLATION

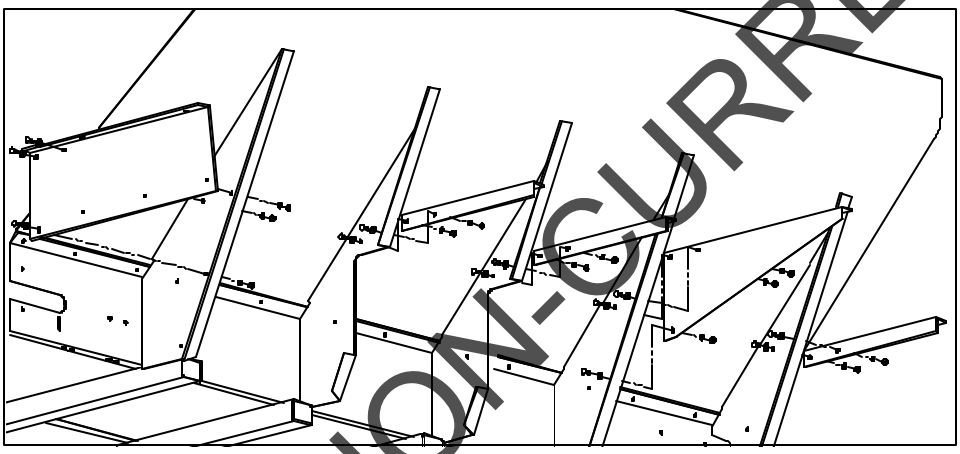


Figure 6 - Fender Angle Installation

Attach fender angles to spreader body as shown in Figure 6. Use the upper set of holes for full or super floatation fenders and the lower set of holes for semi-float and truck chassis mount fenders. Do not tighten the hardware at this time.

NOTE: Some installations have angles in all locations in place of larger panels

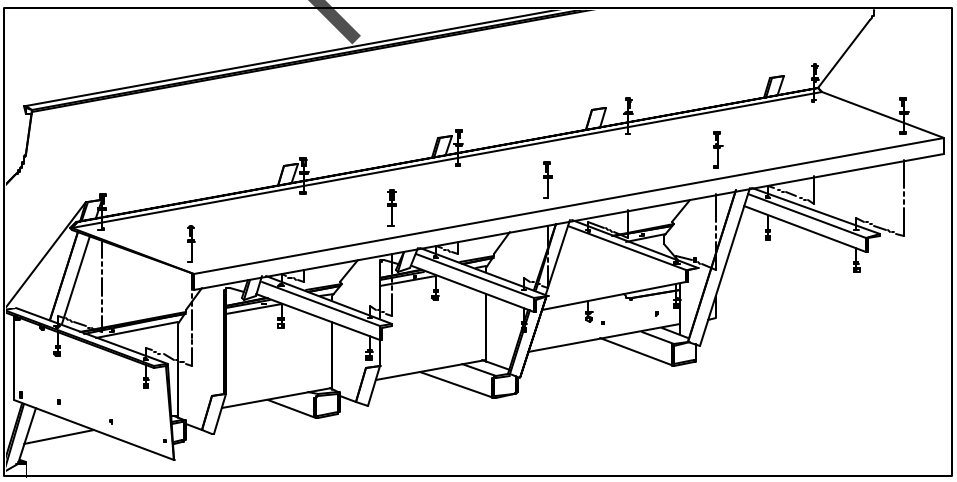


Figure 7 - Fender Installation

Attach the fender panels on top of the fender angles as shown in Figure 7. Tighten angle and panel hardware to recommended torques. Repeat on opposite side.

NON-CURRENT

INSTALLATION INSTRUCTIONS CONT'D

SPINNER ASSEMBLY INSTALLATION

Position A - (Rear)
To be used with a #5 straight belt conveyor.

Position B - (Forward)
To be used with a #2, #3 or #4 BOC conveyor.

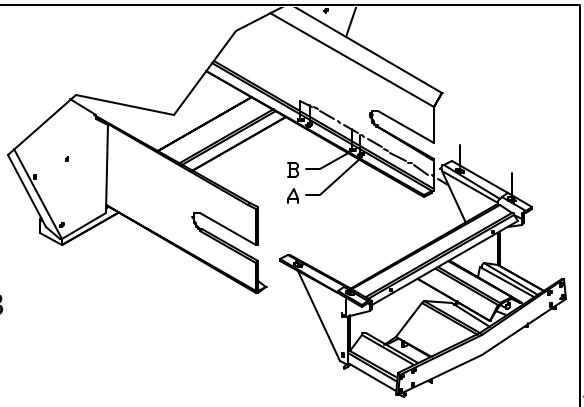


Figure 8 - Mounting The Spinner Assembly

Using any suitable jack or hoist with a 500 pound minimum lifting capacity, lift the spinner assembly into position on top of the sill flange. See Figure 8 to determine which set of mounting holes to use. Install hardware and tighten nuts finger tight only with the assembly in place against the bottom of the sills. Measure diagonally from the corner of the conveyor shield to the spinner hub (Figure 9). Shift the assembly sideways as necessary to equalize the two measurements. Tighten all hardware securely and recheck the diagonal.

To center flow divider and spinners with conveyor measure diagonally points A to B, and points A to C. Move accordingly to obtain equal measurements.

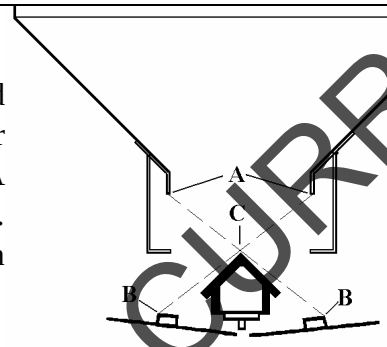


Figure 9 - Aligning Spinner & Flow Divider

NON-CURRENT

FLOW DIVIDER INSTALLATION

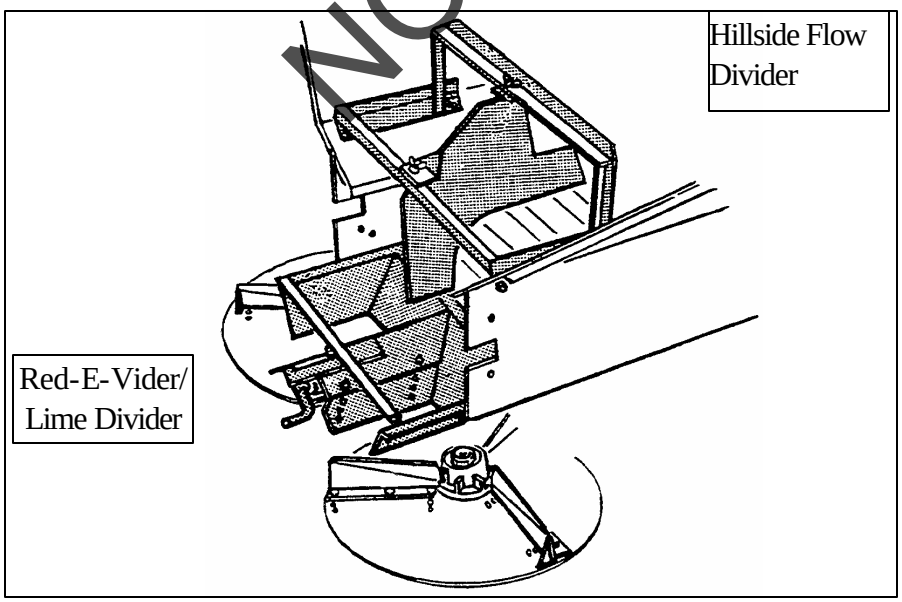


Figure 10 - Flow Divider

Standard Red-E-Vider/
Optional Lime Divider

Slide divider onto formed channel on fan frame. Install square nut on the front side of fan frame. Insert adjusting bolt into bearing on divider and thread into square nut. Tighten set screw on bearing onto adjusting bolt near the handle. Bolt upper section in place using the last two conveyor shield bolts on each side. Center member must be vertical and centered on the conveyor. (Figure 10)

INSTALLATION INSTRUCTIONS CONT'D

HYDRAULIC HOSE INSTALLATION

Determine the pressure port of the pump as shown in Figure 11. Install the pressure hose into this port. Connect the suction hose to the opposite port and to the tank outlet on the reservoir. If necessary, use plastic tie straps to support hoses so that they will not catch on field obstructions, contact the muffler or moving parts.

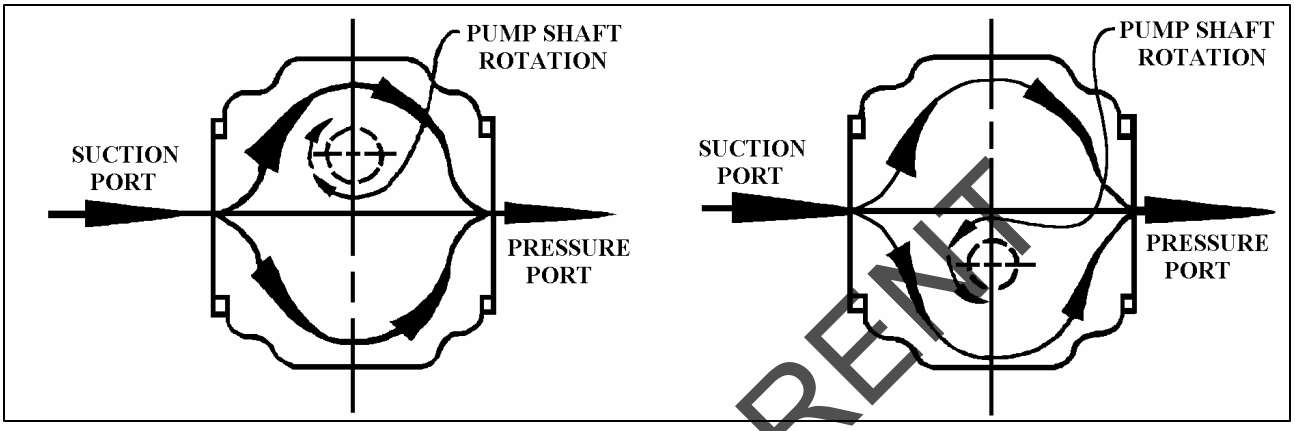


Figure 11 - Hydraulic Pump Installation

Use thread sealer on all fittings, except "O" ring and JIC adapter, "O" ring valves and motors, etc. When using thread sealer, do not put it on the first three threads of the fitting. Too much on the fitting or on the first three threads will force it into the oil stream where it could damage the system.

CAUTION! If a threaded connection is tightened to tightly, the fitting or housing into which the fitting is placed could be distorted and an unstoppable leak could occur.

NON-CURRENT

Assemble the system as shown in the Hydraulics Schematic (Parts pages 75-79). Place the hose clamps as needed to keep hoses away from hot or moving parts. Do not let hoses hang so low as to be snagged. Do not stretch hoses tight.

The Hydraulic Hoses supplied are as follows:

Pressure line - Two wire braid hose, one end fitting crimped on, other end fitting to be field installed after cutting hose to length. See assembly instructions on the following page.

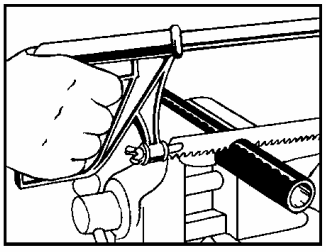
Suction line - Single spiral wire reinforced to be cut to length. Fittings to be assembled with double hose clamps.

All return lines - Double cotton braid to be cut to length as necessary. Fittings to be assembled with single hose clamps.

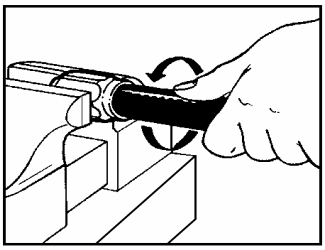
INSTALLATION INSTRUCTIONS CONT'D

AEROQUIP REUSABLE NON-SKIVE TYPE ENDS

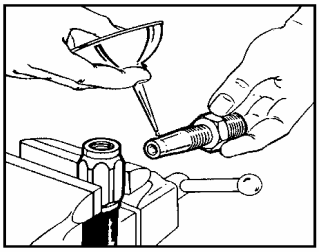
Thru-the-cover style reusable fittings used with hose FC211, FC212, GH663, and GH793.



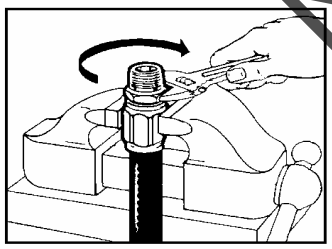
Step 1
Cut hose to length required using a fine tooth hacksaw or cut-off machine.
Clean hose bore.



Step 2
Liberally lubricate hose cover with Aeroquip hose assembly lube.
Place socket in vise and turn hose into socket counterclockwise until it bottoms.
When assembling long lengths of hose, it may be preferred to put hose in the vise just tight enough to prevent from turning, and screw socket onto the hose counterclockwise until it bottoms.



Step 3
Liberally lubricate nipple threads and inside of hose.
Use heavy weight oil or Aeroquip 222070 hose assembly lube.



Step 4
Screw nipple clockwise into socket and hose.
Leave 1/32" to 1/16" clearance between nipple hex and socket.

Disassemble in reverse order.

Used with permission of the Aeroquip Company

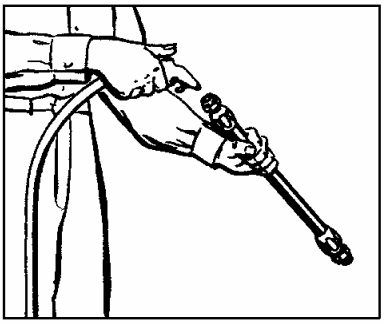
NON-CURRENT

WARNING!	Do not use one manufacturer's hose with another manufacturer's fittings! Such will void any warranty and may cause premature burst or leak of hydraulic fluids! Such bursting or leaking may cause severe injury and/or fire!

INSTALLATION INSTRUCTIONS CONT'D

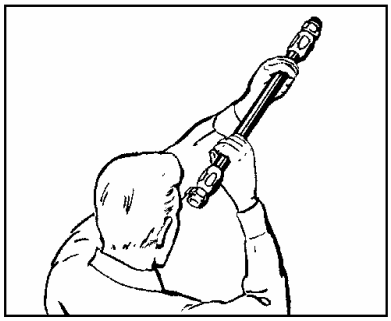
HYDRAULIC HOSE MAINTENANCE

Hose assemblies in operation should be inspected frequently for leakage, kinking, abrasion, corrosion or any other signs of wear or damage. Worn or damaged hose assemblies should be replaced immediately.



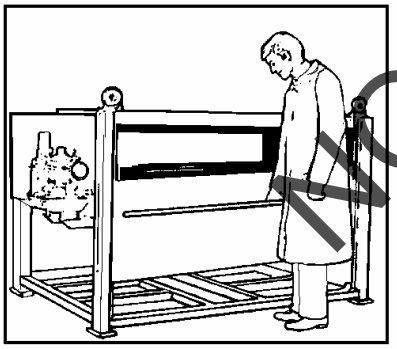
Clean

Clean assembly by blowing out with clean compressed air. Assemblies may be rinsed out with mineral spirits if the tube stock is compatible with oil, otherwise hot water at 150 degrees F maximum may be used.



Inspect

Examine hose assembly internally for cut or bulged tube, obstructions, and cleanliness. For segment style fittings, be sure that the hose butts up against the nipple shoulder; band and retaining ring are properly set and tight, and segments are properly spaced. Check for proper gap between nut and socket or hex and socket. Nuts should swivel freely. Check the layline of the hose to be sure the assembly is not twisted. Cap the ends of the hose with plastic covers to keep clean.



Test

The hose assembly should be hydrostatically tested at twice the recommended working pressure of the hose.

Test pressure should be held for not more than one minute and not less than 30 seconds. When test pressure is reached, visually inspect hose assembly for: 1. Any leaks or signs of weakness. 2. Any movement of the hose fitting in relation to the hose. Any of these defects are cause for rejection.

NON-CURRENT

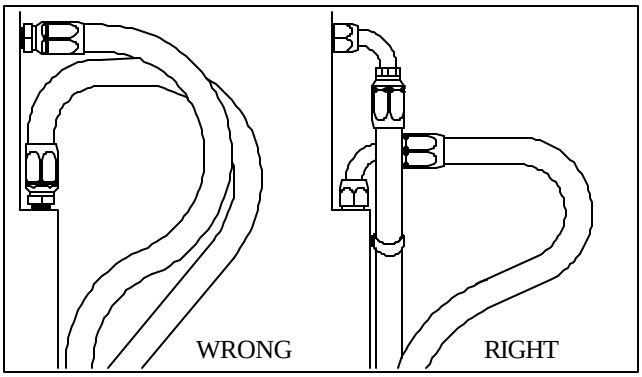
WARNING! Testing should be conducted in approved test stands with adequate guards to protect the operator.

STORAGE AND HANDLING

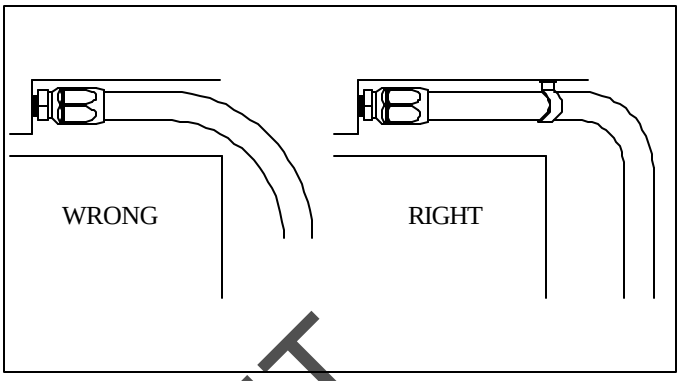
Hose should be stored in a dark, dry atmosphere away from electrical equipment, and the temperature should not exceed 90° F.

INSTALLATION INSTRUCTIONS CONT'D

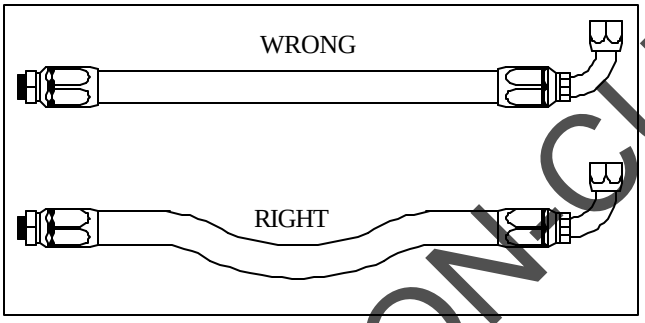
INSTALLATION GUIDE



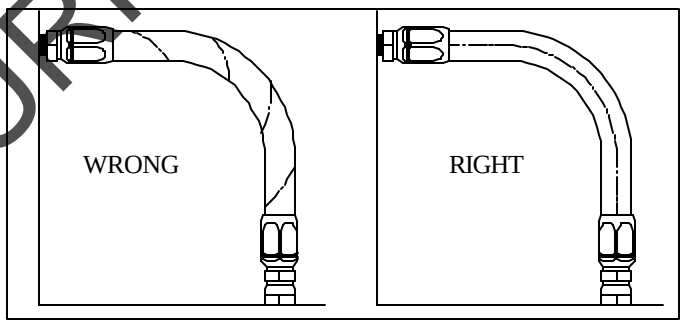
1. Use elbows and adapters in the installation to relieve strain on the assembly, and to provide easier and neater installations that are accessible for inspection and maintenance. Remember that metal end fittings cannot be considered as part of the flexible portion of the assembly.



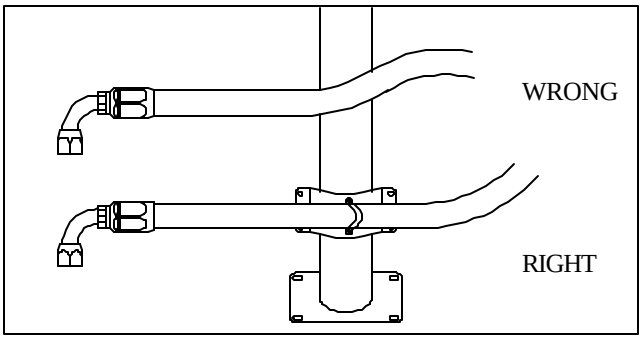
2. Install hose runs to avoid rubbing or abrasion. Clamps are often needed to support long runs of hose or to keep hose away from moving parts. It is important that the clamps be of the correct size. A clamp that is too large will allow the hose to move in the clamp causing abrasion at this point.



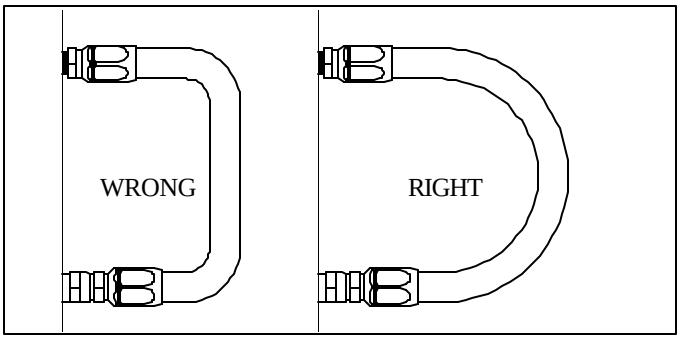
3. In straight hose installations allow enough slack in the hose line to provide for changes in length that will occur when pressure is applied. This change in length can be from +2% to -4%.



4. Do not twist hose during installation. This can be determined by the printed layline on the hose. Pressure applied to a twisted hose can cause hose failure or loosening of the connections.



5. Keep hose away from hot parts. High ambient temperature will shorten hose life. If you cannot route it away from the heat source, insulate it.



6. Keep the bend radii of the hose as large as possible to avoid hose collapsing and restriction of flow. Follow catalog specs on minimum bend radii.

NONCURRENT

(Used with the permission of The Weatherhead Company.)

INSTALLATION INSTRUCTIONS CONT'D

ELECTRICAL CONNECTIONS

Connect all electrical control circuits. The supply conductor should be connected to the accessory terminal of the truck ignition switch through the fifteen amp. circuit breaker provided in the control panel. All wiring should be approved automotive insulated wire, should be supported adequately with insulating ties or straps, should be located where it will not interfere with any control or access, does not contact any moving parts or sharp edge and is kept away from any hydraulic line or any heated part. Lights and reflectors are provided to meet FMVSS 108 requirements but not necessarily any other applicable local, regional or national codes.

FILLING HYDRAULIC SYSTEM

IMPORTANT!	DO NOT attempt to run pump without first filling hydraulic oil reservoir and opening suction line gate valve, or pump may be ruined.

Fill reservoir with hydraulic oil as specified in the Lubricant Specifications section of this manual. Be sure oil is clean, free from dirt, water and other contaminants.

Lubricate all points requiring lubrication per Lubrication Chart in this manual.

CHECKING INSTALLATION

See "Initial Start-Up" procedure.

NON-CURRENT

INITIAL START-UP

Check over entire unit to be sure all fasteners are in place and properly tightened per “Fastener Torque Chart” in this manual. Disengage transmission PTO driving pump.

NOTE: Stand clear of moving machinery. Do not load spreader with material.

1. Check to see that no other person(s) are in the vicinity of the truck or spreader.
2. Check to see that no loose parts are in the body or on conveyor or spinner. Be sure to remove any loose pieces.
3. Open feedgate until it is completely clear of conveyor.
4. Check oil level in reservoir. Fill the hydraulic reservoir with oil if necessary. Refer to the "Lubricant Specification" section of this manual for proper oil. Open the gate valve under the reservoir fully.
5. Start truck engine and set throttle so engine runs at about 1000RPM. Engage PTO driving pump. Allow pump to run and circulate oil for several minutes. In cold weather increase warm-up time.
6. Move spinner control valve to position "3". Spinner should run at slow speed. Allow to run until it is operating smoothly and all air has been purged. Move spinner control valve to "0" position.
7. Place Mark IV.2 in manual mode (see Mark IV.2 Manual) and run conveyor until it’s operating smoothly.
8. Move spinner control valve to position "5" and allow both spinner and conveyor to run. Shut down system. When all parts have come to rest, check all hydraulic system connections for leaks.
9. Check all connections in the hydraulic system to make sure that there are no leaks.
10. Check hydraulic oil reservoir and refill to “FULL” mark on sight gauge. Unit is now ready for road testing.

WARNING! DO NOT check leaks with hands while system is operating as high pressure oil leaks can be dangerous! DO NOT check for leaks adjacent to moving parts while system is operating as there may be danger of entanglement!

NON-CURRENT

ROAD TESTING

Prior to first use of machine, prior to each spreading season's use, and following overhaul or repair work, unit should be road tested to verify that all components and systems are functioning properly. Road testing may be done over any suitable course which will allow vehicle to be driven at speeds to be used while spreading units with radar may require a course terrain for proper radar reception. The following procedure is a guide.

1. Be sure machine has been properly serviced, that oil reservoir is full and gate valve under reservoir is fully open. Do not put any load in spreader.
2. Set spinner control valve to position number 5.
3. Start truck engine. Flip Mark IV.2 power switch to the "on" position. Engage PTO and allow to run at fast idle for five to ten minutes to bring hydraulic oil up to operating temperature. Spinners should revolve at moderate speed, and the conveyor should not move.
4. Set program in Mark IV.2 console. Advance program to the operational mode forward travel. Move the conveyor switch on the Mark IV.2 front panel to the "on" position. Conveyor should start immediately when vehicle moves and should continue to run at speeds which should vary directly with the vehicles road speed; the conveyor should speed up as truck speed increases and slow down as truck speed reduces. Spinner speed should remain constant when engine speed is above minimum operating range.

DANGER!	To observe conveyor and spinner speed while vehicle is in motion, proper safety precautions should be observed! These may include use of suitable mirrors clamped to permit observation by a safely seated observer, following the spreader in another vehicle at a safe distance, or other suitable means. Do not stand on fenders, in body or on any part of spreader as there is danger of falling off the vehicle or into moving parts! Use great care in performing this test!

IMPORTANT!	CHANGE THE HYDRAULIC OIL FILTER AFTER THE FIRST WEEK (OR NOT MORE THAN 50 HOURS) OF OPERATION ON A UNIT.

NON-CURRENT

GENERAL OPERATING PROCEDURES

To operate the L2020GT Synco-Matic® Mark IV.2 spreader, the following sequence should be followed:

1. Be sure unit has been properly serviced and is in good operating condition.
2. Disengage pump drive PTO.
3. Fill body with material to be spread.
4. Drive to location where spreading is to be done.
5. Adjust spinner control valve to setting required for material used to give spread width desired. See Spinner Adjustment pages.
6. Adjust material flow divider or Red-E-Vider to give spread pattern desired. See Spread Pattern Adjustment pages.
7. Using Spread Rate graphs in Mark IV.2 manual, set feed gate opening to obtain the yield desired.
8. Be sure shut-off valve on hydraulic reservoir is fully opened.
9. Start truck engine.
10. Turn on power to processor and set program to desired values.
11. Depress clutch pedal, engage pump drive PTO.
12. Drive at speeds that will allow engines to turn at proper RPM.

Higher transmission gears may be used with speeds to 30 MPH. If lower speeds must be used, shift transmission into lower gears so that engine speed can be maintained to allow adequate hydraulic oil delivery from pump.

⚠	**CAUTION!** Drive only at speeds which permit good control of vehicle!

NON-CURRENT

ADJUSTING THE SPREAD PATTERN

IMPORTANT!	Spinner assembly and material flow divider have not been adjusted at the factory. Before spreading material, spread pattern tests must be conducted to properly adjust the spread pattern. A Spread Pattern Test Kit, Part Number 70889, is available for this purpose. THE MANUFACTURER OF THIS SPREADER WILL NOT BE LIABLE FOR MISAPPLIED MATERIAL DUE TO AN IMPROPERLY ADJUSTED SPREADER.

It is recommended that spread pattern tests be conducted prior to each spreading season, after any spreader maintenance, and periodically during the spreading season. Spread pattern tests must be conducted whenever a new product is to be applied.

GENERAL OPERATING PROCEDURES CONT'D

Spread pattern is affected by many factors—among the more significant of these are:

1. Spinner speed.
2. Material weight per cubic foot.
3. Material granule size.
4. Material flow characteristics.
5. Rate of delivery of material.
6. Point of delivery of material on spinner discs.
7. Balance between deliveries to both spinner discs.
8. Angle of the distributor fins on the spinner discs.
9. Cleanliness of the spinner fins and discs.
10. Level of spreader.
11. Wind.
12. Spacing of swaths.

Since many of these factors will vary for each job, trial and experience must be used to determine the adjustments which must be made to obtain the spread width and spread pattern desired. The following instructions are given to cover the adjustments available and the effect that each will have on the spread pattern.

CAUTION!	As contact with spinners and other moving parts is very dangerous, great caution must be used while working around the spreader. Do not adjust while machinery is moving, wear eye protection, and avoid discharge from spinners. Do not ride on moving spreader.

IMPORTANT!	Spinner discs and fins must be kept clean and polished. Even a small build-up on a spinner fin has disastrous effects on the spread pattern. Rusty, rough fins will produce poor spread patterns.

NON-CURRENT

GENERAL OPERATING PROCEDURES CONT'D

A. SPINNERS

Fan speed is adjustable from approximately 400 to 800 RPM. This is accomplished by moving the spinner speed control valve lever.

Proper fan speed adjustment is very important in obtaining good spread patterns. The best fan speed to use will depend entirely on the material being spread and must be determined by trial and error. Once established for the materials you use, paint marks should be made on the control valve body as shown in Figure 12.

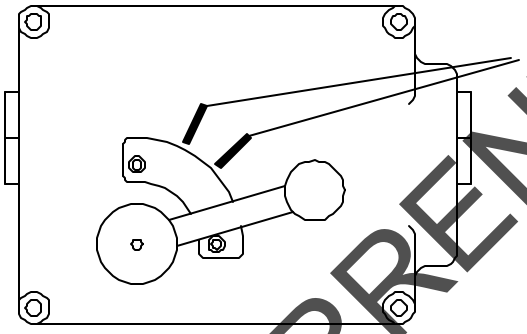


Figure 12 - Spinner Control Valve

NON-CURRENT

Maximum pattern width is determined by particle size. This may vary anywhere from 25 feet for very finely ground dry lime up to 80 feet or more for extremely large fertilizer pellets.

For every particle size and density there is a critical fan speed. In other words, there is a speed which will result in the maximum width obtainable. Going beyond this speed will not increase spread width, but will result in poor patterns.

Too high a fan speed will result in a heavy deposit behind the truck. This upper speed limit will be quite low for finely powdered material and very high for extremely course materials. In general, the critical speed will fall somewhere between 500 and 650 RPM for ordinary materials. (Figure 13, page 31)

One way to adjust fan speed is to watch the material leaving the fans. At slow speed the material leaves the blades in bands. At medium speed it forms wide bands in the air. At somewhat higher speeds the bands close into a uniform blur. At very high speeds, a ridge of material flows over the tops of the blades and falls directly behind the spreader. Normally, the proper fan speed is just higher than when the bands close to a blur.

CAUTION! DO NOT STAND ON FENDER WHILE VEHICLE IS IN MOTION.

GENERAL OPERATING PROCEDURES CONT'D

B. MATERIAL DIVIDER CENTERING

Material divider must be properly centered (Figure 9, page 20) to avoid a pattern which is heavier on one side than on the other. (Figure 14, page 32)

C. SPINNER ADJUSTMENT

Moving the spinner forward will decrease the amount of material deposited behind the truck. Moving to the rear will increase it. (Figures 14 & 15, page 32)

D. DISTRIBUTOR FIN ANGLE ADJUSTMENT

Angling the outer ends of the fins forward (in the direction of rotation) will increase the deposit at the outside of the pattern. Angling backward (opposite the direction of rotation) will decrease deposits at the outside of the pattern. (Figure 17, page 33)

E. PROPER ADJUSTMENT

With correct spinner speeds and settings, uniform material distribution should be obtained. (Fig. 18, page 33)

NON-CURRENT

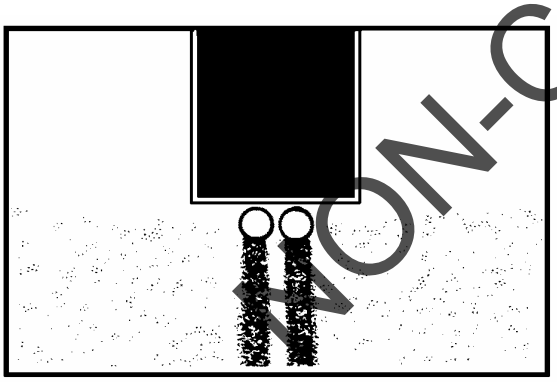


Figure 13

PATTERN - Two heavy swaths located directly behind the fans; material is seen blowing over the tops of the fans.
CAUSE - Fan speed too fast, material blows over the tops of the fans and falls to the ground directly behind the unit.
CURE - Decrease fan speed.

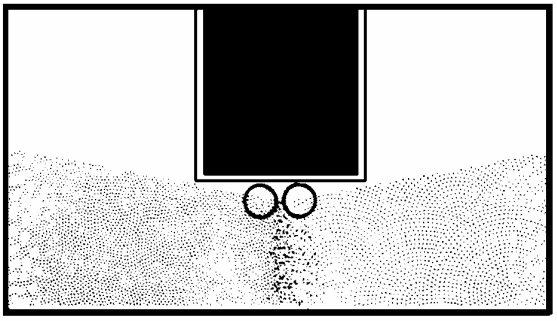


Figure 14

PATTERN - Heavy on one side only.
CAUSE -
1. More material is being deposited on one fan.
2. Material has collected on divider panels.

CURE -
1. Measure accurately the position of the material divider. These units must be centered and the fans must be parallel to the spreader's sills.
2. Keep the divider scraped clean of material build-up.

GENERAL OPERATING PROCEDURES CONT'D

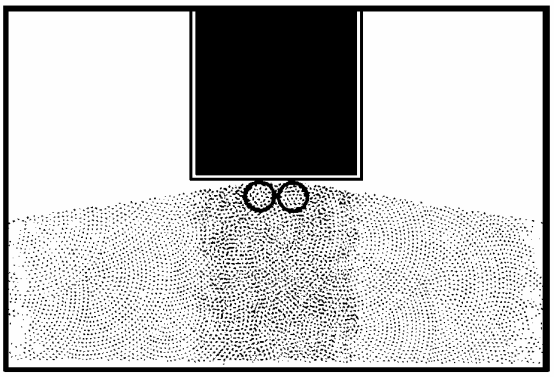


Figure 15

PATTERN - Heavy in center 30% of total spread width. No material exits ahead of fans.
CAUSE -
1. Divider is too far forward.
2. Divider back plate is to far forward.

CURE -
1. Move divider rearward.
2. Move back plate rearward.

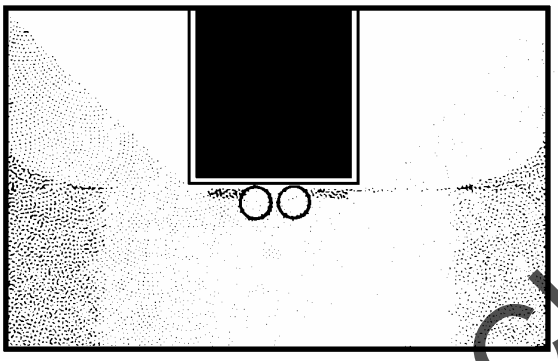


Figure 16

PATTERN - Heavy at outer edges. Excessive material strikes front deflector panels.
CAUSE -
1. Deflector is too far rearward.
2. Fan speed to fast.
3. Back plate is to far rearward.

CURE -
1. Adjust divider forward.
2. If adjusting divider does not work, decrease fan speed.

3. Move back plate forward.

NON-CURRENT

GENERAL OPERATING PROCEDURES CONT'D

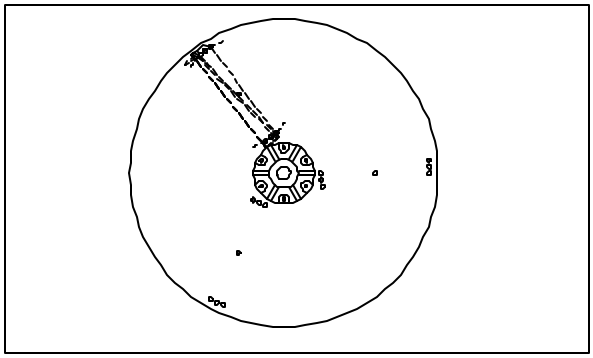


Figure 17

Spreader is equipped with adjustable fins. These may be adjusted as required, according to the following:

If material deposit is excessive at the outside of the pattern, with a great deal of material striking the deflector plates, rotate the outer end of the fin in the opposite direction of rotation of the spinner to assist in correcting this problem.

CAUTION! Be sure cap screws and nuts are in good condition when tightening per torque chart in this manual. If fasteners are damaged, worn or corroded, replace immediately with new SAE Grade 5 or Grade 8 fasteners.

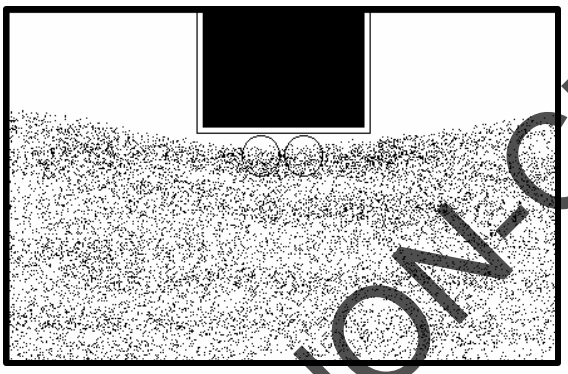


Figure 18

PATTERN - Good pattern.

CAUSE - Proper fan speed and divider setting.

EFFECT - Material exits on an arc from near fan to near front deflector. Pattern density tapers off to nothing at outer 10% on each side of total spread width.

NON-CURRENT

GENERAL OPERATING PROCEDURES CONT'D

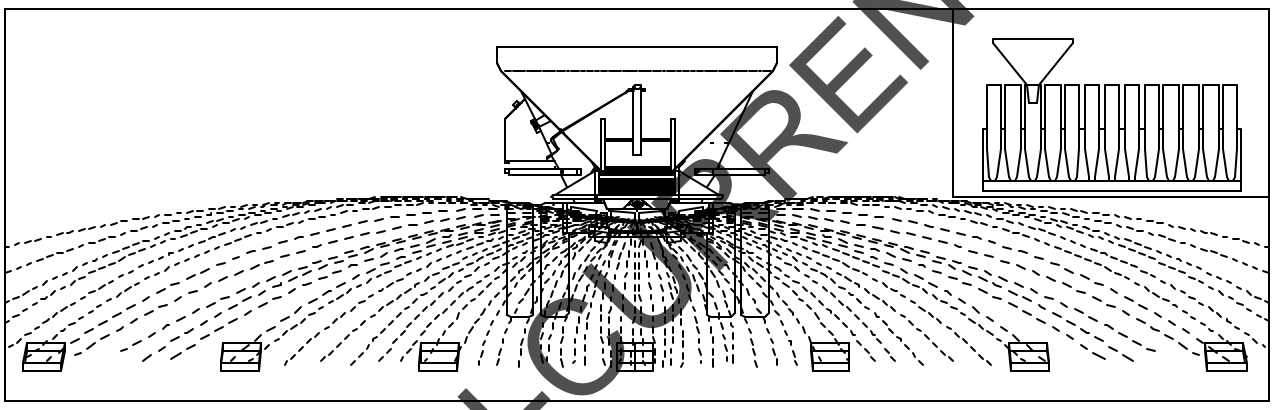
HOW TO CHECK YOUR SPREADER PATTERN

It is highly recommended that a spread pattern test be performed for all products you handle.

We at NEW LEADER have developed a Spread Pattern Test Kit. This kit is available from all NEW LEADER DEALERS and can be ordered under part number 70889.

The kit contains all the necessary devices, along with instructions and data sheets which will allow you to perform the most professional of tests.

Once initial testing is completed, testing should be repeated at the beginning of every season, or any time repair work is performed on any component affecting spread patterns.



NON-CURRENT

LUBRICATION AND MAINTENANCE

PREVENTATIVE MAINTENANCE PAYS!

The handling and spreading of commercial fertilizers is a most severe operation with respect to metal corrosion. Unless a frequent, periodic preventative maintenance program is established, rapid damage to spreading equipment can occur. Proper cleaning, lubrication and maintenance will give you longer life, more satisfactory service and more economical use of your equipment.

HYDRAULIC SYSTEM

The use of proper oil in the hydraulic system is one of the most important factors for satisfactory operation. Utmost cleanliness in handling the oil cannot be stressed enough. Keep the hydraulic oil in original closed containers, clean top of container before opening and pouring, and handle in extremely clean measures and funnels.

Refer to the Lubrication and Hydraulic Oil Specifications section of the manual for selection of the proper hydraulic fluid for use in the hydraulic system.

SERVICE SCHEDULE

1. Check the hydraulic oil daily by means of dipstick. Add oil if required. Periodically inspect the hoses and fittings for leaks.
2. Change the hydraulic oil filter after the first week (or not more than 50 hours) of operation on a unit.
3. After first filter change, replace filter when indicator reaches Red Zone.
4. The reservoir should be drained through drain plug (not through suction outlet), flushed, refilled, and the filter element changed annually, or the oil and filter should be changed if oil shows any signs of breaking down under continued high-pressure operation. Discoloration of oil is one sign of breakdown.

NON-CURRENT

CONVEYOR GEAR CASE

The oil in a new unit should be drained at the end of the first two weeks (or not more than 100 hours) of operation and the case should be thoroughly flushed with light oil. Refer to the Lubrication Specifications section for the proper grade oil. Refill gear case with one (1) pint (.47 liters) of recommended lubricant. After the initial change, the oil should be changed every 2,000 hours of operation or annually, whichever occurs first.

Check the oil level in the gear case monthly.

CONVEYOR CHAIN

Hose down the machine and remove any material build-up on the sprockets or under the chain. If material is allowed to build up, the chain may ride up and damage the chain or body.

LUBRICATION AND MAINTENANCE CONT'D

CONVEYOR CHAIN CONT'D

NOTE: If material builds up under the chain, the chain will ride on the material instead of the bottom panel. The more material allowed to build, the closer the chain will come to the chain shields. If the chain should catch a chain shield, it could permanently distort the chain, the chain shields or the body. In the same manner, if material is allowed to build up on the sprockets, the chain will have a larger diameter to follow. The more material allowed to build up, the closer the chain will run to the chain shields, until damage has occurred. Do not remove material while conveyor or spinner is running.

Lubricate the conveyor chain at least once a week. Use a mixture of 75% fuel oil and 25% SAE 10 oil in a pressurized hand spray gun.

DANGER! When conveyor is running, stay out of the body. Stay clear of all moving parts. Entanglement of clothes, any part of your body or anything you have in your hands can cause serious injury. Do not use a bar, rod or hammer on conveyor while it is moving—if it gets caught it could cause injury. With the spinner shut down and the conveyor running slowly, spray the mixture of oil between the links of the chain by spraying through openings at the rear end of sill or from front outside body when access clearance is adequate. Do this at least once a week and after each time the machine is washed down. Allow to become dry before lubricating.

If a chain oiler is used, fill the oiler reservoir daily with a mixture of 75% fuel oil and 25% SAE 10 oil. Before each filling of the spreader with material to be spread, open petcock and run the conveyor until the full length of chain has been oiled, then shut petcock.

Proper chain tension is also a factor in chain and sprocket life. The proper chain tension is illustrated in Figure 19. Be sure the chain is tensioned equally on both sides. This adjustment is made on each side of the unit at the idler bearings.

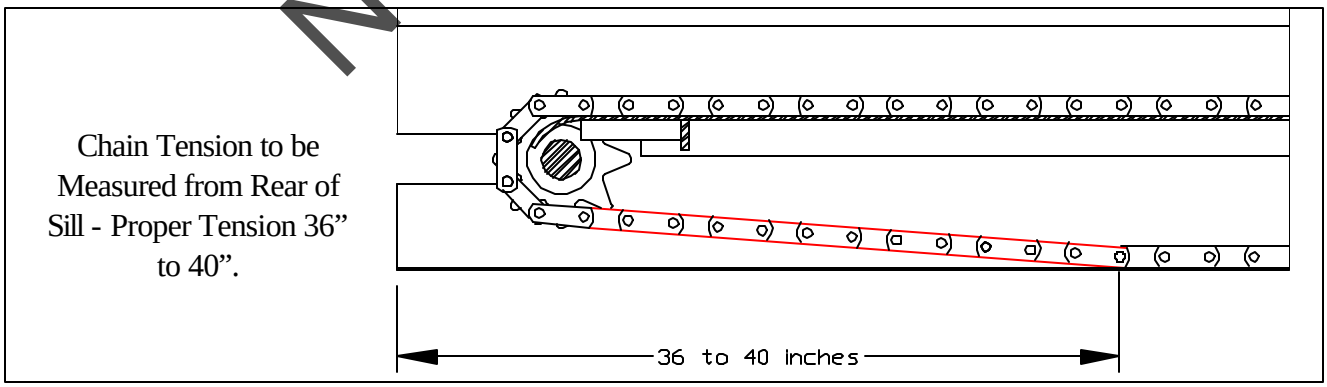


Figure 19 - Adjusting Chain Tension

Conveyor chains that are too tight will tend to stretch. This will cause excess sprocket wear and eventually cause breakage. Excess slack presents the possibility of the chain catching on sub-frame parts. Bent or distorted chain bars will cause damage to the body as well. Straighten or replace bent or distorted chain bars immediately.

NON-CURRENT

LUBRICATION AND MAINTENANCE CONT'D

LUBRICATION OF BEARINGS

Grease in a bearing acts to prevent excessive wear of parts, protects ball races and balls from corrosion and aids in preventing excessive heat within the bearing. It is very important the grease maintains its proper consistency during operation. It must not be fluid and it must not channel.

Bearings should be lubricated by pumping grease slowly until it forms a slight bead around the seals. This bead indicates adequate lubrication and also provides additional protection against the entrance of dirt.

Be sure all fittings are thoroughly cleaned before grease is injected. Points to be lubricated by means of grease gun have standard grease fittings.

CLEAN UP

For maintaining minimum maintenance operation, this equipment should be thoroughly washed every two (2) to three (3) days during the operating season. Hose the unit down under pressure to free all sticky and frozen material.

It is important that the machine be thoroughly cleaned at the end of each operating season. All lubrication and maintenance instructions should be closely followed. For longer life, repaint worn spots to prevent formation of rust.

CAUTION! High pressure wash can inject water and/or fertilizer into Mark III components. Use caution when cleaning these areas.

NON-CURRENT

FASTENERS

Tighten all screw fasteners to recommended torques after the first week of operation and annually thereafter. If loose fasteners are found at any time, tighten to the recommended torques. Replace any lost or damaged fasteners or other parts immediately upon finding such damage or loss. Check body mounting hardware every week.

CONVEYOR BELT MAINTENANCE

The conveyor belt should be checked daily for proper tension and tracking. A conveyor belt that is tracking properly runs in the center of the trough without curling or scuffing the ends. (See tracking instructions in the Belt Conveyor Adjustment Section.)

Do not be alarmed as the sides of the belt wear unless the belt is out of track. The belt has a nylon fabric that is impervious to moisture, weathering or chemical action and will continue to operate satisfactorily with up to 1" total worn from the sides. Inspect the belt lacing occasionally for wear or "raveling" of the belt grip area and loosening hardware. Retighten loose nuts and peen the end of the lacing screw into the slot of the nut as required.

LUBRICATION AND MAINTENANCE CONT'D

BELT CONVEYOR ADJUSTMENT

1. TENSION
   Belt tension should be just tight enough to prevent slippage—no tighter. Generally speaking, if the "flats" on the conveyor drive pulley are visible through the belt, tension is high enough.

2. TRACKING
   To check tracking, be sure the spreader is empty. Then take the following steps:
   A. With truck engine shut off, move spinner control valve to "O" position. Start truck engine and engage pump drive PTO. Spinners should not turn. If they do, correct the problem before proceeding.

> **WARNING!** Do not work near rotating spinners. Severe injury can result from contact with them.

   B. Pull out inner Function Knob (white nylon) located adjacent to conveyor drive gear box on Synco-Matic® Mark III control valve assembly to disengage ground control feedback. With truck engine running, rotate Function Knob until conveyor runs at maximum speed.

> **CAUTION!** As conveyor is running, exercise great care to avoid entanglement with any moving parts.

A properly adjusted belt will either remain in a steady position centered on the pulley or more often will "wander" back and forth 1/4 to 1/2 inch across the pulley, but remain generally centered.

Improper tracking may be due to three basic causes. These causes and their respective solutions are listed below:

PROBLEM 1: (Figure 20)
Belt tracks to one side, contacts side of conveyor. Contact is more severe at the front and may not quite touch at the rear.

SOLUTION:
Tighten idler bearing at the side in contact with the belt. Move this adjustment one turn at a time. Operate conveyor 10 to 15 minutes at a high speed to allow the belt to react to the adjustment. Repeat if necessary.

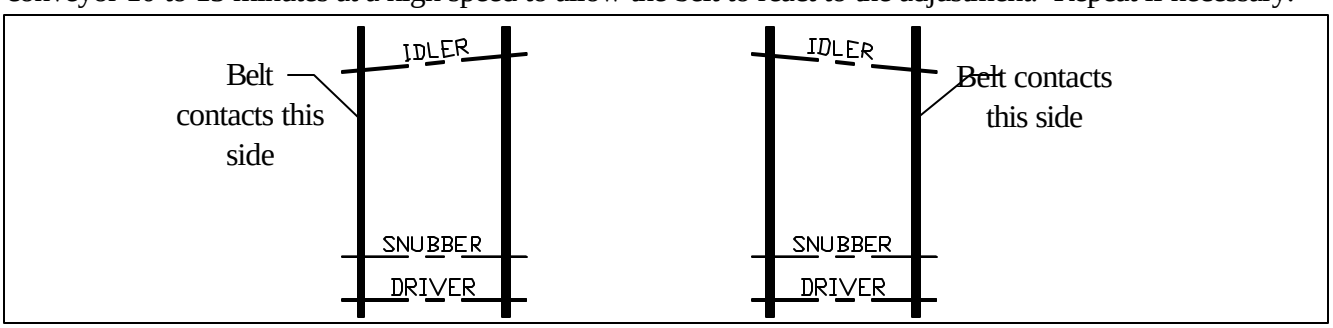


Figure 20

NON-CURRENT

LUBRICATION AND MAINTENANCE CONT'D

PROBLEM 2: (Figure 21)
Belt contacts side panel at the front on side and contacts the other side at the rear.

SOLUTION:
If adjusting as in Problem 1 does not remedy the situation, adjustment of the drive pulley is necessary. Mark the illustration with the location of the adjustment screw on your unit (R.H. side). Check the illustration for the situation present. From the location of the screw adjustment on the illustration, note which direction the shaft should be moved to compensate. Loosen the screw to move the shaft forward; tighten the screw to move the shaft rearward.
NOTE: The illustration is exaggerated. Only move the adjustment screw 1/4 turn at a time after loosening the bolts holding the bearing. Usually, 1/64 to 1/32 inch adjustment is all that is necessary. Retighten the bearing. Operate the conveyor for 10 to 15 minutes at a high speed to allow the belt to react to the adjustment. The problem should change to Problem 1. Adjust as in Problem 1 to track belt properly.

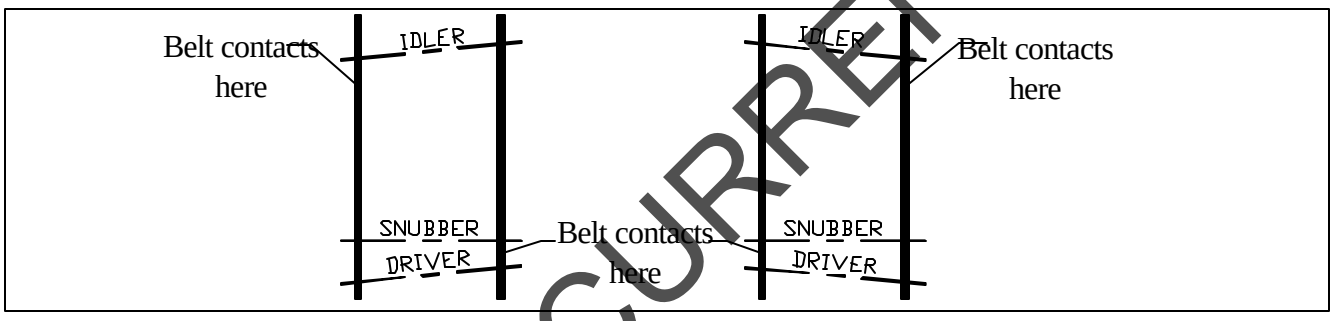


Figure 21

PROBLEM 3: (Figure 22)
Belt contacts side as in Problem 1, but contacts more heavily at a point approximately three feet from the rear.

SOLUTION:
Realign the snubber pulley. Note the point or side of contact from the illustration. This side of the snubber is too low. NOTE: This pulley moves up and down ONLY.
Loosen belt and raise or lower as necessary. Loosen the two bolts holding the snubber bearing on the side to be adjusted after marking the old location. Move approximately 1/16 inch at a time and retighten. Retighten belt the exact number of turns previously loosened. Operate the conveyor 10 to 15 minutes to allow the belt to react to the adjustment. Refer to Problem 1 and readjust. If the readjustment does not compensate, repeat.

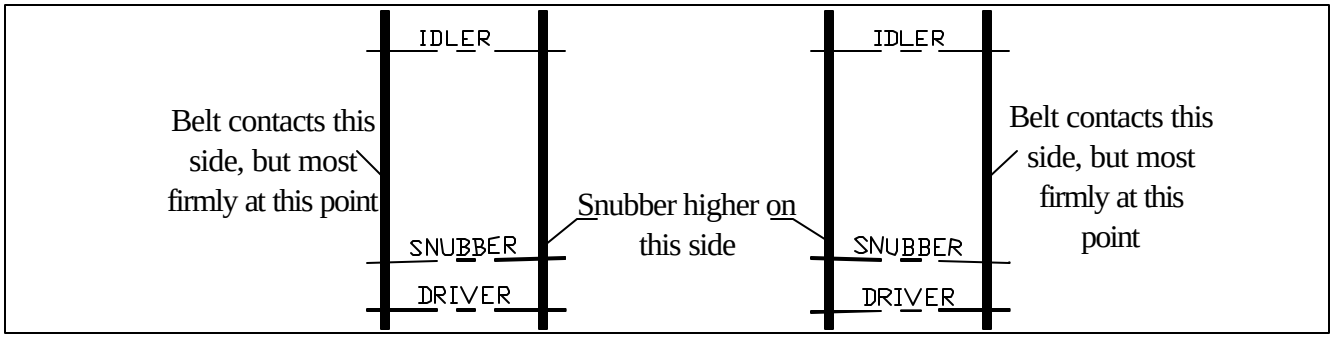


Figure 22

NON-CURRENT

LUBRICATION AND MAINTENANCE CONT'D

If, after continued adjustment, the belt does not track properly, check the following:

1. Check for twisted spreader body. Shims must be placed between spreader cross tubes and the mounting surface to eliminate any twist in the body structure.
2. Check for crowned Idler Pulley by placing a straight edge on the pulley. If properly crowned, the straight edge will contact the center pulley leaving 1/16 inch gap between the straight edge and both pulley ends. Replace the pulley if crown is not present.
3. Check for lacing squareness by removing the belt. This should be done as a last resort. If the lacing is not square to the belt ends, contact your dealer for service.
4. Sight down the body under the belt shields. The only point which should come close to or slightly contact the belt, is the lowest point on the shield. If the belt contacts the shield firmly at any other point, tracking will be impossible and you should see your dealer immediately. Only your dealer can correct the situation.

#5 Belt Conveyor Belt Shield Fit

With a properly adjusted belt without any load, the belt shields along each side of the belt inside the spreader body should be just contacting the belt. (Figure 23) If a shield has clearance along its length, it can be moved down until it just contacts belt by loosening the fastener bolts and allowing the shield to slide downward and then retightening the bolts. If the shield is tending to cut into the belt along its full length, loosening the bolts and raising the shield until it just contacts the belt will correct the problem.

If the shield cuts the belt at one or more points or if it gaps at one or more points, it should be replaced.

NON-CURRENT

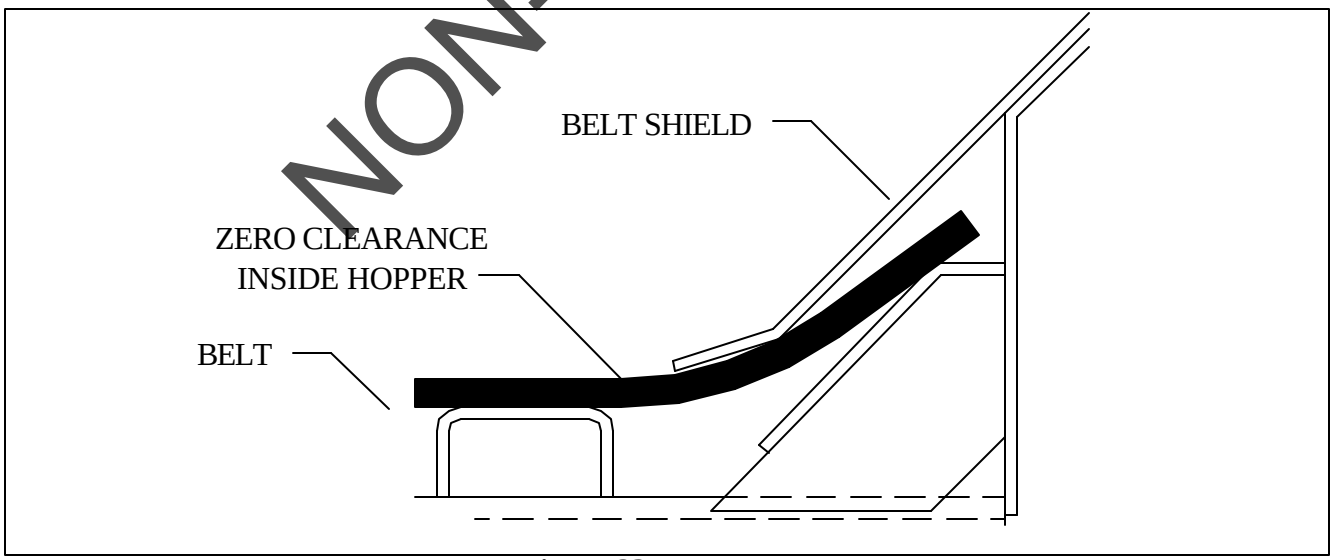


Figure 23 - #5 Bottom

CAUTION! Don't lubricate the #5 belt. Use of lubricants will cause the belt to deteriorate and fail prematurely.

LUBRICATION AND MAINTENANCE CONT'D

CONVEYOR BELT REMOVAL AND REPLACEMENT

Tools and Equipment Required:

1. 1 1/2" Hex Wrench
2. 25 to 30 Feet of 1/4" to 3/8" Rope.
3. 3 or 4 Pieces of 2 x 4 Lumber about 3 Feet Long.
4. 10 Feet of 14 or 16 Gauge Soft Iron Wire.

NOTE: Two men MUST be used for this procedure.

Parts Required: See Parts Pages.

Procedure:

1. Set spinner control valve at "O" position to stop spinners.
2. Remove both belt shields, clean thoroughly and repaint.
3. Pull out inner Function Knob, located adjacent to conveyor drive gear box on Synco-Matic® Mark III control valve assembly to disengage ground control feedback. Rotate knob to run conveyor until lacing is exposed on the rear face of the drive pulley. Rotate knob until conveyor stops with splice pin in line with slots in sill.
4. Move the front idler adjustment bolts to extreme rear position.
5. Pull out splice pin to separate belt splice.
6. Rotate Function Knob so that conveyor operates slowly while one man stands on the drive pulley "walking" the old belt out of the unit.

CAUTION! Use extreme care to avoid entanglement! Hold on to endgate to maintain balance. One man must stay at controls to stop conveyor instantly if required.

7. Shut down spreader. Using any suitable tool, remove any caked material from the drive pulley, snubber pulley, idler pulley and from inside the frame channels. Clean and repaint as required.
8. Thread OLD splice pin through one end of new belt splice. Connect wire to pin about 1/4" in from each side of the belt forming a loop.
9. Thread the rope along the top of the belt channel, around the front idler pulley, over the snubber pulley, and under the drive pulley.

CAUTION! Be sure power is shut off during this threading operation.

10. Tie the end of the rope which is under the drive pulley to the wire loop. Wrap the other end of the rope once around the drive pulley and out to the rear.
11. Start conveyor drive and set Function Knob to cause drive pulley to turn slowly. With one man pulling on the rope, and another feeding the belt into the machine from the rear, pull the new belt under the drive pulley, over the snubber pulley, along the frame channels, around the front idler pulley and back to the drive pulley.

NON-CURRENT

LUBRICATION AND MAINTENANCE CONT'D

CAUTION! Use extreme care to avoid entanglement! Stand well back from drive pulley.

12. Shut off all power and insert the lumber under the belt at the bottom to support its weight as shown in Figure 24.
13. Insert a plastic tube in each splice and across the full width of the belt and pull the two ends together at the center of the rear face of the drive pulley.
14. Insert the splice pin (flexible, plastic covered)/
15. Snug the belt up by tightening the idler pulley.
16. Tighten the belt until the edge of the belt is approximately 2" above the lower edge of the sill lower flange on each side. Remove lumber.
17. Adjust for proper tracking as outlined in the Belt Conveyor Adjustment Section of this manual.

NON-CURRENT

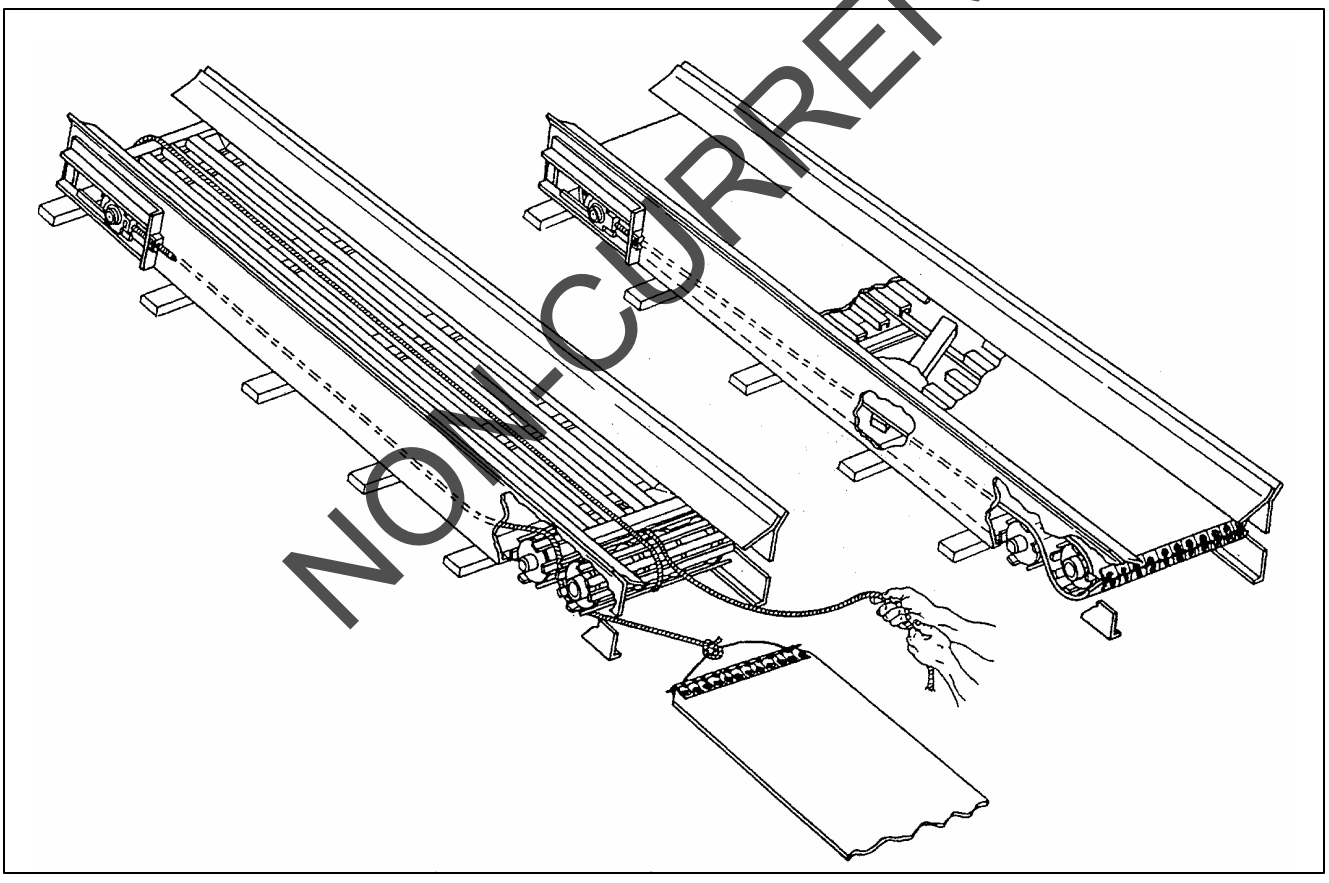


Figure 24 - Installing #5 Belt

LUBRICANT AND HYDRAULIC OIL SPECIFICATIONS

IMPORTANT!	The lubricant distributor and/or supplier is to be held responsible for the results obtained from their products. Procure lubricants from distributors and/or suppliers of unquestionable integrity, supplying known and tested products. Do not jeopardize your equipment with inferior lubricants. No specific brands of oil are recommended. Use only products qualified under the following oil viscosity specifications and classification recommended by reputable oil companies.

HYDRAULIC SYSTEM

The following are the recommended procedures for selecting the proper hydraulic fluid for use in the hydraulic system. Select a major brand industrial PREMIUM QUALITY (anti-wear type) hydraulic oil to provide viscosity between 100-200 SSU at operating temperature. Premium hydraulic oils with viscosity indexes of 95 or above will provide the following temperature ranges :

NON-CURRENT

INDUSTRY IDENTIFICATION VISCOSITY GRADE	OPERATING TEMPERATURE	VISCOSITY
150 SSU	122° F 84° F	100 SSU 200 SSU
225 SSU	140° F 107° F	100 SSU 200 SSU
300 SSU	150° F 116° F	100 SSU 200 SSU
450 SSU	165° F 130° F	100 SSU 200 SSU
600 SSU	182° F 145° F	100 SSU 200 SSU

If, because of necessity or convenience, it is desirable to use an automotive engine oil, multi-viscosity oils of SC rating (formerly MS quality), which will provide between 100-200 SSU at operating temperature, can be used. These will provide proper viscosity over a wide range. For example:

SAE VISCOSITY GRADE	OPERATING TEMPERATURE	VISCOSITY
10W-30	130° F	100 SSU
	100° F	200 SSU
10W-40	190° F	100 SSU
	140° F	200 SSU

The above recommendations cove the normal system operating temperatures. For system temperatures above or below those shown in the charts above, contact the Service Department of Highway Equipment Company. For additional information contact your Highway Equipment Company dealer.

LUBRICANT AND HYDRAULIC OIL SPECIFICATIONS

GEAR CASE LUBRICANT

Lubricate these assemblies with non-corrosive type SAE 90 E.P. (extreme pressure) gear oil conforming to MIL-L2105 B multi-purpose gear lubricating oil requirements (API Service GL 4) with ambient temperatures from 40° to 100° F. Ambient temperatures below 40° F. require SAE 80 E.P. lubricant; above 100° F. use SAE 140 E.P. grade oil.

PRESSURE GUN LUBRICANT

Use a ball and roller bearing lithium base lubricant with a minimum melting point of 300° F. This lubricant should have a viscosity which assures easy handling in the pressure gun at prevailing atmospheric temperatures. The lubricant must be waterproof. The grease should conform to NLGI No. 2 consistency.

CHAIN OILER LUBRICANT

Use a mixture of 75% No. 1 or No. 2 diesel fuel or kerosene mixed with 25% SAE 10 engine oil.

⚠	**WARNING!**	Shut off all power and allow all moving parts to come to a rest before performing any maintenance operation.

NON-CURRENT

LUBRICATION CHART

The spreader should be regularly lubricated with the lubricants recommended in this manual in accordance with the following chart:

LOCATION	PLACES	METHOD	FREQUENCY
Transmission PTO			
Slip Yoke	1	Grease Gun	Weekly
Universal Joint	2	Grease Gun	Monthly
Hydraulic System			
Reservoir	1	Check Daily; Change Annually	
Filter	1	Check Daily; Change when indicator is red	
Conveyor - All Except #5 Conveyor			
Dragshaft Bearings	2	Grease Gun	Weekly
Idler Shaft Bearings	2	Grease Gun	Daily
Idler Adjusting Screws	2	Hand Grease	Weekly
Chain	2 Strands	Spray Oil	Weekly
Chain Oiler (If so equipped)	1	Oil	Daily
Conveyor - #5 Conveyor			
Dragshaft Bearings	2	Grease Gun	Weekly
Idler Shaft Bearings	2	Grease Gun	Weekly
Snubber Pulley Bearings	2	Grease Gun	Weekly
Idler Adjusting Screws	2	Hand Grease	Monthly
Conveyor			
Gear Case	1	Gear Box Oil	Check Monthly, Change Annually
Feedgate			
Jack Assembly - Gears	1	Hand Grease	Annually
Tube	1	Grease Gun	Monthly
Screw Conveyor Discharge Elevator			
Outer Bearing	1	Grease Gun	Weekly

NON-CURRENT

NOTE: Unusual conditions, such as excessive dust, temperature extremes or excessive moisture may require more frequent lubrication of specific parts.

* See Lubricant and Hydraulic Oil Specifications for types of lubricants and oil to be used.

SYNCO-MATIC® CONTROL REPLACEMENT

SYNCO-MATIC® MARK IV.2 - REMOVAL

Repairs to Synco-Matic® Mark IV.2 control box and valve assembly require special techniques and should not be attempted in the field. The complete unit should be removed in one piece and returned to your dealer for repair or replacement. The following instructions cover removal (Figure 19, page 42):

1. Thoroughly clean Synco-Matic® unit and area around it.
2. Disconnect cable plug at "A" and remove.
3. Remove two hydraulic hose connections at top of control valve at "B". Cap holes to keep dirt out of valve.
4. Loosen four cap screws in saddle under hydraulic motor at "C".
5. Remove two allen head screws from the cog belt housing at "D".
6. Holding unit in both hands, move up and down to release from any sealing between unit and other parts and remove by drawing off motor.

REPLACEMENT

1. Using clean wiping cloth and a non-toxic, non-flammable degreasing solvent, thoroughly clean mating surfaces between control valve, hydraulic motor, and cog belt housing.
2. Replace "O" rings in hydraulic motor ports. Be sure threaded inset sleeves in motor ports are slightly below flush with the surface. These sleeves must not protrude at all. Do not push "O" rings into slot at motor port. "O" rings should only be set on top of slots. The valve body will seat them when installed.
3. Apply a narrow line of sealing compound around edges of cog belt housing and flat upper surface of motor where the control valve will seat. Do not overuse sealing compound.
4. Slip unit into place on motor and into cog belt housing being sure shaft engages cogged pulley in cog belt housing and shaft slot engages cross pin.
5. Start four cap screws through saddle and into underside of control valve.
6. Tighten the two allen head screws at "D" and then uniformly tighten the four capscrews at "C". Torque to 18 ft.-lbs.
7. Reconnect hydraulic hoses at "B".
8. Reconnect cable plug at "A".
9. Road test unit to check unit for proper functioning.

NON-CURRENT

SYNCO-MATIC® CONTROL REPLACEMENT CONT'D

REMOVAL OF COMPLETE SYNCO-MATIC® MARK IV.2 CONTROL WITH CONVEYOR GEAR CASE ASSEMBLY

1. Thoroughly clean Synco-Matic® unit and area around it.
2. Disconnect cable plug at "A" and remove.
3. Remove two hydraulic hose connection at top of control valve. Cap holes to keep dirt out of valve.
4. Drain gear case oil.
5. Remove the conveyor gear case torque arm pin, remove pipe plug from the center of the gear case, remove allen head screw from the conveyor drive shaft through plug hole.
6. Slide the complete assembly off the conveyor drive shaft.
7. Reverse steps to reinstall. Carefully position the key inside the gear case before installation. The key must line up with the shaft or the conveyor will not operate.

NON-CURRENT

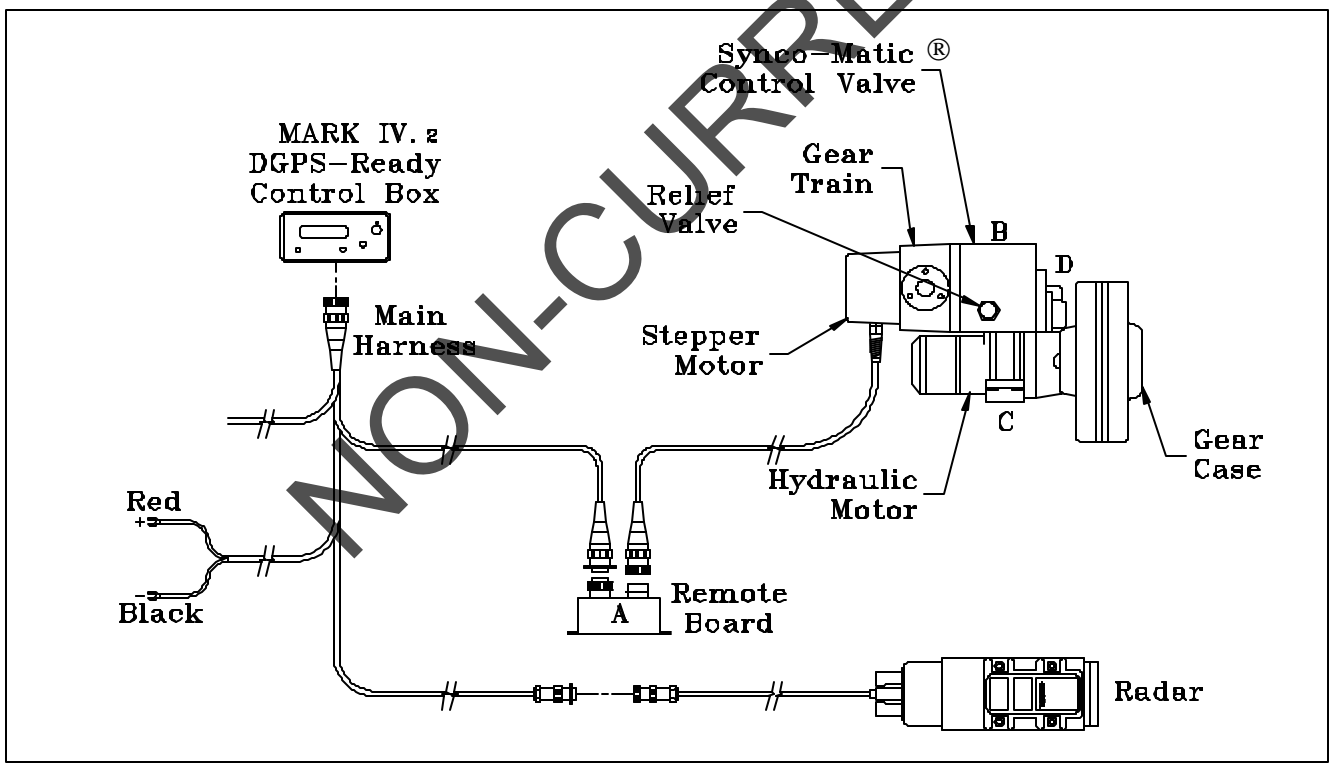


Figure 25 – Synco-MaticÒ **Mark IV.2 Assembly**

TROUBLESHOOTING PROCEDURES

Reason: **Correction:**

1. **Symptom**: Spinner motors do not turn when spinner control valve is in running position or conveyor does not run when function knob is pulled out and manually rotated.	
Hydraulic oil level low	Fill reservoir.
Shut-Off valve on oil reservoir not open	Open valve fully by turning counter-clockwise until it stops.
Hydraulic Pump is not rotating.	1. PTO is disengaged. Shift into engagement. 2. Drive line has failed. Repair or replace. 3. Key in pump shaft has failed. Replace key. 4. U-joint pin or key has failed. Replace pin or key.
In-line relief valve set too low.	In-line relief valve pressure should be 2750 PSI. Set spinner control valve to "0". Disconnect pressure line at Synco-Matic® Mark IV Control which comes from the rear port on the spinner control valve. Reconnect this line to flowmeter inlet port. Disconnect the return line from the Mark IV Control where it joins the return tube running to the reservoir. Connect the flowmeter load valve to the return tube. Open the load valve fully, run truck engine at about 2500 RPM. Slowly close load valve until pressure reaches 2750 PSI. If this pressure cannot be reached, relief valve adjustment should be set up until gauge reads 2750 PSI. CAUTION: Do not set pressure above 2750 PSI.
Worn pump.	With flow meter arranged to check relief valve setting above, open load valve fully. Read flow rate with truck engine running at 2500 RPM. Close load valve until pressure reads 1000 PSI. Flow rate should not fall off more than three (3) GPM. If flow loss is greater, replace pump.
Jammed or frozen spinner motors, conveyor, or conveyor motor.	Free up. If not possible, replace as required.

NON-CURRENT

TROUBLESHOOTING PROCEDURES CONT'D

Reason:	**Correction:**
2. **Symptom**: Spinners turn but conveyor does not run in manual mode.	
Mark IV.2 relief valve open to return line	Using relief valve testing adapter and flow meter, test valve for opening pressure. If not 2000 PSI, replace relief valve.
Jammed or frozen conveyor	Free up conveyor.
Jammed or frozen conveyor hydraulic motor	Replace motor.
Conveyor hydraulic motor shaft key sheared	Replace key.
Mark IV control gears stripped or unpinned	Remove Mark IV.2 service hole cover. With hydraulics off, when control is run in manual mode the idler arm should rotate freely. If it doesn't, examine for stripped gears or unpinned gears. Replace as required. Check also for jammed valve spool. If jammed, replace control unit.

3. **Symptom**: Spinner speed does not stay constant.	
Pump speed is not adequate to provide sufficient flow to maintain spinner speed	Increase engine speed.
Worn pump	Use method for testing of worn pump given in Symptom 1. Replace pump is worn.
In-line relief valve setting too low	Use method for testing of in-line relief valve given in Symptom 1. Setting should be 2750 PSI.
Insufficient hydraulic oil flow at normal driving speeds	Check PTO-Pump matching. If insufficient flow results, install higher percent PTO or use larger pump (Special).
Defective spinner control valve	Replace valve metering spool spring. If no improvement, replace spinner control valve.

4. **Symptom**: Spinners run with cab control in "Off" position.	
Cab control is for conveyor only—spinners run anytime vehicle engine is running. PTO is engaged and spinner control valve is in a running position	None required. This is a normal condition. To stop spinners, set spinner control valve at "O" position, disconnect PTO, or shut off vehicle engine.

NON-CURRENT

TROUBLESHOOTING PROCEDURES CONT'D

Reason:	**Correction:**
5. **Symptom**: Hydraulic oil overheats (200° F. or hotter).	
Oil level is low	Add hydraulic oil up to "Full" mark.
Excessive oil is being pumped	1. PTO percentage too high Change PTO to smaller percentage or use smaller pump. 2. Pump is too large. Do not exceed 30 GPM pumping rate. Change to smaller pump or use smaller percentage PTO.
Worn motor (spinner or conveyor)	Motor heats up at an excessive rate (check for this heating when system is cold). Replace motor.
Improper or deteriorated hydraulic oil	Replace hydraulic oil with proper specification oil and replace filter.
Relief valve set too low—allows oil to throttle through valve and generate heat	Check in-line relief valve as described in Symptom 1 and Mark IV.2 relief valve as in Symptom 2. Reset or replace as required.
Pinched or obstructed hose, hydraulic line or fitting	Clear obstruction or replace part. Straighten kinked hoses.

6. **Symptom**: Light flashes and buzzer sounds intermittently. Conveyor runs in jerks.	
Driving too fast for application rate	Shift truck transmission to a lower gear. Will not normally occur if within maximum application rates.
Synco-Matic® Mark IV.2 cog-belt drive has failed	Cog-belt is broken or disengaged. Reset or replace. Cog drive pulleys may be unpinned—re-pin to shaft.
Synco-Matic® Mark IV.2 control gear has failed	Examine gears for stripping or being disconnected. Replace.

7. **Symptom**: Conveyor does not run with cab control "On", PTO engaged and vehicle driving forward.	
Defective radar	Check speed on console. Repair or replace radar as required.
Defective gear train in Mark IV.2 control	Remove cover from Mark IV.2 control. Idler arm should rotate around connection gear. If not, replace gear train.
Locked spool in Mark IV.2 control valve	Check as for defective gear train above. If arm does not rotate, check for stripped gears in gear train. Replace gears if stripped. With new gears, the idler gears will not turn with hand pressure, check for locked valve spool. Replace Mark IV.2 control if spool is jammed.

NON-CURRENT

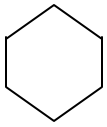
TROUBLESHOOTING PROCEDURES CONT'D

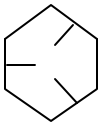
Reason:	**Correction:**
8. **Symptom**: Conveyor runs when control switch in cab is in "Off" position.	
Pump is delivering excess amount of oil	1. Pressure drop in Mark IV.2 valve is sufficient to run lightly loaded conveyor motor. Shut off pump drive by disengaging PTO shaft. 2. PTO-Pump match provides excess oil flow. Install correct PTO-Pump arrangement.
Control processor's power is in "Off" position	Turn on control processor to engage brake on Mark IV.2 valve.

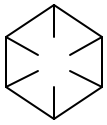
NON-CURRENT

STANDARD TORQUES NATIONAL COARSE (NC) CAP SCREWS

CAP SCREW GRADE IDENTIFICATION - MARKINGS ON HEAD

SAE GRADE 2  NO MARKINGS

SAE GRADE 5  THREE MARKS - 120 DEGREES APART

SAE GRADE 8  SIX MARKS - 60 DEGREES APART

USE GRADE 2 TORQUES FOR STAINLESS STEEL FASTENERS AND CARRIAGE BOLTS.

NON-CURRENT

	TORQUE - FOOT-POUNDS					
CAP SCREW SIZE	GRADE 2		GRADE 5		GRADE 8	
	DRY	LUBE	DRY	LUBE	DRY	LUBE
1/4”	5	4	8	6	12	9
5/16”	11	8	17	13	25	18
3/8”	20	15	30	23	45	35
7/16”	30	24	50	35	70	55
1/2”	50	35	75	55	110	80
9/16”	65	50	110	80	150	110
5/8”	90	70	150	110	220	170
3/4”	100	120	260	200	380	280
7/8”	140	110	400	300	600	460
1”	220	160	580	440	900	650

INSTRUCTIONS FOR ORDERING PARTS

Order from the **AUTHORIZED DEALER** in your area.

1. **Always give the pertinent model and serial number of the spreader.**

2. **Give part name, part number and the quantity required.**

3. **Give the correct street address to where the parts are to be shipped, and the carrier if there is a preference.**

Unless claims for shortages or errors are made immediately upon receipt of goods they will not be considered. Any part returns should be directed through the dealer from which they were purchased.

When broken goods are received, a full description of the damage should be made by the carrier agent on the freight bill. If this description is insisted upon, full damage can always be collected from the transportation company.

No responsibility is assumed for delay or damage to merchandise while in transit. Our responsibility ceases upon delivery of shipment to the transportation company from whom a receipt is received showing that shipment was in good condition when delivered to them. Therefore, claims (if any) should be filed with the transportation company and not with Highway Equipment Company.

If your claims are not being handled (by the transportation company) to your satisfaction, please call the Parts Manager at Highway Equipment Company (319) 363-8281 for assistance.

NON-CURRENT

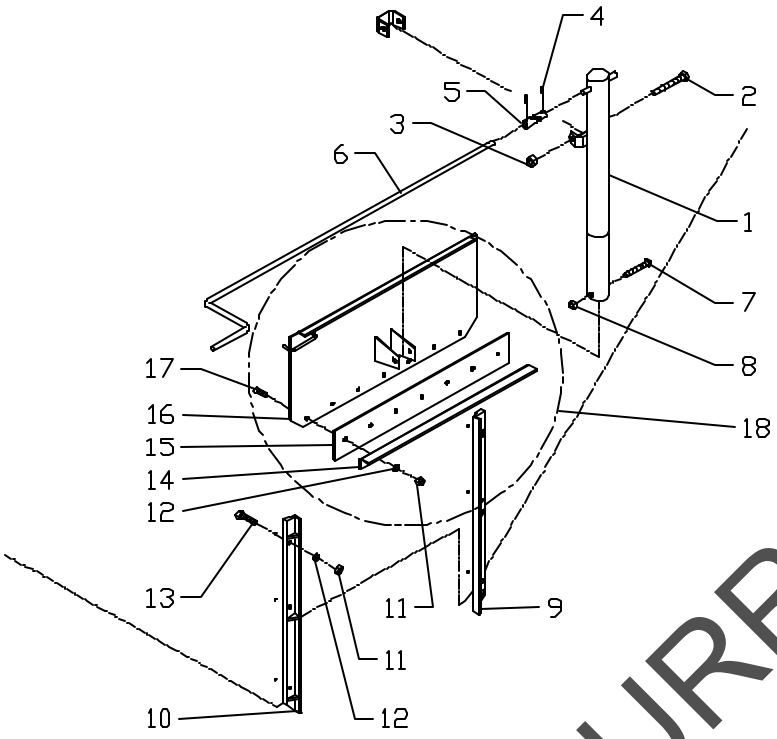
In the parts list the following symbols and abbreviations stand for:

* - Not Shown
AR – As Required
CS – Carbon Steel
SS – Stainless Steel

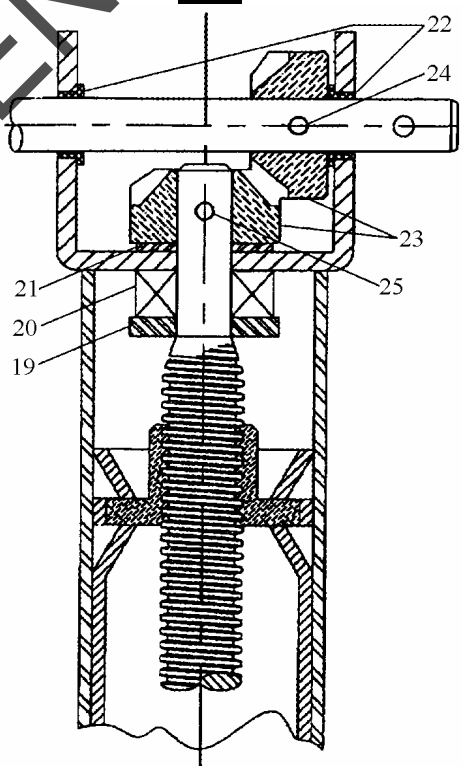
The parts listed under the different steel types (CS and 304 SS) are for that type of unit and do not necessarily mean the part is made of that type of steel.

FEEDGATE AND JACK

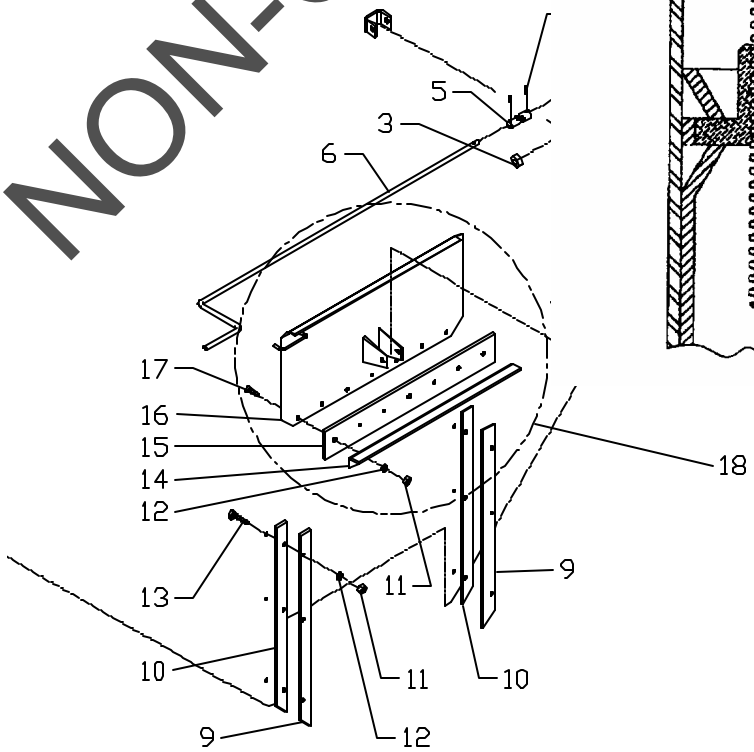
Carbon Steel



Jack



Stainless Steel



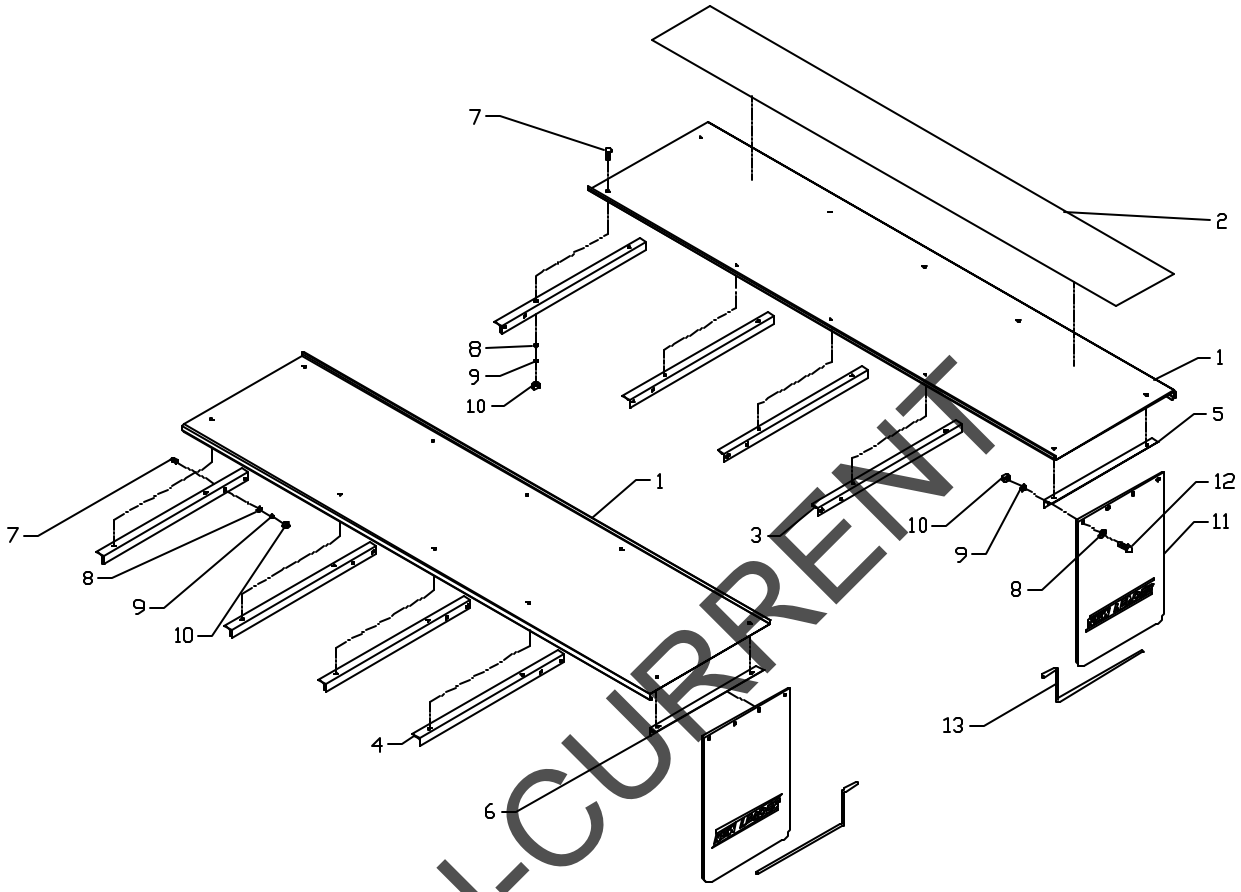
NON-CURRENT

FEEDGATE AND JACK CONTINUED

ITEM	PART NO.			DESCRIPTION	QTY
	CS	409 SS	304 SS		
	85005	85005	85005	Jack Assembly, Includes Items 1,4,5	1
1	40704	40704	40704	Jack	1
2	20138	80798	80798	Cap Screw - 1/2 x 3 3/4	1
3	20680	39016	39016	Nut - Lock, 1/2	1
4	20918	20918	20918	Pin - Roll	2
5	85002	85002	85002	U-Joint	1
6	14382	14382	14382	Handle	1
7	20074	36296	36296	Cap Screw - 3/8 x 2 3/4	1
8	20678	72054	72054	Nut - Lock, 3/8	1
9	2885	36385	36385	Slide – Feedgate R.H.	1
10	2884	36384	36384	Slide – Feedgate L.H.	1
11	20642	36412	36412	Nut - Hex, 1/4	11
12	20710	36418	36418	Washer - Lock, 1/4	11
13	20006	40750	40750	Cap Screw - 1/4 x 1 1/4	6
14	13816	13816	13816	Belt - Sealer	1
15	7084	38756	36388	Retainer - Sealer	1
16	83661	83662	83663	Feedgate Weldment	1
17	20619	36405	36405	Screw - Machine	5
18	83664	83665	83666	Feedgate Assembly, Includes Items	
19	84210	84210	84210	Washer - Thrust	1
20	84211	84211	84211	Bearing - Thrust	1
21	84212	84212	84212	Washer	1
22	84213	84213	84213	Bushing	2
23	84214	84214	84214	Gear - Miter	2
24	84215	84215	84215	Pin - Groove	1
25	84216	84216	84216	Pin - Roll	1
	84221	84221	84221	Kit - Repair, Jack Assembly, Incl. Items 19-25	

NON-CURRENT

FENDERS & MUDFLAPS



NON-CURRENT

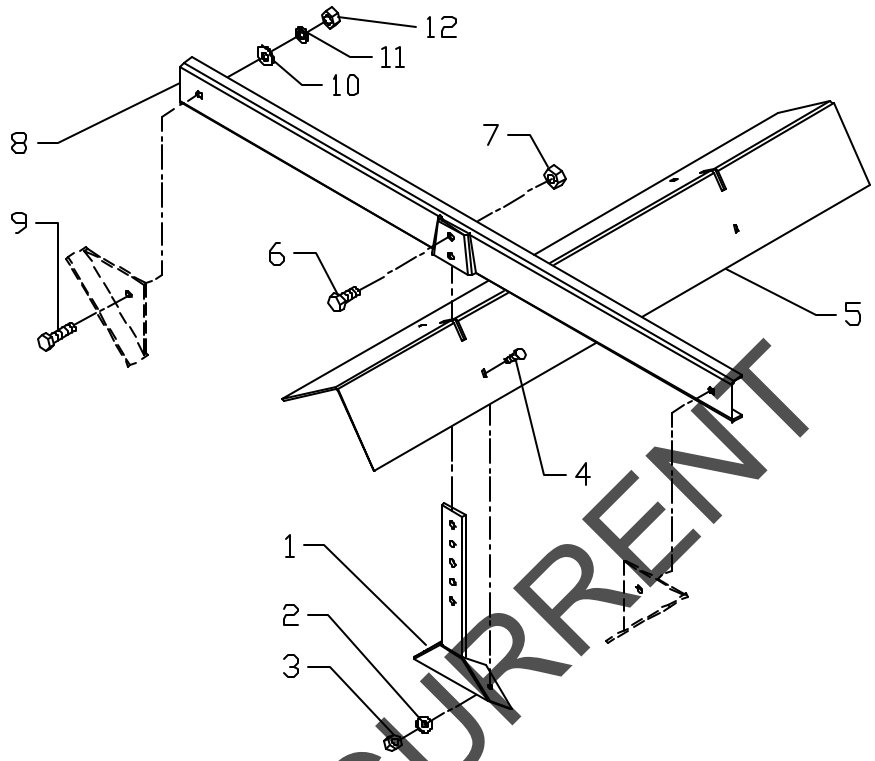
ITEM	PART NO.			DESCRIPTION	QTY
	CS	409 SS	304 SS		
1	81416	81441	81464	Fender - 10' Unit	2
	81417	81442	81465	Fender - 11' Unit	2
	81418	81443	81466	Fender - 12' Unit	2
	81419	81444	81467	Fender - 13' Unit	2
	81420	81445	81468	Fender - 14' Unit	2
	81421	81446	81469	Fender - 15' Unit	2
	81422	81447	81470	Fender - 16' Unit	2
				Fender - R.H., 9" Wider Raised for:	
	81554	81582	81606	10' Unit	1
	81555	81583	81607	11' Unit	1
	81556	81584	81608	12' Unit	1
	81557	81585	81609	13' Unit	1
	81558	81586	81610	14' Unit	1
	81559	81587	81611	15' Unit	1
	81560	81588	81612	16' Unit	1

FENDERS & MUDFLAPS CONT'D

ITEM	PART NO. CS	PART NO. 409 SS	PART NO. 304 SS	DESCRIPTION	QTY
				Fender - L.H., 9" Wider Raised for:	
	* 81697	81720	81742	10' Unit	1
	* 81698	81721	81743	11' Unit	1
	* 81699	81722	81744	12' Unit	1
	* 81700	81723	81745	13' Unit	1
	* 81701	81724	81746	14' Unit	1
	* 81702	81725	81747	15' Unit	1
	* 81703	81726	81748	16' Unit	1
2	83124	83124	83124	Material - Non-skid Inches	AR
3	46445	46445	46445	Angle - Mounting, R.H.	AR
	81428	81428	81428	Angle - Mounting, R.H. Long	AR
	* 81569	81569	81569	Angle - Mounting, R.H. for 9" Wider Raised	AR
4	46446	46446	46446	Angle - Mounting, L.H.	AR
	81429	81429	81429	Angle - Mounting, L.H. Long	AR
	* 81571	81571	81571	Angle - Mounting, L.H. for 9" Wider Raised	AR
	* 81712	81712	81712	Angle - Mounting, L.H. for 9" Wider Raised Cutout	2
5	46434	71900	71872	Bracket - Mudflap, R.H.	1
	* 81573	81597	81621	Bracket - Mudflap, R.H. for 9" Wider Raised	1
6	46435	71901	71873	Bracket - Mudflap, L.H.	1
	* 81574	81598	81622	Bracket - Mudflap, L.H. for 9" Wider Raised	1
7	20318	36408	36408	Bolt - Carriage, 3/8 x 1	AR
8	20693	36425	36425	Washer - Flat, 3/8	AR
9	20712	36420	36420	Washer - Lock	AR
10	20644	36414	36414	Nut - Hex, 3/8	AR
11	7793	7793	7793	Mudflap - NEW LEADER	2
12	20067	36398	36398	Cap Screw - 3/8 x 1	12
13	36844	36844	36844	Rod - Mudflap	AR

NON-CURRENT

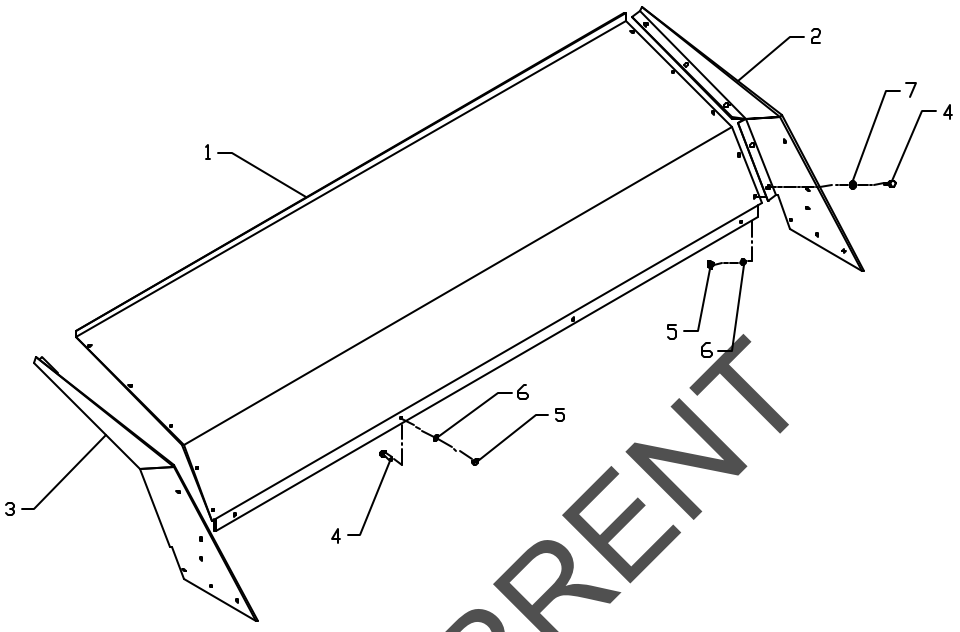
INVERTED "V"



NON-CURRENT

ITEM	PART NO.			DESCRIPTION	QTY
	CS	409 SS	304 SS		
1	82625	82626	82626	Bar - Adjusting. Weldment	AR
2	20692	36424	36424	Washer - Flat, 5/16	AR
3	20677	42221	42221	Nut - Hex, 5/16 Lock	AR
4	20291	42639	42639	Bolt - Carriage, 5/16 x 1	AR
5	82613	82617	82621	Inverted "V" (10' Unit)	1
	82614	82618	82622	Inverted "V" (11' - 12' Units)	1
	82615	82619	82623	Inverted "V" (13' - 14' Units)	1
	82616	82620	82624	Inverted "V" (15' - 16' Unit)	1
6	20176	58800	58800	Screw - Cap	AR
7	20682	41762	41762	Nut - Hex, Locking 5/8	AR
8	81261	81262	81263	Hanger Weldment	AR
9	20128	36402	36402	Cap Screw - 1/2 x 1 1/4	AR
10	20695	36426	36426	Washer - Flat, 1/2	AR
11	20714	36422	36422	Washer - Lock, 1/2	AR
12	20646	36416	36416	Nut - Hex, 1/2	AR

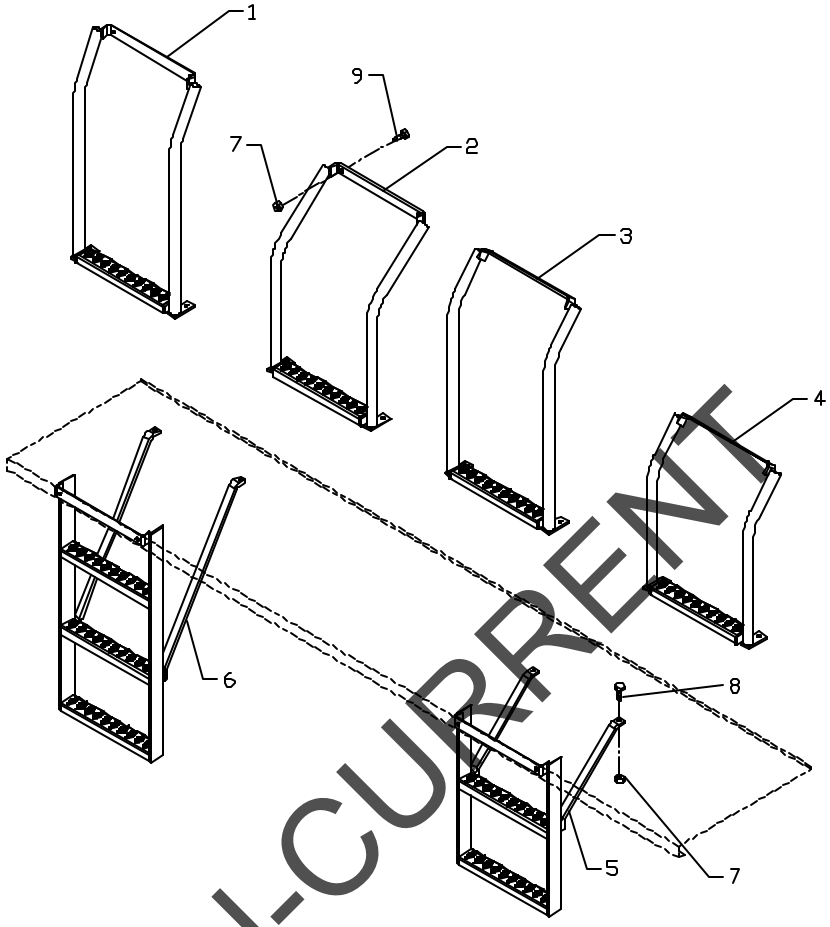
CAB SHIELD



NON-CURRENT

ITEM	PART NO.			DESCRIPTION	QTY
	CS	409 SS	304 SS		
	81910	81912	81911	Cab Shield Assembly - 57” Height	1
	81913	81915	81914	Cab Shield Assembly - 63” Height	1
	81916	81918	81917	Cab Shield Assembly - 69” Height	1
1	81901	81903	81902	Panel - Shield, 57” Height	1
	81904	81906	81905	Panel - Shield, 63” Height	1
	81907	91909	81908	Panel - Shield, 69” Height	1
2	31788	79167	79166	Support Weldment - R.H. 57” Height	1
	39813	79170	79171	Support Weldment - R.H. 63” Height	1
	39819	79175	79174	Support Weldment - R.H. 69” Height	1
3	31789	79169	79168	Support Weldment - L.H. 57” Height	1
	39815	79173	79172	Support Weldment - L.H. 63” Height	1
	39821	79177	79176	Support Weldment - L.H. 69” Height	1
4	20067	36398	36398	Cap Screw - 3/8 x 1	AR
5	20644	36414	36414	Nut - Hex, 3/8	AR
6	20712	36420	36420	Washer - Lock, 3/8	AR
7	20693	36425	36425	Washer - Flat, 3/8	AR

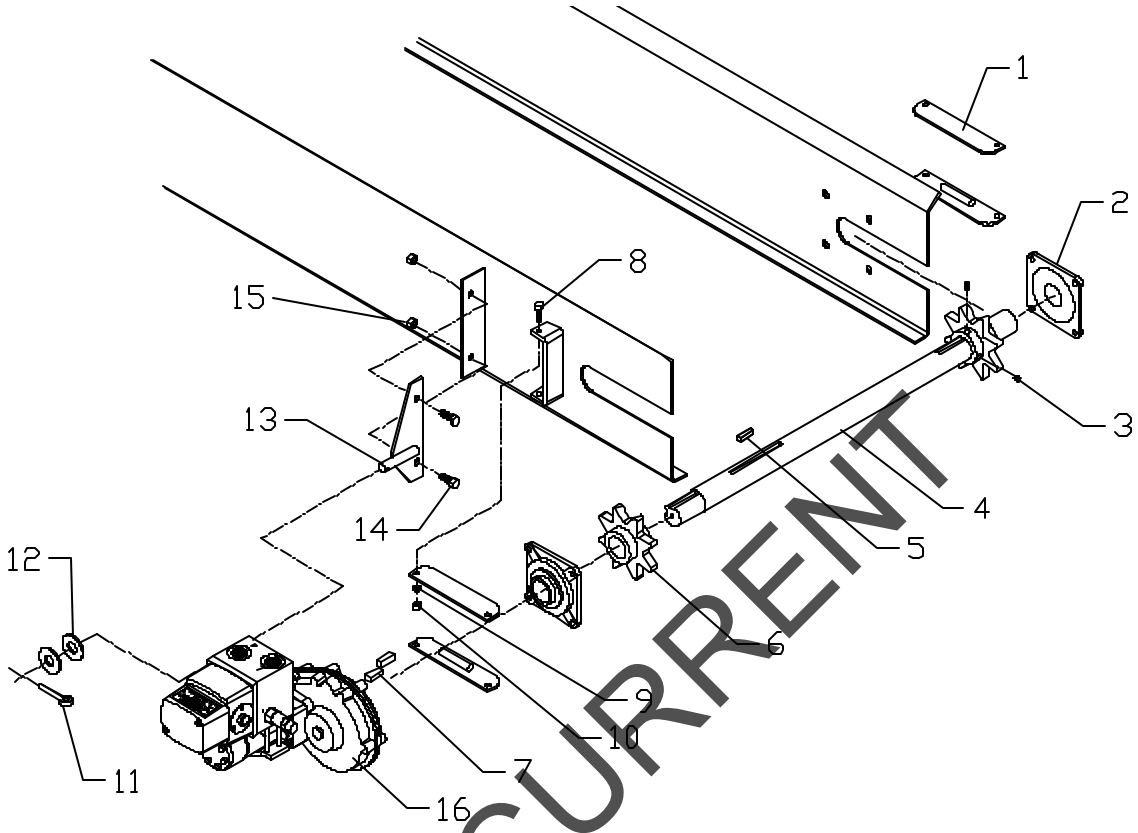
LADDER



NON-CURRENT

ITEM	PART NO.	DESCRIPTION	QTY
	46458	Group - Ladder	
	46460	Group - Ladder for Units with Raised Fenders	
	53955	Group - Ladder for 96” Wide Units	
	53951	Group - Ladder for 96” Wide Units with Raised Fenders	
1	72795	Ladder - Upper	1
2	72777	Ladder - Upper for Units with Raised Fenders	1
3	72779	Ladder - Upper for 96” Wide Units	1
4	72778	Ladder - Upper for 96” Wide Units with Raised Fenders	1
5	72797	Ladder - Lower	1
6	72796	Ladder - Lower for Units with Raised Fenders	1
7	20644	Nut - Hex, 3/8	8
8	20069	Cap Screw - 3/8 x 1 1/2	2
9	20068	Cap Screw - 3/8 x 1 1/4	6

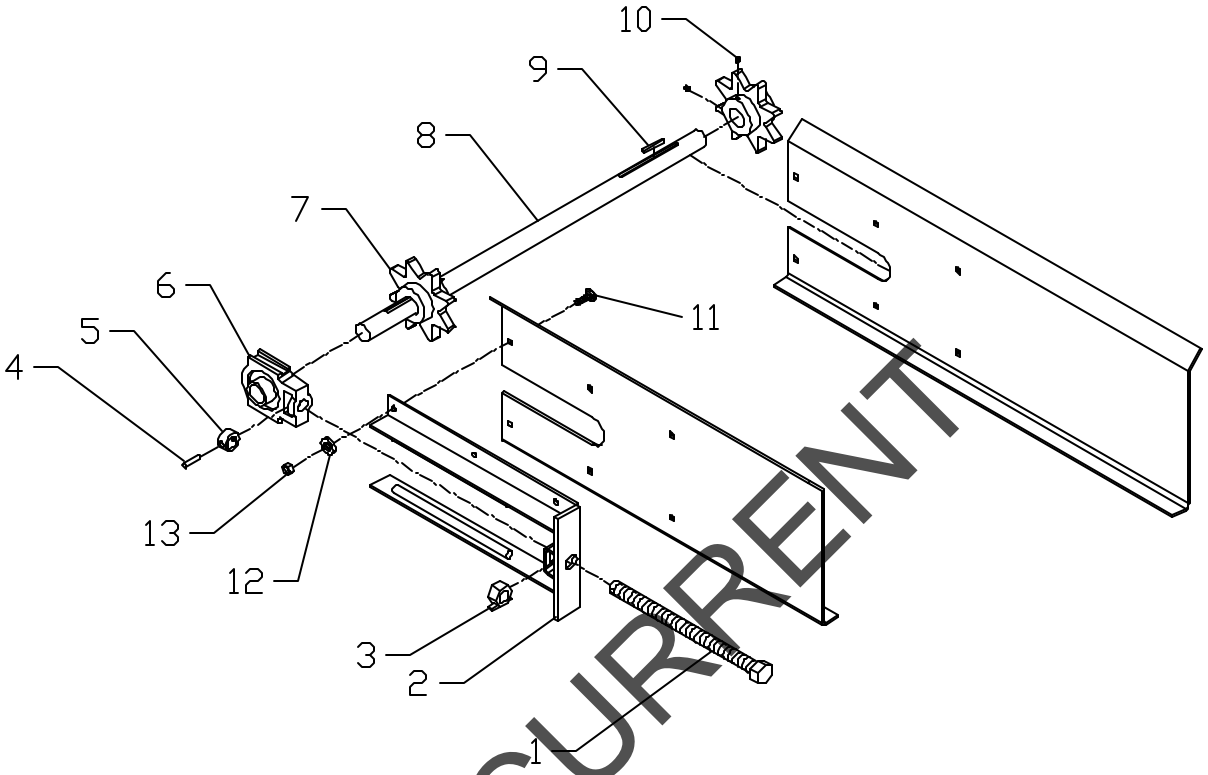
CONVEYOR DRIVE



NON-CURRENT

ITEM	PART NO. CS	PART NO. SS	DESCRIPTION	QTY
1	82882	82885	Guide - Bearing	4
2	6465	6465	Bearing	2
3	20748	20748	Screw - Set, 3/8	4
4	55999	55999	Shaft - Drive	1
5	6131	6131	Key - Square, 1/2 x 1 1/2	2
6	27275	27275	Sprocket	2
7	37010	37010	Key - Square, 1/2 x 1 1/2	2
8	20068	36399	Cap Screw - 3/8 x 1 1/4	8
9	20712	36420	Washer - Lock, 3/8	8
10	20644	36414	Nut - Hex, 3/8	8
11	20833	20833	Pin - Cotter, 1/4 x 1 1/2	1
12	2716	2716	Washer - Flat, 3/4	AR
13	82550	82552	Torque Arm Weldment - L.H.	1
14	20128	20128	Cap Screw - 1/2 x 1 1/4	2
15	20680	20680	Nut - Hex, Locking 1/2	2
16	84956	84956	Gear Case - Single, Mark IV.2 Assy (10'-13' Units)	1
	84957	84957	Gear Case – Dual, Mark IV.2 Assy (14'-16 Units)	1

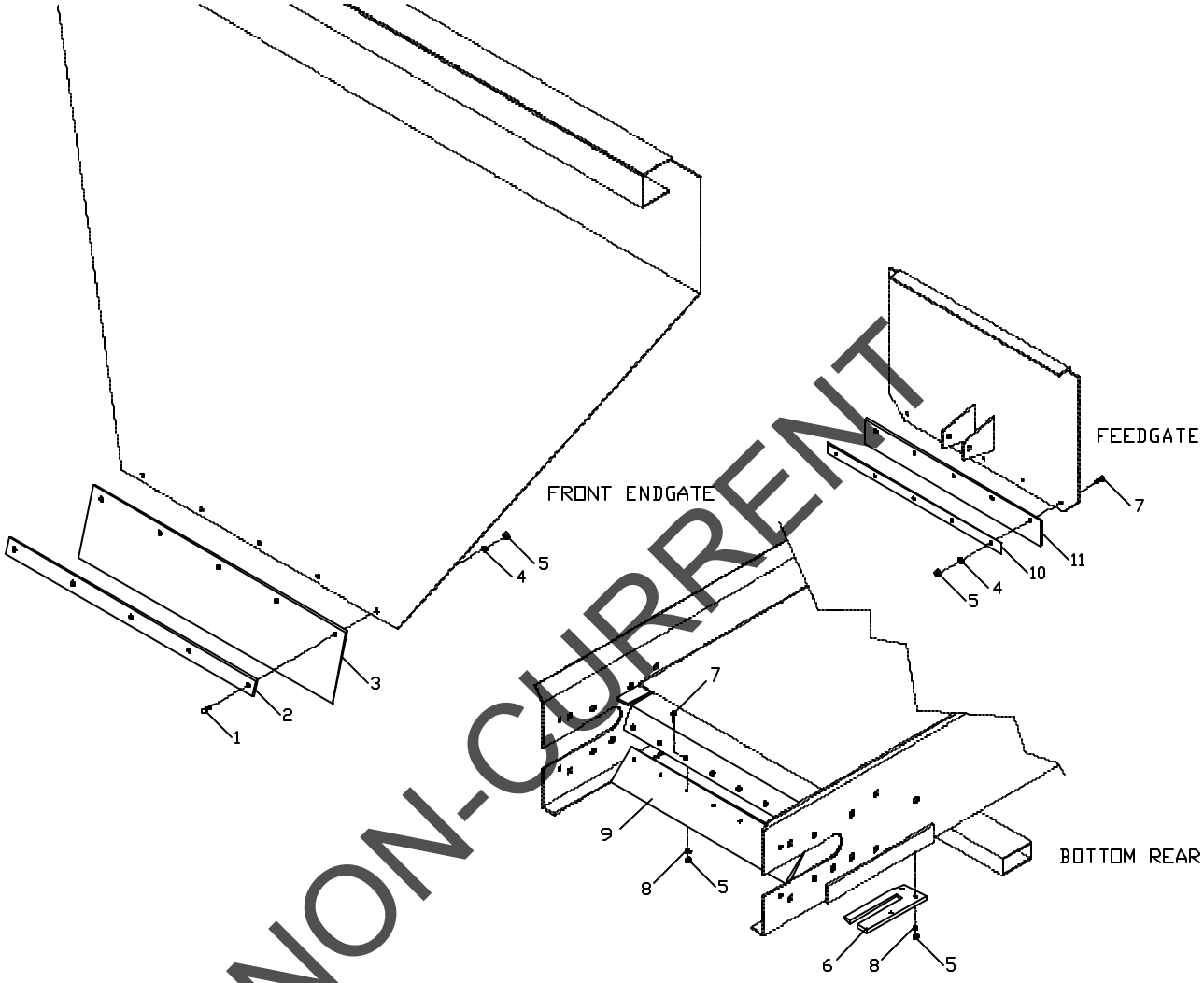
CONVEYOR IDLER



NON-CURRENT

ITEM	PART NO. CS	PART NO. SS	DESCRIPTION	QTY
1	36508	36508	Chain Tightener Weldment	2
2	7895	7895	Take-up Weldment	2
3	39110	39110	Nut Weldment	2
4	20925	20925	Pin - Roll, 1/4 x 1 1/2	2
5	30725	30725	Collar - Set, 1”	2
6	22511	22511	Bearing - Take-up	2
7	1899	1899	Sprocket - Idler	2
8	48279	48279	Shaft - Idler	1
9	2135	2135	Key - Square	2
10	20743	20743	Screw - Set, 5/16 x 3/8	4
11	20318	36408	Bolt - Carriage, 3/8 x 1	12
12	20712	36420	Washer - Lock, 3/8	12
13	20644	36414	Nut - Hex, 3/8	12

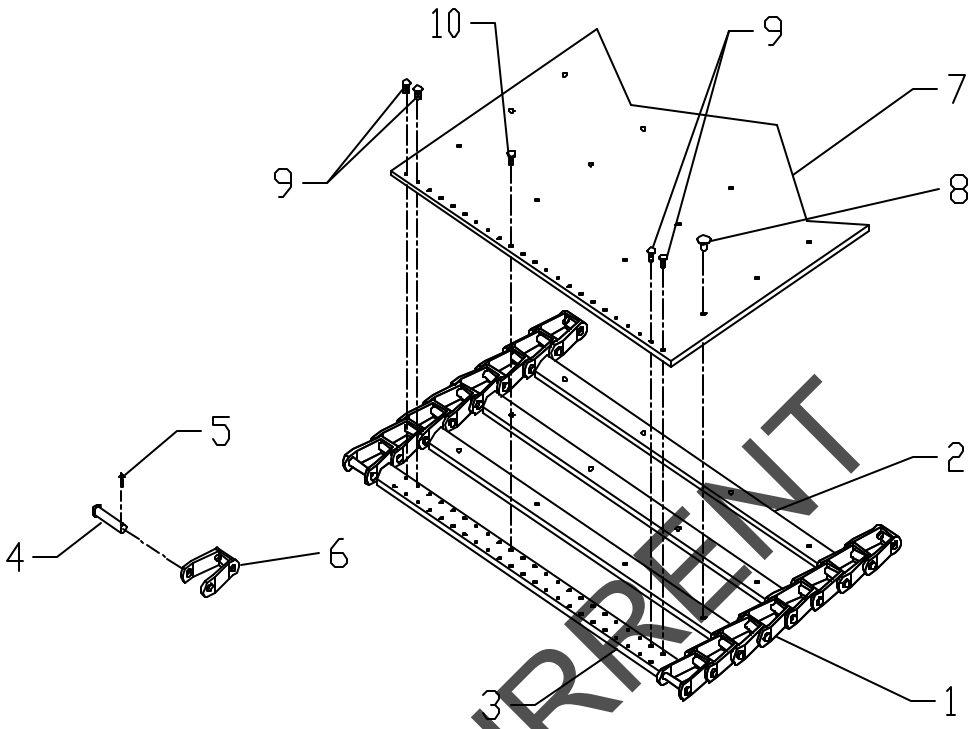
SEALER AND WIPER BELTS



NON-CURRENT

ITEM	PART NO.	DESCRIPTION	QTY
1	20583	Screw - Machine	5
2	39408	Retainer - Front Wiper Belt	1
3	39426	Belt - Front Wiper	1
4	20710	Washer - Lock, 1/4	10
5	20642	Nut - Hex, 1/4	21
6	33207	Belt - Sealer	2
7	20619	Screw - Machine, 1/4 x 3/4	16
8	20691	Washer - Flat, 1/4	11
9	3735	Belt - Rear Wiper	1
10	7084	Retainer - Sealer Belt	1
11	13816	Belt - Sealer	1

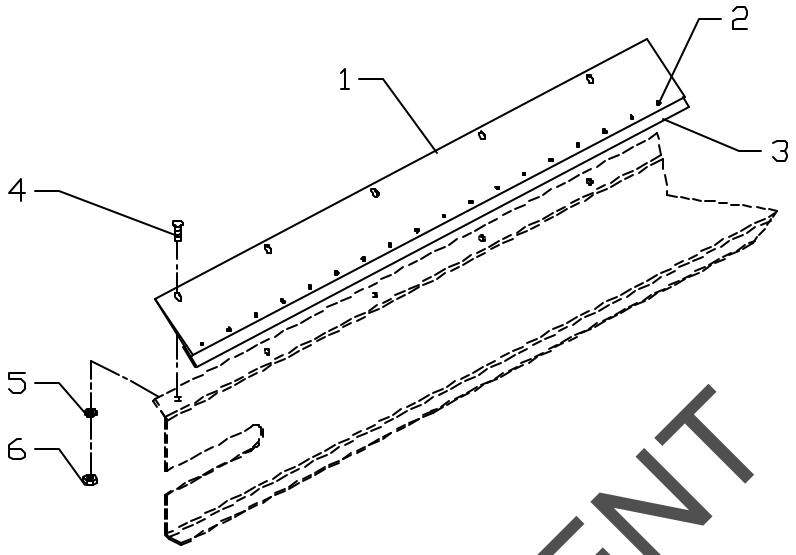
CONVEYOR CHAIN



NON-CURRENT

ITEM	PART NO.	DESCRIPTION	QTY
1		Conveyor Chain Assembly - #4 Pintle For:	
	81389	10’ Unit	1
	81390	11’ Unit	1
	81391	12’ Unit	1
	81786	12’6” Unit	1
	81392	13’ Unit	1
	81393	14’ Unit	1
	81394	15’ Unit	1
	81395	16’ Unit	1
2	81403	Cross Bar Weldment with Rivet Holes - #4 Pintle	A.R.
3	81404	Splice Bar Weldment - #4 Pintle	1
4	36697	Pin - Connecting, #4 Pintle	A.R.
5	20817	Pin - Cotter	A.R.
6	36699	Link - Connecting, #4 Pintle	A.R.
7	6251	Belt - Conveyor (Specify Body Length)	1
8	6245	Rivet	A.R.
9	20617	Screw - Machine, Flat Head	4
10	20624	Screw - Machine, Truss Head	32

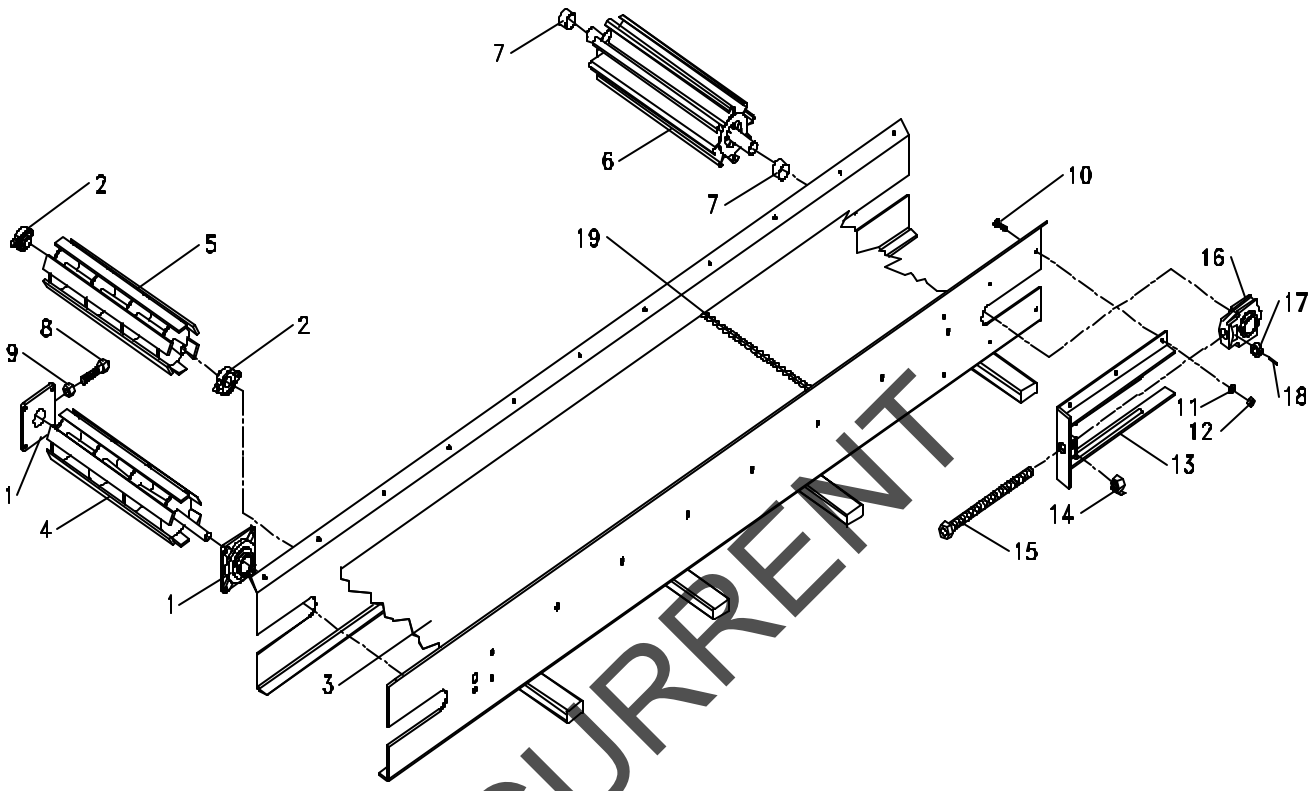
CHAIN SHIELD



	CS	409 SS	304 SS		
1				Chain Shield Assembly for #4 Chain Only	
	37367	43816	54143	10’ Unit	2
	37368	43818	54144	11’ Unit	2
	37369	43820	54145	12’ Unit	2
	55416	78902	78903	12’6” Unit	2
	37370	43810	54146	13’ Unit	2
	39625	43827	54147	14’ Unit	2
	37371	46993	54148	15’ Unit	2
	46302	46994	54149	16’ Unit	2
C				Chain and Belt Shield	
	39615	43697	54119	10’ Unit	1
	39616	43698	54120	11’ Unit	1
	39617	43699	54121	12’ Unit	1
	39618	43700	54122	13’ Unit	1
2	6244	6244	6244	Rivet	AR
3				Belt - Sealer	
		4768-132		10’ Unit	1
		7687-144		11’ Unit	1
		7687-156		12’ Unit	1
		7687-168		13’ Unit	1
		7687-180		14’ Unit	1
		7687-192		15’ Unit	1
		7687-204		16’ Unit	1
4	20318	71829	71829	Bolt - Carriage, 3/8 x 1	AR
5	20712	36420	36420	Washer - Lock, 3/8	AR
6	20644	36414	36414	Nut - Hex, 3/8	AR

NON-CURRENT

#5 BOTTOM



NON-CURRENT

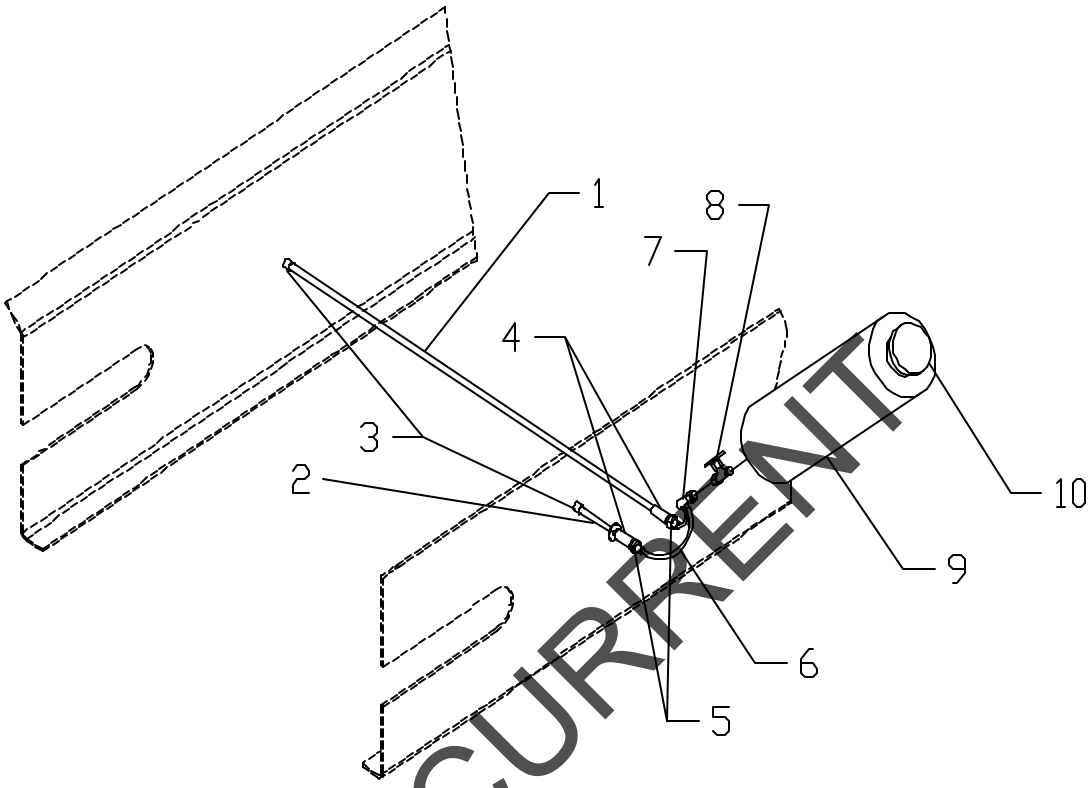
ITEM	PART NO.		DESCRIPTION	QTY
	CS	SS		
	53982	53982	#5 Belt Assembly (10’ Unit)	
	53983	53983	#5 Belt Assembly (11’ Unit)	
	53984	53984	#5 Belt Assembly (12’ Unit)	
	53985	53985	#5 Belt Assembly (13’ Unit)	
NOTE: The above assemblies include Items 3 and 19.				
1	6465	6465	Bearing	2
2	32468	32468	Bearing	2
3	39597	39597	Belt Only (10’ Unit)	1
	39598	39598	Belt Only (11’ Unit)	1
	39599	39599	Belt Only (12’ Unit)	1
	39600	39600	Belt Only (13’ Unit)	1
4	39572	43793	Pulley – Drive, Use with Single Pinion	1
	54736	54737	Pulley – Drive, Use with Dual Pinion	1
5	33875	36366	Pulley - Snub	1
6	81343	81344	Pulley - Idler	1
7	81345	81345	Spacer - Pipe	2
8	81354	81354	Screw - Set, 3”	1
9	36417	36417	Nut - Hex, 5/8	1

#5 BOTTOM CONT'D

ITEM	PART NO. CS	PART NO. SS	DESCRIPTION	QTY
10	20319	36409	Bolt - Carriage, 3/8 x 1 1/4	12
11	20712	36420	Washer - Lock, 3/8	12
12	20644	36414	Nut - Hex, 3/8	12
	36507	36507	Take-up Assembly - Includes Items 13 - 18	2
13	7895	7895	Bracket - Take-up Weldment	2
14	39110	39110	Nut Weldment	2
15	36508	36508	Chain Tightener Weldment	2
16	22511	22511	Bearing - Take-up	2
17	30725	30725	Collar - Set	2
18	20925	20925	Pin - Roll	2
19	53995	53995	Kit - Belt Splicing, Consisting of:	1
	53992	53992	Fastener - Hinge 1 Bolt	4
	53993	53993	Fastener - Hinge 2 Bolt	2
	53994	53994	Fastener - Hinge 3 Bolt	4
	33884-23	33884-23	Tape - Belt Stiffener	2
	39603	39603	Pin - Hinge	1
	39604-23	39604-23	Tube - Sealer	2

NON-CURRENT

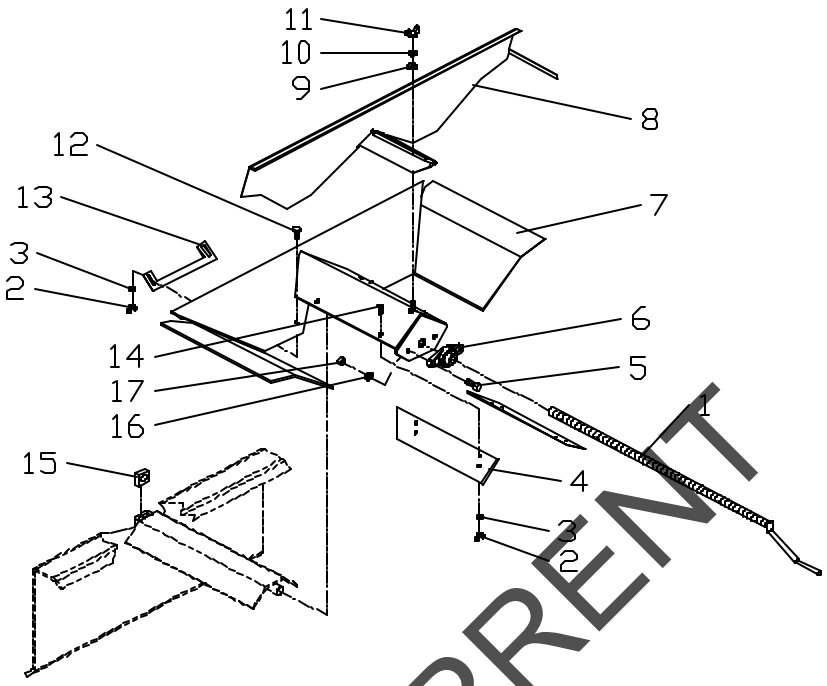
CONVEYOR CHAIN OILER



NON-CURRENT

ITEM	PART NO.	DESCRIPTION	QTY
	82825	Tank – Oiler Assembly, Includes Items 8,9,10	
1	85065	Tube – Oiler Long	1
2	82924	Tube – Oiler Short	1
3	82921	Cap – Pipe	2
4	6001	Coupler – Pipe	2
5	82919	Connector - Male	2
6	82920-10	Tubing – Clear	2
7	82918	Tee – Swivel	1
8	82917	Valve – Shut-off	1
9	1572	Tank – Oiler Weldment	1
10	21980	Cap – Tank	1
11	* 20710	Washer - Lock, 1/4	4
12	* 20004	Cap Screw - 1/4 x 7/8	4
13	* 20642	Nut - Hex, 1/4	4

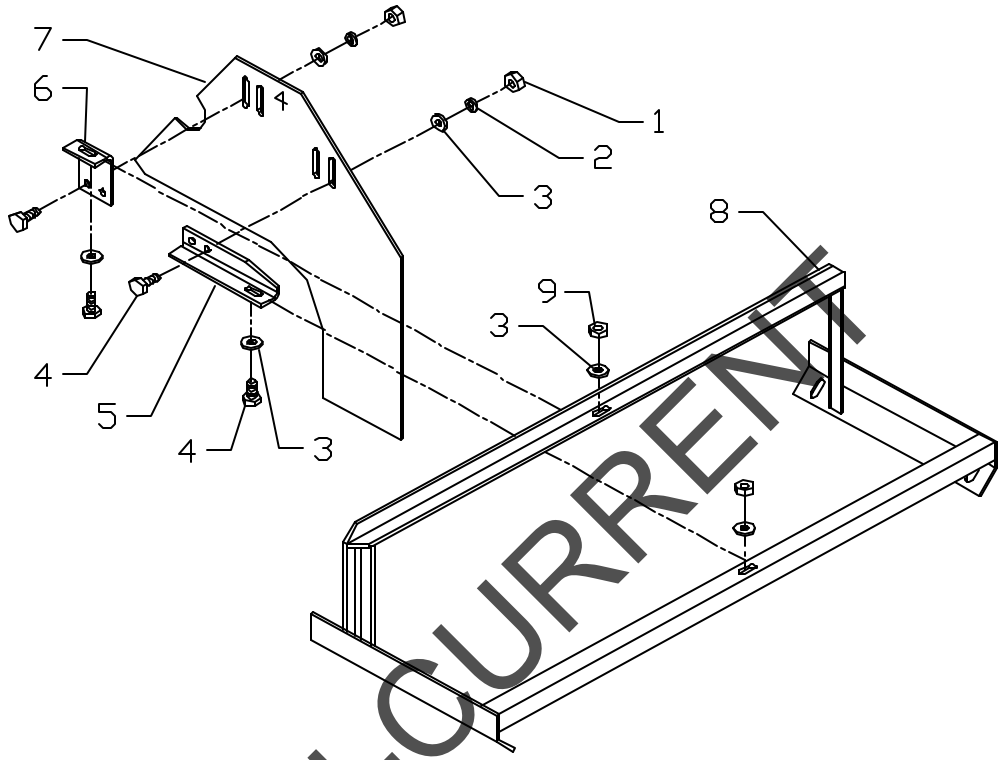
RED-E-VIDER / LIME DIVIDER



NON-CURRENT

ITEM	PART NO.	DESCRIPTION	QTY
	81224	Red-E-Vider Assembly	
	81225	Lime Divider Assembly	
1	81228	Screw - Adjusting Weldment	1
2	32445	Nut - Wing, 1/4 SS	6
3	36418	Washer - Lock, 1/4 SS	6
4	81238	Extension - "V" Divider, SS	2
5	34580	Cap Screw - 5/16 x 1 SS	2
6	200040	Screw - Outer Screw Support	1
7	81233	Material Divider Weldment	1
	81234	Lime Divider Weldment	1
8	81231	Back Plate Weldment for Red-E-Vider	1
	81232	Back Plate Weldment for Lime Divider	1
9	36425	Washer - Flat, 3/8 SS	1
10	36420	Washer - Lock, 3/8 SS	1
11	20673	Nut - Wing, 3/8	1
12	36393	Cap Screw - 1/4 x 3/4 SS	2
13	81237	Adjuster - Bar Guide	1
14	32446	Screw - Truss Head, 1/4 x 3/4 SS	4
15	80995	Nut - Square, 5/8	1
16	36419	Washer - Lock, 5/16 SS	2
17	36413	Nut - Hex, 5/16 SS	2
18	* 36423	Washer - Flat, 1/4 SS	2

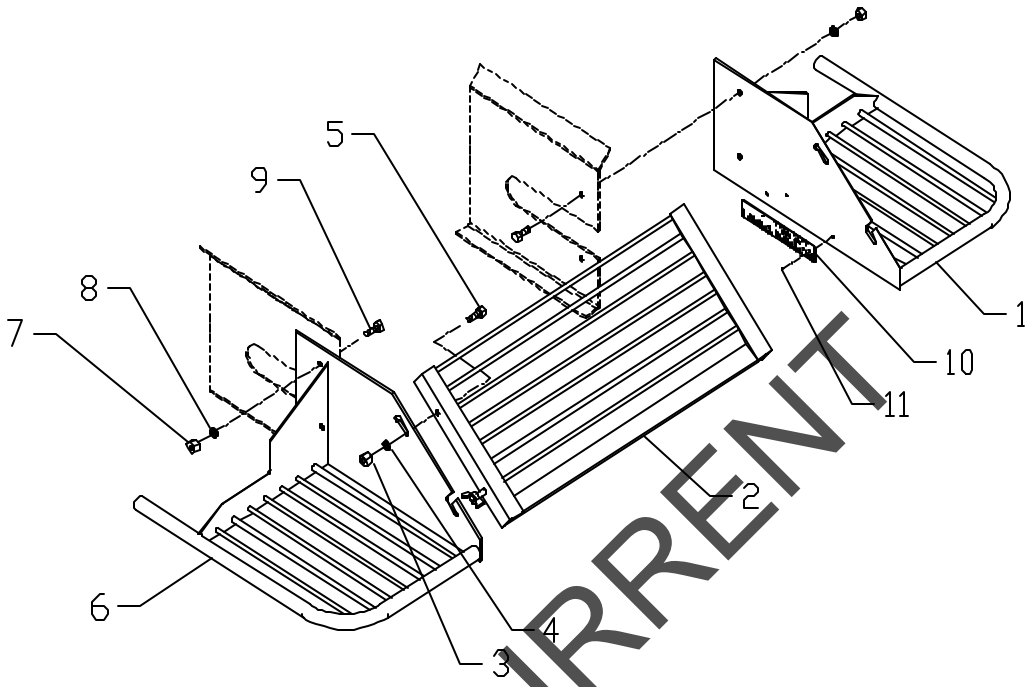
HILLSIDE FLOW DIVIDER



NON-CURRENT

ITEM	PART NO.	DESCRIPTION	QTY
1	36413	Nut - Hex, 5/16 SS	4
2	36419	Washer - Lock, 5/16 SS	4
3	36424	Washer - Flat, 5/16 SS	8
4	34580	Cap Screw - 5/16 x 1 SS	6
5	56879	Bracket - Clamp, SS	1
6	56880	Angle - Clamp, SS	1
7	56878	Panel - Divider, SS	1
8	56926	Support Weldment, SS	1
9	20677	Nut - Lock, 5/16 SS	2

SPINNER GUARD

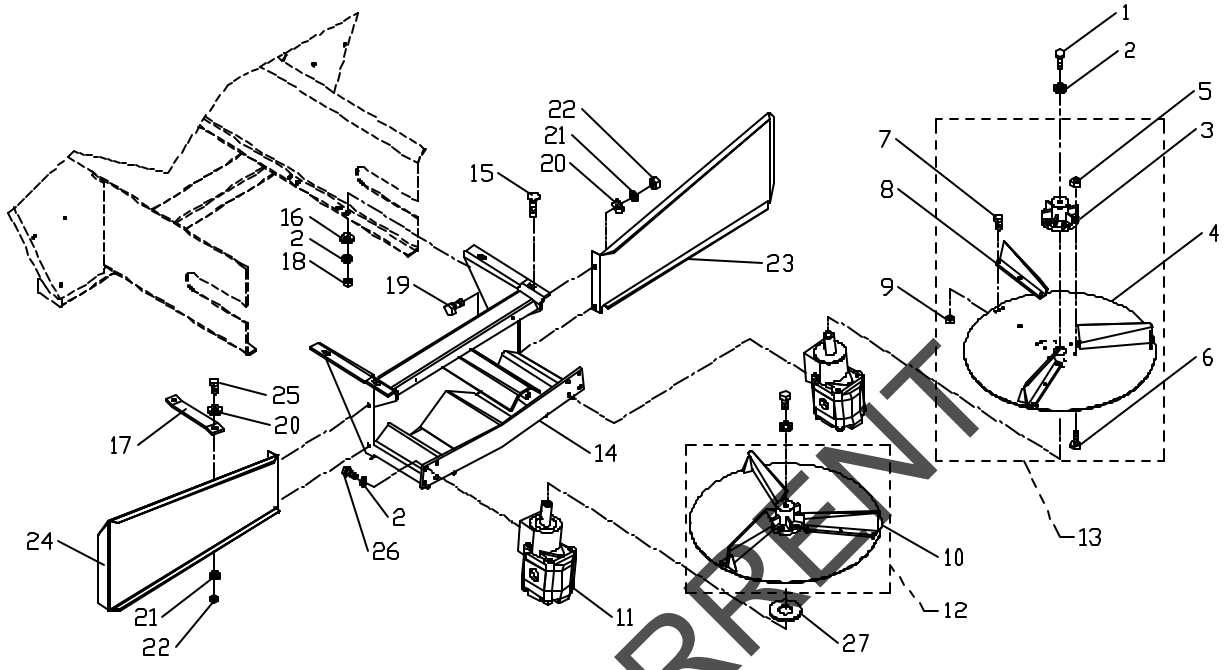


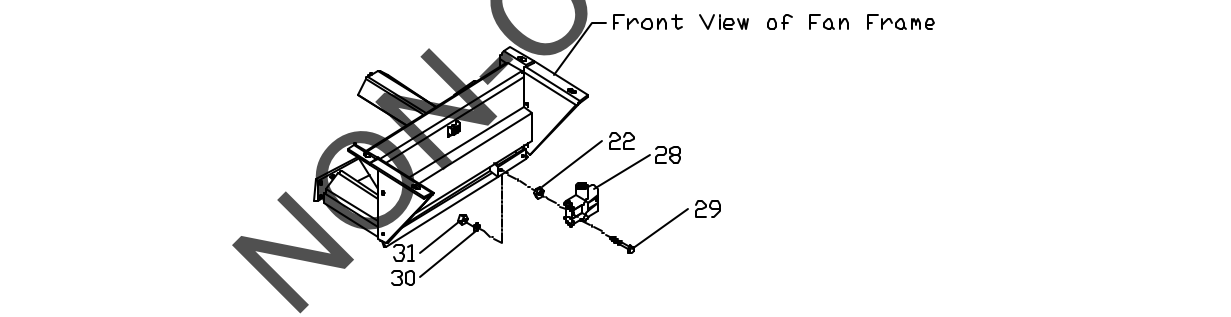
NON-CURRENT

ITEM	PART NO.	DESCRIPTION	QTY
	43022	Guard - Spinner	
1	82908	Guard - R.H.Weldment	1
2	47336	Guard - Center Section Weldment	1
3	72054	Nut - Hex, 3/8 Lock	2
4	36425	Washer - Flat, 3/8	2
5	36398	Cap Screw - 3/8 x 1	2
6	55218	Guard - Weldment L.H.	1
7	20644	Nut - Hex, 3/8	4
8	20714	Washer - Lock, 3/8	4
9	20067	Cap Screw - 3/8 x 1	4
10	90623	Scale - Material Divider	1
11	6276	Screw - Drive	3
12	82908	Guard - Spinner Assembly, R.H. (Includes Items 1,10,11)	1

NOTE: Guards are intended to reduce hazard of entanglement with machinery and injury. All guards must be installed per this drawing before spreader is put into operation.

24" HYDRAULIC FANS





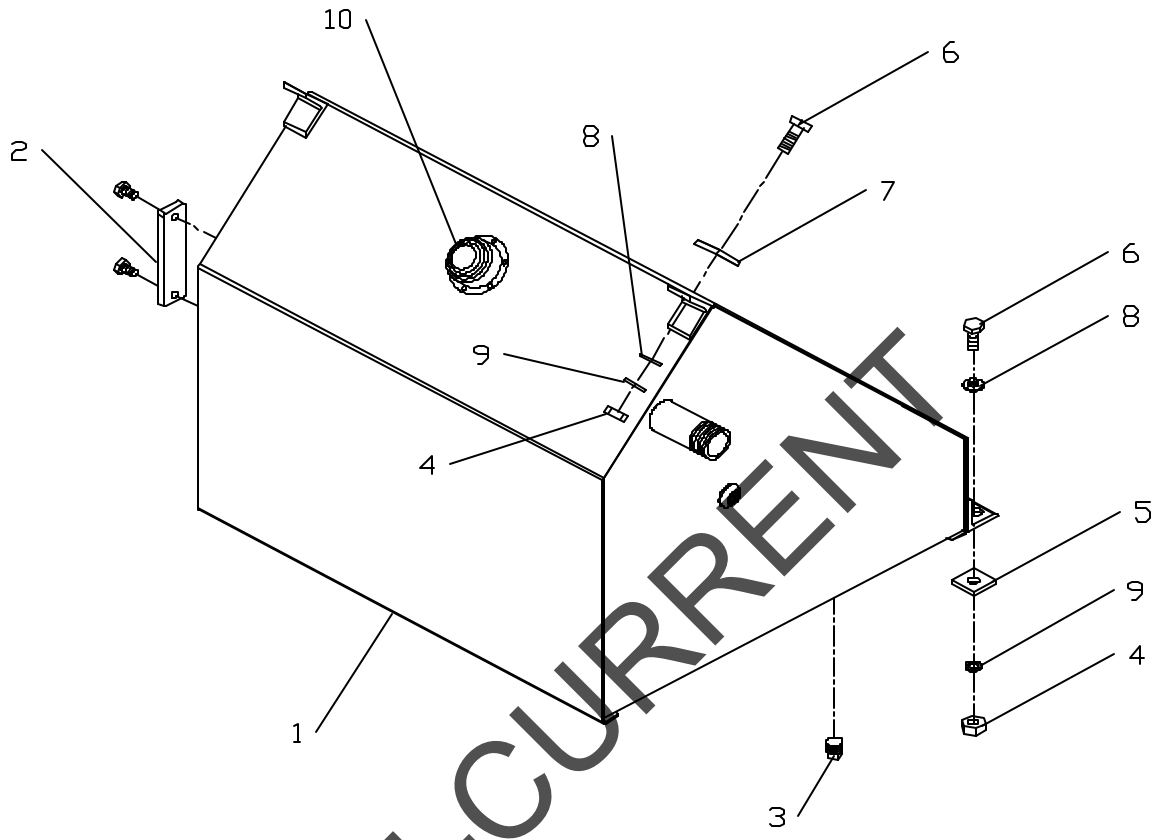
NON-CURRENT

24" HYDRAULIC FANS CONTINUED

ITEM	PART NO.			DESCRIPTION	QTY
	CS	409 SS	304 SS		
	81201	81202	81203	24" Hydraulic Fans Assembly	
1	20127	36401	36401	Cap Screw - 1/2 x 1	2
2	20714	36422	36422	Washer - Lock, 1/2	14
3	10877	10877	10877	Hub	2
4	27056	27056	27056	Disc - Distributor	2
5	20676	20676	20676	Nut - Hex, Locking, 1/4	12
6	20004	20004	20004	Cap Screw - 1/4 x 7/8	12
7	20034	20034	20034	Cap Screw - 5/16 x 3/4	18
8	25870	25870	25870	Fin - R.H. Weldment	3
9	20677	20677	20677	Nut - Hex, Locking	18
10	25871	25871	25871	Fin - L.H. Weldment	3
11	23800	23800	23800	Motor - Hydraulic	2
12	14373	14373	14373	Fan - L.H. Assembly	1
13	14372	14372	14372	Fan - R.H. Assembly	1
14	81210	81211	81211	Frame Weldment	1
15	20430	36411	36411	Bolt - Carriage, 1/2 x 1 1/2	4
16	20695	36426	36426	Washer - Flat, 1/2	4
17	85098	85099	85099	Bar - Stiffener	2
18	20646	36416	36416	Nut - Hex, 1/2	4
19	20067	36398	36398	Cap Screw - 3/8 x 1	6
20	20693	36425	36425	Washer - Flat, 3/8	8
21	20712	36420	36420	Washer - Lock, 3/8	8
22	20644	36414	36414	Nut - Hex, 3/8	10
23	82960	82964	82964	Extension - Shield, R.H.	1
24	82961	82965	82965	Extension - Shield, L.H.	1
25	20068	36399	36399	Cap Screw – 3/8 x 1 1/4	2
26	20128	36402	36402	Cap Screw - 1/2 x 1 1/4	8
27	72294	72294	72294	Washer - Rubber	2
28	43510	43510	43510	Valve - Flow Divider	1
29	20010	34865	34865	Cap Screw - 1/4 x 2 1/4	2
30	20710	36418	36418	Washer - Lock, 1/4	2
31	20642	36412	36412	Nut - Hex, 1/4	2

NON-CURRENT

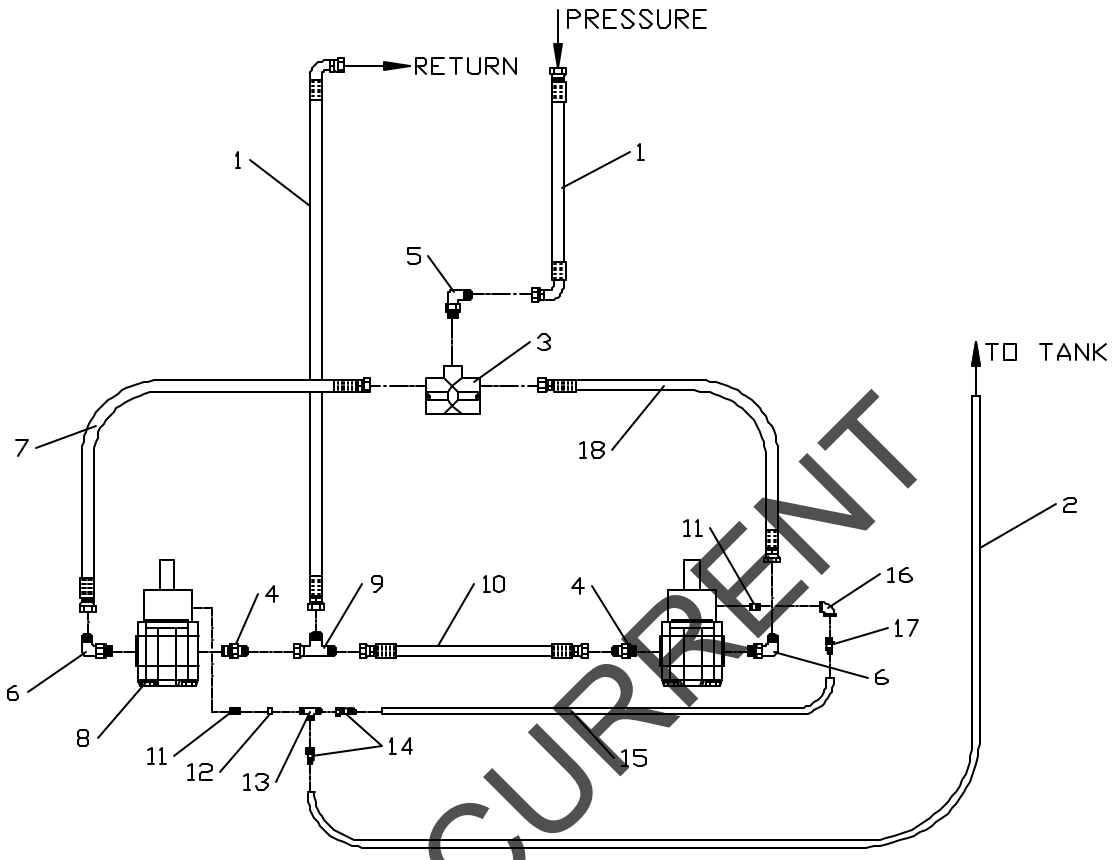
RESERVOIR



NON-CURRENT

ITEM	PART NO.		DESCRIPTION	QTY
	CS	SS		
1	31140	31140	Assembly - Reservoir (Includes Items 2, 3 & 10)	1
2	38575	38575	Assembly - Sight & Temperature Gauge	1
3	6033	6033	Plug - Pipe, 3/4	1
4	20644	36414	Nut - Hex, 3/8	4
5	39158	39158	Belt - Flex Mount	2
6	20069	34858	Screw - Cap, 3/8 x 1 1/2	4
7	39159	39159	Belt - Flex Mount	2
8	20693	36425	Washer - Flat, 3/8	4
9	20712	36420	Washer - Lock, 3/8	4
10	21850	21850	Assembly - Filler Cap	1

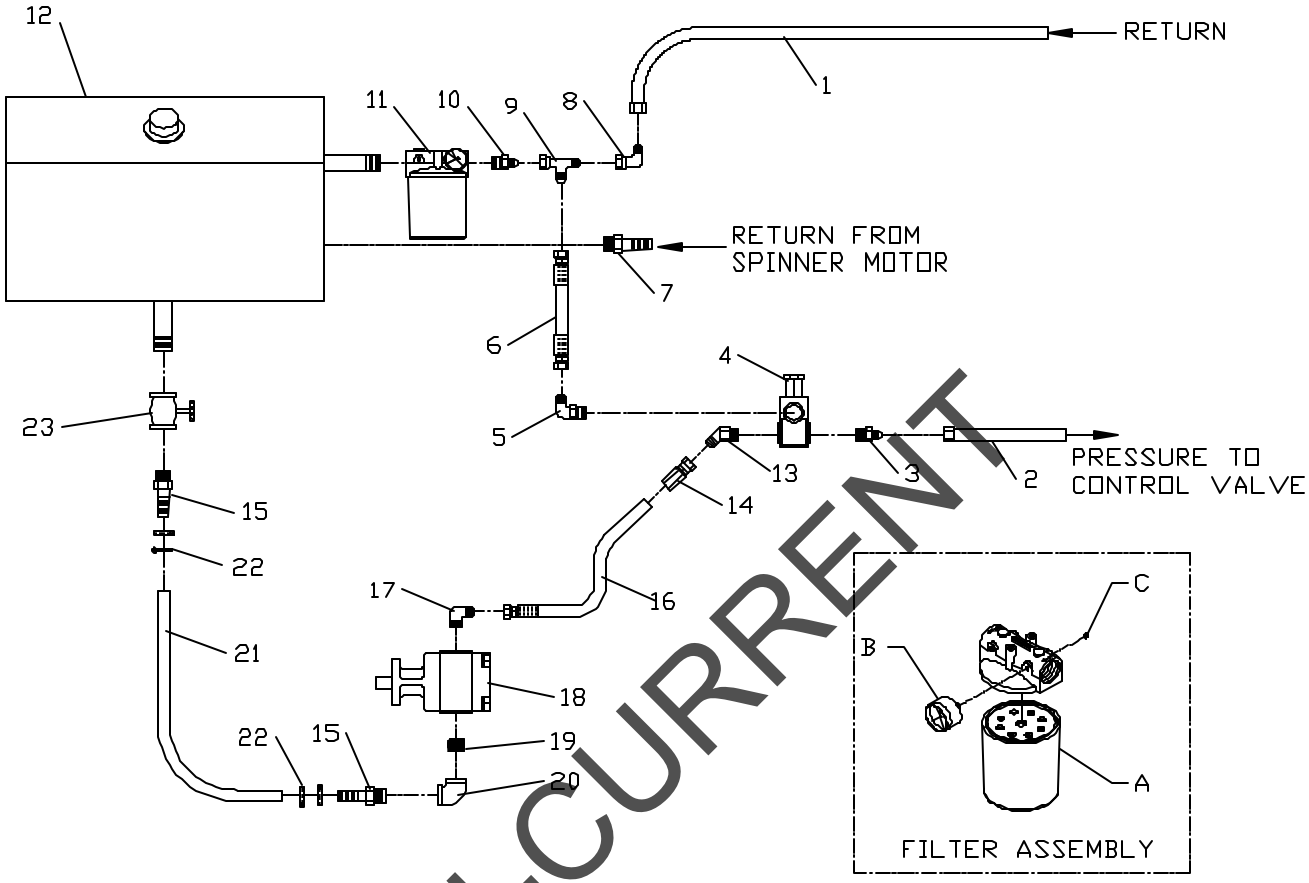
TWIN SPINNER HYDRAULICS



NON-CURRENT

ITEM	PART NO.	DESCRIPTION	QTY
1	29642	Hose Assembly	2
2	34195-180	Hose - Push-on	1
3	43510	Valve - Flow Divider	1
4	34717	Adapter - Connector	2
5	29847	Adapter - 90° Elbow	1
6	29761	Adapter - 90° Elbow	2
7	29713	Hose Assembly	1
8	23800	Motor - Spinner	2
9	29781	Adapter - Tee	1
10	29574	Hose Assembly	1
11	4343	Nipple - Close	2
12	6001	Coupling - Pipe	1
13	34762	Adapter - Tee	1
14	34761	Fitting - Socketless	2
15	34195-29	Hose - Push-on	1
16	6007	Elbow - 90°	1
17	34760	End - Hose	1
18	29714	Hose Assembly	1

RESERVOIR/PUMP HYDRAULICS



NON-CURRENT

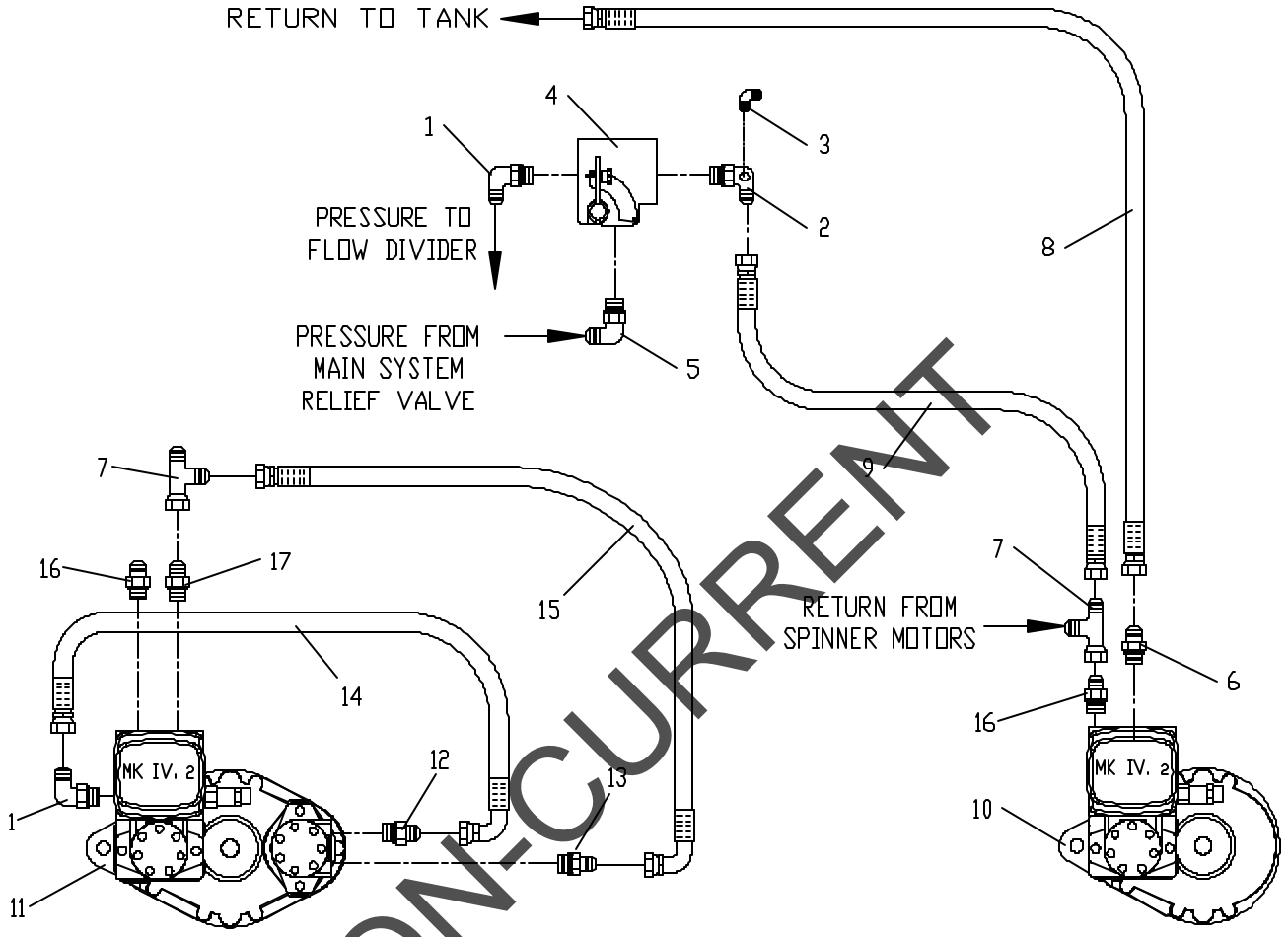
ITEM	PART NO.	DESCRIPTION	QTY
1	58694	Tube Assembly for: 10' Unit	1
	58695	11' Unit	1
	58696	12' Unit	1
	58697	13' Unit	1
	58698	14' Unit	1
	58699	15' Unit	1
	58700	16' Unit	1
2	82500	Tube Assembly for: 10' Unit	1
	43539	11' Unit	1
	43540	12' Unit	1
	82501	13' Unit	1
	82502	14' Unit	1
	82503	15' Unit	1
	82504	16' Unit	1
3	29803	Adapter - O-ring	1

RESERVOIR/PUMP HYDRAULICS CONT'D

ITEM	PART NO.	DESCRIPTION	QTY
4	37447	Valve - Relief	1
5	29840	Adapter - 90° Elbow	1
6	81336	Hose - 1" Dia. x 17 7/8"	1
7	34761	Fitting - Socketless	1
8	29807	Adapter - 90° Elbow	1
9	29850	Adapter – Tee Swivel Nut	1
10	34724	Adapter - Close Nipple	1
11	39845	Filter - Oil	1
A	43530	Filter Element	1
B	43534	Indicator	1
C	6029	Plug - Pipe	3
12	31140	Tank - Hydraulic	1
	38575	Gauge - Sight & Temperature	1
	21850	Cap - Filler	1
13	34726	Adapter - 45° Elbow	1
14	56509	End - Hose	1
15	24502	Barb - Hose	2
16	29610	Hose - 1" x 120"	1
17	29763	Adapter - 90° Elbow (Use with 1 1/4" & 1 1/2" Pumps)	1
	29794	Adapter - Reducing (Use with 1 3/4" - 2 1/2" Pumps)	1
	Driveline / Direct Mount		
18	22393 / 31230	Pump Assembly - 1 1/4"	1
	22394 / 31231	Pump Assembly - 1 1/2"	1
	22395 / 30168	Pump Assembly - 1 3/4"	1
	22396 / 31232	Pump Assembly - 2"	1
	22397 / 36847	Pump Assembly - 2 1/4"	1
	22398 / 31233	Pump Assembly - 2 1/2"	1
19	6027	Nipple - Close (Use with 1 1/4" & 1 1/2" Pumps)	1
	6028	Adapter - Close Nipple (Use w/ 1 3/4" - 2 1/2" Pumps)	1
20	11738	Adapter - 90° Elbow (Use with 1 1/4" & 1 1/2" Pumps)	1
	6011	Adapter - Elbow (Use with 1 3/4" - 2 1/2" Pumps)	1
21	21878-72	Hose - Suction	1
22	6288	Clamp - Hose	4
23	22155	Valve - Gate	1

NON-CURRENT

MARK IV.2 CONTROL HYDRAULICS



NON-CURRENT

ITEM	PART NO.	DESCRIPTION	QTY
1	29847	Adapter - 90° Elbow	AR
2	34725	Adapter - 90° Tapped	1
3	34732	Adapter - 90° Elbow	1
4	32485	Valve - Control	1
	43550	Bracket - Valve	1
	20011	Cap Screw - 1/4 x 2 1/2	2
	20676	Nut - Lock, 1/4	2
5	29838	Adapter - 90° Elbow	1
6	29775	Adapter - Connector	1
7	29781	Adapter - Tee	1
8	81340	Hose - Return Assembly (Single Pinion Gear Case)	1
	42996	Hose - Return Assembly (Dual Pinion Gear Case)	1
9	29726	Hose Assembly (Single Pinion Gear Case)	1
	56111	Hose Assembly (Dual Pinion Gear Case)	1

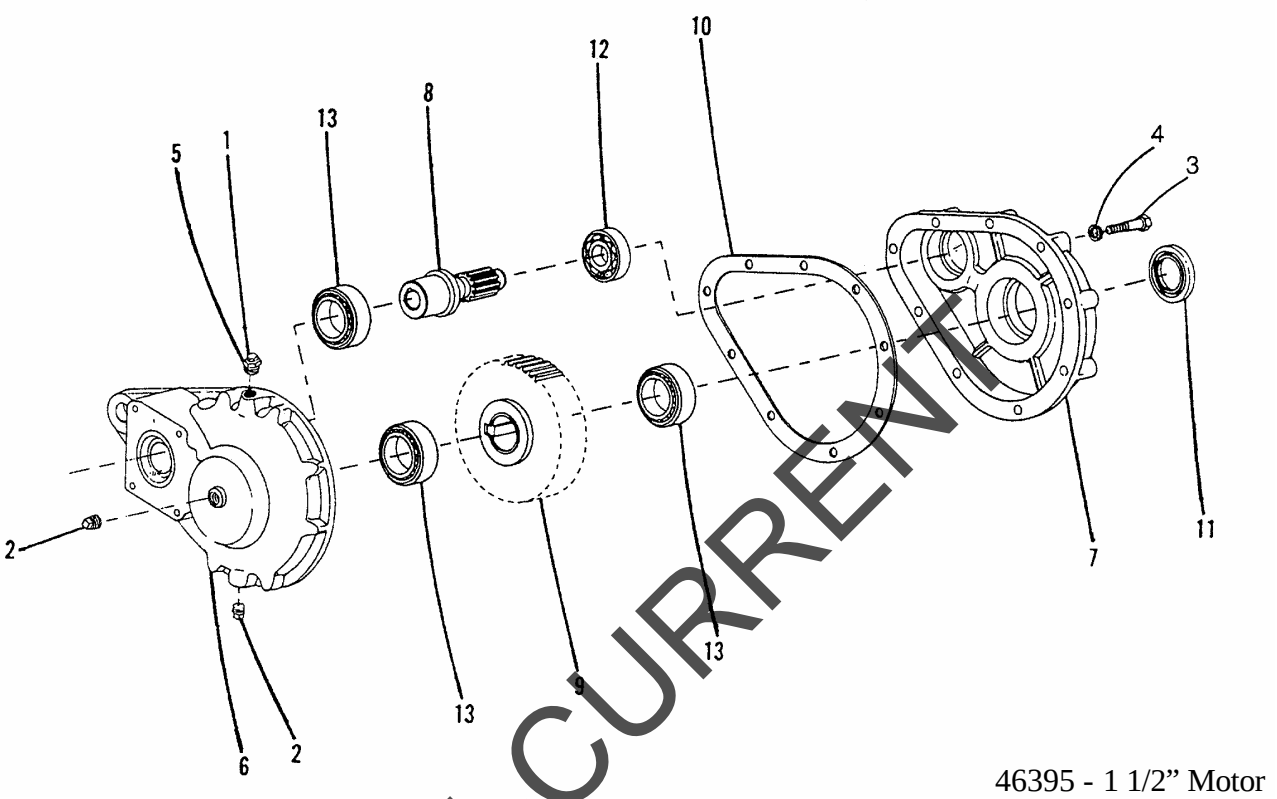
MARK IV.2 CONTROL HYDRAULICS CONTINUED

ITEM	PART NO.	DESCRIPTION	QTY
10	84956	Gear Case – Single Mark IV.2 Assembly	1
	84954	Gear Case – Single Pinion Mark IV.2	1
	46395	Motor – Hydraulic, 1 1/2”	1
	* 73325	Gear Case – Single Mark III Assembly	1
	* 73327	Gear Case – Single Pinion Mark III	1
11	84957	Gear Case – Dual Mark IV.2 Assembly	1
	84955	Gear Case – Dual Pinion Mark IV.2	1
	82459	Motor – Hydraulic, 1 1/4” Standard	1
	82462	Motor – Hydraulic, 1 1/4” Modified	1
	* 82465	Gear Case – Dual Mark III Assembly	1
	* 73329	Gear Case – Dual Pinion Mark III	1
12	29753	Adapter - Connector	1
13	29778	Adapter - Connector	1
14	56107	Hose Assembly	1
15	56121	Hose Assembly	1
16	29850	Adapter - Tee	1
17	29781	Adapter - Tee	1

NOTE: Hydraulic fittings for Mark III are different than those shown.

NON-CURRENT

SINGLE PINION GEAR CASE

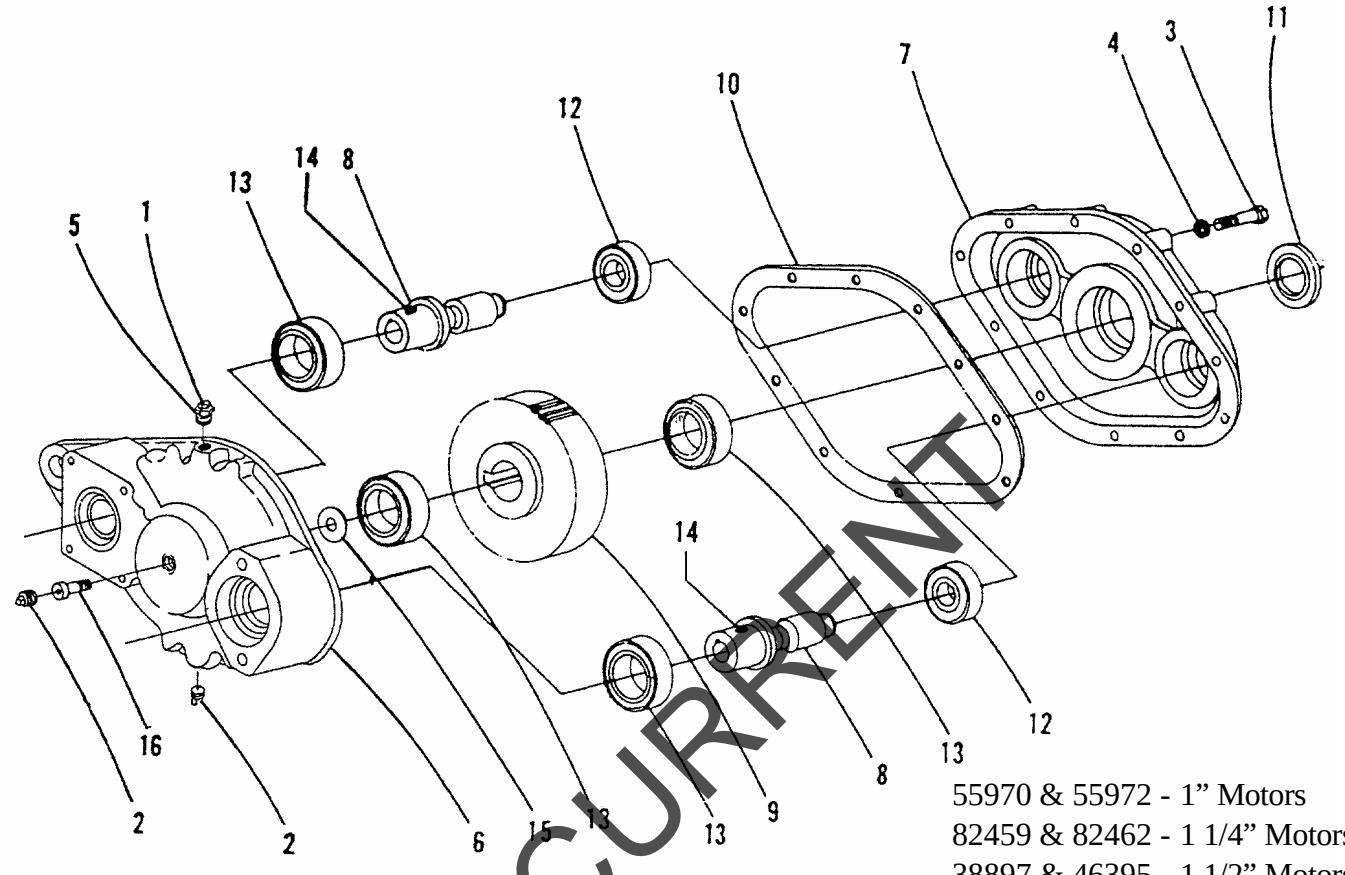


46395 - 1 1/2" Motor
46396 - 2" Motor

NON-CURRENT

ITEM	PART NO.	DESCRIPTION	QTY
	43501	Gear Case Assembly	
1	2564	Cap - Breather	1
2	6031	Plug - Pipe	2
3	20040	Cap Screw - 5/16 x 2	9
4	20711	Washer - Lock, 5/16	9
5	27465	Bushing - Pipe, 1/8" x 7/8X	1
6	44403	Housing - Outboard	1
7	37002	Housing - Inboard	1
8	37003	Gear - Pinion	1
9	38981	Gear	1
10	37005	Gasket	1
11	37006	Seal - Oil	1
12	37007	Bearing	1
13	37008	Bearing	3

DUAL PINION GEAR CASE

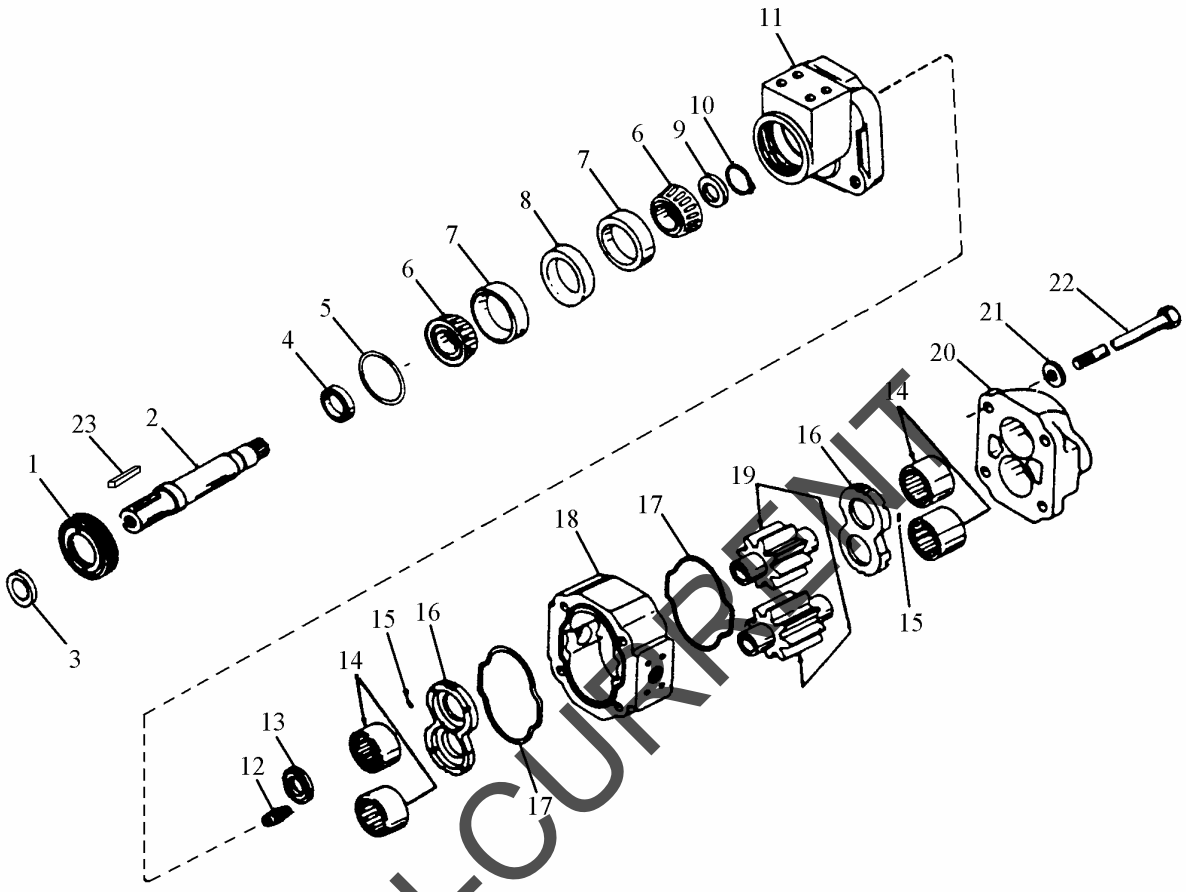


55970 & 55972 - 1” Motors
82459 & 82462 - 1 1/4” Motors
38897 & 46395 - 1 1/2” Motors
38898 & 46396 - 2” Motors

NON-CURRENT

ITEM	PART NO.	DESCRIPTION	QTY
	55971	Gear Case Assembly	
1	2564	Cap - Breather	1
2	6031	Plug - Pipe	2
3	20040	Cap Screw - 5/16 x 2	10
4	20711	Washer - Lock, 5/16	10
5	27465	Bushing - Pipe, 1/8” x 7/8X	9
6	55974	Housing - Outboard	1
7	38982	Housing - Inboard	1
8	37003	Gear - Pinion	2
9	38981	Gear	1
10	38978	Gasket	1
11	37006	Seal - Oil	1
12	37007	Bearing	2
13	37008	Bearing	4
14	20431	Screw - Nylock Set, 5/16 x 3/4	1
15	38979	Washer	2
16	38980	Screw - Allen Head	1

SPINNER MOTOR



NON-CURRENT

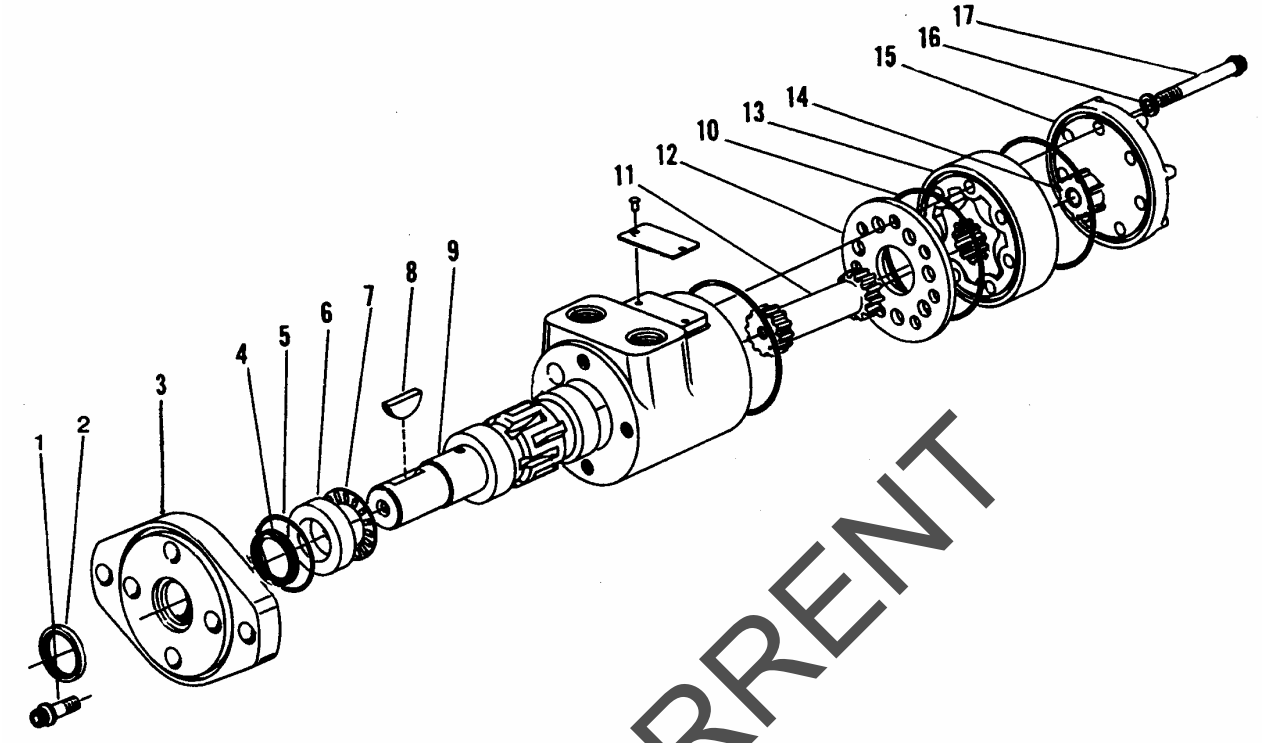
ITEM	PART NO.	DESCRIPTION	QTY
	23800	Motor Assembly	
1	33777	Ring - Retainer	1
2	28485	Shaft	1
3	33809	Seal - Excluder	1
4	71980	Seal	1
	23940	Tool Seal Installation (Required to Install Item 4)	
5	28494	"O" Ring	1
6	41014	Cone - Bearing	2
7	41013	Cup - Bearing	2
8	28454	Spacer	1
9	28486	Spacer (Kit)	1
10	28499	Ring - Snap	1
11	28490	Plate - Shaft End	1
12	58797	Plug	2

SPINNER MOTOR CONTINUED

ITEM	PART NO.	DESCRIPTION	QTY
13	28495	Bushing	1
14	23806	Bearing	4
15	23819	Seals - Pocket (Makes 12 Seals)	1
16	23818	Plate	2
17	23820	Gasket	2
18	28498	Housing	1
19	23822	Set - Gear	1
20	23812	Cover - Port End	1
21		Washer	4
22	23833	Cap Screw	4
23	24458	Key	1
	72547	Kit - Overhaul (Includes Items 1,3-7,9,13,15 & 17)	
	72548	Kit - Seal (Includes Items 3-5)	

NON-CURRENT

CONVEYOR MOTOR



NON-CURRENT

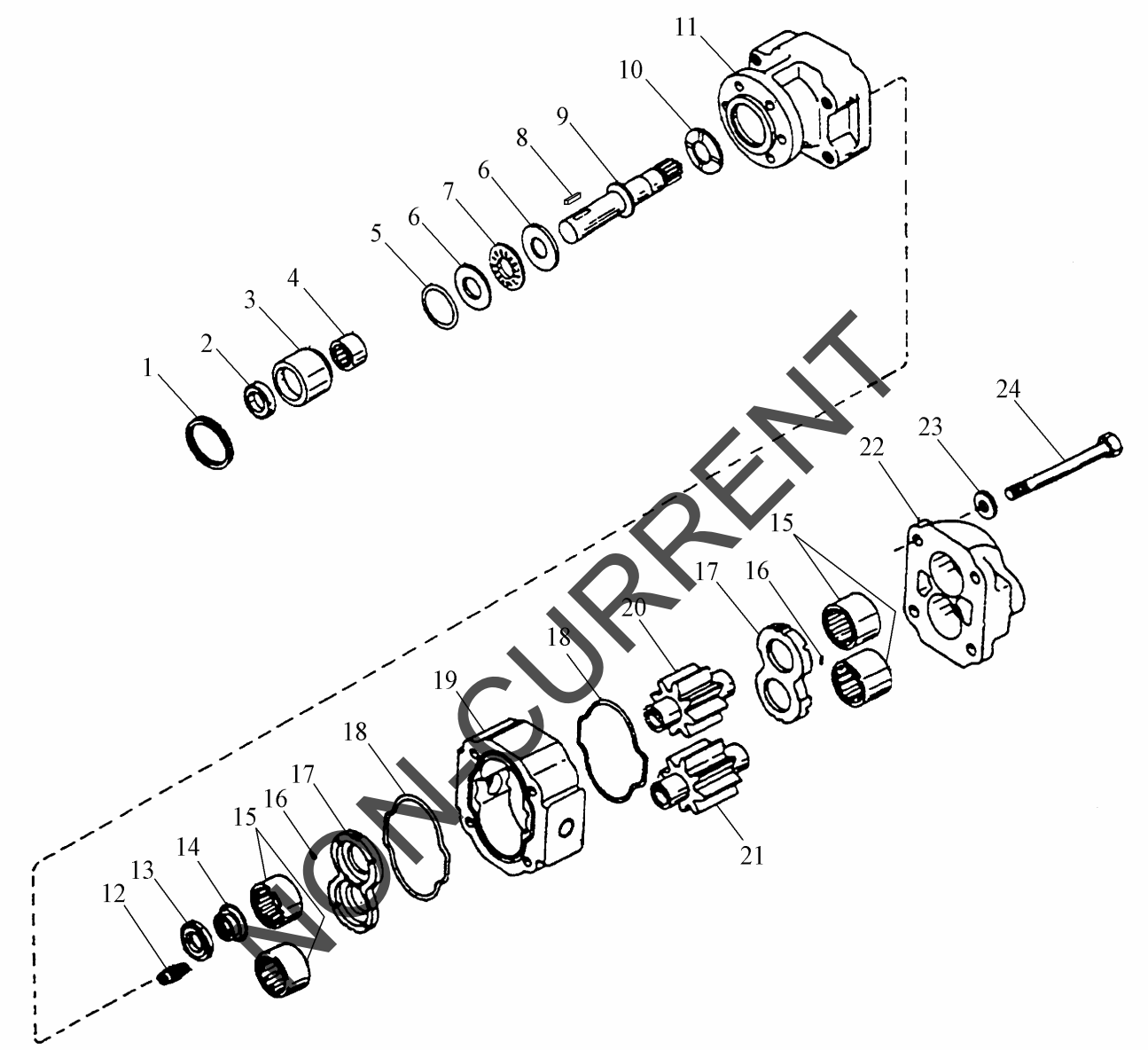
ITEM	PART NO.	DESCRIPTION	QTY
	82459	Motor - Hydraulic, 1 1/4”	
	82462	Motor - Hydraulic, 1 1/4” Modified	
	46395	Motor - Hydraulic, 1 1/2” Modified	
	46396	Motor - Hydraulic, 2”	
	38897	Motor - Hydraulic, 1 1/2” (Use w/ Mark III)	
	46395	Motor - Hydraulic, 1 1/2” Modified (Use w/ Mark III)	
	55970	Motor - Hydraulic, 1”	
	55972	Motor - Hydraulic, 1” Modified	
1	30665	Cap Screw - 5/16 x 7/8	4
2	73471	Seal	1
3	73556	Flange - Mounting (Used on 46395,46396 & 55972)	1
	73555	Flange - Mounting (Used on 38897 & 55970)	1
4	73473	Seal	1
5	73474	Seal - “O” Ring	1
6	37385	Race - Bearing	1
7	37401	Bearing - Thrust Needle	1
8	3065	Key	1
9	37386	Shaft - Output Keyed	1
10	73480	Seal - “O” Ring	3

CONVEYOR MOTOR CONTINUED

ITEM	PART NO.	DESCRIPTION	QTY
11	16946	Drive (Used on 46395, 46396 & 38897)	1
	47062	Drive (Used on 55970 & 55972)	1
12	37388	Plate - Spacer	1
13	83015	Gerotor - 1 1/4”	1
	37394	Gerotor - 1 1/2”	1
	37395	Gerotor - 2”	1
	47063	Gerotor - 1”	1
14	37398	Spacer - 1 1/2”	1
	37399	Spacer - 2”	1
	47064	Spacer - 1”	1
		* No Spacer (Item 14) on 1 1/4” Motor	
15	37400	Cap - End	1
16	37381	Washer - Seal	7
17	16938	Cap Screw (Used on 46396)	7
	16937	Cap Screw (Used on 46395 & 38897)	7
	47065	Cap Screw (Used on 55970 & 55972)	7
18	* 73477	Seal - “O” Ring	1
19	* 73472	Washer - Back-up	1
	39137	Seal Kit (Includes Items 2,4,5,10,16,18 & 19)	

NON-CURRENT

PUMP



PART NO.	DESCRIPTION
22394	Pump - Gear Assembly, 1 1/2”
22395	Gear Assembly, 1 3/4”
22396	Gear Assembly, 2”
22397	Gear Assembly, 2 1/4”
22398	Gear Assembly, 2 1/2”

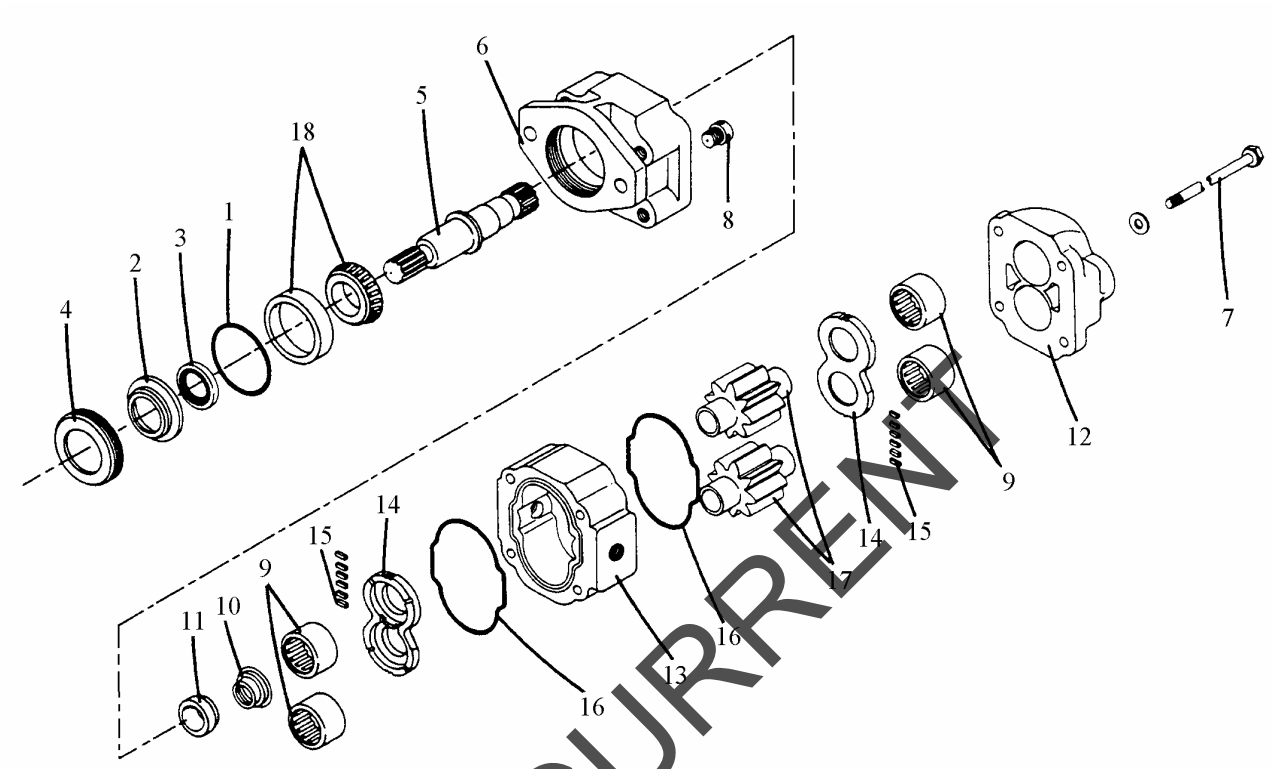
PUMP CONTINUED

ITEM	PART NO.	DESCRIPTION	QTY
1	* 22630	Ring - Snap	1
2	* 23804	Seal - Double Lip	1
3	23811	Sleeve - Bearing	1
4	23803	Bearing - Roller	1
5	* 23802	"O" Ring	1
6	* 23809	Bearing Race - Thrust	2
7	* 23810	Bearing - Thrust	1
8	23828	Key	1
9	23821	Shaft - Drive	1
10	23827	Washer - Thrust	1
11	23801	Cover - End, Shaft	1
12	23805	Assembly - Check	2
13	* 23808	Bushing - Shaft	1
14	23807	Spring	1
15	23806	Bearing - Roller	4
16	* 23819	Seal - Pocket (Makes 12 Seals)	1
17	23818	Plate - Thrust	2
18	* 23820	Gasket	2
19	23814	Housing - Gear, 1 1/2"	1
	30039	Housing - Gear, 1 3/4"	1
	23815	Housing - Gear, 2"	1
	23816	Housing - Gear, 2 1/4"	1
	23817	Housing - Gear, 2 1/2"	1
20		Gear - Drive, Comes only as a matched set:	1
21		Gear - Driven, Comes only as a matched set:	1
	23823	Gear Set, 1 1/2"	1
	30040	Gear Set, 1 3/4"	1
	23824	Gear Set, 2"	1
	23825	Gear Set, 2 1/4"	1
	23826	Gear Set, 2 1/2"	1
22	23812	Cover - End, Port	1
23		Washer	4
24	20188	Cap Screw - for 1 1/2" Pump	4
	20189	Cap Screw - for 1 3/4" Pump	4
	20190	Cap Screw - for 2" Pump	4
	20191	Cap Screw - for 2 1/4" Pump	4
	20192	Cap Screw - for 2 1/2" Pump	4

NON-CURRENT

* - Included in Seal Kit 27490—Shaft and Seal Kit 27491 includes 27490 plus Items 4 and 9

PUMP DIRECT MOUNT



NON-CURRENT

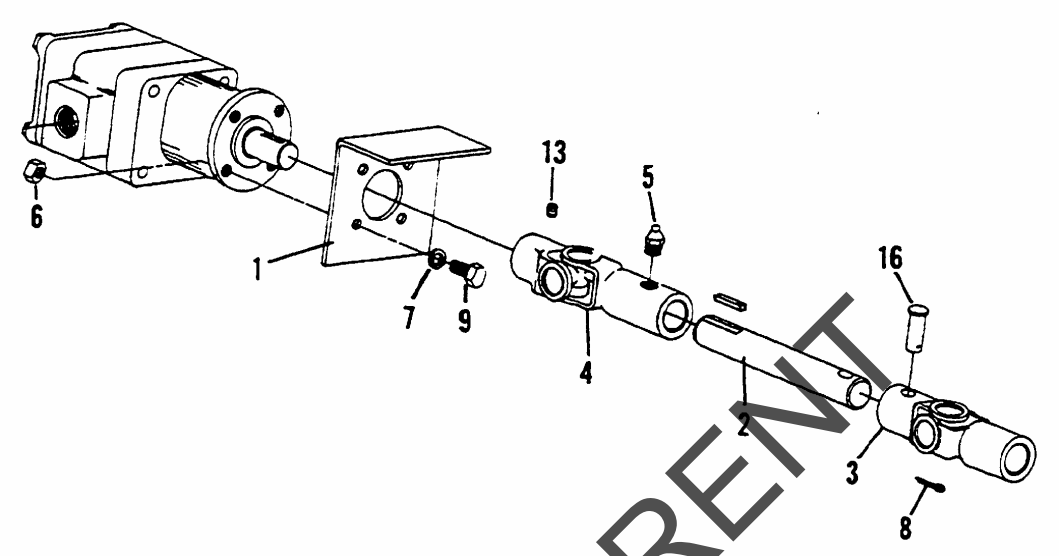
ITEM	PART NO.	DESCRIPTION	QTY
	31231	Pump - Gear Assembly, 1 1/2”	
	30168	Gear Assembly, 1 3/4”	
	31232	Gear Assembly, 2”	
	36847	Gear Assembly, 2 1/4”	
	31233	Gear Assembly, 2 1/2”	
1	11760	“O” Ring	1
2	11761	Seal - Double Lip	1
3	11762	Seal - Double Lip	11
4	11763	Ring - Retainer	1
5	11764	Shaft - Drive	1
6	13149	Cover - End, Shaft	1
7	20188	Cap Screw - for 1 1/2” Pump	4
	20189	Cap Screw - for 1 3/4” Pump	4
	20190	Cap Screw - for 2” Pump	4
	20191	Cap Screw - for 2 1/4” Pump	4
	20192	Cap Screw - for 2 1/2” Pump	4

PUMP DIRECT MOUNT CONTINUED

ITEM	PART NO.	DESCRIPTION	QTY
8	23805	Check Assembly	2
9	23806	Bearing - Roller	4
10	23807	Spring	1
11	23808	Bushing - Shaft	1
12	23812	Cover - End, Port	1
13	23814	Housing - Gear, 1 1/2”	1
	30039	Housing - Gear, 1 3/4”	1
	23815	Housing - Gear, 2”	1
	23816	Housing - Gear, 2 1/4”	1
	23817	Housing - Gear, 2 1/2”	1
14	23818	Plate - Thrust	2
15	23819	Seal - Pocket (Makes 12 Seals)	1
16	23820	Gasket	2
17		Gear - Drive & Driven, Comes only as a matched set:	1
	23823	Gear Set, 1 1/2”	1
	30040	Gear Set, 1 3/4”	1
	23824	Gear Set, 2”	1
	23825	Gear Set, 2 1/4”	1
	23826	Gear Set, 2 1/2”	1
18	28491	Bearing - Tapered Roller	1
	13048	Kit - Seal (Includes Items 1-3,15 & 16)	

NON-CURRENT

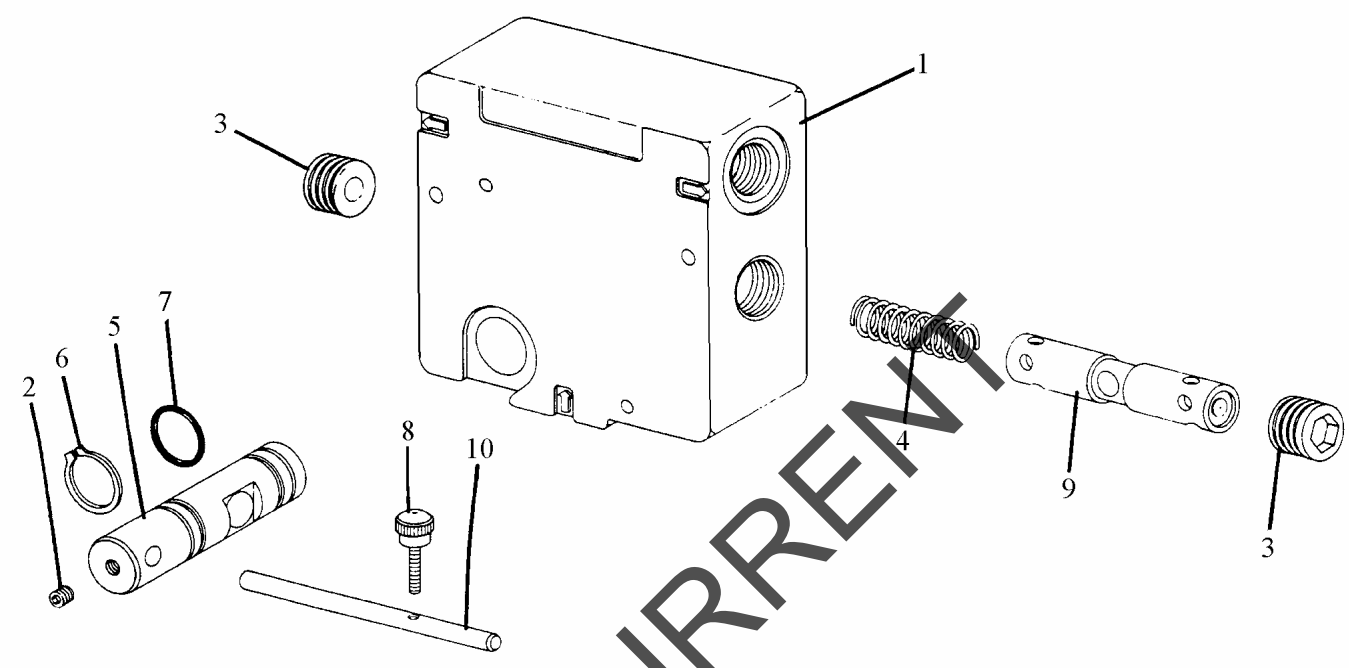
PUMP MOUNTING KIT



NON-CURRENT

ITEM	PART NO.	DESCRIPTION	QTY
1	13850	Bracket - Pump Weldment	1
2	17932	Shaft - Drive	1
3	7210	U-Joint	1
4	5649	U-Joint	1
	11756	Group - Hardware, Pump (Includes Items 5 - 16)	1
5	6069	Zerk - Grease	1
6	20644	Nut - Hex	4
7	20712	Washer - Lock	4
8	20817	Pin - Cotter	1
9	20069	Cap Screw	4
10	* 20129	Cap Screw	4
11	* 2211	Key - Square	1
12	* 2776	Key - Square	1
13	20748	Screw - Set	2
14	* 20646	Nut - Hex	4
15	* 20714	Washer - Lock	4
16	6122	Pin - Shear	1

SPINNER CONTROL VALVE

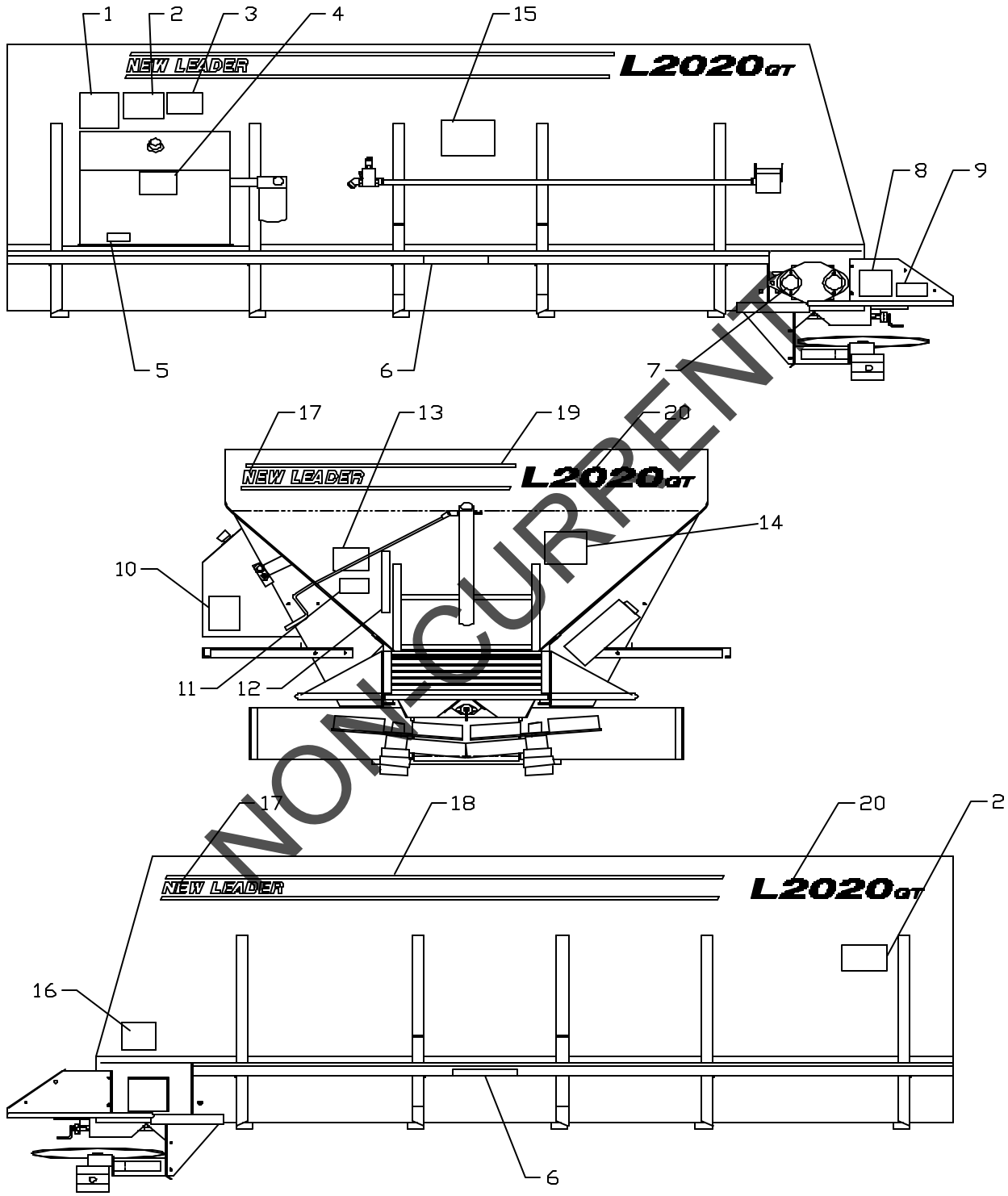


NON-CURRENT

ITEM	PART NO.	DESCRIPTION	QTY
	32485	Valve - Hydraulic	
1	N.S.	Body - Adjustable Divider	1
2	20735	Screw - Set, 1/4 x 1/4	1
3	24555	Plug	2
4	24556	Spring	1
5	24557	Spool - Rotary	1
	28474	Kit - Seal (Includes Items 6 & 7)	1
6	24559	Ring - Snap	2
7	24563	"O" Ring	2
8	24566	Screw - Thumb	1
9	24574	Spool	1
10	24558	Handle	1

N.S. - Not Serviced Separately

DECALS



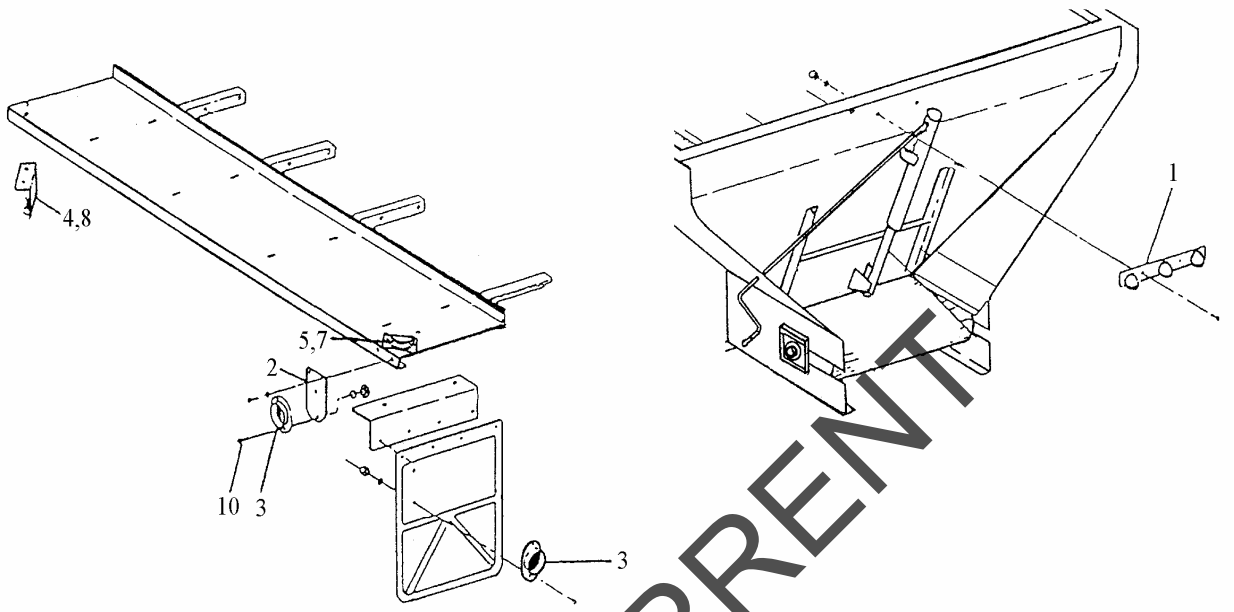
NON-CURRENT

DECALS CONTINUED

ITEM	PART NO.	DESCRIPTION	QTY
1	150034	Decal - Caution, Improper Operation	1
2	364	Decal - Warning, Stay Out of Box	2
3	321	Decal - Caution, Material to be Spread	1
4	8665	Decal - Caution, Hydraulic Oil Only	1
5	8664	Decal - Caution, Keep Valve Open	1
6	39200	Decal - Fender Capacity	2
7	90665	Decal - Synco-Matic® Mark IV.2	1
8	55630	Decal - Warning, No Step	2
9	55631	Decal - Warning, Guard is for Your Protection	2
10	39379	Decal - Filter	1
11	6541	Decal - Oil Lube Chart	1
12	23769	Decal - Feedgate Slide Scale	1
13	71526	Decal - Important, Adjust Spinner (On Divider)	1
14	368	Decal - Flying Material	1
15	39138	Decal - Warning, Hot Components	1
16	21476	Decal - Important, Conveyor Chain Live	1
17	58937	Decal - New Leader, White	3
	58938	Decal - New Leader, Red	3
18	58935	Decal - Striping White (Specify Length)	1
	58936	Decal - Striping Red (Specify Length)	1
19	58935-53	Decal - Striping White Rear	1
	58936-53	Decal - Striping Red Rear	1
20	79867	Decal - L2020GT, White	3
	79868	Decal - L2020GT, Red	3
	31736	Paint - Touch Up, New Leader Red	AR
	31740	Paint - Touch Up, White	AR

NON-CURRENT

LIGHTS



NON-CURRENT

ITEM	PART NO.	DESCRIPTION	QTY
	39830	Kit - Lights	
1	6114	Lamp - Cluster, Red	1
2	3824	Mount - Belt, Reflector	4
3	6107	Reflector - Red	4
4	6108	Clearance Lamp - Amber	2
5	6110	Clearance Lamp - Amber	2
6	* 21580-600	Wire - 14 Ga. Black	1
7	3775	Bracket - Clearance Lamp	2
8	38611	Bracket - Clearance Lamp	2
9	* 20003	Cap Screw - 1/4 x 3/4	24
10	20572	Screw - Machine, 3/16 x 3/4	33
11	* 20641	Nut - Hex, 3/16	33
12	* 20642	Nut - Hex, 1/4	24
13	* 20691	Washer, 1/4	24
14	* 20709	Washer - Lock, 3/16	33
15	* 20710	Washer - Lock	8
16	* 6198	Clip - Wire	21
17	* 21986	Grommet - Rubber, 3/16	10