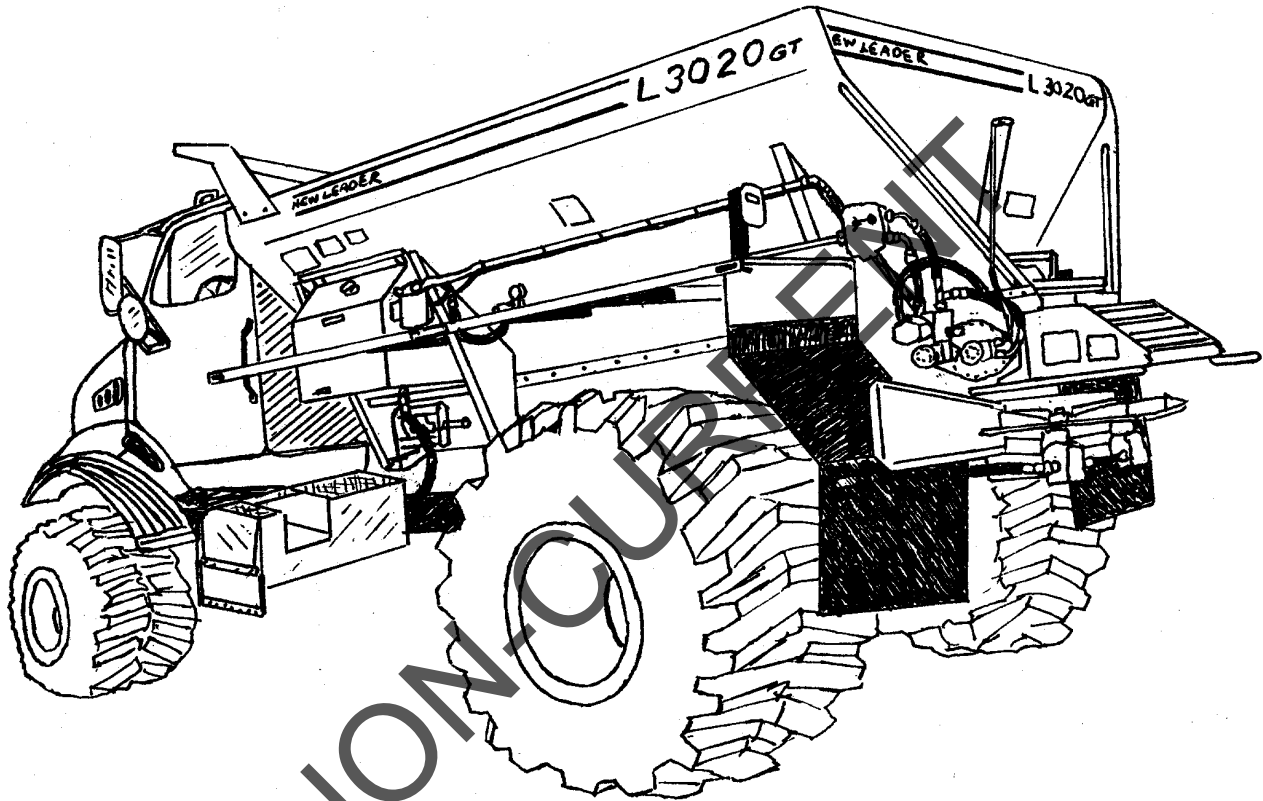


GENERAL MANUAL FOR MODEL L3020GT



**SAFETY GUIDELINES
ASSEMBLY
OPERATION
MAINTENANCE
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
616 "D" AVENUE N.W., CEDAR RAPIDS, IOWA 52405
PH. (319) 363-8281 www.highwayequipment.com FAX (319) 363-8284**

NEW LEADER

MODEL L3020GT

UNIT SERIAL NUMBER _____

MANUAL NUMBER: 82800-C

EFFECTIVE 11/99

***HIGHWAY EQUIPMENT COMPANY
616 D AVENUE N.W.
CEDAR RAPIDS, IOWA 52405***

PHONE (319) 363-8281

FAX (319) 363-8284

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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 Highway 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.

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.

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.

NATIONAL SAFETY COUNCIL

**CAUTION!**

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



Please Give Part No., Description and Unit Serial No. 82800-C

SAFETY DECALS

MAINTENANCE INSTRUCTIONS

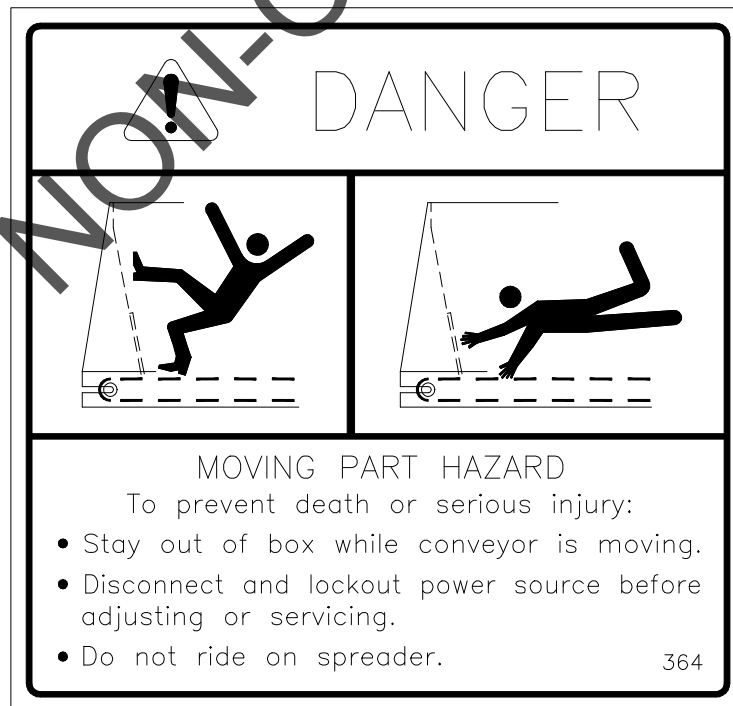
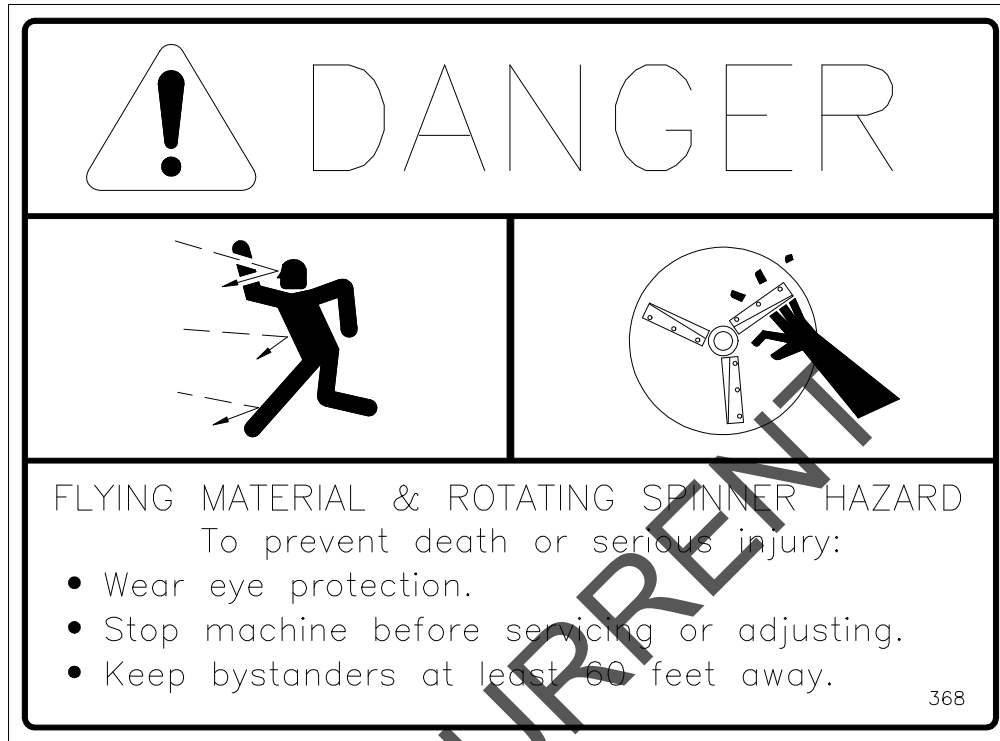
1. Keep safety decals and signs clean and legible at all times.
2. Replace safety decals and signs that are missing or have become illegible.
3. Replaced parts that displayed a safety sign should also display the current sign.
4. Safety decals or signs are available from your dealer's Parts Department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

INSTALLATION INSTRUCTIONS

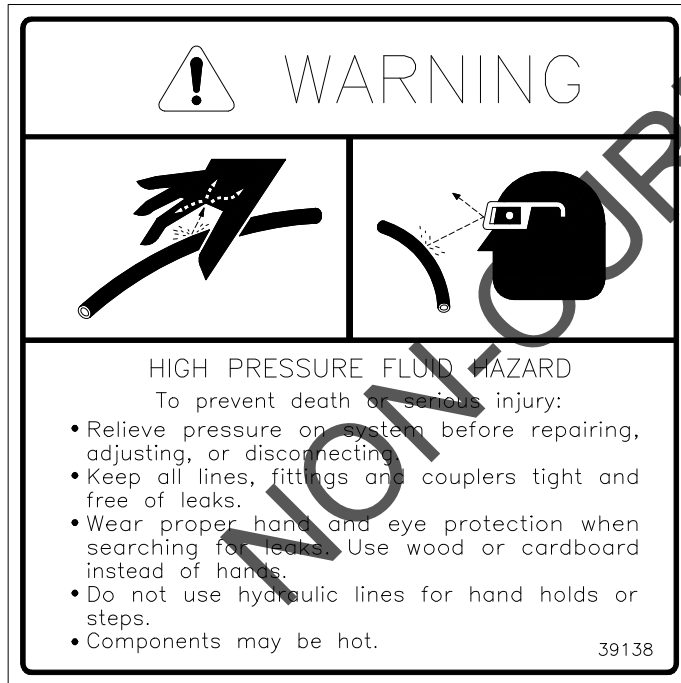
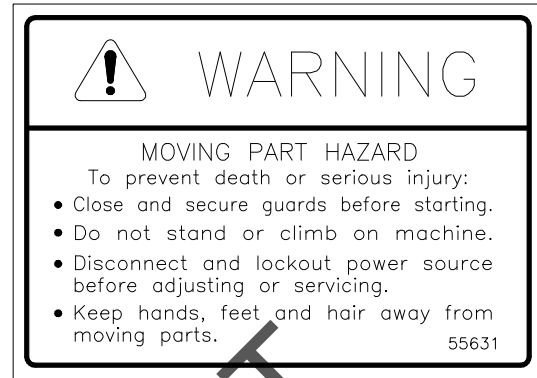
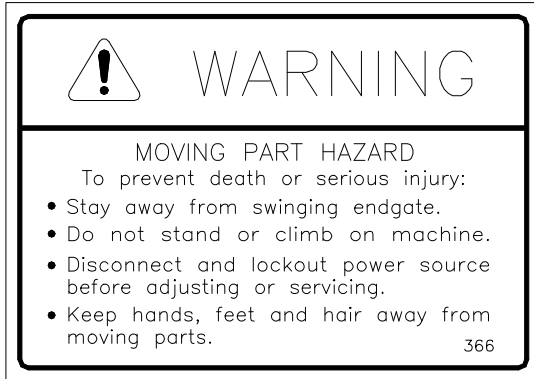
1. Clean Surface
Wash the installation surface with a synthetic, free rinsing detergent. Avoid washing the surface with a soap containing creams or lotion. Allow to dry.
2. Position Safety Decal
Decide on the exact position before application. Application marks may be made on the top or side edge of 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



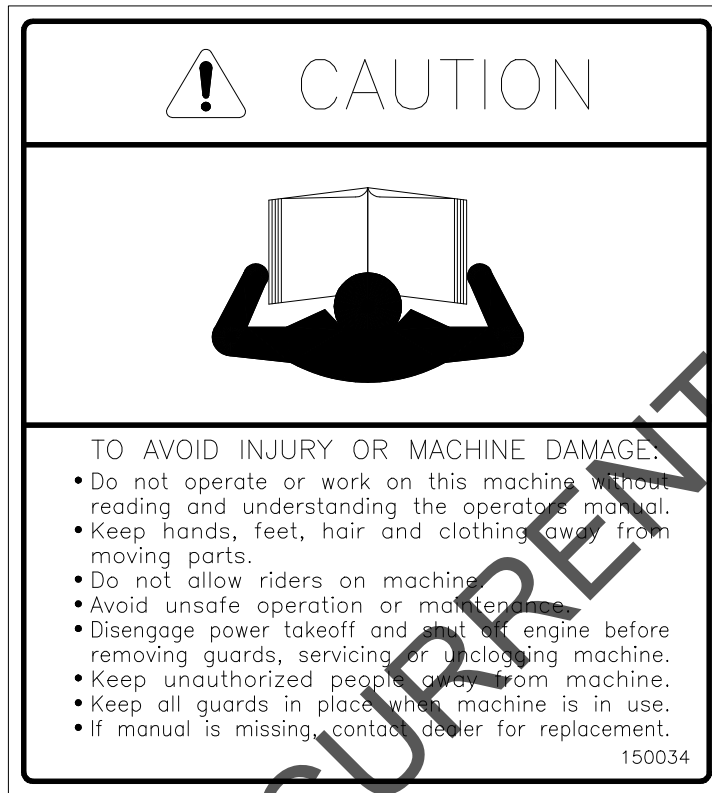
SAFETY DECALS (DANGER) CONT'D



SAFETY DECALS (WARNING) CONT'D



SAFETY DECALS (CAUTION) CONT'D



GENERAL DESCRIPTION



The Model L3020GT (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.

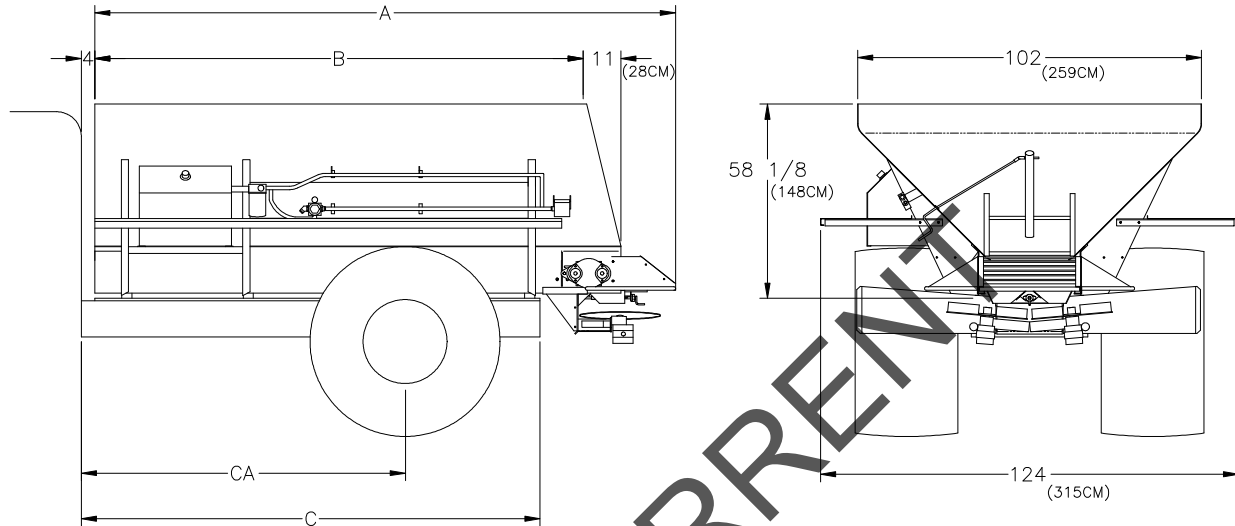
The unit is powered hydraulically and provides independent variable speed control for the spinner and full automatic ground speed control for the conveyor by means of the Synco-Matic® Mark IV.2 control system. The hydraulic pump which provides the hydraulic power is a gear type pump and is driven by 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. The conveyor is driven by two orbital type hydraulic motors mounted to a 6 to 1 ratio spur gear case. The standard conveyor is a belt over chain type having parallel strands of pintle type chain joined by cross bars every other link.

The distributor spinner assembly has two 24 inch diameter discs canted upward at outer edges by five degrees. Each disc has three formed and heat treated fins that are adjustable to radial angle. Spinners are fed through an adjustable material flow divider.



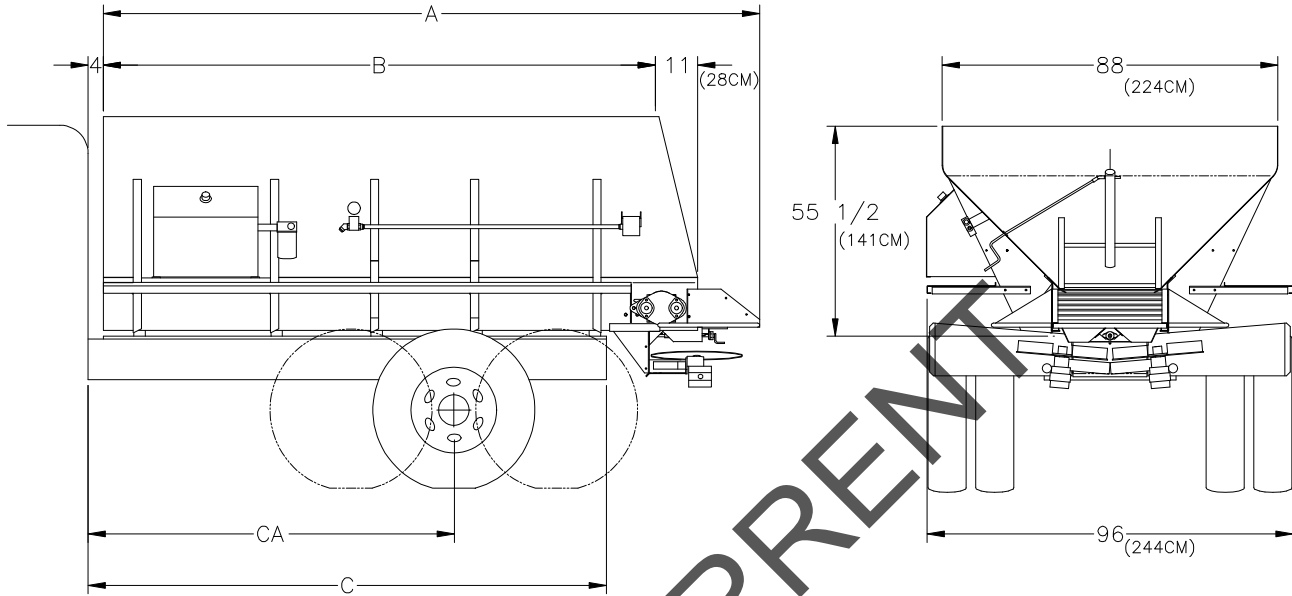
GENERAL DESCRIPTION CONT'D 102" WIDE SPREADER



Dimensions And Capacities

Body Length	Overall A	Inside B	Frame C	Cab to Axle C.A.	Struck Capacity Cu.Yd. (Cu. M.) Cu. Ft.
10' (305 cm)	148" (376 cm)	120" (305 cm)	111" (282 cm)	84" (213 cm)	7.8 (5.9) 209.6
11' (336 cm)	160" (406 cm)	132" (335 cm)	123" (312 cm)	84" (213 cm)	8.6 (6.6) 232.1
12' (366 cm)	172" (437 cm)	144" (366 cm)	135" (343 cm)	102" (259 cm)	9.4 (7.2) 254.6
13' (396 cm)	184" (467 cm)	156" (396 cm)	147" (373 cm)	102 - 108" (259 - 274 cm)	10.3 (7.8) 277.1
14' (427 cm)	196" (498 cm)	168" (427 cm)	159" (404 cm)	120" (305 cm)	11.1 (8.5) 299.6
15' (457 cm)	208" (528 cm)	180" (457 cm)	171" (434 cm)	130" (330 cm)	11.9 (9.1) 322.1
16' (488 cm)	220" (559 cm)	192" (487 cm)	183" (465 cm)	138" (351 cm)	12.8 (9.8) 344.6

GENERAL DESCRIPTION CONT'D 88" WIDE SPREADER



Dimensions And Capacities

Body Length	Overall A	Inside B	Frame C	Cab to Axle C.A.	Struck Capacity Cu.Yd. (Cu. M.) Cu. Ft.
10' (305 cm)	148" (376 cm)	120" (305 cm)	111" (282 cm)	84" (213 cm)	6.9 (5.3) 187.3
11' (336 cm)	160" (406 cm)	132" (335 cm)	123" (312 cm)	84" (213 cm)	7.7 (5.9) 207.2
12' (366 cm)	172" (437 cm)	144" (366 cm)	135" (343 cm)	102" (259 cm)	8.4 (6.4) 227.1
13' (396 cm)	184" (467 cm)	156" (396 cm)	147" (373 cm)	102 - 108" (259 - 274 cm)	9.2 (7.0) 246.9
14' (427 cm)	196" (498 cm)	168" (427 cm)	159" (404 cm)	120" (305 cm)	9.9 (7.6) 266.8
15' (457 cm)	208" (528 cm)	180" (457 cm)	171" (434 cm)	130" (330 cm)	10.6 (8.1) 286.7
16' (488 cm)	220" (559 cm)	192" (487 cm)	183" (465 cm)	138" (351 cm)	11.4 (8.7) 306.6

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. **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. For popular medium duty V-8 engines, recommended operating range would be 2800 - 3200 engine RPM.
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. PTO Pump Selection
It's important to remember that the correct pump delivery for the L3020GT hydraulic system is 40 GPM (Gallons Per Minute). It is also very important that the hydraulic pump does 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
22395/30168	35	1900
	37	2000
22396/31232	35	1650
	40	1900
22397/36847	35	1500
	40	1700
22398/31233	35	1350
	40	1550



INSTALLATION INSTRUCTIONS CONT'D

To determine PTO (Power Take-Off) percentage:

$$(\text{PTO RPM} \div \text{OPTIMAL TRUCK ENGINE RPM}) \times 100 = \text{PTO}\%$$

To determine Engine RPM:

$$\text{PTO RPM} \div (\text{PTO}\% \div 100) = \text{Engine RPM}$$

For example: If the optimal truck engine RPM is 3600, using the standard pump part no. 22397, the maximum PTO% is $(1700 \div 3600) \times 100 = 47\%$.

the minimum PTO% is $(1500 \div 3600) \times 100 = 42\%$.

Suppose a 46% PTO is selected, the truck engine operating RPM range is:

$$1700 \div (46\% \div 100) = 3695 \text{ Engine RPM.}$$

$$1500 \div (46\% \div 100) = 3260 \text{ Engine RPM.}$$

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.

GENERAL INSTALLATION INSTRUCTIONS:

In mounting the L3020GT 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 see the Dimensions charts on pages 13 and 15. This will assist in matching spreader to truck.

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:

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

HYDRAULIC PUMP INSTALLATION

A mounting bracket for the optional 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 possible. In no case should the angle of 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.

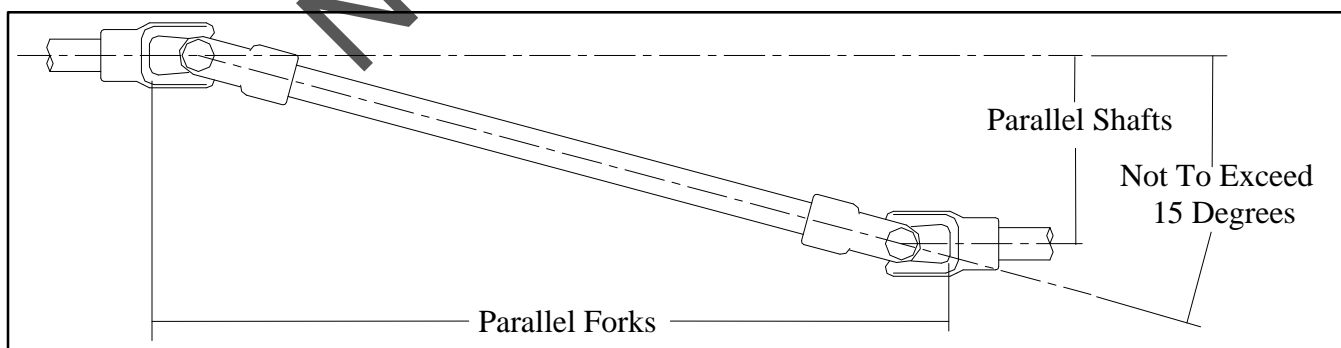


Figure 1 - Timing of Universal Joints



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.



Please Give Part No., Description and Unit Serial No. 82800-C

INSTALLATION INSTRUCTIONS CONT'D

MOUNTING OF SPREADER BODY

Truck Frame Length

In many cases, 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 under "C" (*General Descriptions*).

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. If frame has rivets in top flange, strike directly above each rivet head with a heavy hammer to mark the position of the rivet. Remove the filler strips and counterbore for the 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 fish plates 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 fish plates and as wide as the frame channel top flange. These shim bars or strips must be drilled out to clear any rivet or bolt heads. **DO NOT WELD** these bars or strips to the truck frame, to do so may void truck warranty. Place the wood filler strips on top of them and secure both steel shims and wood filler strips by means of bending the anchor clips around them and the frame top flange. Each steel shim bar or strip and each separate wood filler strip should have three (3) anchor clips. Locate anchor clips between spreader body cross sills. Secure each anchor clip by driving a 1/4" sheet metal screw through clip into wood filler strip as shown in Figure 2.

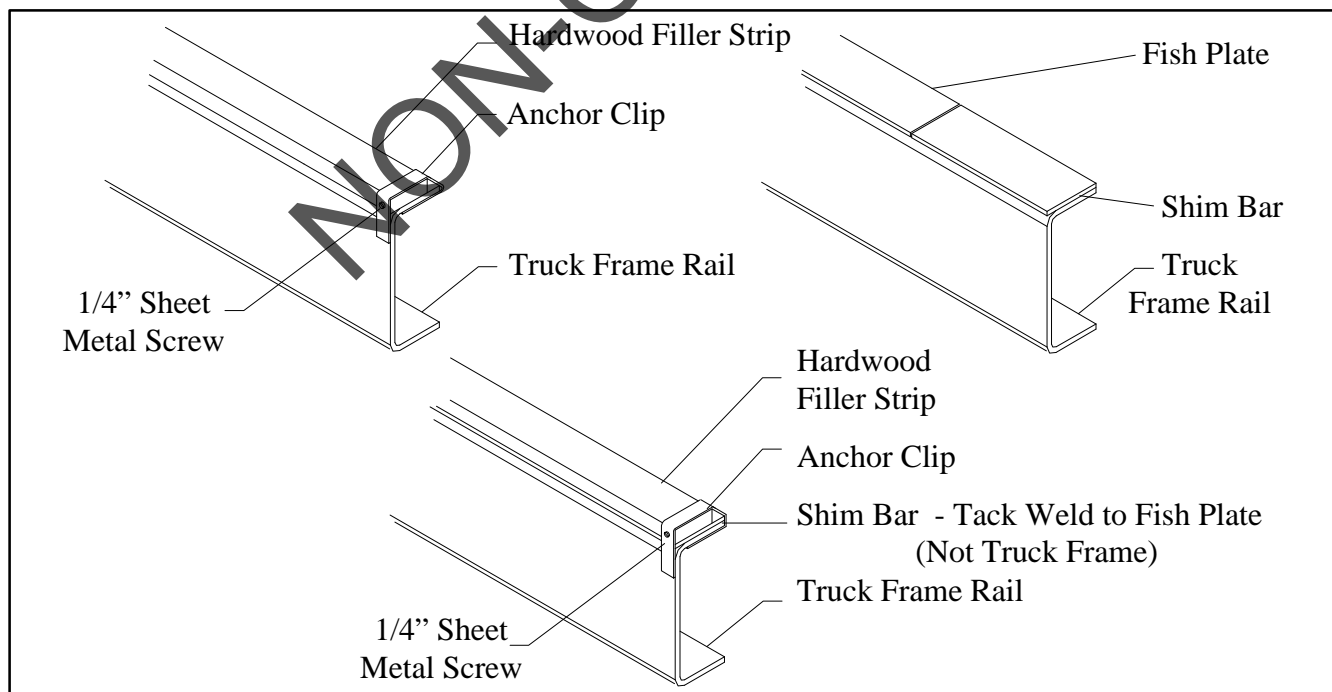


Figure 2 - Wood Filler Strips & Anchor Clips

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.

Installing Front Mounting Angles

Assemble the two front mounting angle springs and hardware. Use a 3/8" shim between the cross tube mounting plate and truck frame mounting angle. Position assembly under the second cross tube from the front and against the truck frame, make sure that the springs do not contact the cross tube. Mark the position of the holes in the mounting angle onto the truck frame. Drill two 9/16" holes through the truck frame and install the mounting assembly using the 1/2" hardware supplied. Weld on three sides the mounting plate to the bottom of the cross tube and remove 3/8" shim. (Figure 4, page 21) Tighten the spring assembly until the spring compressed height is 3 5/8". There should be a 3/8" space between the cross tube mounting plate and the truck frame mounting angle. (Figure 3, page 20) Repeat this procedure on the other side of the truck frame, on the same cross tube.

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)

Position the center mounting angles at a convenient cross tube near the center of the body with the slotted faces against the truck frame. Weld on three sides the mounting angle to the bottom of the cross tube. (Figure 4, page 21) Do not install hardware, these mounting angles are for side to side support only. (Figure 3, page 20)

Installing Center Mounting Angles (12 Foot to 16 Foot Bodies)

Position the center mounting angles at a convenient cross tube 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) Weld the mounting angle to the bottom of the cross tube on three sides. (Figure 4) Install hardware and torque according to torque chart.

NOTE: The position of the center mounting angles will vary from truck to truck due to obstructions such as spring shackles, etc.



INSTALLATION INSTRUCTIONS CONT'D

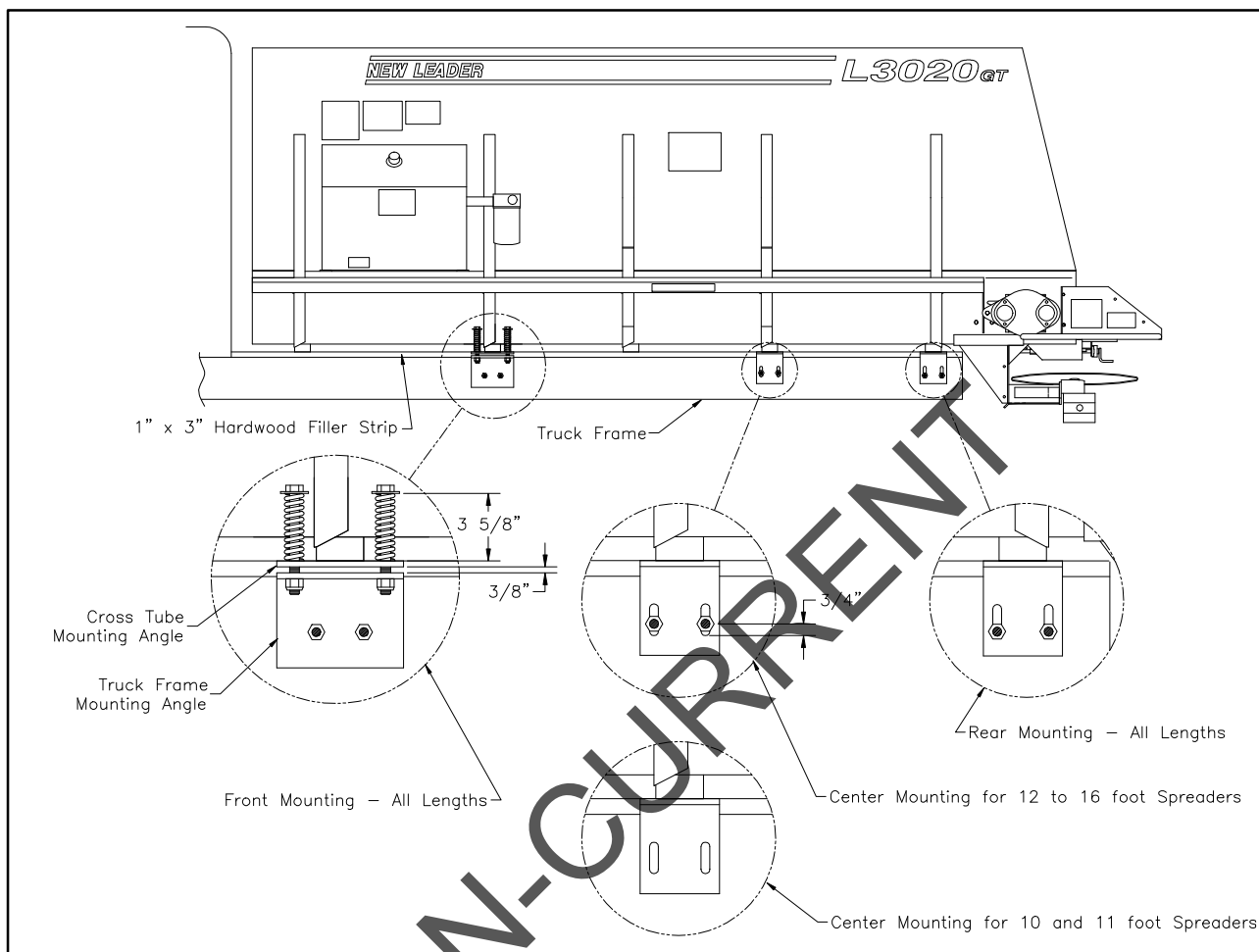


Figure 3 - Mounting Angle Installation

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 sill. 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) Weld on three sides the mounting angle to the bottom of the cross tube. (Figure 4) 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!



Please Give Part No., Description and Unit Serial No. 82800-C

INSTALLATION INSTRUCTIONS CONT'D

Securing Spreader Body to Frame

Install the mounting angles and tighten the mounting bolts according to the torque chart. 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 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.

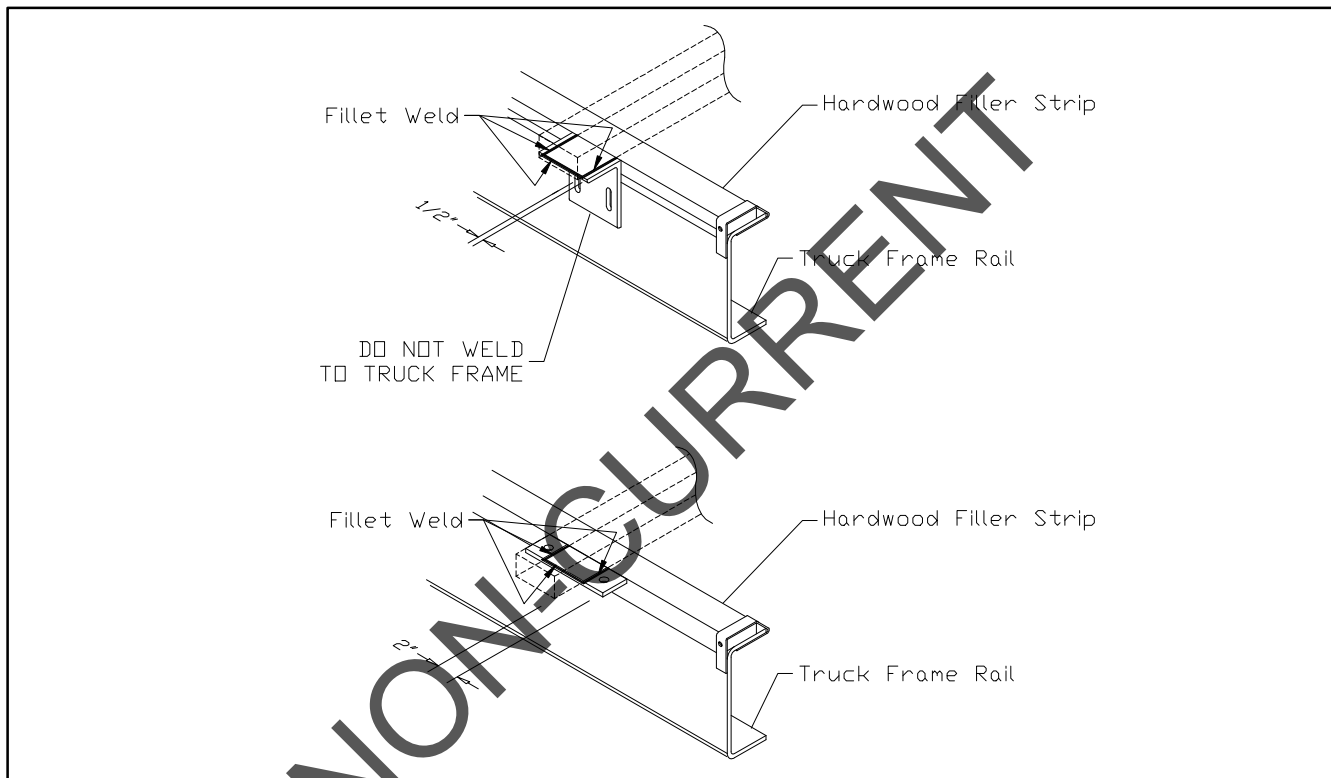


Figure 4 - Welding Instructions

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 IV 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.

LIGHT INSTALLATION

See Light Group on page 94 to install lights and reflectors. If mudflaps are not used, then use two belt reflector mounts to attach the rear red reflectors. The three lamp cluster should be mounted in the center of the rear endgate near the top. The red side lamps need to be mounted on the fenders at the back of the spreader facing rearward, the amber lamps at the opposite end of the fenders facing forward as shown.



Please Give Part No., Description and Unit Serial No. 82800-C

INSTALLATION INSTRUCTIONS CONT'D

ELECTRIC DUMP VALVE CONTROL INSTALLATION

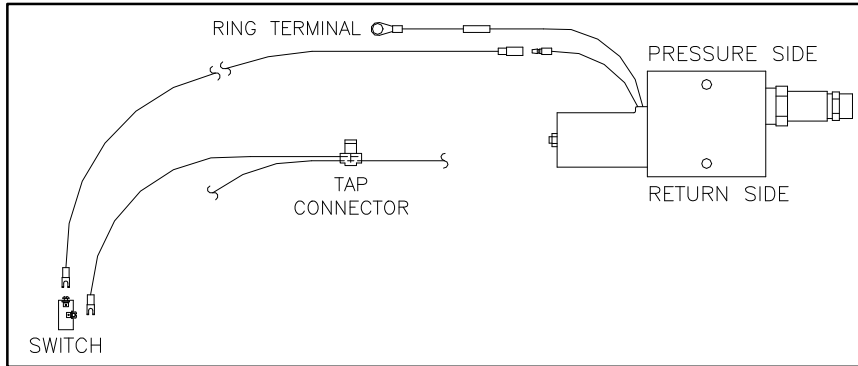


Figure 5 - Electric Dump Valve Control

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

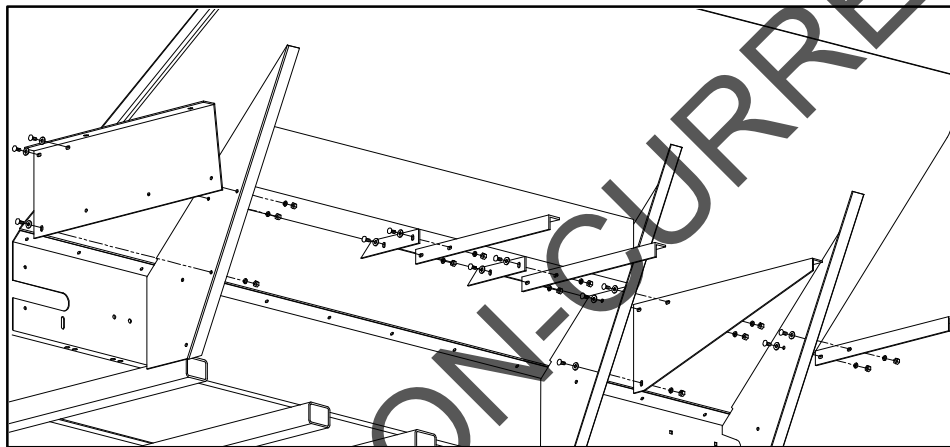


Figure 6 - Fender Angle Installation

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 shown.

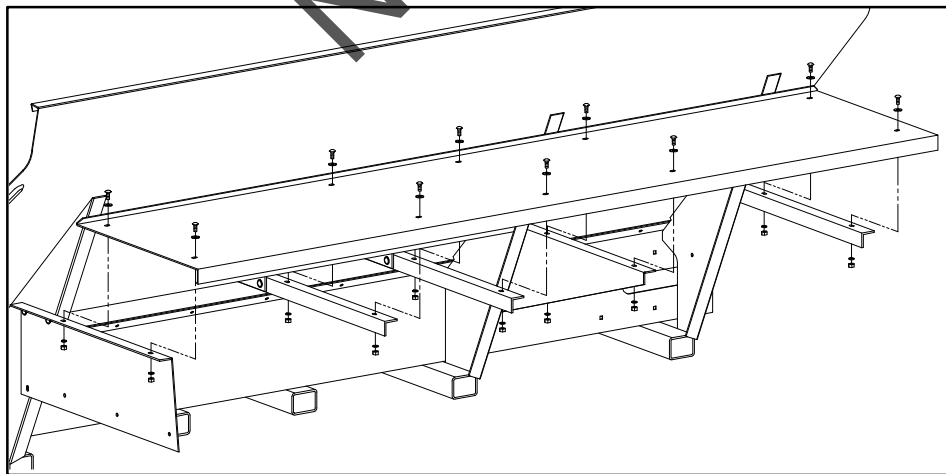


Figure 7 - Fender Installation

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.

INSTALLATION INSTRUCTIONS CONT'D

SPINNER ASSEMBLY INSTALLATION

Position A - (Rear)

To be used with a Lime Divider and a #2 or #4 BOC conveyor.

Position B - (Forward)

To be used with a Red-E-Vider and a #2 or #4 BOC conveyor.

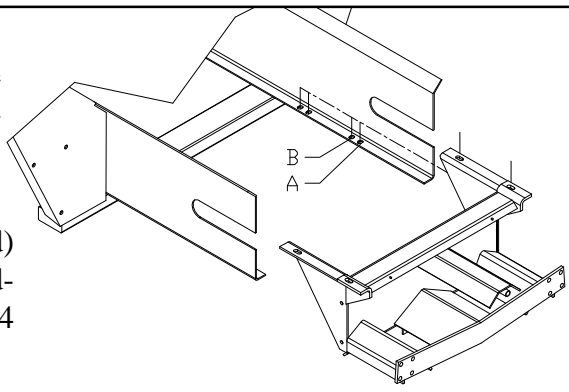


Figure 8 - Mounting The Spinner Assembly

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.

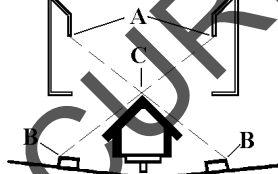
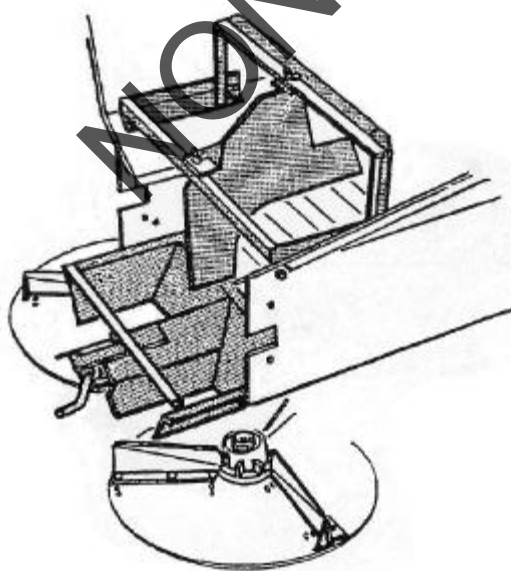


Figure 9 - Aligning Spinner & Flow Divider

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.

FLOW DIVIDER INSTALLATION



Red-E-Vider/
Lime Divider

Figure 10 - Flow Divider



Please Give Part No., Description and Unit Serial No. 82800-C

INSTALLATION INSTRUCTIONS CONT'D

HYDRAULIC HOSE INSTALLATION

Determine the pressure port of the pump. Install the pressure hose into this port as shown in Figure 11. 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.

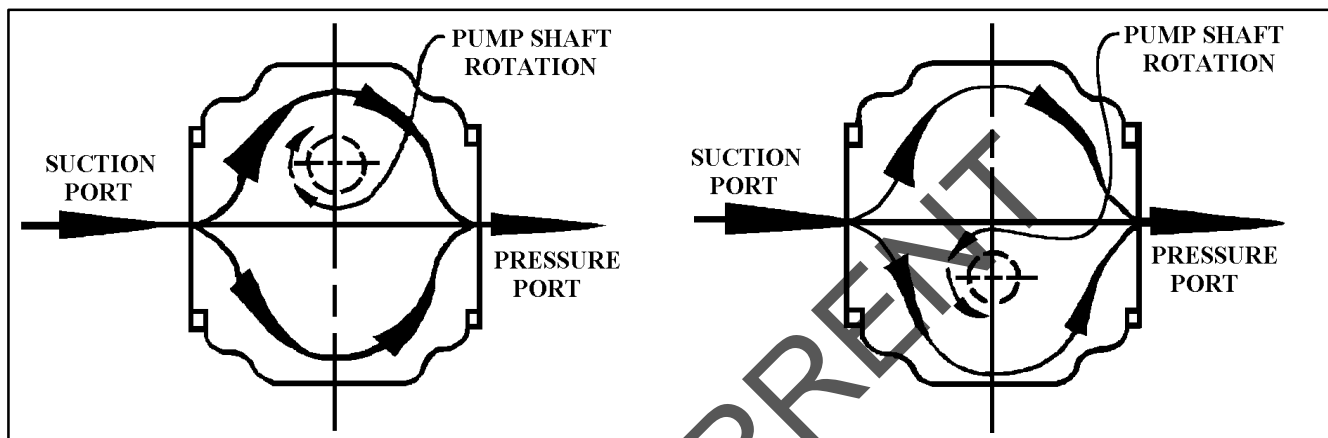


Figure 11 - Hydraulic Pump Installation

Use thread sealer on all fittings, except "O" ring and JIC adapters, "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 too tightly, the fitting or housing into which the fitting is placed could be distorted and an unstoppable leak could occur.

Assemble the system as shown in the Hydraulics Parts List. 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 with crimped end fittings.

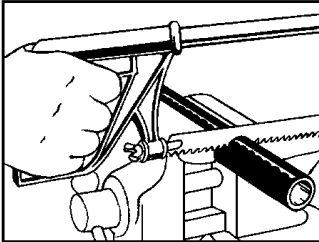


Please Give Part No., Description and Unit Serial No. 82800-C

INSTALLATION INSTRUCTIONS CONT'D

AEROQUIP REUSABLE NON-SKIVE TYPE ENDS

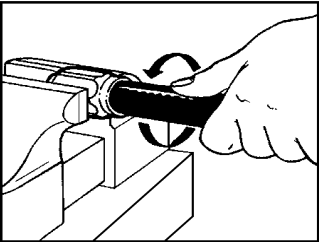
Thru-the-cover style reusable fittings used with hose FC211, FC212, GH663, and GH793.



Step 1

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

Clean hose bore.

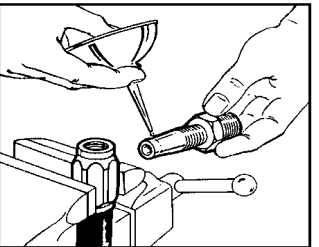


Step 2

Liberal lubricate hose cover with Aeroquip hose assembly lube.

Place socket in vise and turn hose into socket counterclockwise until it bottoms.

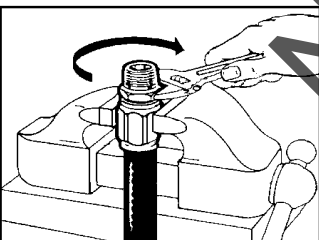
When assembling long lengths of hose, it may be preferred to put hose in the vise just tight enough to prevent from turning, and screw socket onto the hose counterclockwise until it bottoms.



Step 3

Liberal 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



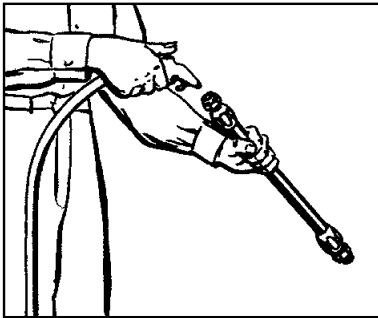
WARNING!

Do not use one manufacturer's hose with another manufacturer's fittings! Such use 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

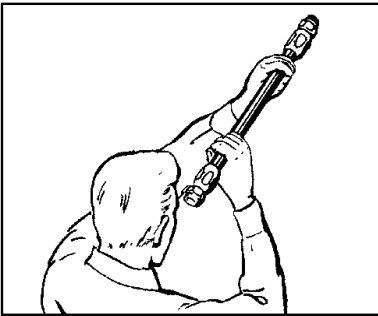
HYDRAULIC HOSE MAINTENANCE

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.



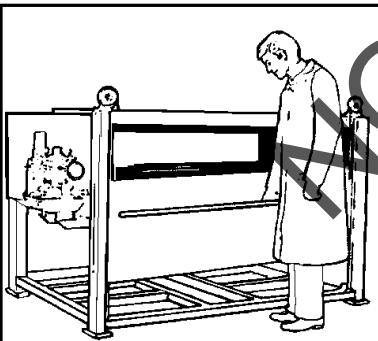
Clean

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.



WARNING! To prevent serious personal injury, testing should be conducted in approved test stands with adequate guards to protect the operator.

STORAGE AND HANDLING

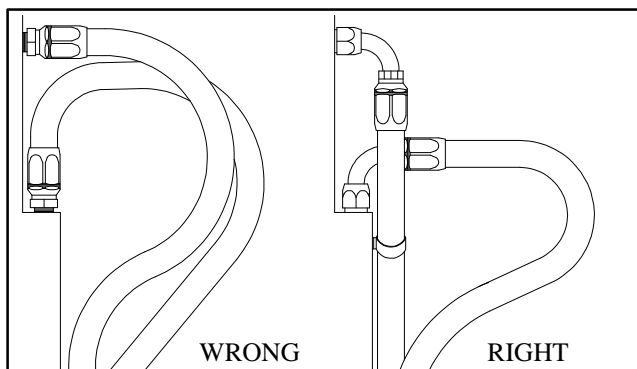
Hose should be stored in a dark, dry atmosphere away from electrical equipment, and the temperature should not exceed 90° F.



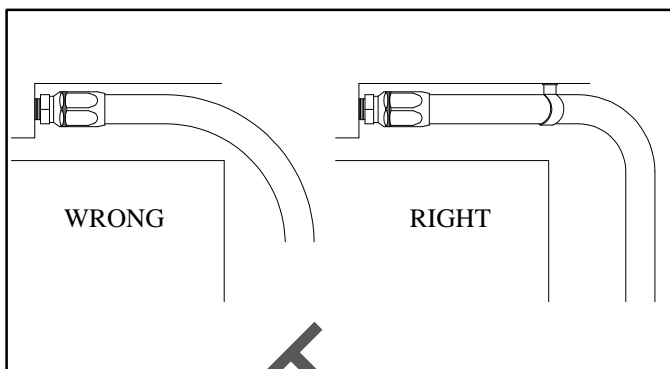
Please Give Part No., Description and Unit Serial No. 82800-C

INSTALLATION INSTRUCTIONS CONT'D

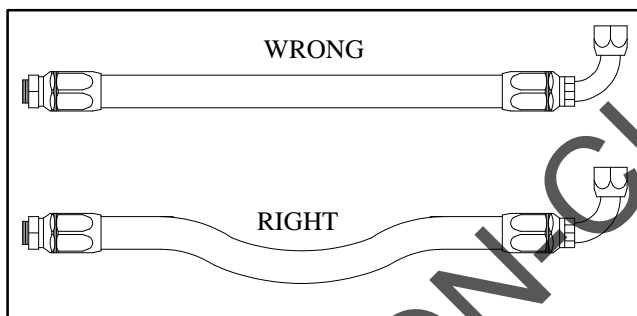
INSTALLATION GUIDE



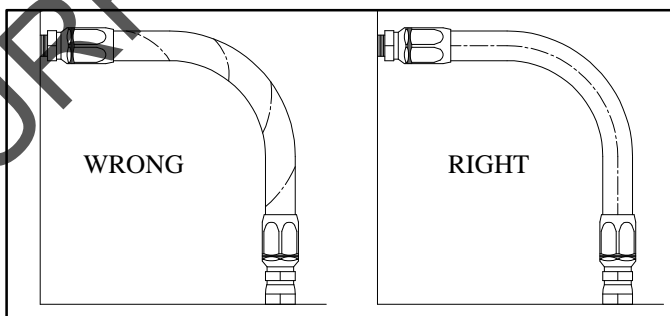
1. Use elbows and adapters in the installation to relieve strain on the assembly, and to provide easier and neater installations that are accessible for inspection and maintenance. Remember that metal end fittings cannot be considered as part of the flexible portion of the assembly.



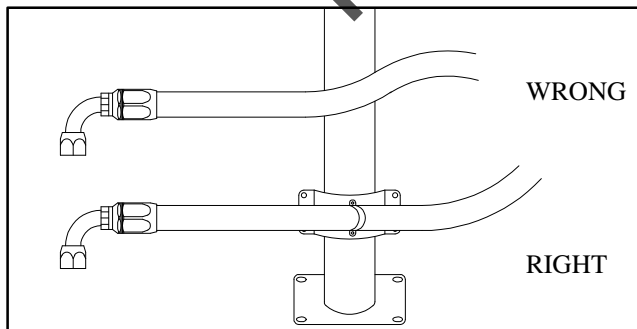
2. Install hose runs to avoid rubbing or abrasion. Clamps are often needed to support long runs of hose or to keep hose away from moving parts. It is important that the clamps be of the correct size. A clamp that is too large will allow the hose to move in the clamp causing abrasion at this point.



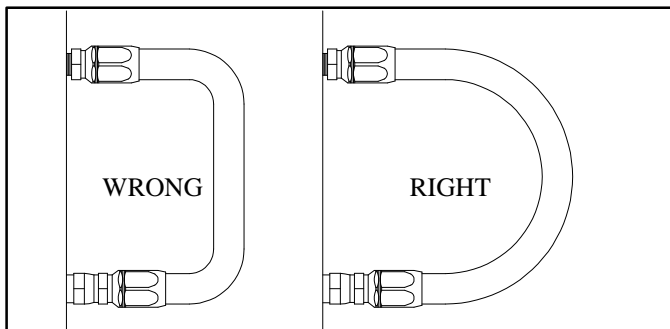
3. In straight hose installations allow enough slack in the hose line to provide for changes in length that will occur when pressure is applied. This change in length can be from +2% to -4%.



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.

(Used with the permission of The Weatherhead Company.)



Please Give Part No., Description and Unit Serial No. 82800-C

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. Place Synco-Matic® Mark IV function knob in "Automatic" position and spinner control valve in "0" position.
6. 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.
7. 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.
8. Pull out inner function knob (white nylon) located adjacent to conveyor gear case on Synco-Matic® Mark IV control valve assembly to disengage automatic ground control feedback. Slowly rotate this knob until all air is purged and conveyor is operating smoothly.
9. 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.
10. With PTO disengaged, push the inner function knob of the Synco-Matic® in, while rotating it slowly so that it fully engages in the "Automatic" position. When properly engaged it should seat fully and rotation of knob will stop. **Do Not Force!** Engage PTO and run engine at low speed.
11. Check all connections in the hydraulic system to make sure that there are no leaks.
12. 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!



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. Put function knob on inner side of Synco-Matic® Mark IV housing into "Automatic" by pushing in and rotating until it seats.
3. Set spinner control valve at position number 5.
4. Start truck engine. Flip Mark IV 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.
5. Set program in Mark IV console. Advance program to the operational mode forward travel. Move the conveyor switch on the Mark IV 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.



GENERAL OPERATING PROCEDURES

To operate the L3020GT Synco-Matic® Mark IV 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. Push in Function Knob on Mark IV control, rotating it until it fully engages into "Automatic" position.
4. Fill body with material to be spread.
5. Drive to location where spreading is to be done.
6. Adjust spinner control valve to setting required for material used to give spread width desired. See Spinner Adjustment pages.
7. Adjust material flow divider or Red-E-Vider to give spread pattern desired. See Spread Pattern Adjustment pages.
8. Using Spread Rate graphs in Mark IV manual, set feed gate opening to obtain the yield desired.
9. Be sure shut-off valve on hydraulic reservoir is fully opened.
10. Start truck engine.
11. Turn on power to processor and set program to desired values.
12. Depress clutch pedal, engage pump drive PTO.
13. Drive at speeds which 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!



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.

Spread pattern is affected by many factors. Among the more significant are:

1. Spinner speed.
2. Material weight per cubic foot
3. Material granular size.
4. Material flow characteristics.
5. Rate of delivery of material.
6. Point of delivery of material.
7. Balance between deliveries both spinner discs.
8. Angle of the distributor fins on the spinner disc.
9. Cleanliness of the spinner fins and disc.
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.



WARNING!

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!

SPINNERS

IMPORTANT!

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

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



Please Give Part No., Description and Unit Serial No. 82800-C

ADJUSTING THE SPREAD PATTERN CONT'D

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.

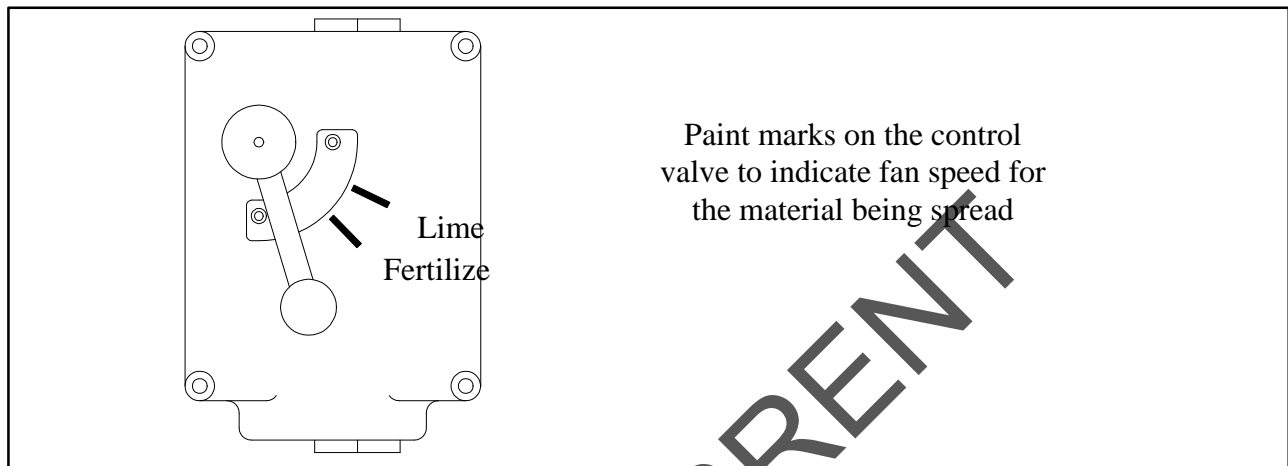


Figure 12 - Spinner Control

Maximum pattern width is determined by particle size. This may vary anywhere from 25 feet for very finely ground dry lime 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 will be very high for extremely coarse materials. In general, this critical speed will fall somewhere between 500 and 650 RPM for ordinary materials.

One way to adjust fan speed is to watch the material leaving the fans. At slow spinner speed the material leaves the blades in bands. At medium speed it forms wide bands in the air. At somewhat higher speed, the bands close into a uniform blur. At very high speed, 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 that when the bands close to blur.

MATERIAL DIVIDER CENTERING

Material divider must be properly centered to avoid a pattern which is heavier on one side than on the other. (Figure 14, page 33)

MATERIAL DIVIDER ADJUSTMENT

Moving the divider forward will increase the amount of material deposited behind the truck. Moving to the rear will decrease it. (Figures 14 and 15, page 33)



ADJUSTING THE SPREAD PATTERN CONT'D

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.

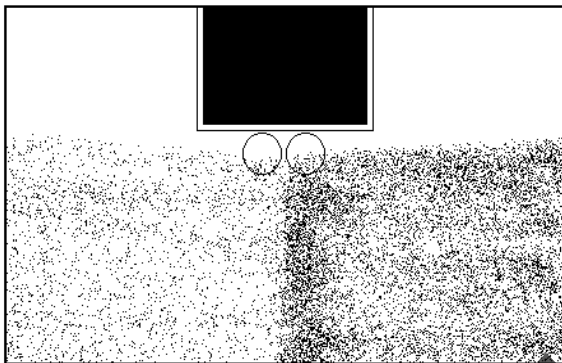
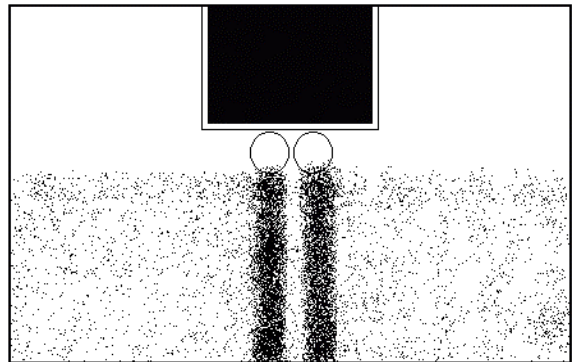


Figure 14:

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.

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 too far forward.

CURE -

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

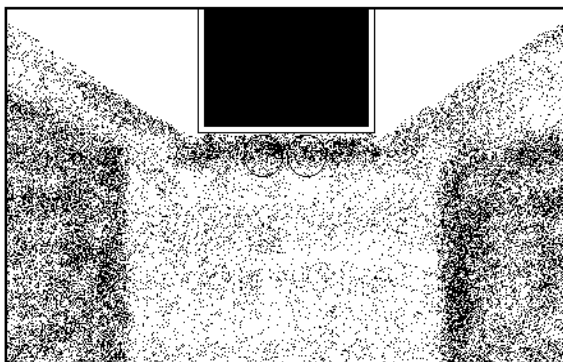
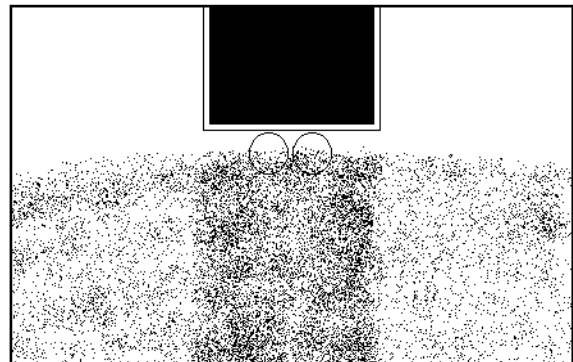


Figure 16:

PATTERN - Heavy at outer edges. Excessive material strikes front deflector panels.

CAUSE -

1. Deflector is too far rearward.
2. Fan speed too fast.
3. Back plate is too far rearward.

CURE -

1. Adjust divider forward.
2. If adjusting divider does not work, decrease fan speed.
3. Move back plate forward.

ADJUSTING THE SPREAD PATTERN CONT'D



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.

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.

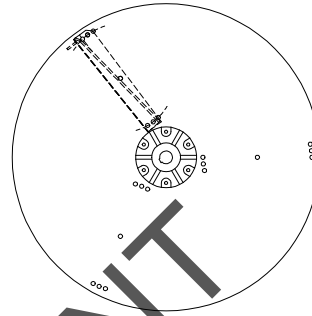
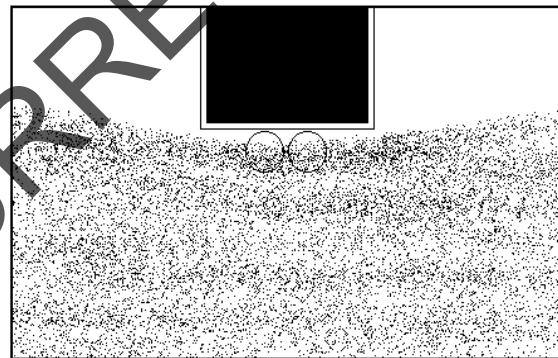


Figure 17:

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.



DIVIDER BACK PLATE ADJUSTMENT

Adjusting the divider to a wider position (moving back plate rearward) will throw material to the outside of the pattern. Adjusting to a narrower position (moving back plate forward) will throw it to the center. (Figures 15 and 16, page 33)

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.

PROPER ADJUSTMENT

With correct spinner speeds and flow divider settings, uniform material distribution should be obtained. (Figure 17)



CAUTION!

DO NOT STAND ON FENDER WHILE VEHICLE IS IN MOTION.
Fenders are not intended to carry loads.

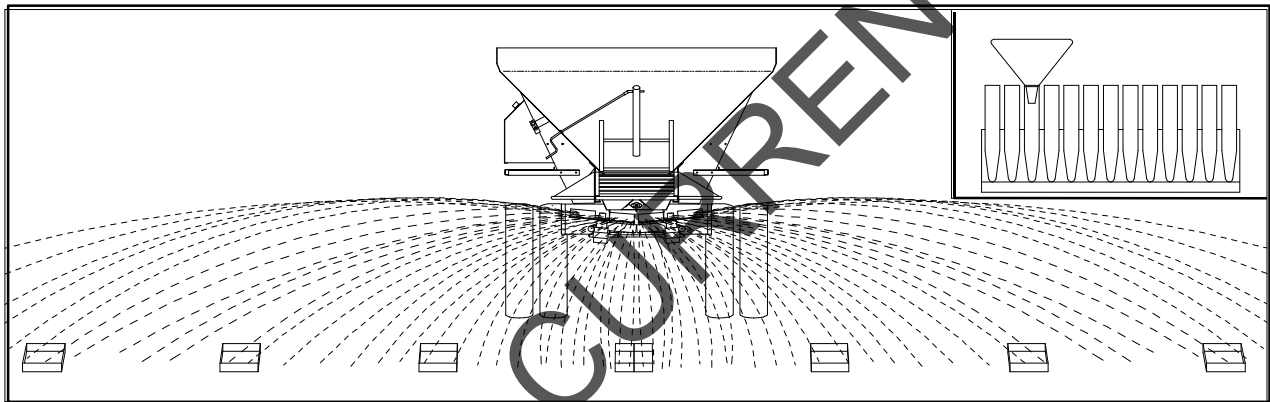


ADJUSTING THE SPREAD PATTERN CONT'D**HOW TO CHECK YOUR SPREAD PATTERN**

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

There is a special Spread Pattern Test Kit part number 70889, available from all NEW LEADER DEALERS. This kit contains all the necessary equipment, instructions and data information to achieve an accurate spread pattern test.

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.



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.

SERVICE SCHEDULE

1. Check the hydraulic oil daily by means of sight gauge on the reservoir. Add oil if required. Periodically inspect the hoses and fittings for leaks.



WARNING!

DO NOT check leaks with hands while system is operating as high pressure leaks are very dangerous. DO NOT check for leaks adjacent to moving parts while system is operating as there may be danger of

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, and refilled and filter element changed annually, or the oil and filter should be changed if oil shows any sign of breaking down under continued high-pressure operation. Discoloration of oil is one sign of breakdown.

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. Refill gear case with one pint of recommended lubricant. After the initial change, the oil should be changed every 2000 hours of operation or annually, whichever occurs first. Check oil level of the gear case monthly.

CONVEYOR CHAIN

Hose down the machine, and remove any material build-up on the sprockets or beneath the chain. If material is allowed to build up, the chain may ride up and damage the body. NOTE: If material builds up under the chain, the chain will ride up on the material instead of the bottom panel. The more material allowed to build, the closer the chain will come to the chain shields, or the body. 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!



LUBRICATION AND MAINTENANCE CONT'D

Proper chain tension is also a factor in chain and sprocket life. The proper chain tension is illustrated in Figure 15. Be sure the chain is tensioned equally on both sides this adjustment is made on each side of the unit at the idler bearings.

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 the subframe parts. Bent or distorted chain bars will cause damage to the body also. Straighten or replace bent or distorted chain bars immediately.

**DANGER!**

When conveyor is running stay out of body and stay clear of all moving parts! Entanglement of clothes, or 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 be very dangerous!

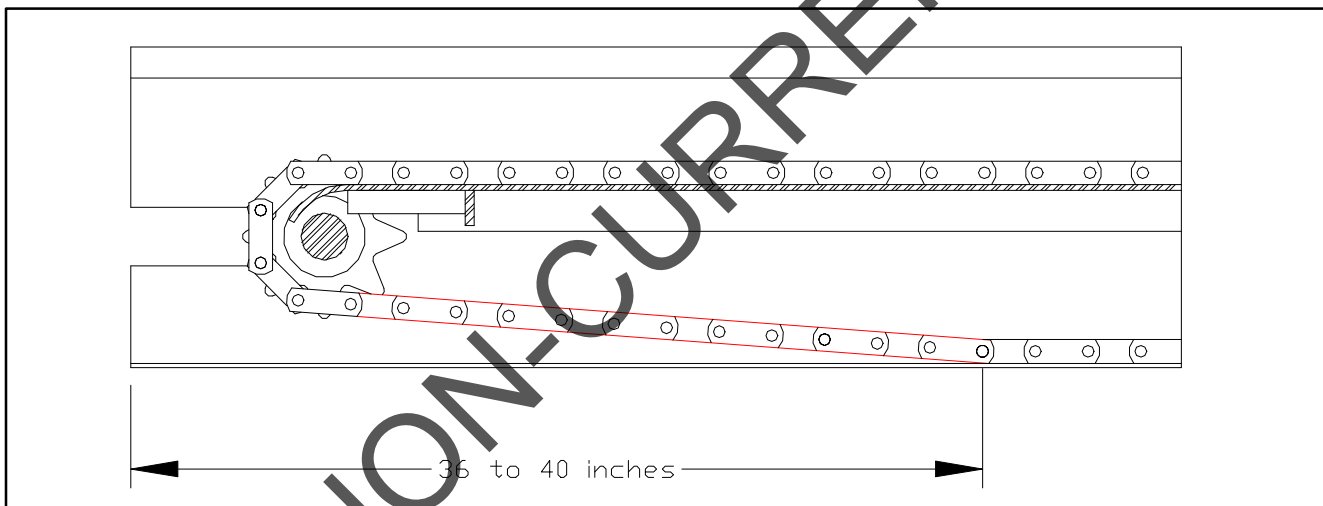


Figure 18 - Adjusting Chain Tension

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 that the grease maintain its proper consistency during operation. It must not be fluid, and it must not channel.

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

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



LUBRICATION AND MAINTENANCE CONT'D

CLEAN UP

For maintaining a minimal maintenance operation, this equipment should be thoroughly washed every two or three 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 operation season. All lubrication and maintenance instructions listed in this section should be closely followed. For longer life, repaint worn spots to prevent formation of rust.

FASTENERS

Tighten all screws fasteners to recommended torque's after first week of operation and annually thereafter. If loose fasteners are found at anytime, tighten to recommended torque's. 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 standard belt for the #4 chain has a nylon fabric that is impervious to moisture, weathering, or normal chemical action except oil. The optional high-temperature oil resisting belting is highly recommended where an asphalt mix is going to be run through the spreader. Inspect the belt fastener occasionally for wear or "raveling" of the belt grip area.

HIGH-TEMPERATURE BELTING

In order to achieve maximum life out of the high-temperature belting, the following recommendations should be followed:

1. Keep the belt free from build up of asphalt or other material. Keep it clean.
2. Spray the belt often with oil to assure flexibility of the rubber and to ease cleaning. Spray the underpart of the conveyor also, as dry heat is very detrimental to the life of the belt.
3. Keep the asphalt temperature below 350 degrees F and the belt running as much as possible when loaded. A hot sitting load is more detrimental since it does not allow a cooling cycle for the belt.
4. Allow the belt to flex and warm up in the cold weather before loading it with extremely hot product.
5. Do not operate the belt in temperatures below -10 degrees F. Operating in temperatures below -10 degrees F. will cause the belt to crack prematurely.

In normal use, a properly cared for belt will first experience cracking of the belt cover. This is normal for a belt of this type in an asphalt environment and does not indicate a failing belt. Eventually, the belt cover will begin to harden and chunks of the cover begin falling off exposing the carcass. When this happens, it is time for belt replacement.



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 unquestioned 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

HYDRAULIC SYSTEM

The recommended lubricant to use is an automotive engine oil SAE 15W-40 for diesel engine service. The normal system operating temperature range, with 15W-40 oil, is between 140 and 180 degrees F. Extreme operating temperatures may require a different viscosity oil range. If the temperature rises above 180 degrees, there may be defective components in the system causing excessive heat. Consult your New Leader dealer or the Service Department at Highway Equipment Company for additional information.

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 degrees F. Ambient temperatures below 40 degrees F. require an SAE 80 E.P. lubricant; above 100 degrees F. use an 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 degrees 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.



WARNING!

Shut off all power and allow all moving parts to come to rest before performing any maintenance operation.



LUBRICATION AND MAINTENANCE CHART

<u>LOCATION</u>	<u>PLACES</u>	<u>METHOD</u>	<u>FREQUENCY</u>
Hydraulic System			
Reservoir	1		Check Daily. Change Annually
Filter	1	Check daily; Change when indicated (Red)	
Conveyor			
Dragshaft Bearings	2	Grease Gun	Weekly
Idler Shaft Bearings	2	Grease Gun	Weekly
Take-Up Screws	2	Hand Grease	Weekly
Chain Oiler	1	Oil Mixture	Fill Daily
Gear Case	1	Gear Oil	Check Monthly; Change Annually
Jack Assembly			
Gears	1	Grease Gun	Annually
Tube	1	Grease Gun	Weekly
Swinging Rear Endgate			
Pivot Pins	2	Hand Grease	Annually
Transmission PTO			
Slip Yoke	1	Grease Gun	Weekly
Universal Joint	2	Grease Gun	Monthly

HYDRAULIC SYSTEM LUBRICANT

Use an automotive engine oil SAE 15W-40 for diesel engine service.

CONVEYOR LUBRICANT

Use non-corrosive type SAE 90 (40° to 100° F.); SAE 80 (below 40° F.); SAE 140 (above 100° F.) E.P. (extreme pressure) multi-purpose gear lubricating oil.

CHAIN OILER MIXTURE

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

GREASE GUN LUBRICANT

Use a lithium base lubricant with a minimum melting point of 300° F.

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.

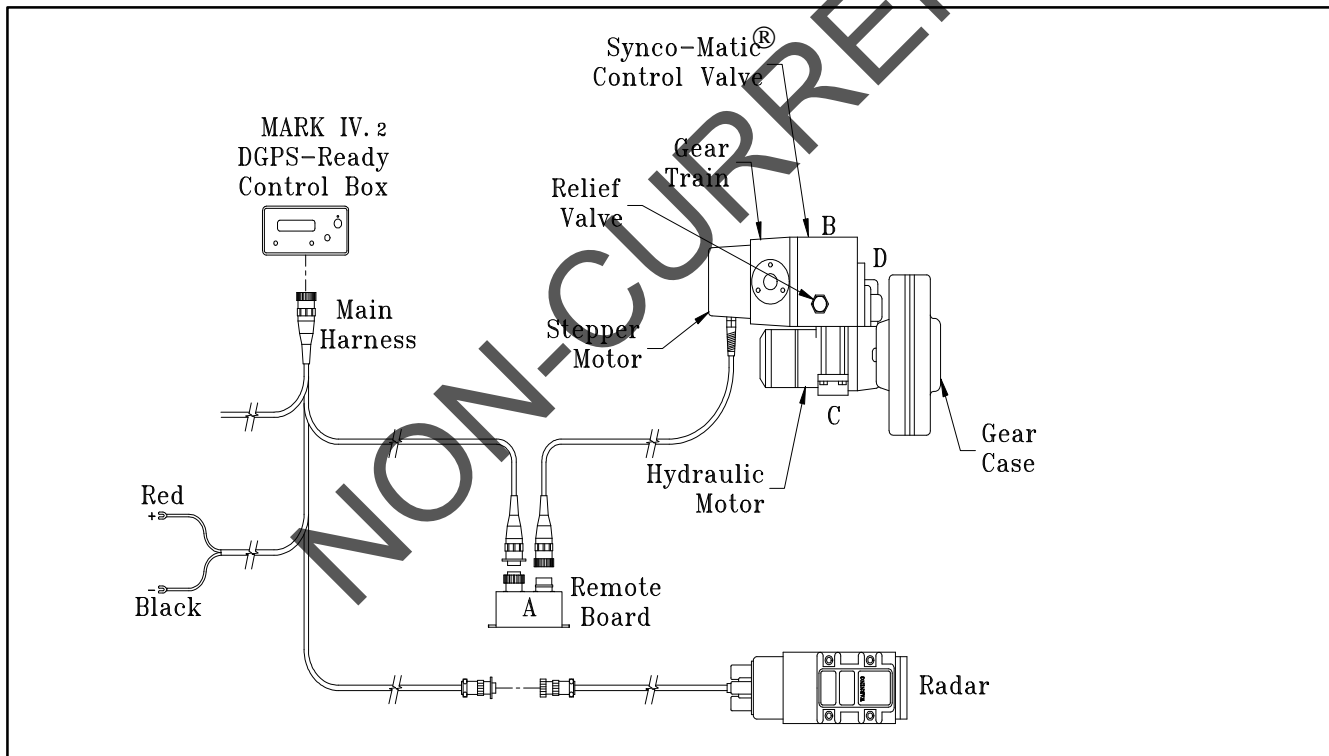
REPLACEMENT

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 clogged 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.



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.

**Figure 19 – Synco-Matic® 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.	<ol style="list-style-type: none"> 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.

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.



TROUBLESHOOTING PROCEDURES

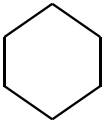
Reason:

Correction:

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.
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 40 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 track 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.
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.



STANDARD TORQUES NATIONAL COARSE (NC) CAPSCREWS**CAPSCREW 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.

	TORQUE - FOOT / POUNDS					
CAPSCREW 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.
2. Give part name, part number and the quantity required.
3. Give the correct address to where the parts are to be shipped, and the carrier if there is a preference.

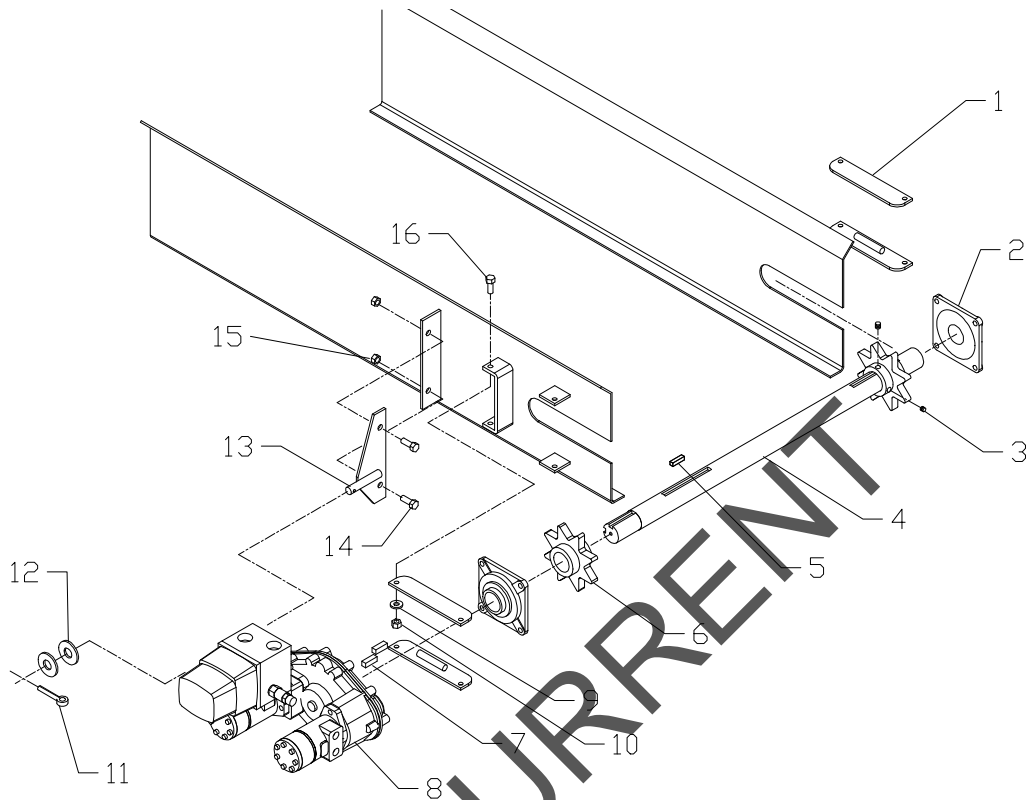
Unless claims for shortages or errors are made immediately upon receipt of goods they will not be considered. Any part returns should be directed through the dealer from which they were purchased.

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.



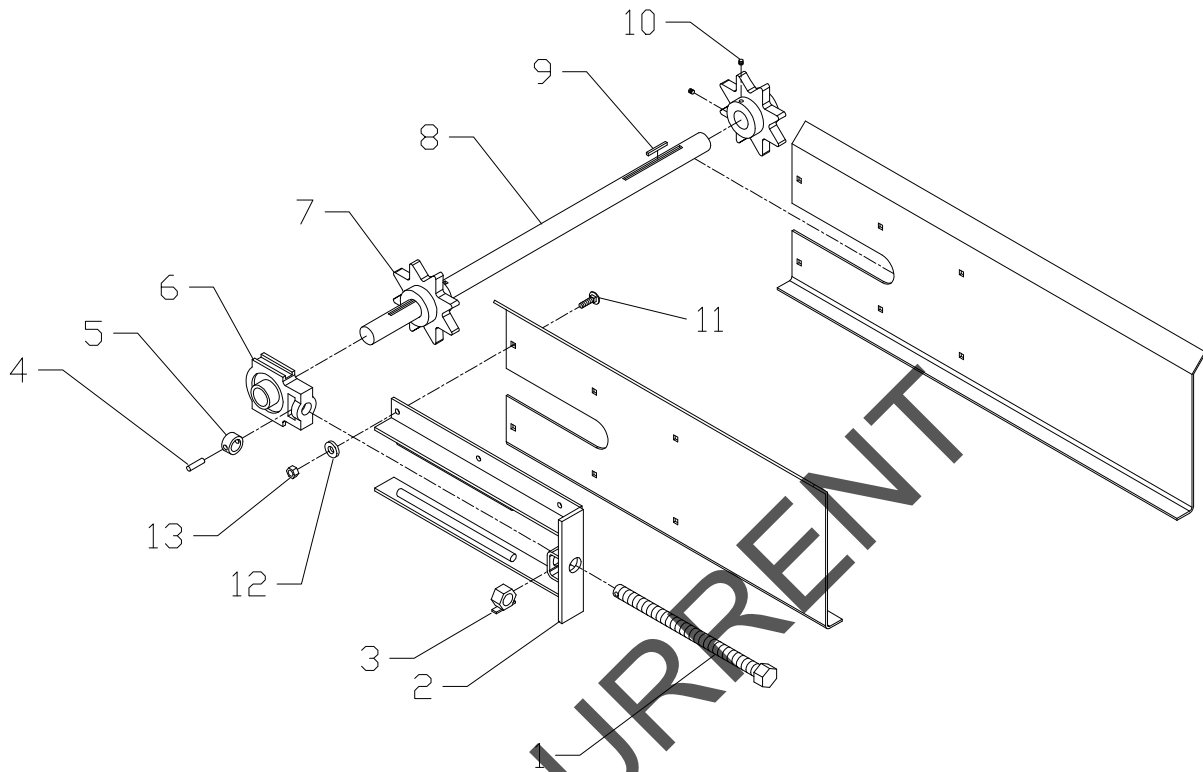
CONVEYOR DRIVE GROUP

<u>ITEM</u>	<u>PART NO.</u>		<u>DESCRIPTION</u>	<u>QTY</u>
	S.S.	M.S.		
1	82885	82882	Bearing Guide	4
2	6465	6465	Bearing	2
3	20748	20748	Screw - Set, 3/8	4
4	38600	38600	Shaft - Drive	1
5	6131	6131	Key - Square, 3/8 x 1 1/2	2
6	27275	27275	Sprocket	2
7	37010	37010	Key - Square, 1/2 x 1 1/2	2
8	84957	84957	Mark IV.2 Gear Case Assembly	1
	82852	82852	Mark IV Gear Case Assembly	1
9	36420	20712	Washer - Lock, 3/8	8
10	36414	20644	Nut - Hex, 3/8	8
11	20833	20833	Pin - Cotter, 1/4 x 1 1/2	1
12	2716	2716	Washer - Flat, 3/4	A.R.
13	82552	82550	Torque Arm - LH Weldment	1
14	20128	20128	Cap Screw - 1/2 x 1 1/4	2
15	20680	20680	Nut - Locking, 1/2	2
16	36399	20068	Cap Screw - 3/8 x 1 1/4	8

A.R. - As Required S.S. - Stainless Steel Spreader M.S. - Mild Steel Spreader



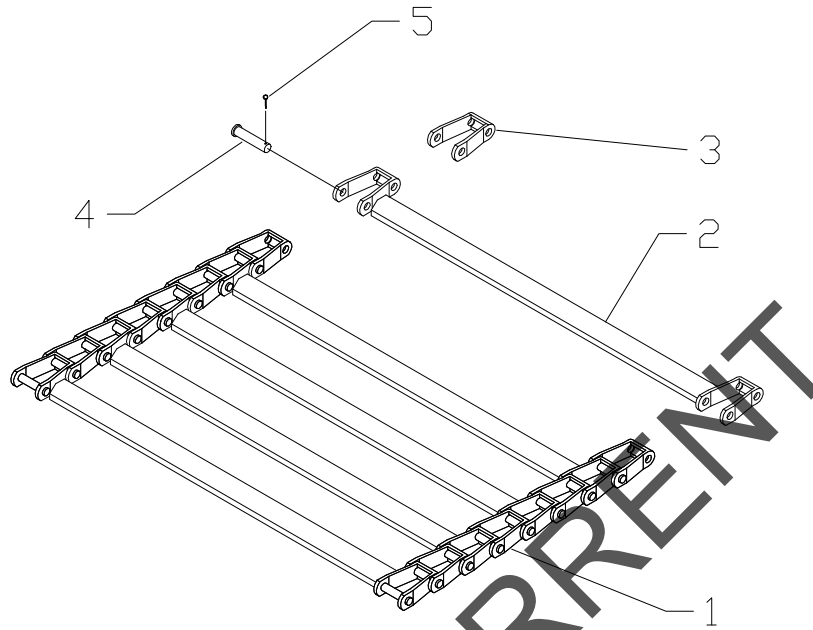
Please Give Part No., Description and Unit Serial No. 82800-C

CONVEYOR IDLER GROUP

<u>ITEM</u>	<u>PART NO.</u>		<u>DESCRIPTION</u>	<u>QTY</u>
	S.S.	M.S.		
1	36508	36508	Weldment - Chain Tightener	2
2	7895	7895	Weldment - Take-up	2
3	39110	39110	Weldment - Nut	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	82799	82799	Shaft - Idler	1
9	2135	2135	Key - Square, 5/16 x 2 1/2	2
10	20743	20743	Screw - Set, 5/16 x 3/8	4
11	36408	20318	Bolt - Carriage, 3/8 x 1	12
12	36420	20712	Washer - Lock, 3/8	12
13	36414	20644	Nut - Hex, 3/8	12

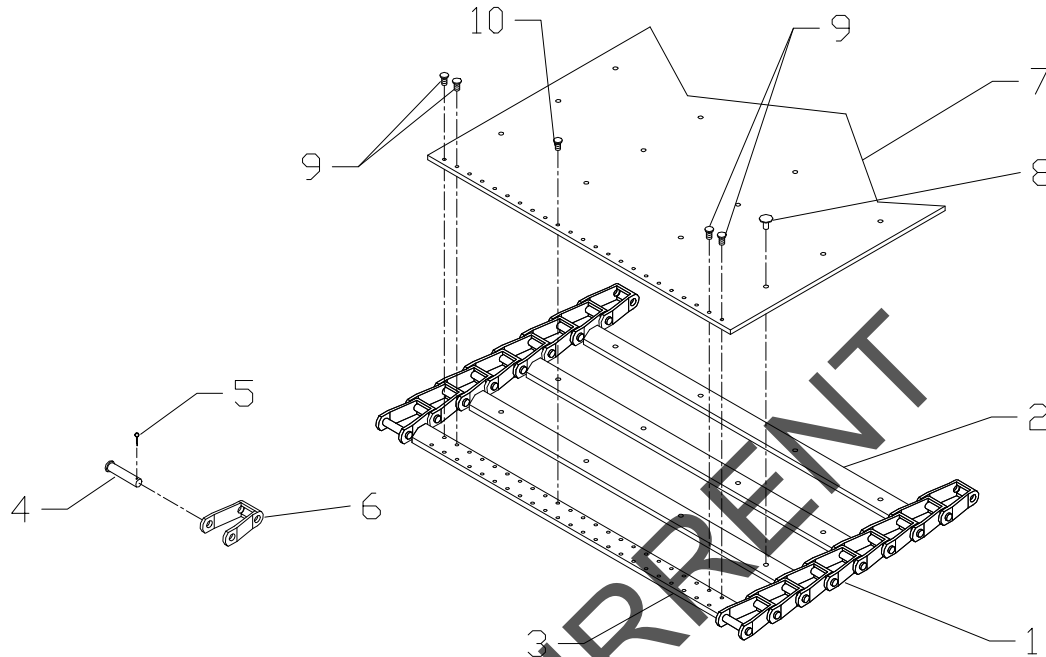
S.S. - Stainless Steel Spreader M.S. - Mild Steel Spreader



#2 PINTLE CHAIN CONVEYOR

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	55765	Assembly - #2 Pintle Chain, 10' Unit	1
	55766	Assembly - #2 Pintle Chain, 11' Unit	1
	55767	Assembly - #2 Pintle Chain, 12' Unit	1
	55768	Assembly - #2 Pintle Chain, 13' Unit	1
	55769	Assembly - #2 Pintle Chain, 14' Unit	1
	55770	Assembly - #2 Pintle Chain, 15' Unit	1
	55771	Assembly - #2 Pintle Chain, 16' Unit	1
2	55772	Weldment - Cross Bar	A.R.
3	36699	Link - Pintle Chain	A.R.
4	36697	Pin - Pintle Chain	A.R.
5	20817	Pin - Cotter	A.R.

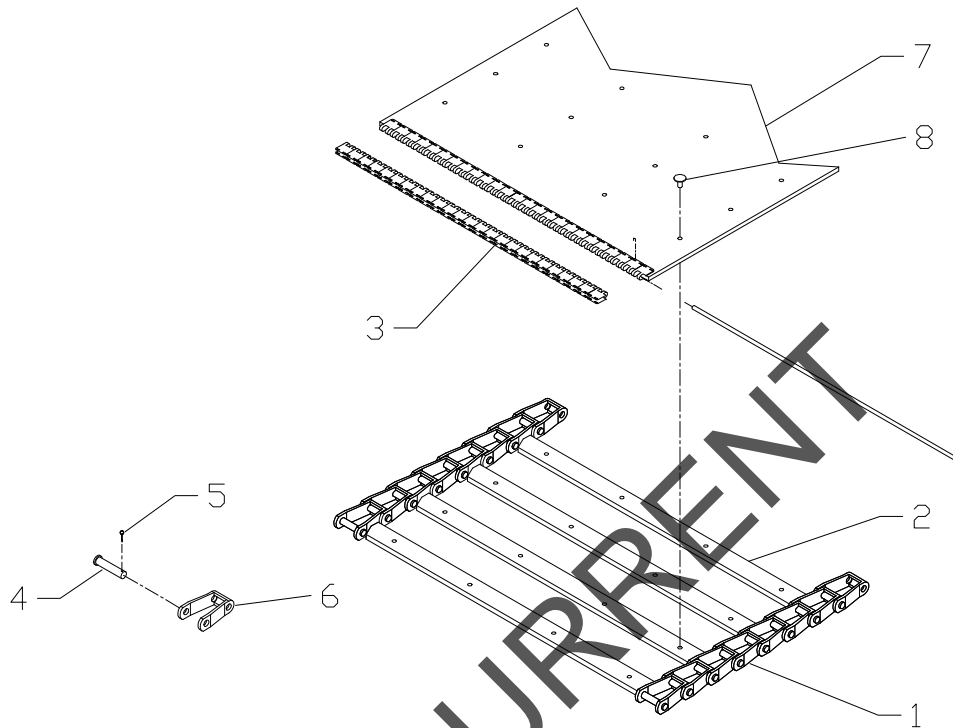
A.R. - As Required

#4 BELT OVER PINTLE CHAIN CONVEYOR

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	55795	Assembly - #4 Belt-Over-Chain, 10' Unit	1
	55796	Assembly - #4 Belt-Over-Chain, 11' Unit	1
	55797	Assembly - #4 Belt-Over-Chain, 12' Unit	1
	55798	Assembly - #4 Belt-Over-Chain, 13' Unit	1
	55799	Assembly - #4 Belt-Over-Chain, 14' Unit	1
	55800	Assembly - #4 Belt-Over-Chain, 15' Unit	1
	55801	Assembly - #4 Belt-Over-Chain, 16' Unit	1
2	56947	Weldment - Cross Bar with Rivet Holes	A.R.
3	55788	Weldment - Splice Bar	1
4	36697	Pin - Pintle Chain	A.R.
5	20817	Pin - Cotter	A.R.
6	36699	Link - Pintle Chain	A.R.
7	18027	Belt - Conveyor (Specify Body Length)	A.R.
8	6245	Rivet	A.R.
9	20617	Screw - Flat Head (Outside Two Holes Only)	A.R.
10	20624	Screw - Truss Head	A.R.

A.R. - As Required

#4 BELT OVER PINTLE CHAIN CONVEYOR
with HIGH-TEMPERATURE BELTING

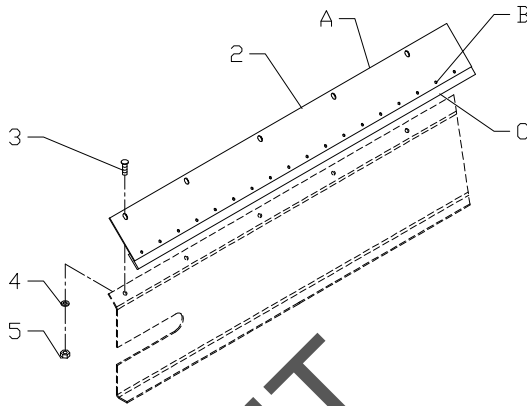
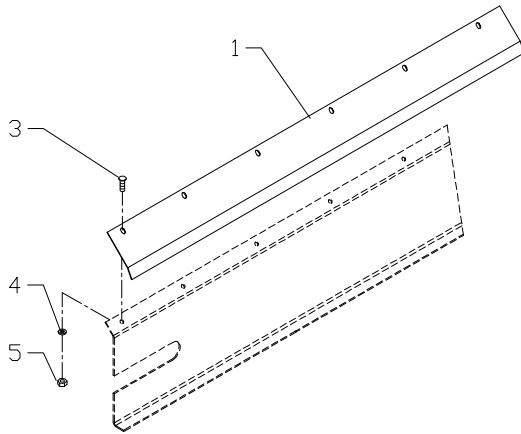


<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	56939	Assembly - #4 Belt-Over-Chain, 10' Unit	1
	56940	Assembly - #4 Belt-Over-Chain, 11' Unit	1
	56941	Assembly - #4 Belt-Over-Chain, 12' Unit	1
	56942	Assembly - #4 Belt-Over-Chain, 13' Unit	1
	56943	Assembly - #4 Belt-Over-Chain, 14' Unit	1
	56944	Assembly - #4 Belt-Over-Chain, 15' Unit	1
	56945	Assembly - #4 Belt-Over-Chain, 16' Unit	1
2	56947	Weldment - Cross Bar with Rivet Holes	A.R.
3	56946	Kit - Splicer	1
		Lacing Strips, 23"	2
		Pin - Connecting	1
		Staples	A.R.
4	36697	Pin - Pintle Chain	A.R.
5	20817	Pin - Cotter	A.R.
6	36699	Link - Pintle Chain	A.R.
7	55794	Belt - Conveyor (Specify Body Length)	A.R.
8	6245	Rivet	A.R.

A.R. - As Required



Please Give Part No., Description and Unit Serial No. 82800-C

CHAIN SHIELDS

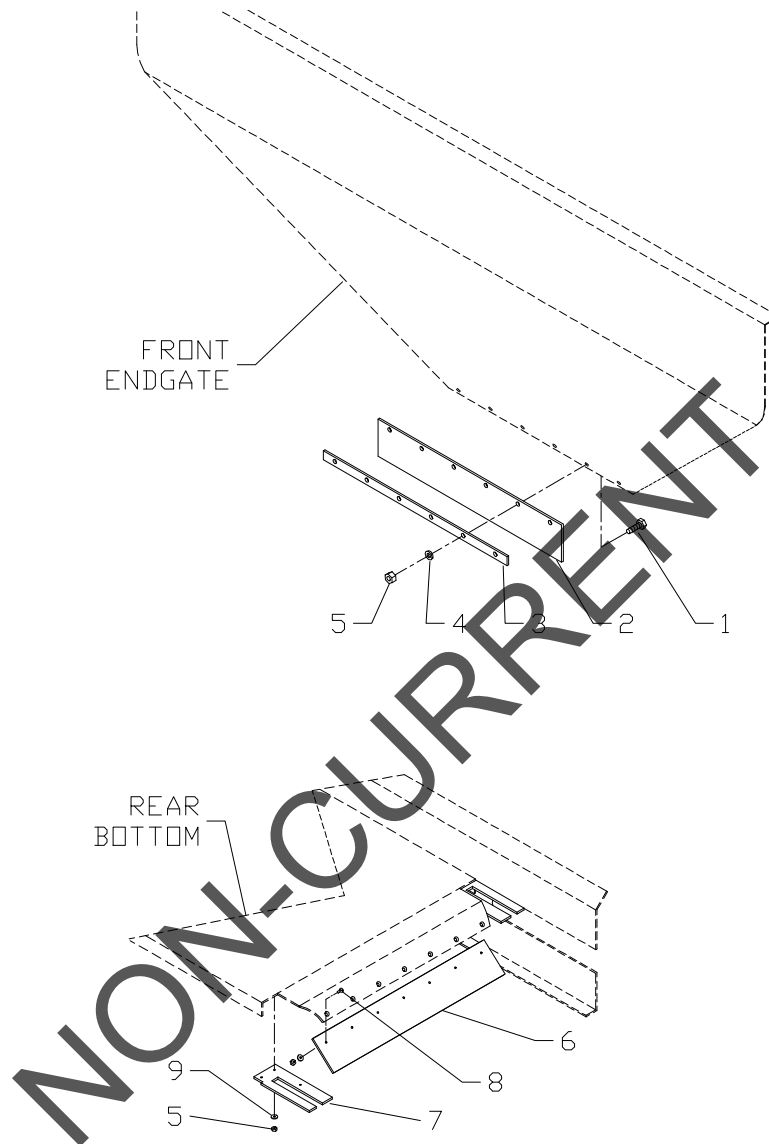
<u>ITEM</u>	<u>PART NO.</u>			<u>DESCRIPTION</u>	<u>QTY</u>
	M.S.	409 S.S.	304 S.S.		
1	39615	43697	54119	Chain Shield #2 Chain only for: 10' Unit	2
	39616	43698	54120	11' Unit	2
	39617	43699	54121	12' Unit	2
	39618	43700	54122	13' Unit	2
	39619	43701	54123	14' Unit	2
	46297	46987	54124	15' Unit	2
	46298	46988	54125	16' Unit	2
2				Chain Shield #4 BOC only for:	
	37367	43816	54143	10' Unit	2
	37368	43818	54144	11' Unit	2
	37369	43820	54145	12' Unit	2
	37370	43824	54146	13' Unit	2
	39625	43827	54146	14' Unit	2
	37371	46993	54148	15' Unit	2
	46302	46994	54149	16' Unit	2
				Chain Shield #4 BOC Hi-Temp only for: (Not Available in Stainless Steel)	
	54808			10' Unit	2
	54809			11' Unit	2
	54810			12' Unit	2
	54811			13' Unit	2
	54812			14' Unit	2
	54813			15' Unit	2
	54814			16' Unit	2

CHAIN SHIELDS CONT'D

<u>ITEM</u>	<u>PART NO.</u>			<u>DESCRIPTION</u>	<u>QTY</u>
	M.S.	409 S.S.	304 S.S.		
A	17792	43817	54152	Chain Shield, 10' Unit	1
	17652	43819	54153	Chain Shield, 11' Unit	1
	12636	43821	54154	Chain Shield, 12' Unit	1
	17653	43825	54155	Chain Shield, 13' Unit	1
	12637	43828	54156	Chain Shield, 14' Unit	1
	17654	46995	54157	Chain Shield, 15' Unit	1
	46303	46997	54158	Chain Shield, 16' Unit	1
B	6244			Rivet, #4 BOC Shield	A.R.
	6245			Rivet, #4 BOC Hi-Temp Shield	A.R.
C	7687			Belt Sealer, #4 BOC Shield (Specify Body Length)	A.R.
	38349			Belt Sealer, #4 BOC Hi-Temp Shield (Specify Body Length)	A.R.
3	20318	71829	71829	Bolt - Carriage	A.R.
4	20712	36420	36420	Washer - Lock	A.R.
5	20644	36414	36414	Nut - Hex	A.R.

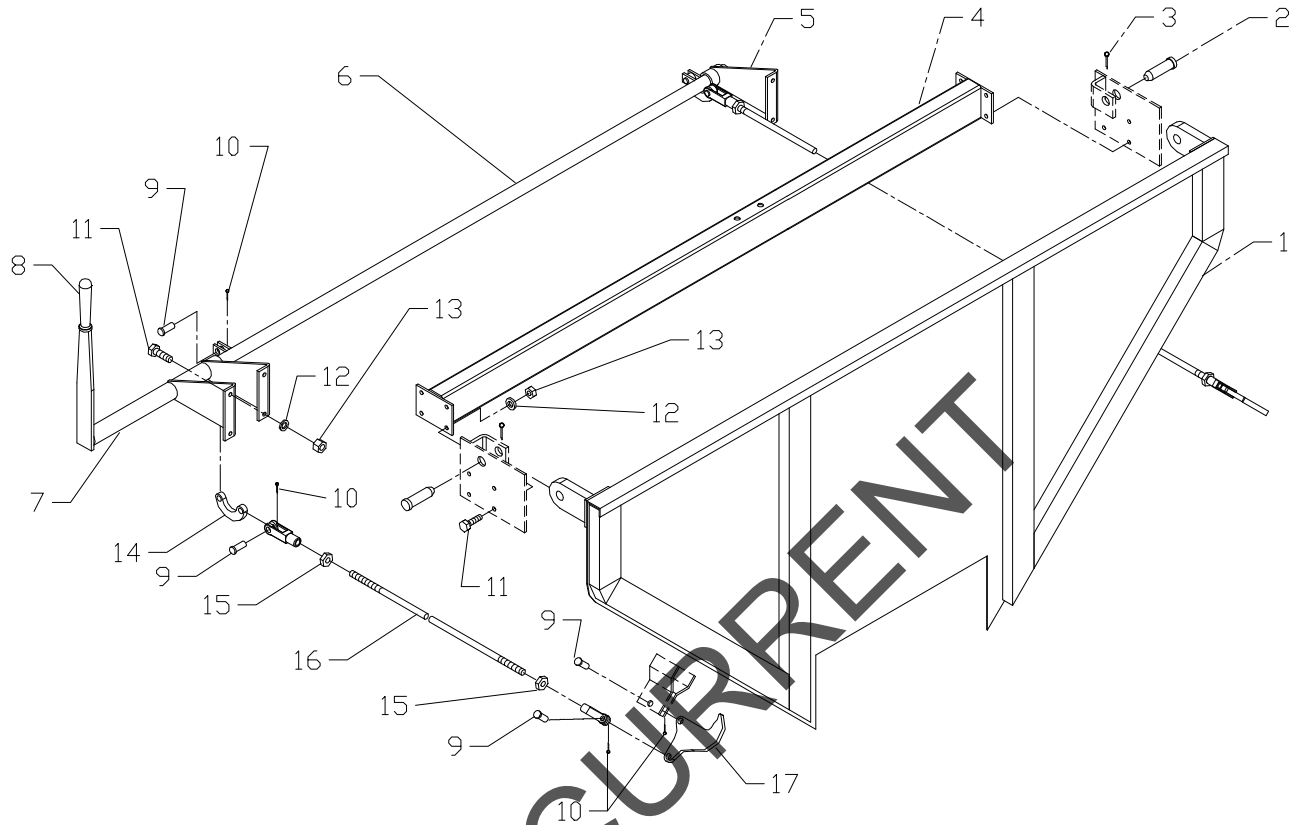
A.R. - As Required M.S. - Mild Steel Spreader S.S. - Stainless Steel Spreader



WIPER BELT

<u>ITEM</u>	<u>PART NO.</u>			<u>DESCRIPTION</u>	<u>QTY</u>
	M.S.	409 S.S.	304 S.S.		
1	20583	36393	36393	Screw - Machine, 1/4 x 3/4	6
2	14743	14743	14743	Belt - Wiper	1
3	14742	55834	71656	Belt - Retainer	1
4	20710	36418	36418	Washer - Lock, 1/4	6
5	20642	36412	36412	Nut - Hex, 1/4	19
6	27243	27243	27243	Belt - Rear Wiper	1
7	33207	33207	33207	Belt - Sealer, Drag Sprockets	2
8	20619	36405	36405	Screw - Machine, 1/4 x 3/4	7
9	20691	36423	36423	Washer - Flat, 1/4	13

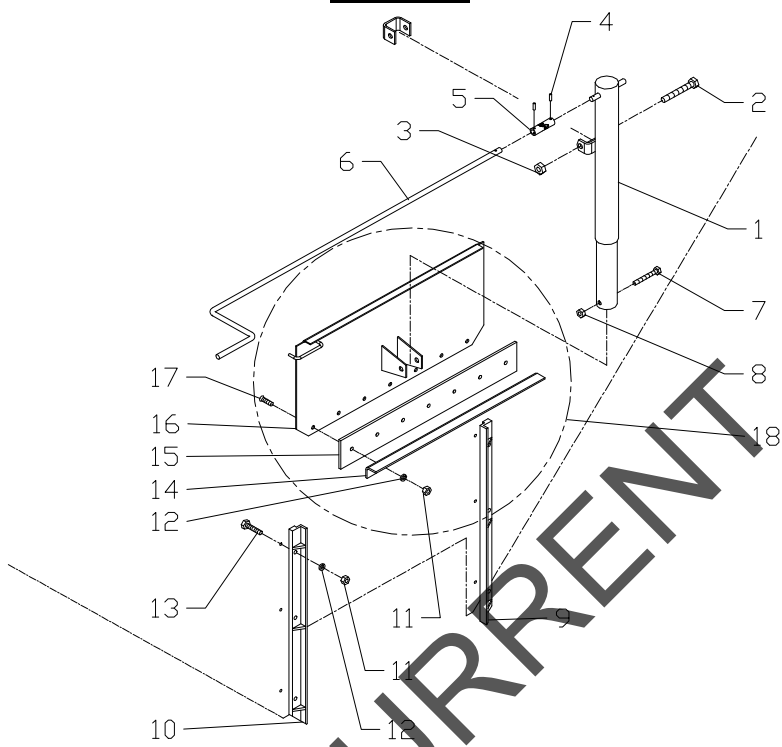
**Please Give Part No., Description and Unit Serial No. 82800-C**

SWINGING REAR ENDGATE

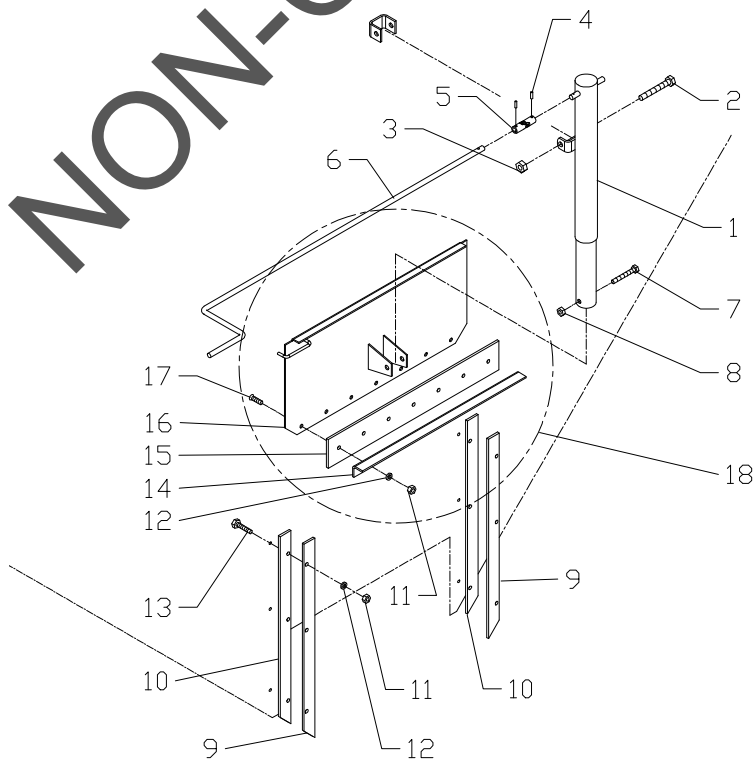
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	82963	Weldment - Rear Endgate	1
2	36719	Pin - Clevis	2
3	20828	Pin - Cotter	2
4	72274	Weldment - Tube	1
5	83512	Weldment - Pivot, Short	1
6	36727	Weldment - Pivot Shaft	1
7	83513	Weldment - Pivot, Long	1
8	36899	Handle	1
9	21027	Pin - Clevis	8
10	20821	Pin - Cotter	8
11	20067	Screw - Cap, 3/8 x 1	14
12	20712	Washer - Lock, 3/8	14
13	20644	Nut - Hex, 3/8	14
14	36819	Link - Over Center	2
15	9342	Yoke - Female	4
16	21084	Nut - Hex, Jam	4
17	56078	Control Rod - 16' Unit	2
18	36736	Hook - Endgate	2

FEEDGATE AND JACK

Mild Steel



Stainless Steel



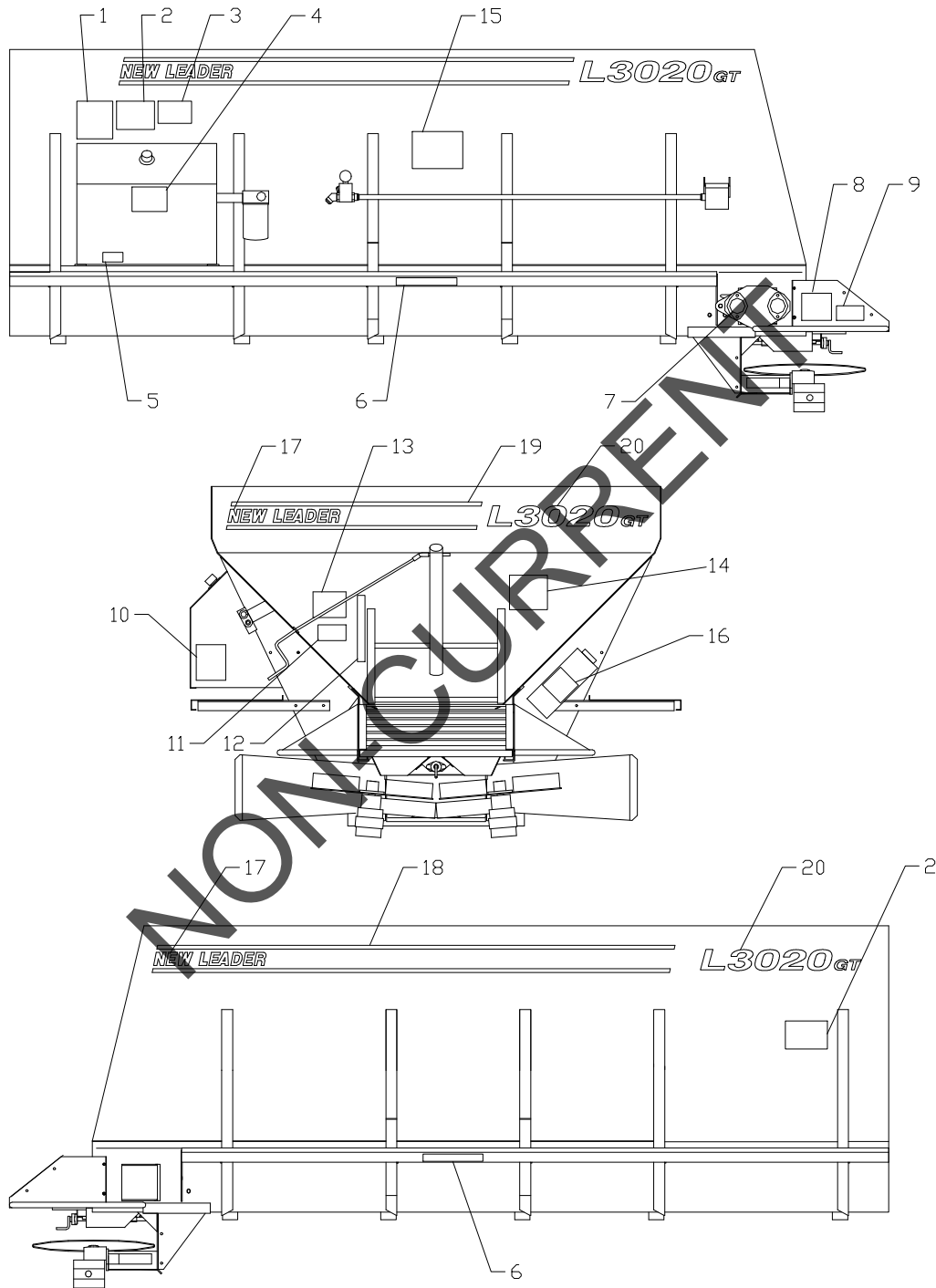
FEEDGATE AND JACK CONT'D

<u>ITEM</u>	<u>PART NO.</u>			<u>DESCRIPTION</u>	<u>QTY</u>
	M.S.	409 S.S.	304 S.S.		
1	85005	85005	85005	Jack Assembly, Includes Jack, Items 4 & 5	1
	40704	40704	40704	Jack	
2	20136	34581	34581	Cap Screw - 1/2 x 3 1/4	1
3	20680	20680	20680	Nut - Hex, 1/2	1
4	20986	20986	20986	Pin - Roll	2
5	85002	85002	85002	U-Joint	1
6	14382	14382	14382	Handle	1
	36725	36725	36725	Handle (Use w/ Swinging Rear Endgate)	1
7	20074	36296	36296	Cap Screw - 3/8 x 2 3/4	1
8	20678	20678	20678	Nut - Hex, 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	13
12	20710	36418	36418	Washer - Lock, 1/4	13
13	20005	40750	40750	Cap Screw - 1/4 x 1	6
14	27297	55870	55870	Belt - Retainer	1
15	27296	27296	27296	Belt - Sealer	1
16	14262	55867	71510	Feedgate Weldment	1
	42835			Feedgate Weldment (Use with Swinging Rear Endgate)	1
17	20621	36405	36405	Screw - Machine, 1/4 x 1	7
18	14261	55868	71509	Feedgate Assembly, Includes Items 11,12,14-17	1
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

M.S. – Mild Steel S.S. – Stainless Steel



DECAL GROUP

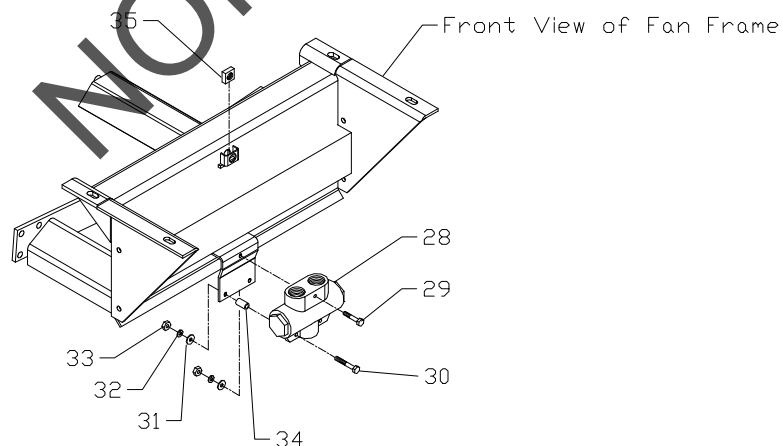
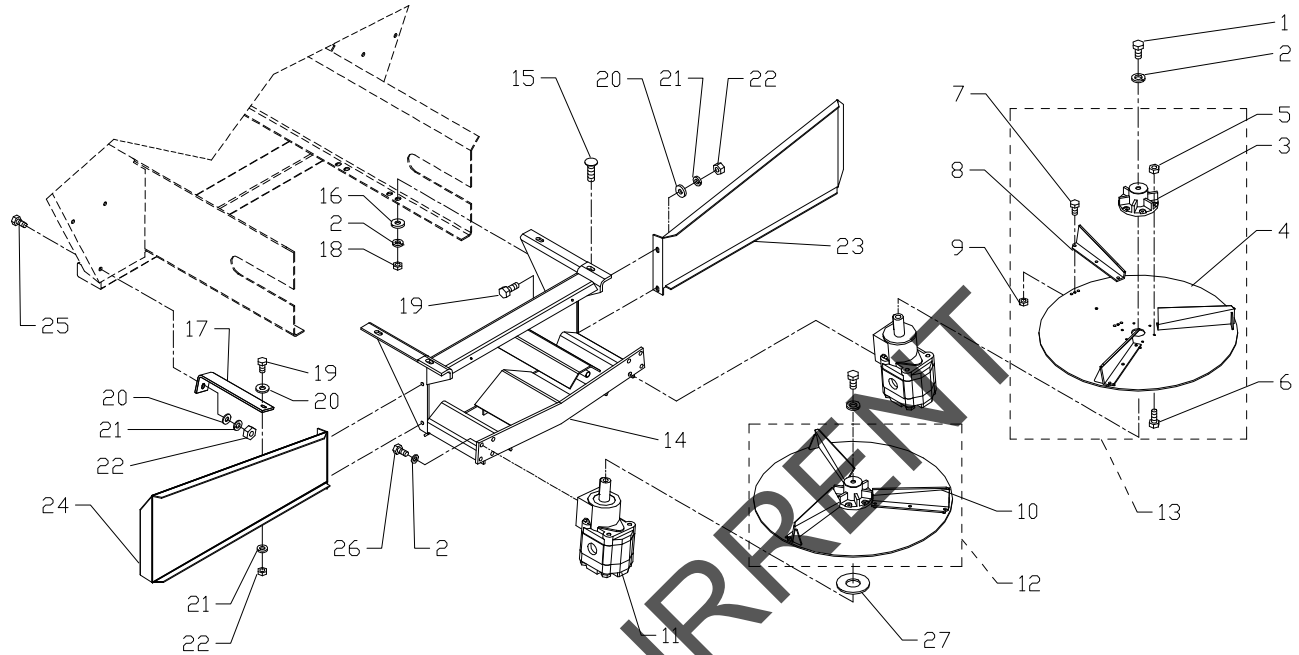


DECAL GROUP CONT'D

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	150034	Decal - Caution, To Avoid Injury	1
2	364	Decal - Danger, Moving Part Hazard	2
3	321	Decal - Caution, Hazardous Materials	1
4	8665	Decal - Important, Hydraulic Oil Only	1
5	8664	Decal - Important, Keep Valve Open	2
6	39200	Decal - Warning, Keep Off Fenders	1
7	42997	Decal - Synco-Matic	1
8	55630	Decal - Warning, Falling Hazard	1
9	55631	Decal - Warning, Moving Part Hazard	1
10	39378	Decal - Important, Change Oil	1
11	6541	Decal - Oil Lube Chart	1
12	23769	Decal - Feedgate Slide Scale	1
13	71526	Decal - Important, Adjust Spinner	1
14	368	Decal - Danger, Flying Material	1
15	39138	Decal - Warning, High Pressure Fluid	1
16	21476	Decal - Important, Conveyor Chain Life	1
17	58937	Decal - NEW LEADER, White	3
	58938	Decal - NEW LEADER, Red	3
18	58935-68	Decal - White Striping	2
	58935-80	Decal - White Striping	2
	58935-92	Decal - White Striping	2
	58935-104	Decal - White Striping	2
	58935-116	Decal - White Striping	2
	58935-128	Decal - White Striping	2
	58935-140	Decal - White Striping	2
	58936-68	Decal - Red Striping	2
	58936-80	Decal - Red Striping	2
	58936-92	Decal - Red Striping	2
	58936-104	Decal - Red Striping	2
	58936-116	Decal - Red Striping	2
	58936-128	Decal - Red Striping	2
	58936-140	Decal - Red Striping	2
19	58935-59	Decal - White Striping, Rear	1
	58936-59	Decal - Red Striping, Rear	1
20	82795	Decal - L3020GT, White	3
	82976	Decal - L3020GT, Red	3



FAN ASSEMBLY



FAN ASSEMBLY CONT'D

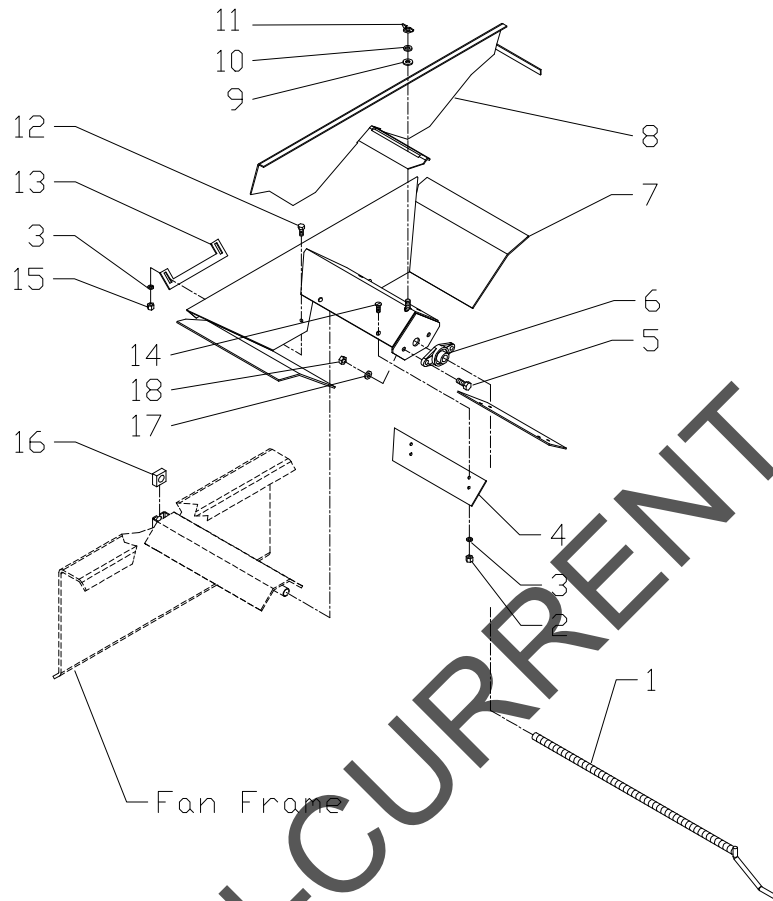
<u>ITEM</u>	<u>PART NO.</u>		<u>DESCRIPTION</u>	<u>QTY</u>
	S.S.	M.S.		
1	20128	20128	Screw - Cap, 1/2 x 1 1/4	2
2	20714	20714	Washer - Lock, 1/2	12
3	10877	10877	Weldment - Hub	2
4	27056	27056	Disc - Distributor	2
5	20676	20676	Nut - Hex, 1/4 Locking	12
6	20004	20004	Screw - Cap, 1/4 x 7/8	12
7	20034	20034	Screw - Cap, 5/16 x 3/4	18
8	25870	25870	Weldment - Fin, R.H.	3
9	20677	20677	Nut - Hex, 5/16 Locking	18
10	25871	25871	Weldment - Fin, L.H.	3
11	36580	36580	Motor - Hydraulic	2
12	14373	14373	Assembly - Fan, L.H.	1
13	14372	14372	Assembly - Fan, R.H.	1
14	82994	82993	Weldment - Fan Frame	1
15	36940	20368	Bolt - Carriage, 1/2 x 2	4
16	36426	20695	Washer - Flat, 1/2	4
17	82967	82966	Brace Shield (Use with Red-E-Vider)	2
	82969	82968	Brace Shield (Use with Lime Divider)	2
18	36416	20646	Nut - Hex, 1/2	4
19	36398	20067	Screw - Cap, 3/8 x 1	4
20	36425	20693	Washer - Flat, 3/8	4
21	36420	20712	Washer - Lock, 3/8	4
22	36414	20644	Nut - Hex, 3/8	4
23	82964	82960	Weldment - Shield, R.H.	1
24	82965	82961	Weldment - Shield, L.H.	1
25	36399	20068	Screw - Cap, 3/8 x 1 1/4	2
26	36402	20128	Screw - Cap, 1/2 x 1 1/4	6
27	72294	72294	Washer - Rubber	2
28	71781	71781	Valve - Flow Divider	1
29	34866	20012	Screw - Cap, 1/4 x 2 3/4	1
30	34865	20010	Screw - Cap, 1/4 x 2 1/4	1
31	36423	20691	Washer - Flat, 1/4	3
32	36418	20710	Washer - Lock, 1/4	3
33	36412	20642	Nut - Hex, 1/4	3
34	76825	6461	Spacer	2
35	80995	80995	Nut - Square, 5/8	1

M.S. - Mild Steel Spreader

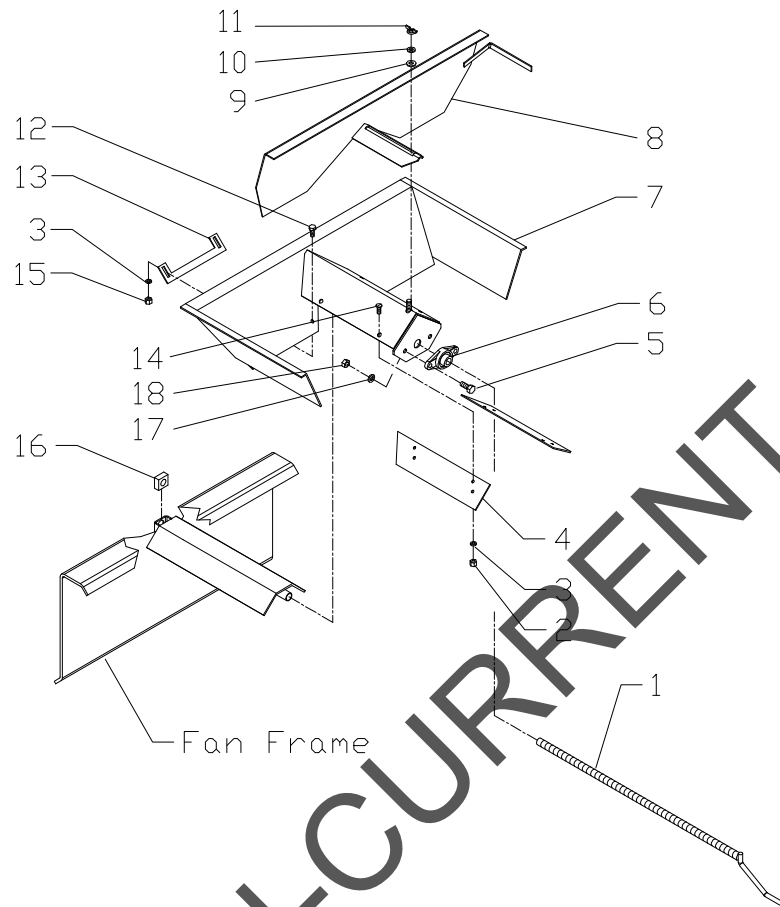
S.S. - Stainless Steel Spreader



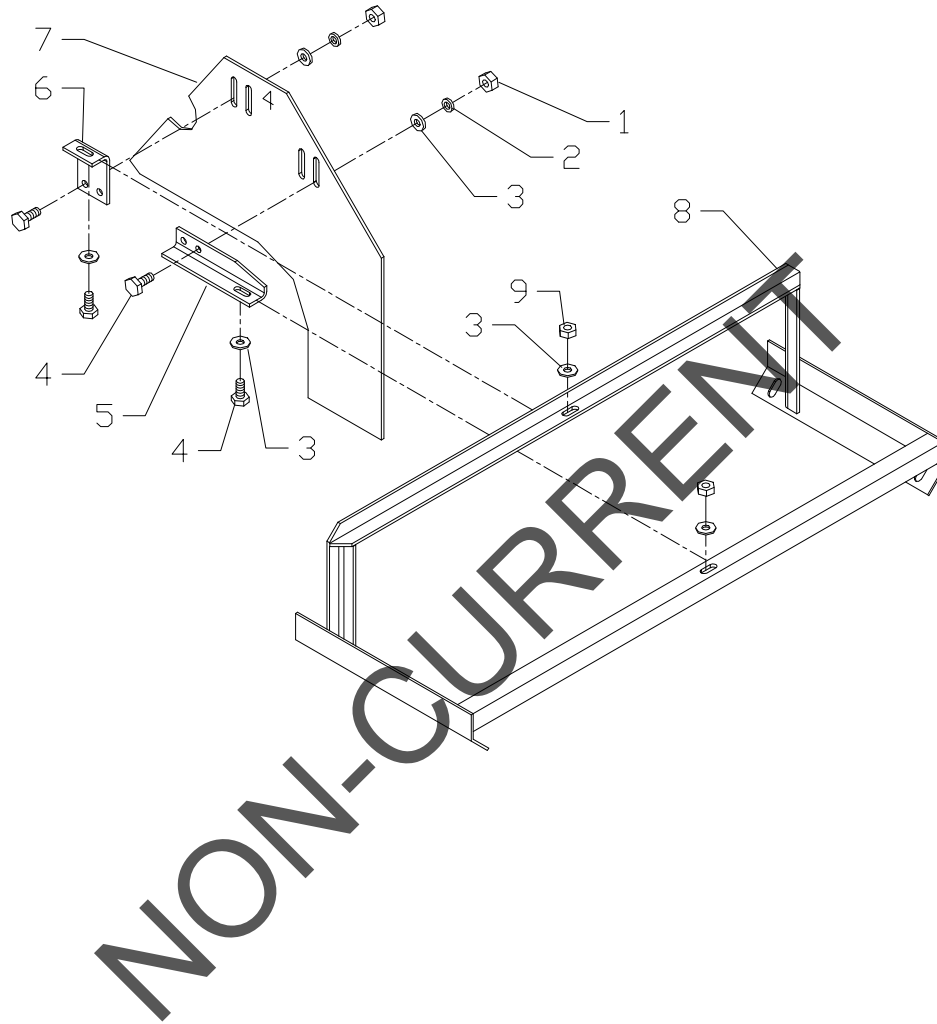
Please Give Part No., Description and Unit Serial No. 82800-C

RED - E - VIDER

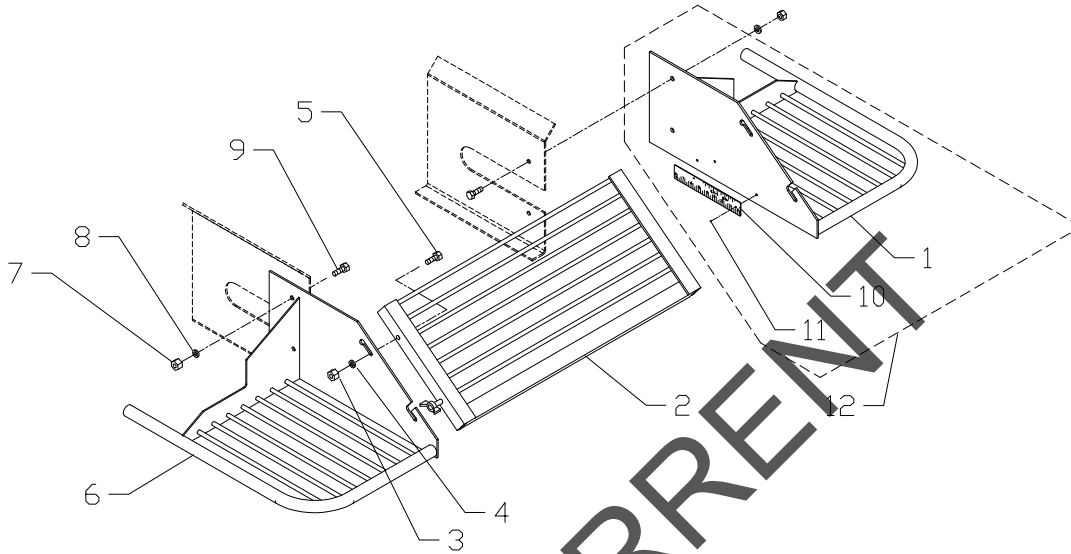
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	81228	Weldment - Adjusting Screw	1
2	32445	Nut - Wing, 1/4	4
3	36418	Washer - Lock, 1/4	4
4	81238	Extension - Vee Divider	2
5	34580	Screw - Cap, 5/16 x 1	2
6	200040	Bearing	1
7	82937	Weldment - Material Divider	1
8	82934	Weldment - Back Plate	1
9	36425	Washer - Flat, 3/8	1
10	36420	Washer - Lock, 3/8	1
11	20673	Nut - Wing, 3/8	1
12	36393	Screw - Cap, 1/4 x 3/4	2
13	81237	Bar Guide Adjuster	1
14	32446	Screw - Truss Head, 1/4 x 3/4	4
15	36412	Nut - Hex, 1/4	2
16	80995	Nut - Square, 5/8	1
17	36419	Washer - Lock, 5/16	2
18	36413	Nut - Hex, 5/16	2

LIME DIVIDER

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	81228	Weldment - Adjusting Screw	1
2	32445	Nut - Wing, 1/4	4
3	36418	Washer - Lock, 1/4	4
4	81238	Extension - Vee Divider	2
5	34580	Screw - Cap, 5/16 x 1	2
6	200040	Bearing	1
7	82946	Weldment - Material Divider	1
8	82943	Weldment - Back Plate	1
9	36425	Washer - Flat, 3/8	1
10	36420	Washer - Lock, 3/8	1
11	20673	Nut - Wing, 3/8	1
12	36393	Screw - Cap, 1/4 x 3/4	2
13	81237	Bar Guide Adjuster	1
14	32446	Screw - Truss Head, 1/4 x 3/4	4
15	36412	Nut - Hex, 1/4	2
16	80995	Nut - Square, 5/8	1
17	36419	Washer - Lock, 5/16	2
18	36413	Nut - Hex, 5/16	2

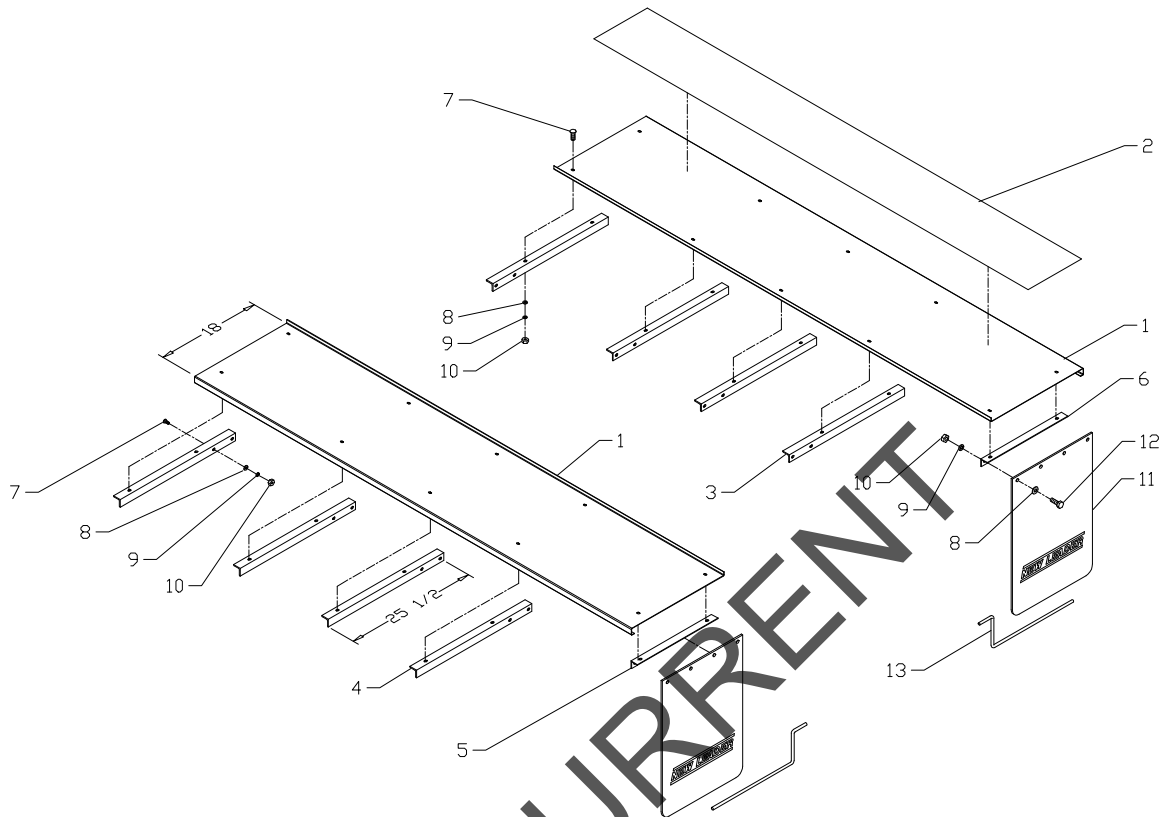
HILLSIDE FLOW DIVIDER

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	36413	Nut - Hex, 5/16 S.S.	4
2	36419	Washer - Lock, 5/16 S.S.	4
3	36424	Washer - Flat, 5/16 S.S.	8
4	34580	Screw - Cap, 5/16 x 1 S.S.	6
5	56879	Bracket - Clamp	1
6	56880	Angle - Clamp	1
7	82288	Panel	1
8	56871	Weldment - Support Bracket	1
9	20677	Nut - Hex, 5/16 Locking	2

SPINNER GUARD

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	82949	Weldment - Spinner Guard, R.H.	1
2	47337	Weldment - Spinner Guard, Center Section	1
3	72054	Nut - Hex, 3/8 Locking S.S.	2
4	36425	Washer - Flat, 3/8 S.S.	2
5	36398	Screw - Cap, 3/8 x 1 S.S.	2
6	55218	Weldment - Spinner Guard, L.H.	1
7	20644	Nut - Hex, 3/8	4
8	20714	Washer - Lock, 3/8	4
9	20067	Screw - Cap, 3/8 x 1	4
10	79866	Scale - Material Divider	1
11	6276	Screw - Drive	3
12	82908	Assembly - Spinner Guard, R.H. (Includes Items 1,10 & 11)	1

FENDER GROUP - TRUCK TIRES

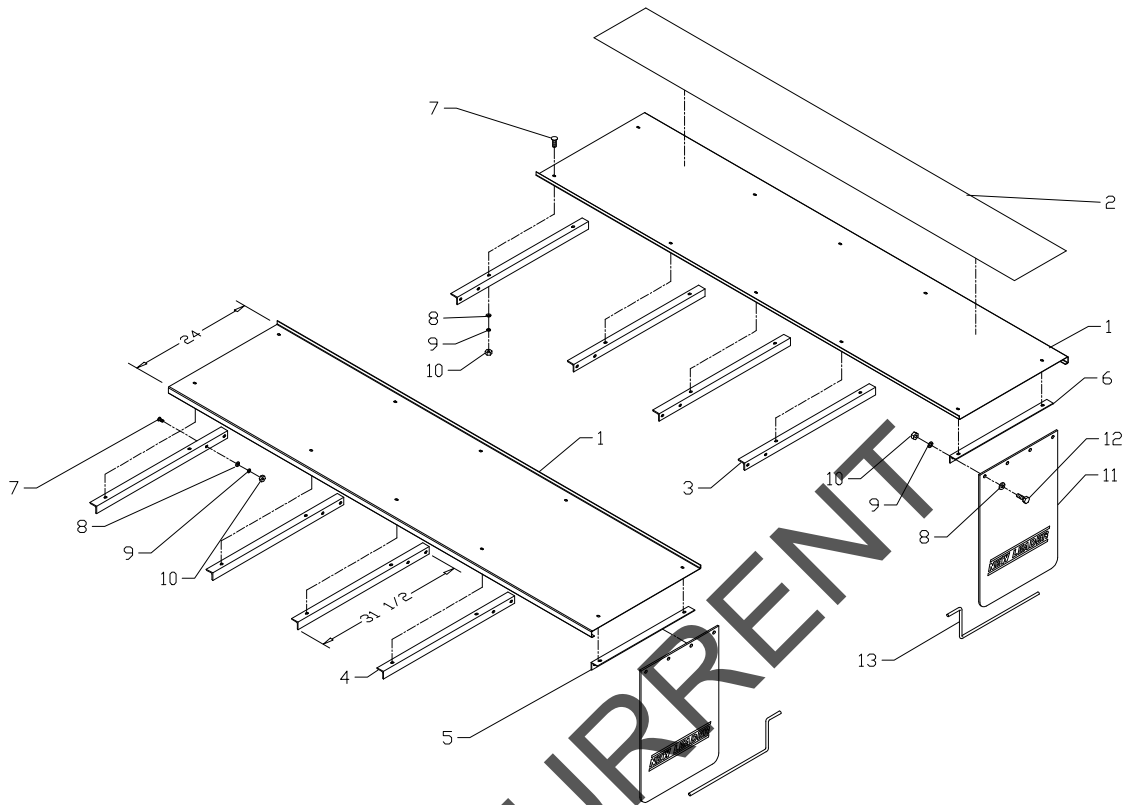


ITEM	PART NO.			DESCRIPTION	QTY
	M.S.	409 S.S.	304 S.S.		
1	83385	83395	83405	Fender - 10' Unit	2
	83386	83396	83406	Fender - 11' Unit	2
	83387	83397	83407	Fender - 12' Unit	2
	83388	83398	83408	Fender - 13' Unit	2
	83415	83418	83421	Fender - 14' Unit	2
	83416	83419	83422	Fender - 15' Unit	2
	83417	83420	83423	Fender - 16' Unit	2
2	83124	83124	83124	Material - Non-Skid	Inches A.R.
3	83383	83383	83383	Angle - Mounting, R.H.	A.R.
4	83384	83384	83384	Angle - Mounting, L.H.	A.R.
5	55855	83517	83519	Bracket - Mudflap, L.H.	1
6	55854	83516	83518	Bracket - Mudflap, R.H.	1
7	20318	36408	36408	Bolt - Carriage, 3/8 x 1	A.R.
8	20693	36425	36425	Washer - Flat, 3/8	A.R.
9	20712	36420	36420	Washer - Lock, 3/8	A.R.
10	20644	36414	36414	Nut - Hex, 3/8	A.R.
11	7793	7793	7793	Mudflap - New Leader	2
	21770	21770	21770	Mudflap - Plain	2
12	20067	36398	36398	Screw - Cap, 3/8 x 1	8
13	36844	36844	36844	Rod - Anti-Sail	2

A.R. - As Required M.S.- Mild Steel Spreader S.S.- Stainless Steel Spreader



Please Give Part No., Description and Unit Serial No. 82800-C

FENDER GROUP - SEMI-FLOAT TRUCK TIRES

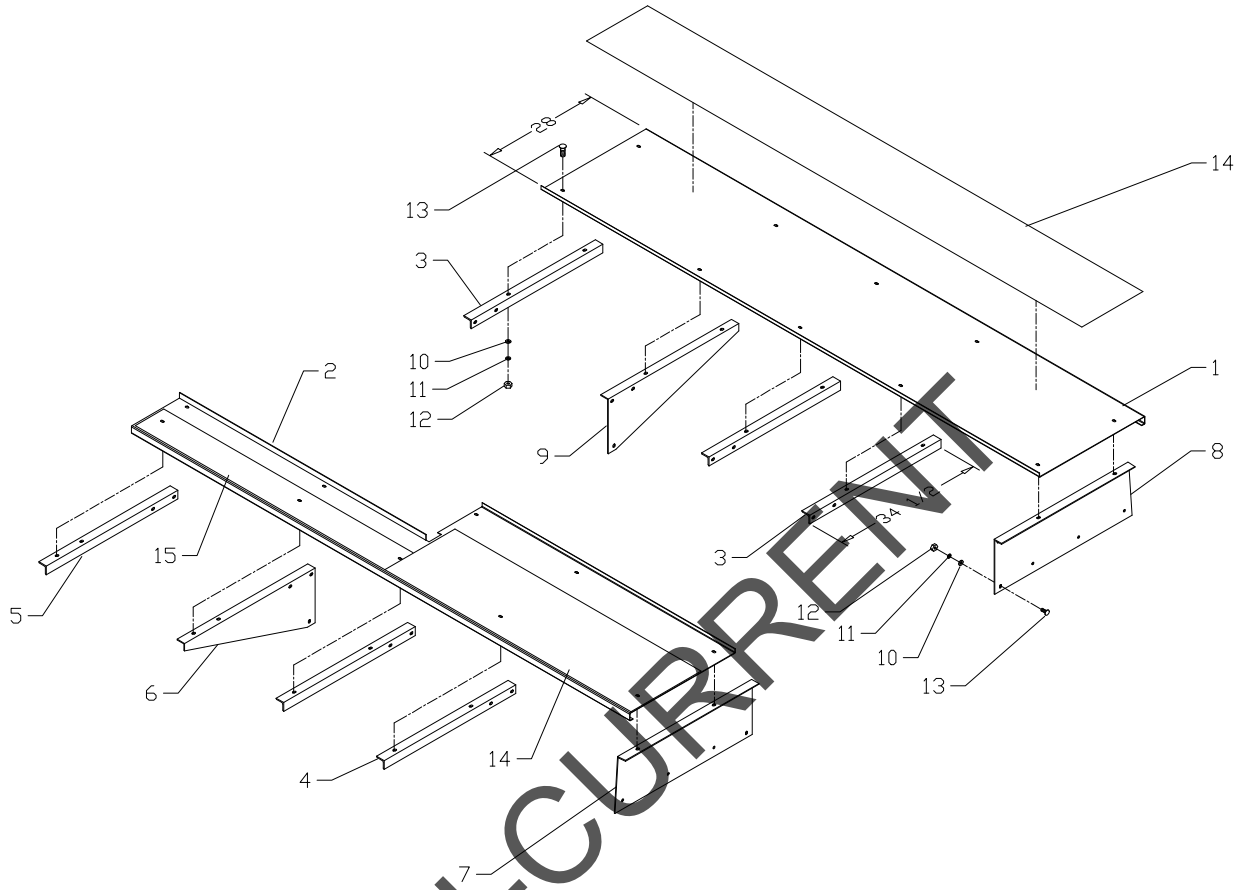
<u>ITEM</u>	<u>PART NO.</u>			<u>DESCRIPTION</u>	<u>QTY</u>
	M.S.	409 S.S.	304 S.S.		
1	83451	83461	83471	Fender - 10' Unit	2
	83452	83462	83472	Fender - 11' Unit	2
	83543	83463	83473	Fender - 12' Unit	2
	83453	83464	83474	Fender - 13' Unit	2
	83481	83484	83487	Fender - 14' Unit	2
	83482	83485	83488	Fender - 15' Unit	2
	83483	83486	83489	Fender - 16' Unit	2
2	83124	83124	83124	Material - Non-Skid, 16" Wide Inches	A.R.
3	83514	83514	83514	Angle - Mounting, R.H.	A.R.
4	83515	83515	83515	Angle - Mounting, L.H.	A.R.
5	83521	83523	83525	Bracket - Mudflap, L.H.	1
6	83520	83522	83524	Bracket - Mudflap, R.H.	1
7	20318	36408	36408	Bolt - Carriage, 3/8 x 1	A.R.
8	20693	36425	36425	Washer - Flat, 3/8	A.R.
9	20712	36420	36420	Washer - Lock, 3/8	A.R.
10	20644	36414	36414	Nut - Hex, 3/8	A.R.
11	7793	7793	7793	Mudflap - New Leader	2
	21770	21770	21770	Mudflap - Plain	2
12	20067	36398	36398	Screw - Cap, 3/8 x 1	8
13	36844	36844	36844	Rod - Anti-Sail	2

A.R. - As Required

M.S.- Mild Steel

S.S.- Stainless Steel

**Please Give Part No., Description and Unit Serial No. 82800-C**

FENDER GROUP - FULL FLOATATION TIRES

<u>ITEM</u>	<u>PART NO.</u>			<u>DESCRIPTION</u>	<u>QTY</u>
	M.S.	409 S.S.	304 S.S.		
1	83024	83040	83056	Fender - R.H., 10' Unit	1
	83025	83041	83057	Fender - R.H., 11' Unit	1
	83026	83042	83058	Fender - R.H., 12' Unit	1
	83027	83043	83059	Fender - R.H., 13' Unit	1
	83072	83078	83084	Fender - R.H., 14' Unit	1
	83073	83079	83085	Fender - R.H., 15' Unit	1
	83074	83080	83086	Fender - R.H., 16' Unit	1
2	83032	83048	83064	Fender - L.H., 10' Unit	1
	83033	83049	83065	Fender - L.H., 11' Unit	1
	83034	83050	83066	Fender - L.H., 12' Unit	1
	83035	83051	83067	Fender - L.H., 13' Unit	1
	83075	83081	83087	Fender - L.H., 14' Unit	1
	83076	83082	83088	Fender - L.H., 15' Unit	1
	83077	83083	83089	Fender - L.H., 16' Unit	1

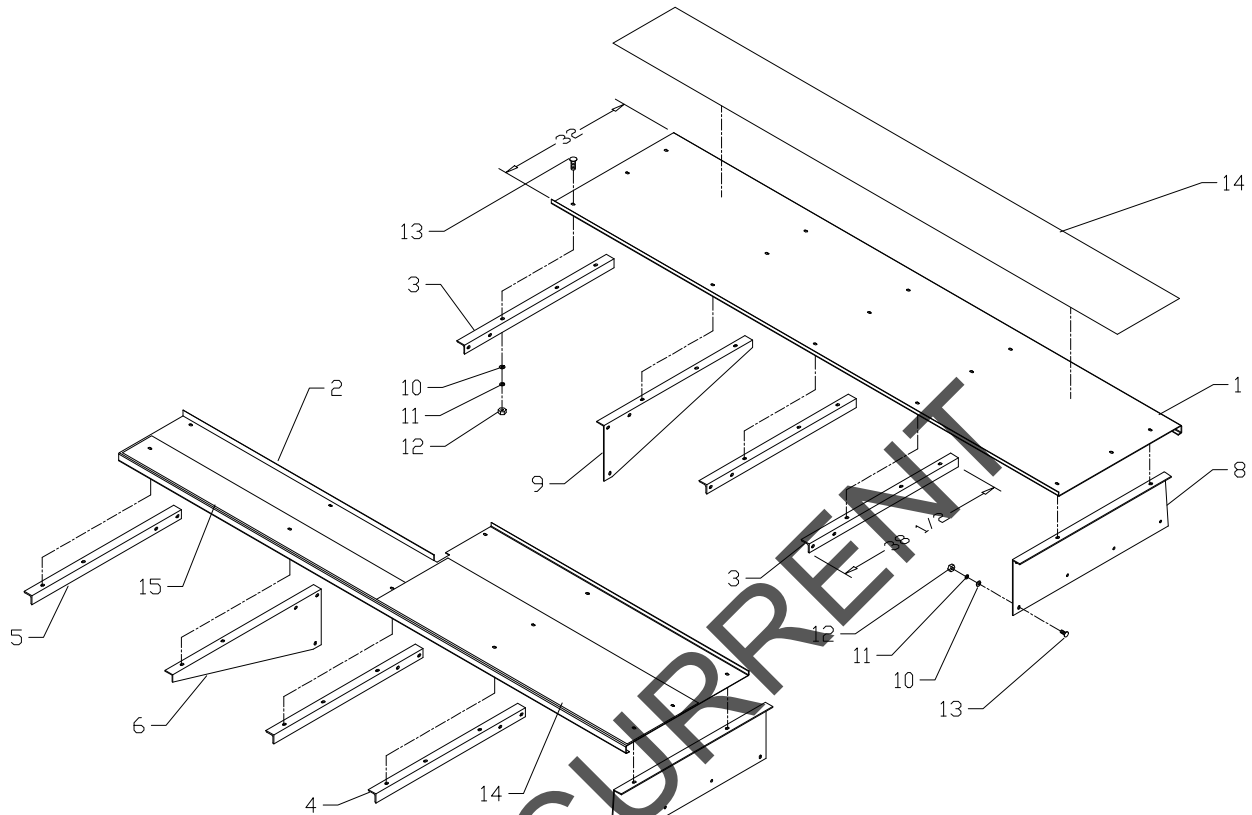
FENDER GROUP - FULL FLOATATION TIRES CONT'D

<u>ITEM</u>	<u>PART NO.</u>		<u>DESCRIPTION</u>	<u>QTY</u>
	M.S.	S.S.		
3	83021		Angle - Mounting, R.H.	A.R.
4	83022		Angle - Mounting, L.H.	A.R.
5	83023		Angle - Mounting, L.H. Front	1
6	83018		Formed Angle - L.H.	1
7	83020		Formed Angle - L.H. Rear	1
8	83019		Formed Angle - R.H. Rear	1
9	83017		Formed Angle - R.H.	1
10	20693	36425	Washer - Flat, 3/8	A.R.
11	20712	36420	Washer - Lock, 3/8	A.R.
12	20644	36414	Nut - Hex, 3/8	A.R.
13	20318	36408	Bolt - Carriage, 3/8 x 1	A.R.
14	83124	83124	Material - Non-Skid, 16" Wide	Inches A.R.
15	21699	21699	Material - Non-Skid, 8" Wide	Inches A.R.

A.R. - As Required M.S. - Mild Steel Spreader S.S. - Stainless Steel Spreader

NOTE: Items 3 through 9 are available in Mild Steel Only.



FENDER GROUP - SUPER FLOATATION TIRES

<u>ITEM</u>	<u>PART NO.</u>			<u>DESCRIPTION</u>	<u>QTY</u>
	M.S.	409 S.S.	304 S.S.		
1	83259	83275	83291	Fender - R.H., 10' Unit	1
	83260	83276	83292	Fender - R.H., 11' Unit	1
	83261	83277	83293	Fender - R.H., 12' Unit	1
	83262	83278	83294	Fender - R.H., 13' Unit	1
	83307	83313	83319	Fender - R.H., 14' Unit	1
	83308	83314	83320	Fender - R.H., 15' Unit	1
	83309	83315	83321	Fender - R.H., 16' Unit	1
2	83267	83283	83299	Fender - L.H., 10' Unit	1
	83268	83284	83300	Fender - L.H., 11' Unit	1
	83269	83285	83301	Fender - L.H., 12' Unit	1
	83270	83286	83302	Fender - L.H., 13' Unit	1
	83310	83316	83322	Fender - L.H., 14' Unit	1
	83311	83317	83323	Fender - L.H., 15' Unit	1
	83312	83318	83324	Fender - L.H., 16' Unit	1

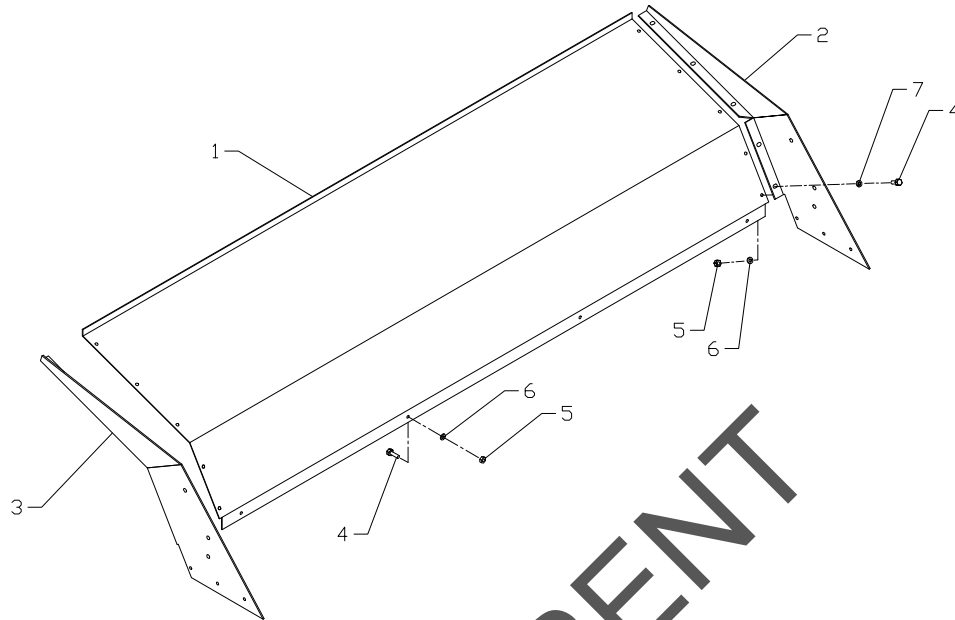
FENDER GROUP - SUPER FLOATATION TIRES CONT'D

<u>ITEM</u>	<u>PART NO.</u>		<u>DESCRIPTION</u>	<u>QTY</u>
	M.S.	S.S.		
3	83256		Angle - Mounting, R.H.	A.R.
4	83257		Angle - Mounting, L.H.	A.R.
5	83258		Angle - Mounting, L.H. Front	1
6	83253		Formed Angle - L.H.	1
7	83255		Formed Angle - L.H. Rear	1
8	83254		Formed Angle - R.H. Rear	1
9	83252		Formed Angle - R.H.	1
10	20693	36425	Washer - Flat, 3/8	A.R.
11	20712	36420	Washer - Lock, 3/8	A.R.
12	20644	36414	Nut - Hex, 3/8	A.R.
13	20318	36408	Bolt - Carriage, 3/8 x 1	A.R.
14	83124	83124	Material - Non-Skid, 16" Wide	Inches A.R.
15	21699	21699	Material - Non-Skid, 8" Wide	Inches A.R.

A.R. - As Required M.S. - Mild Steel Spreader S.S. - Stainless Steel Spreader

NOTE: Items 3 through 9 are available in Mild Steel Only.



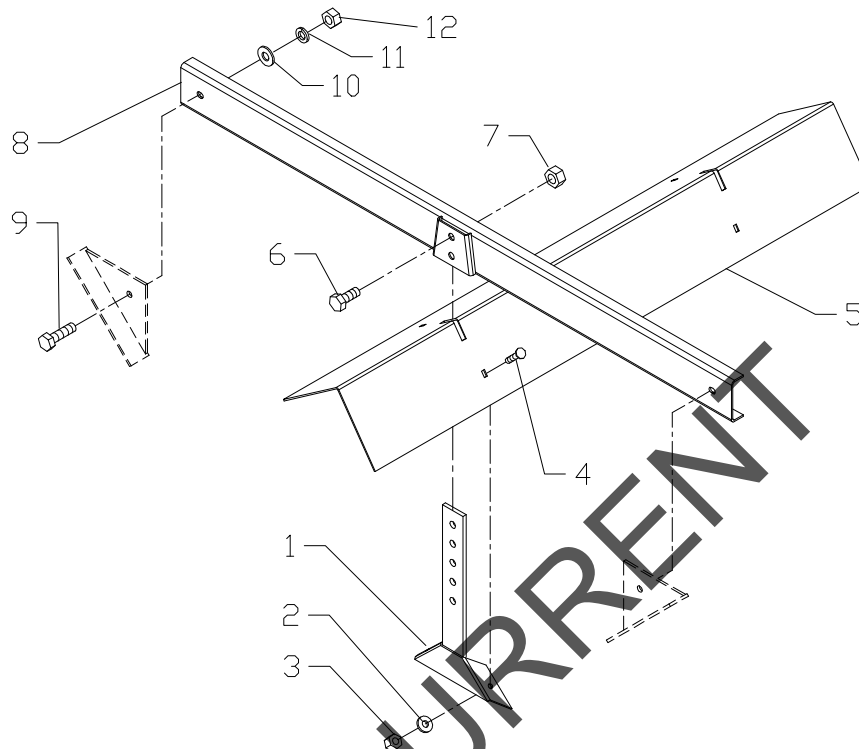
CAB SHIELD

<u>ITEM</u>	<u>PART NO.</u>			<u>DESCRIPTION</u>	<u>QTY</u>
	M.S.	409 S.S.	304 S.S.		
				Assembly Group - Cab Shield:	
	55923	79147	79146	57" x 88"	
	55924	79149	79148	63" x 88"	
	55925	79151	79150	69" x 88"	
	82786	82787	82788	57" x 102"	
	82789	82790	82791	63" x 102"	
	82792	82793	82794	69" x 102"	
1	55926	79161	79160	Panel - Cab Shield, 57" x 88"	1
	55927	79163	79162	Panel - Cab Shield, 63" x 88"	1
	55928	79165	79164	Panel - Cab Shield, 69" x 88"	1
	82777	82778	82779	Panel - Cab Shield, 57" x 102"	1
	82780	82781	82782	Panel - Cab Shield, 63" x 102"	1
	82783	82784	82785	Panel - Cab Shield, 69" x 102"	1
2	31788	79167	79166	Weldment - R.H. Support, 57"	1
	39813	79171	19170	Weldment - R.H. Support, 63"	1
	39819	79175	79174	Weldment - R.H. Support, 69"	1
3	31789	79169	79168	Weldment - L.H. Support, 57"	1
	39815	79173	79172	Weldment - L.H. Support, 63"	1
	39821	79177	79176	Weldment - L.H. Support, 69"	1
4	20067	36398	36398	Screw - Cap, 3/8 x 1	A.R.
5	20644	36414	36414	Nut - Hex, 3/8	A.R.
6	20712	36420	36420	Washer - Lock, 3/8	A.R.
7	20693	36425	36425	Washer - Flat, 3/8	A.R.

A.R. - As Required M.S. - Mild Steel S.S. - Stainless Steel



Please Give Part No., Description and Unit Serial No. 82800-C

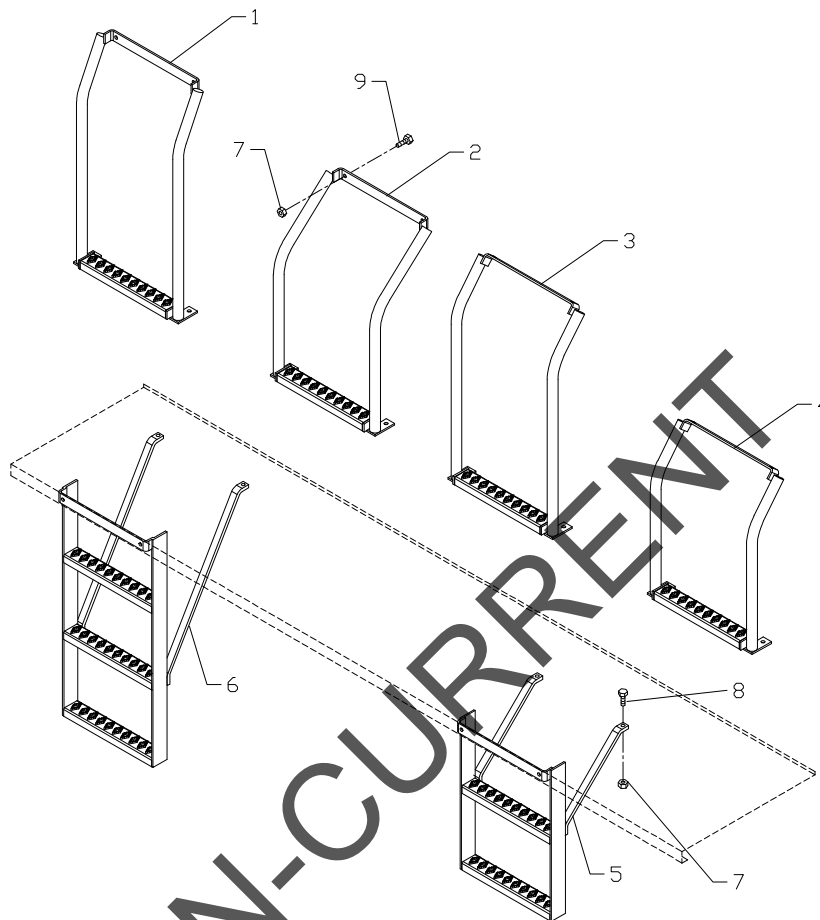
GROUP - INVERTED VEE

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

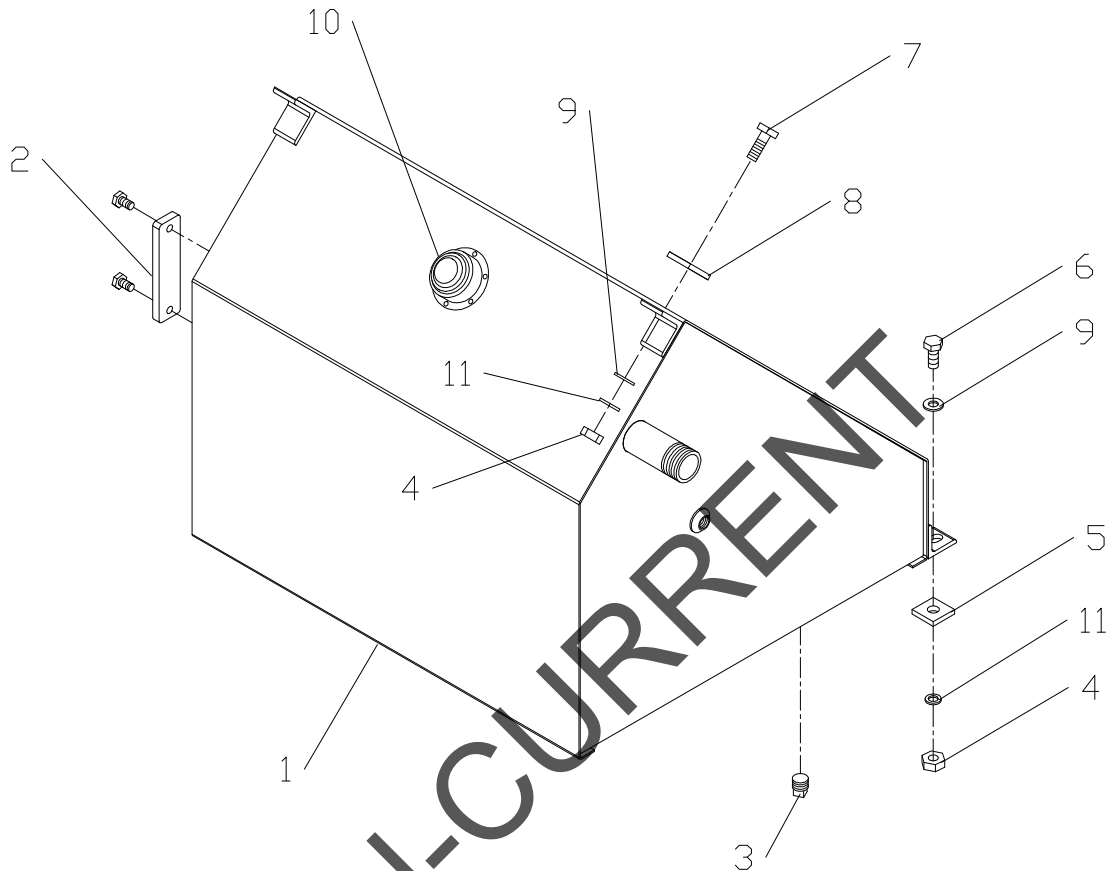
A.R. - As Required M.S. - Mild Steel Spreader S.S. - Stainless Steel Spreader



Please Give Part No., Description and Unit Serial No. 82800-C

LADDERS

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	72776	Ladder - Upper (Used on 88" Wide Body/Standard Fenders)	1
2	72799	Ladder - Upper (Used on 88" Wide Body/Raised Fenders)	1
3	72779	Ladder - Upper (Used on 102" Wide Body/Standard Fenders)	1
4	72778	Ladder - Upper (Used on 102" Wide Body/Raised Fenders)	1
5	72796	Ladder - Lower (Used on Raised Fenders)	1
6	72797	Ladder - Lower (Used on Standard Fenders)	1
7	20644	Nut - Hex, 3/8	8
8	20069	Screw - Cap, 3/8 x 1 1/2	2
9	20068	Screw - Cap, 3/8 x 1 1/4	6

RESERVOIR

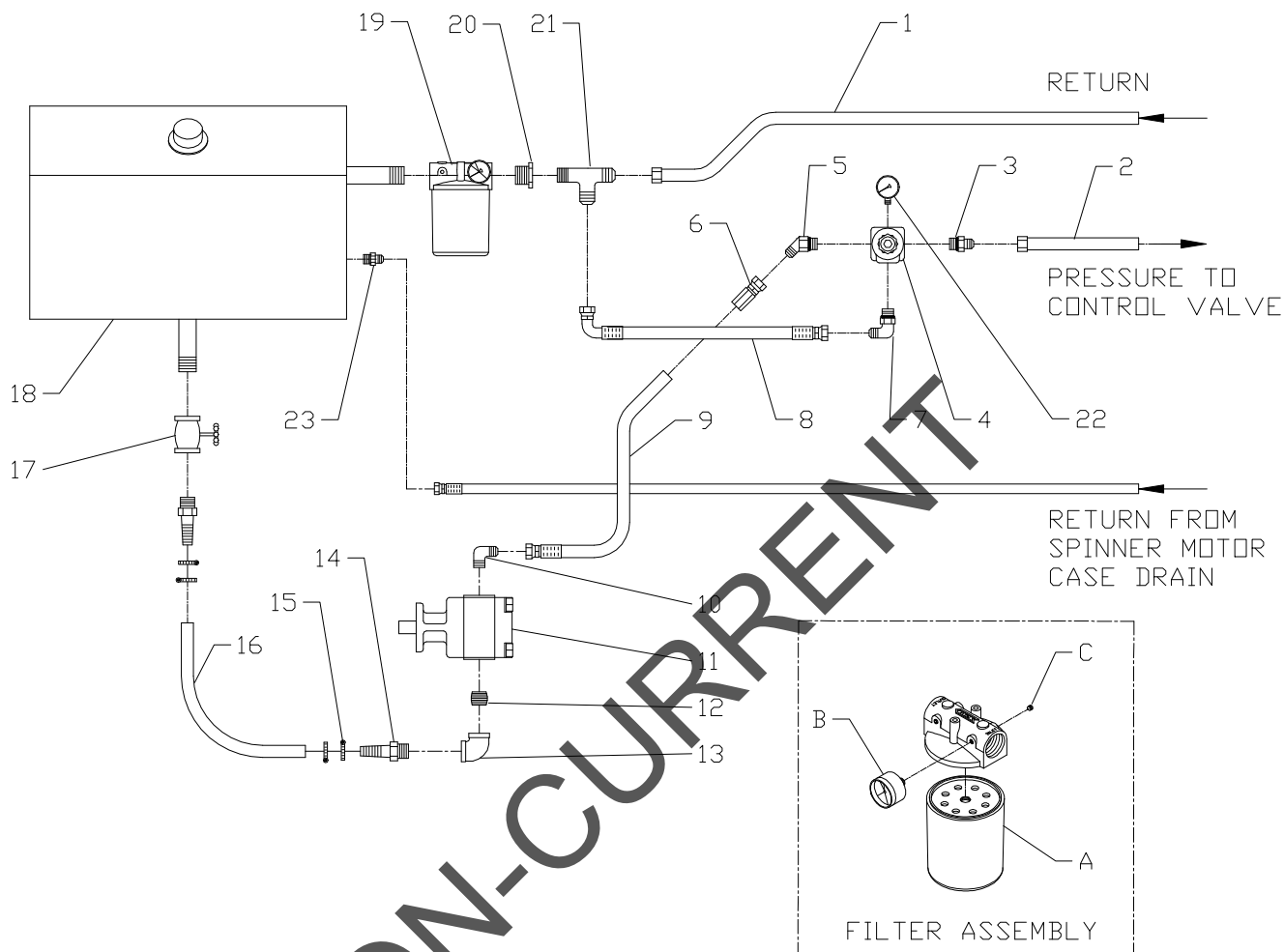
<u>ITEM</u>	<u>PART NO.</u>		<u>DESCRIPTION</u>	<u>QTY</u>
	M.S.	S.S.		
1	83004	83004	Assembly - Tank (Includes Items 2 - 4 & 11)	1
2	38575	38575	Assembly - Sight & Temperature Gauge	1
3	6033	6033	Plug - Pipe, 3/4	1
4	20680	36416	Nut - Hex, 1/2	4
5	39158	39158	Belt - Flex Mount	2
6	20128	36402	Screw - Cap, 1/2 x 1 1/4	2
7	20129	36539	Screw - Cap, 1/2 x 1 1/2	2
8	39159	39159	Belt - Flex Mount	2
9	20695	36426	Washer - 1/2	4
10	21850	21850	Assembly - Filler Cap	1
11	20714	36422	Washer - Lock, 1/2	4

M.S. - Mild Steel S.S. - Stainless Steel



Please Give Part No., Description and Unit Serial No. 82800-C

RESERVOIR/PUMP HYDRAULICS

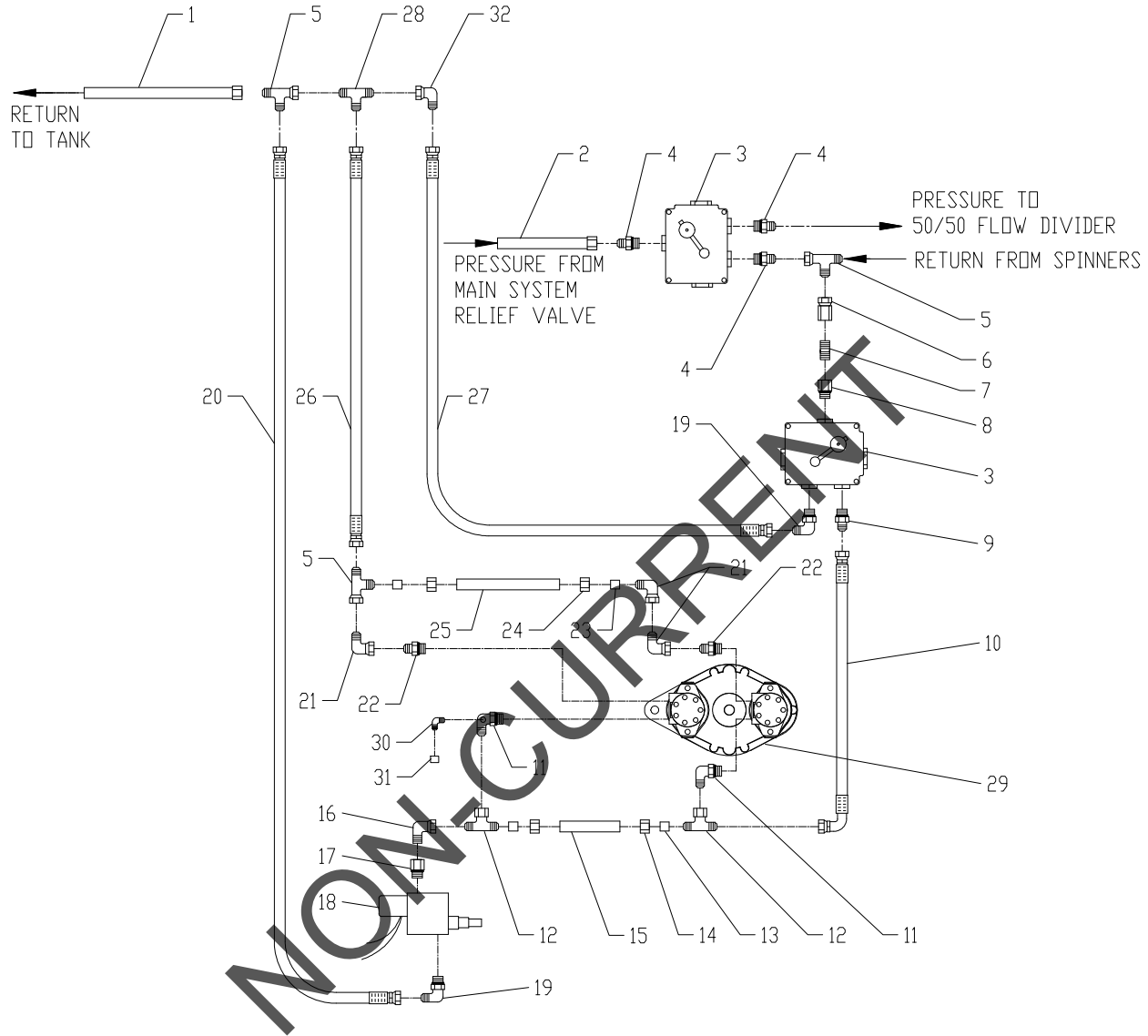


<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	82970	Tube Assembly - 10' Unit	1
	82971	Tube Assembly - 11' Unit	1
	82972	Tube Assembly - 12' Unit	1
	82973	Tube Assembly - 13' Unit	1
	82974	Tube Assembly - 14' Unit	1
	82975	Tube Assembly - 15' Unit	1
	82976	Tube Assembly - 16' Unit	1
2	43538	Tube Assembly - 10' Unit	1
	43539	Tube Assembly - 11' Unit	1
	43540	Tube Assembly - 12' Unit	1
	43541	Tube Assembly - 13' Unit	1
	43542	Tube Assembly - 14' Unit	1
	43543	Tube Assembly - 15' Unit	1
	43544	Tube Assembly - 16' Unit	1

RESERVOIR/PUMP HYDRAULICS CONT'D

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
3	29803	Adapter	1
4	37447	Valve - Relief	1
	43488	Cartridge - Relief Valve	1
5	34726	Adapter - Elbow 45°	1
6	56509	End - Hose	1
7	29840	Adapter - Elbow 90°	1
8	83013	Assembly - Hose	1
9	29610	Assembly - Hose (Use with Driveline Pump)	1
	29688	Assembly - Hose (Use with Direct Mount Pump)	1
10	29764	Adapter	1
11	Driveline Direct Mount		
	22395 30168	Assembly - Pump, 1 3/4"	1
	22396 31232	Assembly - Pump, 2"	1
	22397 36847	Assembly - Pump, 2 1/4"	1
	22398 31233	Assembly - Pump, 2 1/2"	1
12	6028	Nipple	1
13	6011	Elbow	1
14	24502	End - Hose	1
15	6288	Clamp	1
16	21878-72	Hose (Use with Driveline Pump)	1
	21878-108	Hose (Use with Direct Mount Pump)	1
17	22155	Valve - Gate	1
18	83004	Assembly - Hydraulic Reservoir	1
19	39845	Assembly - Filter	1
A	43530	Filter	1
B	43534	Indicator - Service	1
C	6029	Plug - Pipe	3
20	22206	Bushing	1
21	34730	Tee	1
22	28389	Gauge	1
23	29766	Adapter	1

MANUAL CONTROL HYDRAULICS

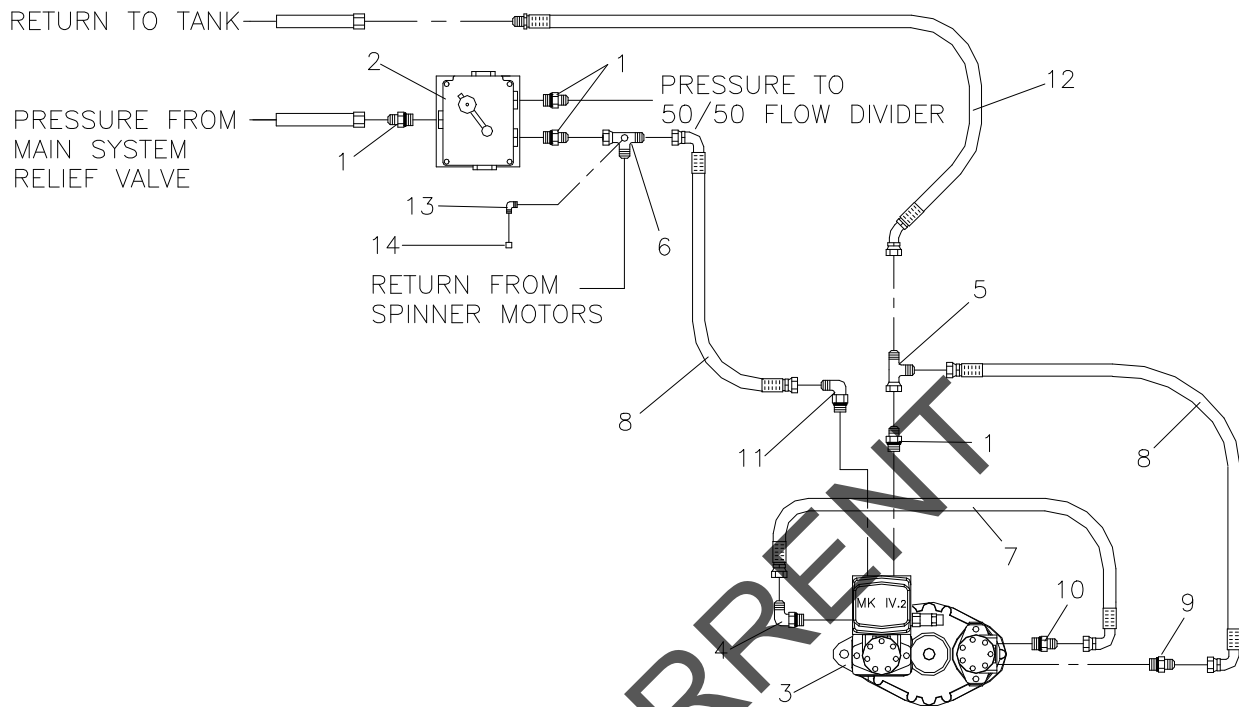


ITEM	PART NO.	DESCRIPTION	QTY
1	43538 - 43544	Assembly - Tube, 10' - 16' Units (Refer to Tank/Pump Hydraulics Page)	1
2	82970 - 82976	Assembly - Tube, 10' - 16' Units (Refer to Tank/Pump Hydraulics Page)	1
3	38576	Valve - Control	2
4	29803	Adapter	3
5	29850	Adapter - Tee	3
6	34716	Adapter - Swivel	1
7	16363	Nipple - Close	1
8	22017	Adapter	1

MANUAL CONTROL HYDRAULICS CONT'D

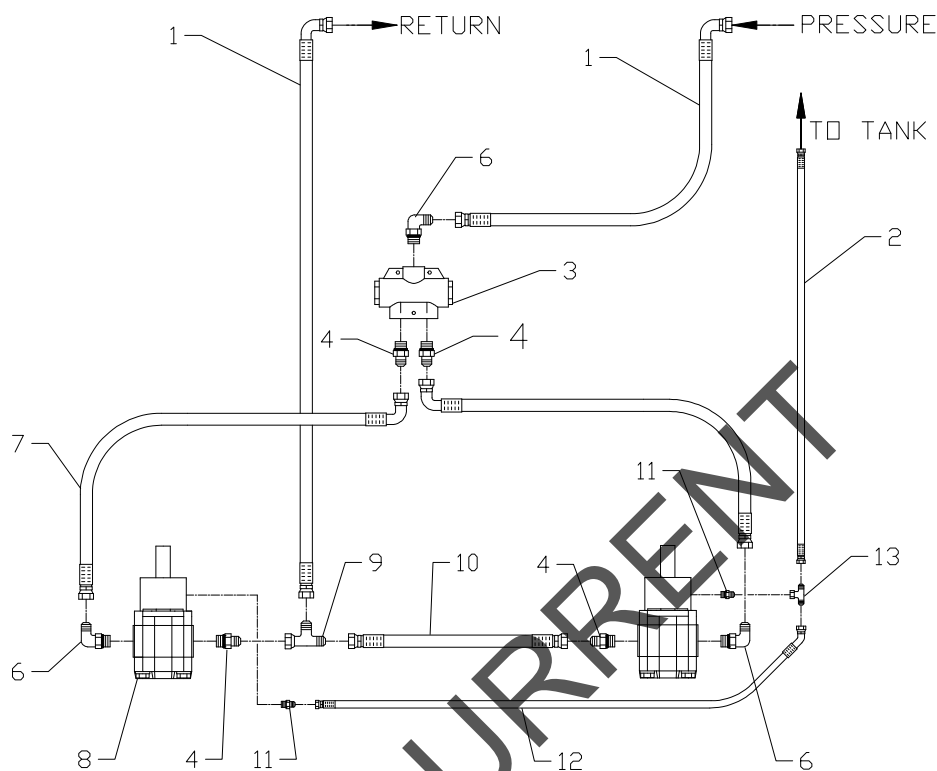
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
9	29835	Adapter	1
10	56107	Assembly - Hose	1
11	29773	Adapter - Elbow 90°	2
12	29809	Adapter - Tee	2
13	34744	Sleeve - Tube	2
14	34739	Fitting - Tube	2
15	85253	Tube - Hydraulic	1
16	29827	Adapter - Elbow 90°	1
17	21505	Adapter - Bushing	1
18	78948	Valve - Dump with Relief	1
19	29840	Adapter - Elbow 90°	2
20	79555	Assembly - Hose	1
21	29807	Adapter - Elbow 90°	3
22	29778	Adapter	2
23	34745	Sleeve - Tube	2
24	34740	Fitting - Tube	2
25	85255	Tube - Hydraulic	1
26	82958	Assembly - Hose	1
27	79554	Assembly - Hose	1
28	34711	Adapter - Tee	1
29	57304	Assembly - Gear Case	1
	38897	Motor - Hydraulic, 1 1/2"	2
30	34732	Adapter - Elbow 90°	1
31	34855	Cap	1
32	76579	Adapter - Elbow, Tapped	1

MARK IV CONTROL HYDRAULICS

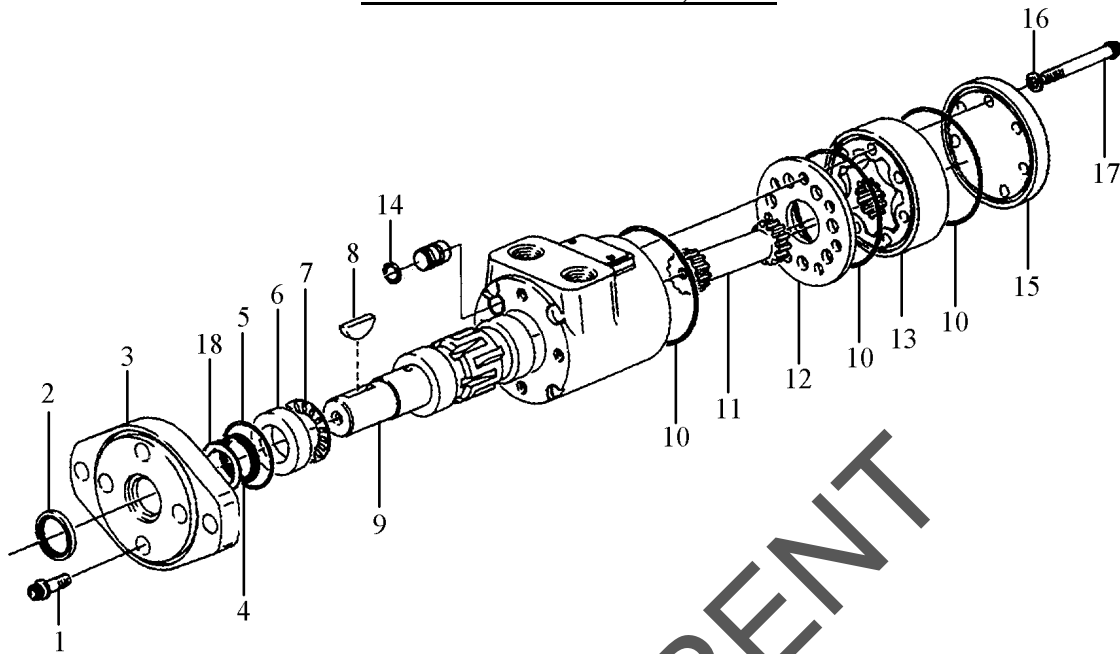


<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	29803	Adapter	4
2	38576	Valve - Flow Control	1
	42794	Cap Screw - 5/16 x 3.75	4
	42221	Nut - Lock, 5/16	4
3	84957	Mark IV.2 Gear Case Assembly	1
	84955	Gear Case - Dual Pinion (for 84957)	1
	82852	Mark IV Gear Case Assembly	1
	82909	Gear Case - Dual Pinion (for 82852)	1
	82459	Motor - Hydraulic, 1 1/4" Standard	1
	82462	Motor - Hydraulic, 1 1/4" Modified	1
4	29847	Adapter - Elbow 90°	1
5	29850	Adapter - Tee	1
6	34751	Adapter - Tee	1
7	54773	Hose Assembly	1
8	56121	Hose Assembly	2
9	29778	Adapter	1
10	29753	Adapter	1
11	29840	Adapter - Elbow 90°	1
12	85150	Hose Assembly	1
13	34732	Adapter - Elbow 90°	1
14	34855	Adapter - Cap	1

TWIN SPINNER HYDRAULICS



<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	56109	Assembly - Hose	2
2	82977	Assembly - Hose, 10' Unit	1
	82978	Assembly - Hose, 11' Unit	1
	82979	Assembly - Hose, 12' Unit	1
	82980	Assembly - Hose, 13' Unit	1
	82981	Assembly - Hose, 14' Unit	1
	82982	Assembly - Hose, 15' Unit	1
	82983	Assembly - Hose, 16' Unit	1
3	71781	Valve - Flow Divider	1
4	29803	Adapter	4
5	29807	Adapter - 90°	1
6	29840	Adapter - 90°	3
7	29712	Assembly - Hose	2
8	36580	Motor - Spinner	2
9	29850	Tee - Run	1
10	29731	Assembly - Hose	1
11	34763	Adapter	1
12	82907	Assembly - Hose	1
13	29825	Tee	1

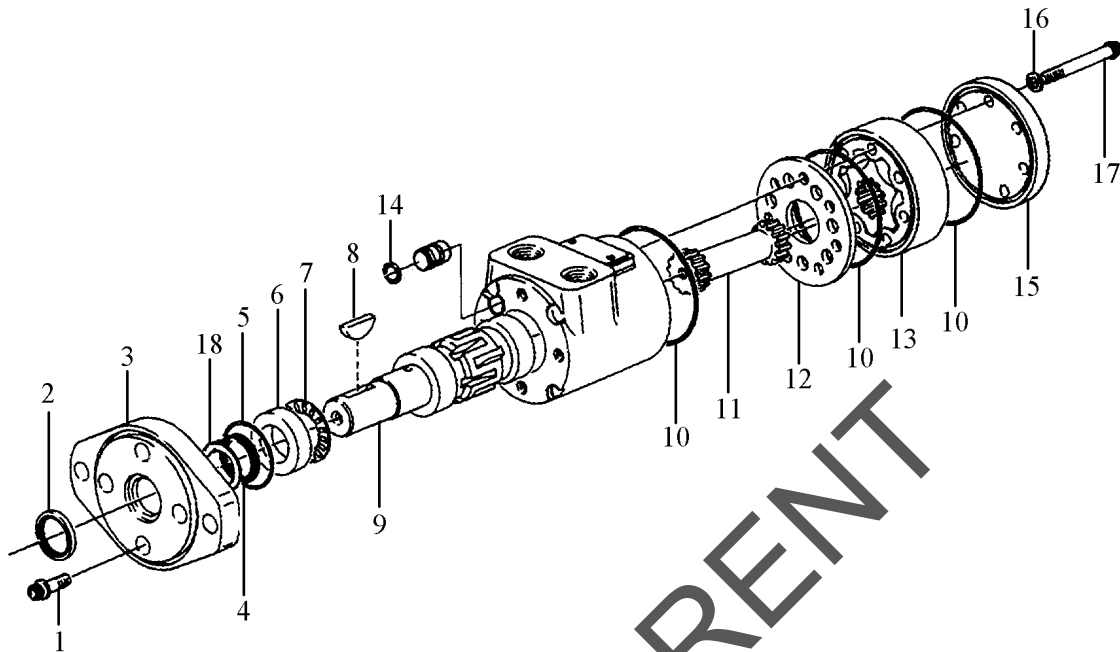
CONVEYOR MOTOR, 1 1/4"

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
	82459	Motor - Hydraulic, 1 1/4" Standard	
	82462	Motor - Hydraulic, 1 1/4" Modified	
1	30665	Screw - Cap	4
2	73471	Seal	1
3	73555	Flange - Mounting (Used on 82459)	1
	73556	Flange - Mounting (Used on 82462)	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	1
11	83014	Drive	1
12	37388	Plate - Spacer	1
13	83015	Gerotor - 1 1/4"	1
14	22068	Seal - "O" Ring	1
15	37400	Cap - End	1
16	37381	Washer - Seal	7
17	83016	Screw - Cap	7
18	73472	Washer - Back-up	1
19	* 73477	Seal - "O" Ring	1
	39137	Kit - Seal, Includes Items 2,4,5,10,16,18 & 19	

* - Not Shown



Please Give Part No., Description and Unit Serial No. 82800-C

CONVEYOR MOTOR, 1 1/2"

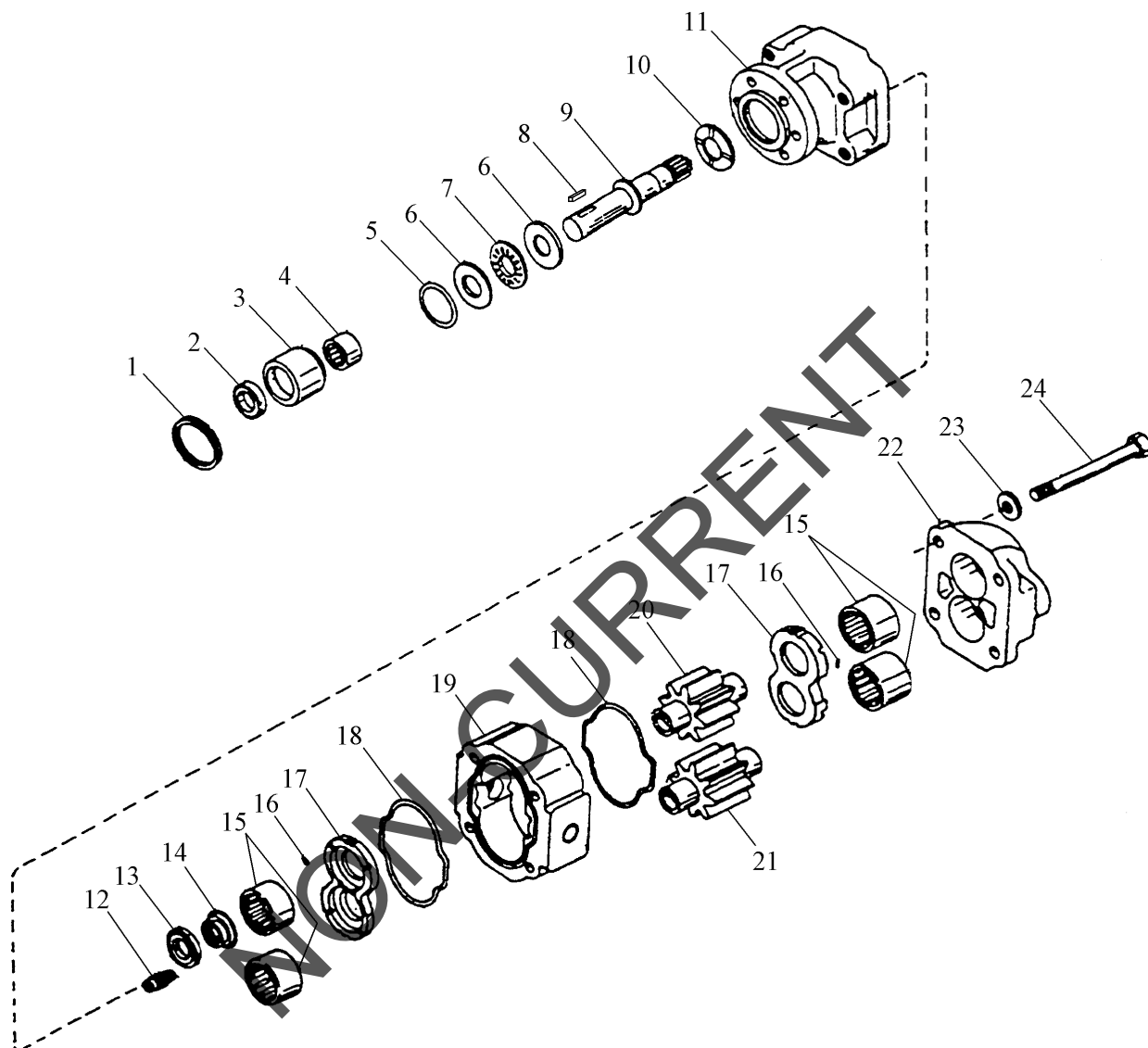
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
	38897	Motor - Hydraulic, 1 1/2"	
1	30665	Screw - Cap	4
2	73471	Seal	1
3	73555	Flange - Mounting (Used on 82459)	1
4	73473	Seal	1
5	73474	Seal - "O" Ring	1
6	37385	Race - Bearing	1
7	37401	Bearing - Thrust Needle	1
8	3065	Key	1
9	37386	Shaft - Output Keyed	1
10	73480	Seal - "O" Ring	1
11	83014	Drive	1
12	37388	Plate - Spacer	1
13	73553	Gerotor - 1 1/2"	1
14	22068	Seal - "O" Ring	1
15	37400	Cap - End	1
16	37381	Washer - Seal	7
17	16937	Screw - Cap	7
18	73472	Washer - Back-up	1
19	* 73477	Seal - "O" Ring	1
	39137	Kit - Seal, Includes Items 2,4,5,10,16,18 & 19	

* - Not Shown



Please Give Part No., Description and Unit Serial No. 82800-C

DRIVE SHAFT PUMP



PART NO.

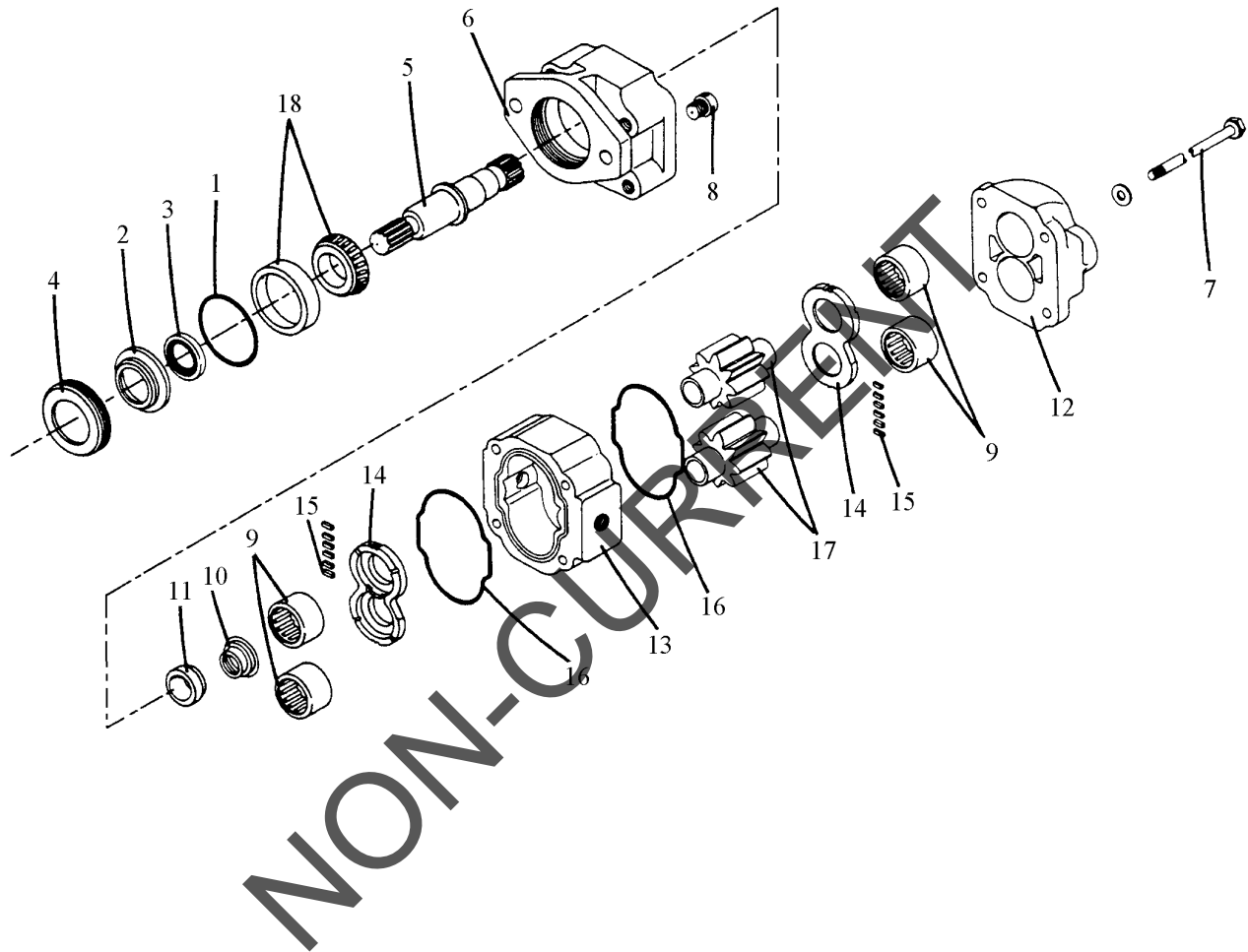
DESCRIPTION

22395	Pump - Gear, 1 3/4"
22396	Pump - Gear, 2"
22397	Pump - Gear, 2 1/4"
22398	Pump - Gear, 2 1/2"

DRIVE SHAFT PUMP CONT'D

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
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	Thrust Bearing Race	1
7	23810	Thrust Bearing	1
8	23809	Thrust Bearing Race	1
9	23821	Shaft - Drive	1
10	23827	Thrust Washer	1
11	23801	Cover - Shaft End	1
12	23805	Check Assembly	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	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:	
21		Gear - Driven, Comes only as a matched set:	
	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 - Port End	1
23	N/A	Washer	4
24	20189	Screw - Cap for 1 3/4" Pump	4
	20190	Screw - Cap for 2" Pump	4
	20191	Screw - Cap for 2 1/4" Pump	4
	20192	Screw - Cap for 2 1/2" Pump	4
	27490	Kit - Seal (Includes Items 1,2,5,7,8,13,16 & 18)	
	27491	Kit - Shaft & Seal (Includes Items 4,9 & PN 27490)	

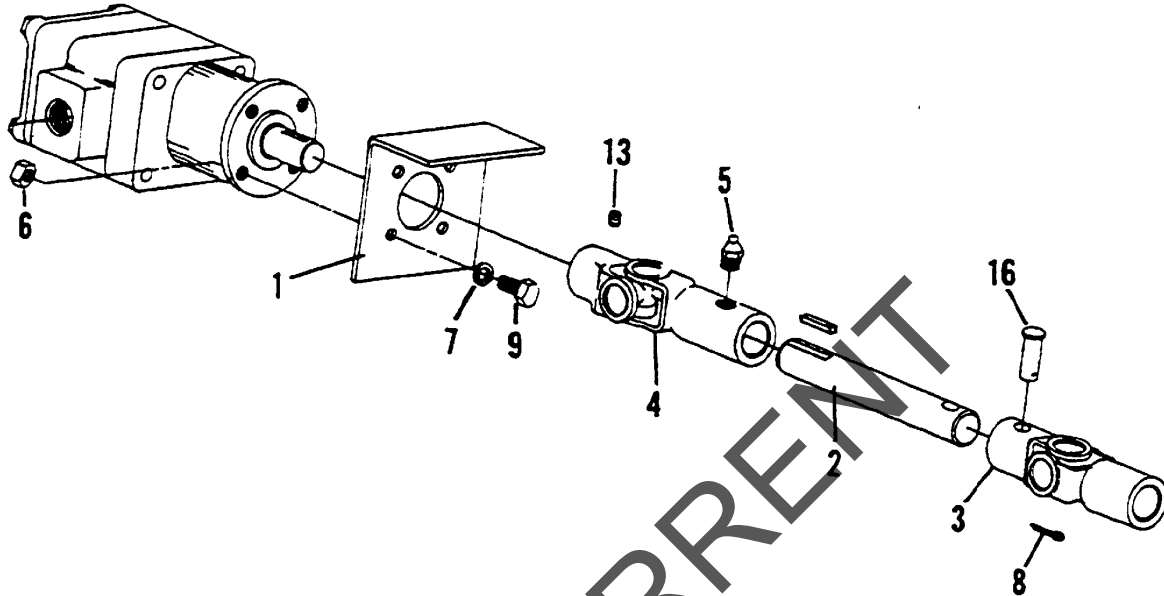
DIRECT MOUNT PUMP



<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
	30168	Pump - Gear, 1 3/4"	
	31232	Pump - Gear, 2"	
	36847	Pump - Gear, 2 1/4"	
	31233	Pump - Gear, 2 1/2"	
1	11760	"O" Ring	1
2	11761	Seal - Double Lip	1
3	11762	Seal - Double Lip	1
4	11763	Ring - Retainer	1
5	11764	Shaft - Drive	1

DIRECT MOUNT PUMP CONT'D

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
6	13149	Shaft - End Cover	1
7	20189	Screw - Cap for 1 3/4" Pump	4
	20190	Screw - Cap for 2" Pump	4
	20191	Screw - Cap for 2 1/4" Pump	4
	20192	Screw - Cap for 2 1/2" Pump	4
8	23805	Check Assembly	2
9	23806	Bearing - Roller	4
10	23807	Spring	1
11	23808	Bushing - Shaft	1
12	23812	Cover - Port End	1
13	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	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 1,2,3,15 & 16)	

PUMP MOUNTING KIT

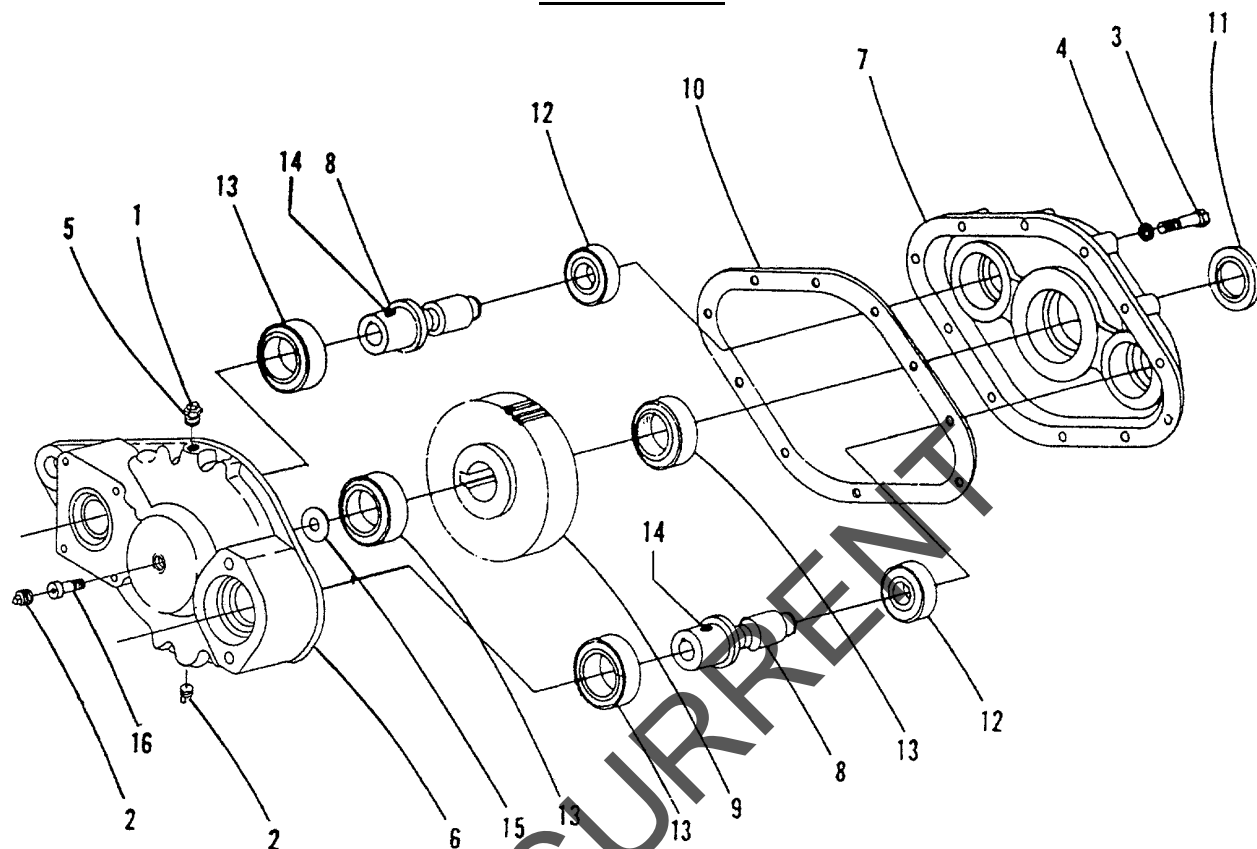
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	13850	Weldment - Pump Bracket	1
2	17932	Shaft - Drive	1
3	7210	U-Joint	1
4	5649	U-Joint	1
	11756	Group - Hardware (Includes Items 5 - 10)	1
5	6069	Zerk - Grease	1
6	20644	Nut - Hex	4
7	20712	Washer - Lock	4
8	20817	Pin - Cotter	1
9	20069	Screw - Cap	4
10	* 20129	Screw - Cap	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

* - Not Shown



Please Give Part No., Description and Unit Serial No. 82800-C

GEAR CASE

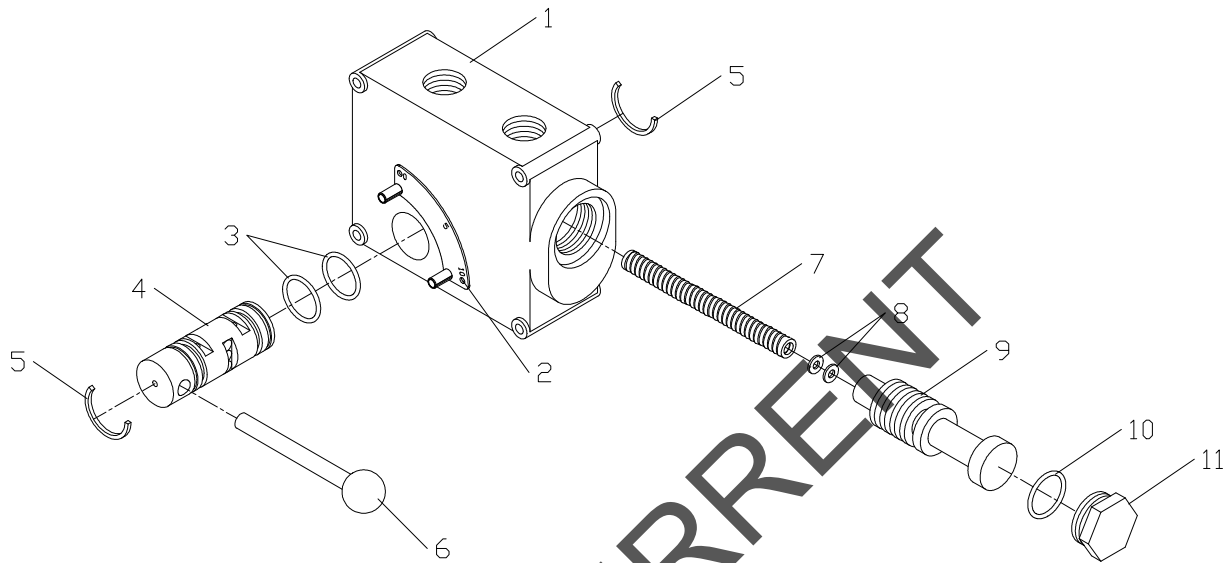


<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
	55971	Assembly - Gear Case (Used with Mark IV)	
	37985	Assembly - Gear Case (Used with Manual Hydraulics)	
1	2564	Cap - Breather	1
2	6031	Plug - Pipe	2
3	20040	Screw - Cap, 5/16 x 2	10
4	20711	Washer - Lock, 5/16	10
5	27465	Bushing - Pipe, 1/8 x 7/8	9
6	55974	Housing - Outboard (Mark IV)	1
	* 38983	Housing - Outboard (Manual)	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 - Set, 5/16 x 3/4 Lock	1
15	38979	Washer	2
16	38980	Screw - Allen Head	1



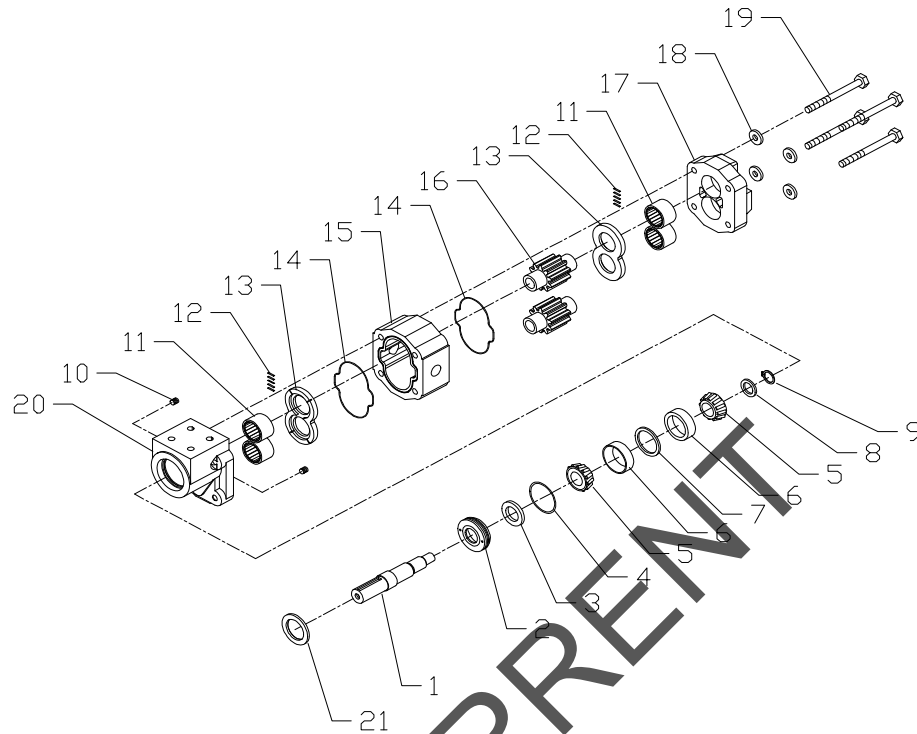
Please Give Part No., Description and Unit Serial No. 82800-C

* - Not Shown

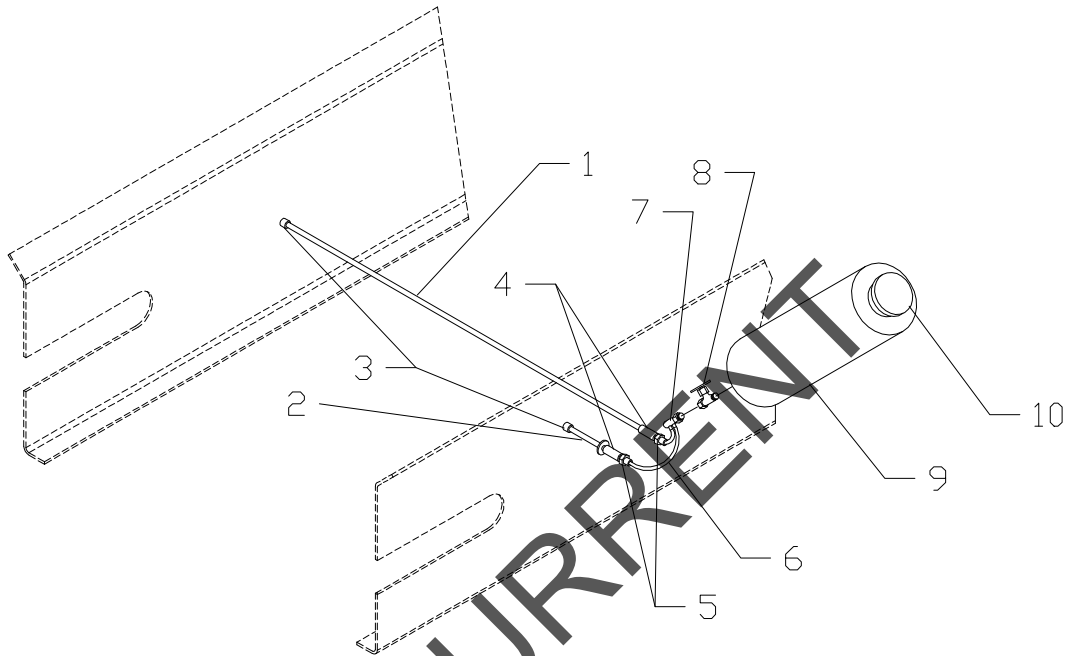
CONTROL VALVE

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	38576	Valve - Flow Control	1
2	43116	Scale	1
3	29887	"O" Ring	2
4	53962	Spool - Rotary	1
5	53963	Ring - Snap	2
6	53961	Handle - Spool	1
7	53960	Spring	1
8	N.S.	Shim	2
9	N.S.	Spool	1
10	N.S.	"O" Ring	1
11	N.S.	Plug	2

N.S. - Not Serviced Separately

SPINNER MOTOR ASSEMBLY

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
	36580	Motor - Hydraulic	
1	28485	Shaft	1
2	33777	Ring - Retainer	1
3	71980	Seal	1
4	28494	"O" Ring	1
5	41014	Cone - Bearing	2
6	41013	Cup - Bearing	2
7	28454	Spacer	1
8	28486	Spacer	1
9	6089	Ring - Snap	1
10	58797	Plug	1
11	23806	Bearing	4
12	23819	Seals - Pocket (Makes 12 Seals)	1
13	23818	Plate	2
14	23820	Gasket	2
15	38687	Housing	1
16	23824	Gear Set	1
17	23812	Cover - Port End	1
18	N/A	Washer	4
19	20190	Screw - Cap	4
20	28490	Cover - Shaft End	1
21	33809	Seal - Excluder	1
	28483	Kit - Seal, Includes Items 3,4 & 21	

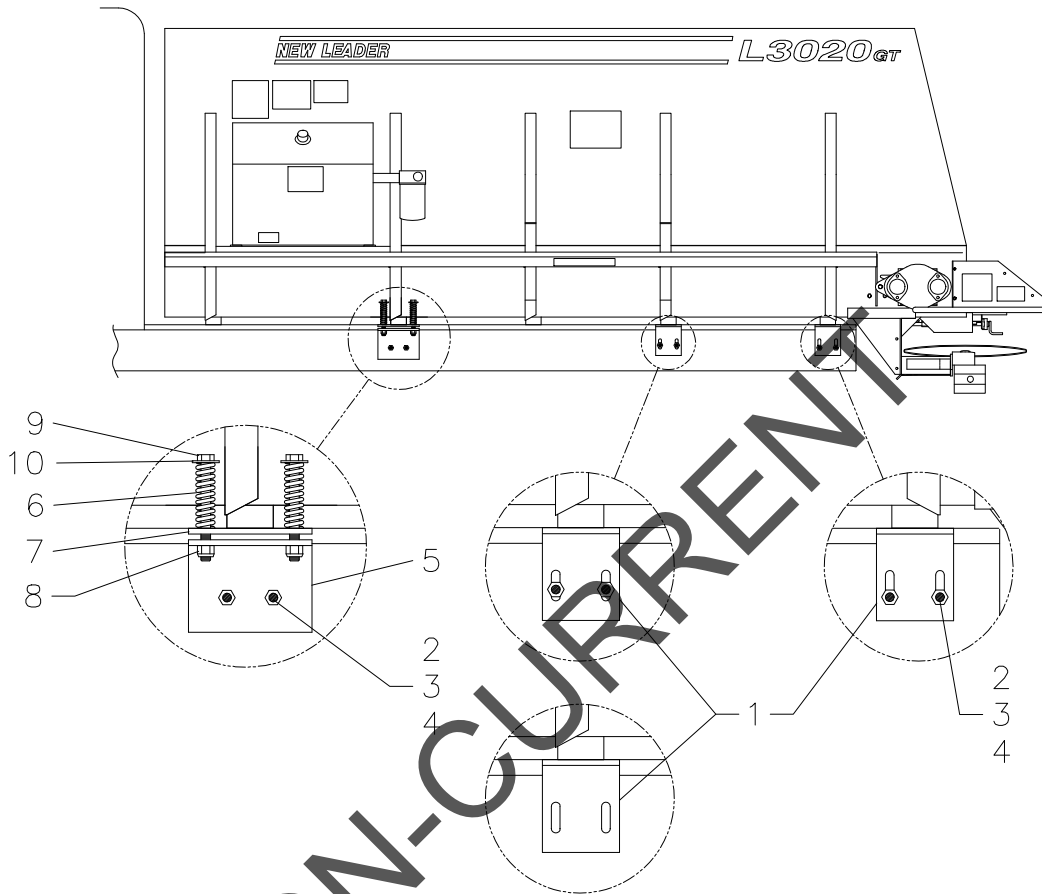
GROUP - CHAIN OILER

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	82922	Tube - Oiler, 31"	1
2	82924	Tube - Oiler, 3 1/4"	1
3	82921	Pipe - Cap, 1/4"	2
4	6001	Pipe - Coupler, 1/4"	2
5	82919	Connector - Male, 1/4 x 1/4	2
6	82920-7	Tubing - Clear, 7"	2
7	82918	Connector - Swivel Tee, 1/4 x 1/8	1
8	82917	Valve - Shut Off	1
9	1572	Weldment - Oiler Tank	1
10	21980	Cap - Filler	1
11	* 20710	Washer - Lock, 1/4	4
12	* 20004	Screw - Cap, 1/4 x 7/8	4
13	* 20642	Nut - Hex, 1/4	4

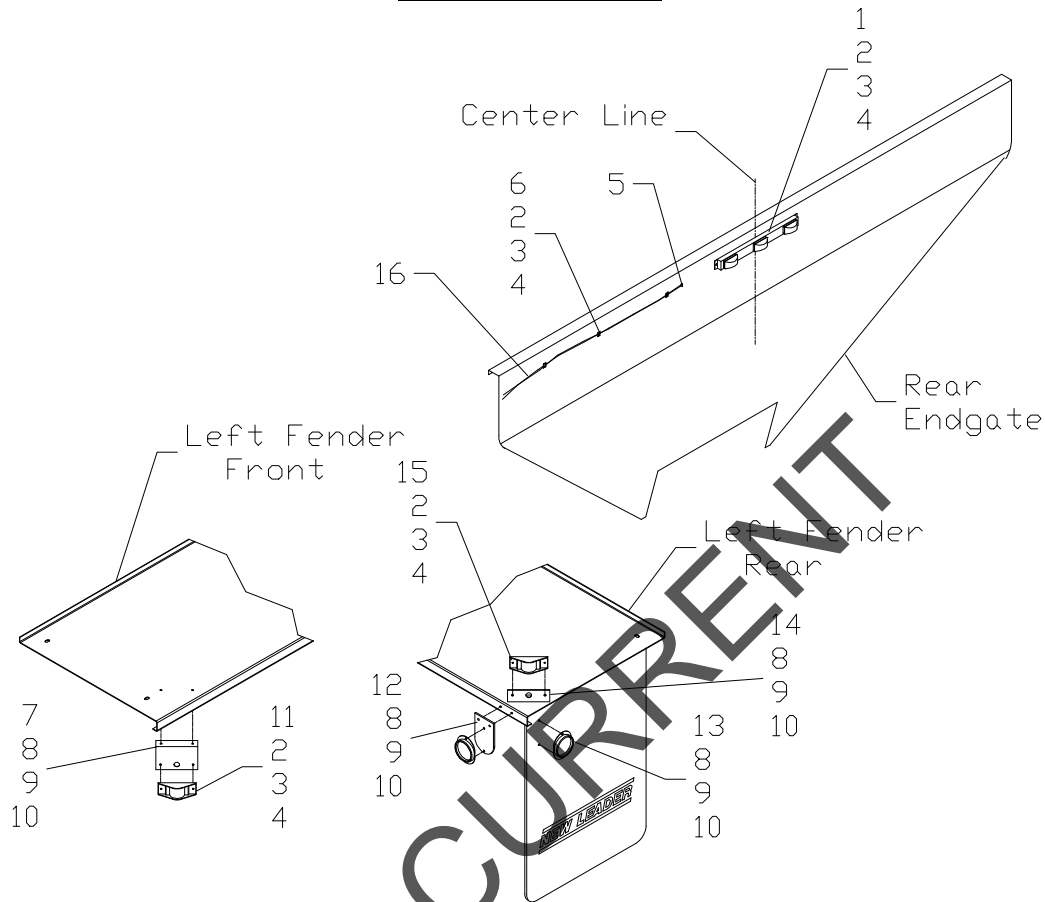
* Not Shown



Please Give Part No., Description and Unit Serial No. 82800-C

GROUP - MOUNTING ANGLE

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	31856	Angle - Mounting	4
2	20131	Screw - Cap, 1/2 x 2	12
3	20695	Washer - Flat, 1/2	12
4	20680	Washer - Flat, 1/2	12
5	81847	Angle - Mounting	22
6	81000	Spring	4
7	81848	Mounting - Bar	2
8	41762	Nut - Lock, 5/8	4
9	20195	Screw - Cap, 5/8 x 6 1/2	4
10	20697	Washer - Flat, 5/8	4

GROUP - LIGHTS

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	6114	Cluster - Light, Red	1
2	20572	Screw - Machine, 3/16 x 3/4	33
3	20709	Washer - Lock, 3/16	33
4	20641	Nut - Hex, 3/16	33
5	21986	Grommet - Rubber	A.R.
6	6198	Clamp - Wire	A.R.
7	38611	Bracket - Front Light, Amber	2
8	20003	Screw - Cap, 1/4 x 3/4	24
9	20691	Washer - Flat, 1/4	24
10	20642	Nut - Hex, 1/4	24
11	6108	Clearance Lamp - Amber	2
12	3824	Mount - Belt Reflector	4
13	6107	Reflector - Red	4
14	3775	Bracket - Rear Light, Red	2
15	6110	Clearance Lamp - Red	2
16	21580	Wire - 14 Gauge, Black	Inches A.R.

A.R. - As Required



Please Give Part No., Description and Unit Serial No. 82800-C