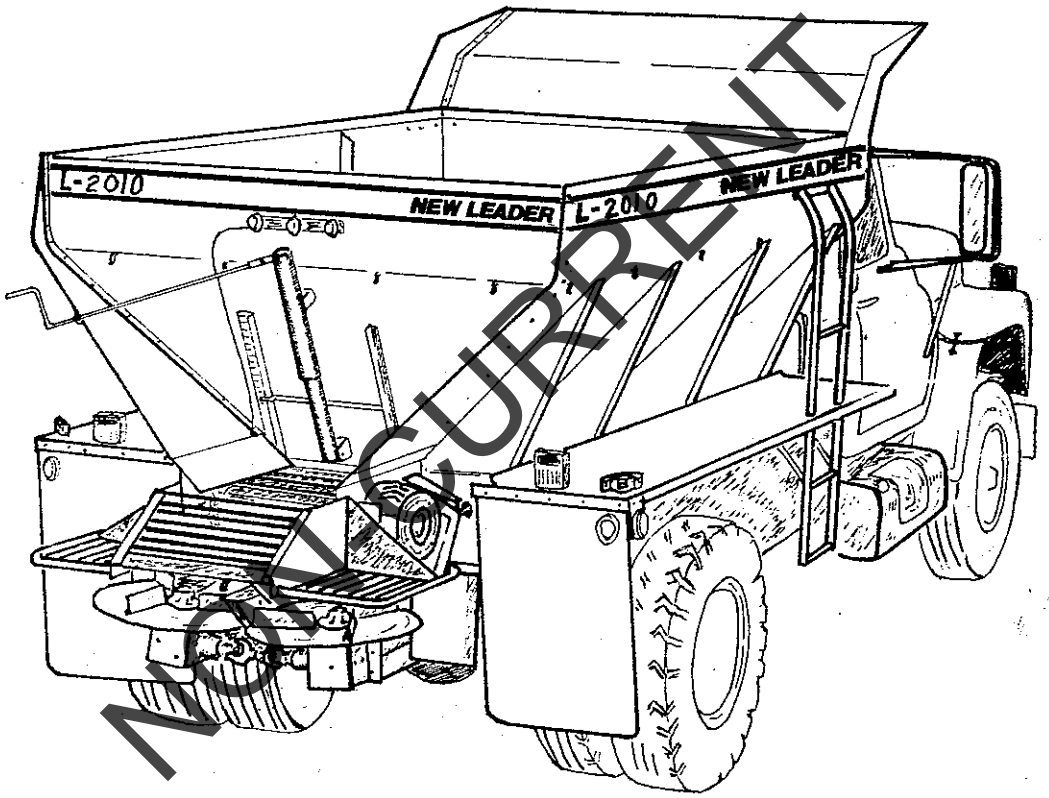
NEW LEADER

MANUAL NO. 44400

ASSEMBLY, OPERATION & MAINTENANCE MANUAL WITH PARTS LISTS



MODEL L-2010

HIGHWAY EQUIPMENT COMPANY — NEW LEADER DIVISION
616 "D" Ave. N.W., Cedar Rapids, Iowa 52405 (319) 363-8281

NEW LEADER

MODEL L-2010

MANUAL NUMBER 44400-F

UNIT SERIAL NUMBER _____

EFFECTIVE 3/96

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

PHONE 319-363-8281 *FAX 319-363-8284*

BUILDING THE BEST SINCE 1939.

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 service center 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 us at 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.

Many owners of NEW LEADER products use our Authorized Service Centers for all work other than routine care and adjustments. We strongly urge you to use genuine NEW LEADER parts and service to protect your investment.

Highway Equipment Company reserves the right to make alterations or modifications in 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 supplid, 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 fundamental 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 service center or our factory at (319–363–8281).

SAFETY DECALS CONTINUED

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 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 lotions. Allow to dry.

2. Position Safety Decal
   Decide on the exact position before application. Application marks may be made on top or side edge of the substrate with a lead pencil, marking pen, or small pieces of masking tape. NOTE: Do not use a 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° 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 a 180° 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 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.

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.

INDEX

INDEX CONT'D

GENERAL DESCRIPTION

The Model L-2010 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 mounting; however, it may also be incorporated into a towed trailer unit.

The unit is powered mechanically and provides power for both the spinner and the conveyor by means of a drive shaft mechanism driven by a PTO.

The conveyor runs the full length of the hopper bottom to deliver material to the spinners through an adjustable metering gate at the rear of the hopper body. It is driven through a 50:1 ratio worm gear box. The standard chain conveyor is a number two type having parallel strands of roller chain joined by cross bars every other link.

Optional conveyors for lower application rates as well as maximum rates are:

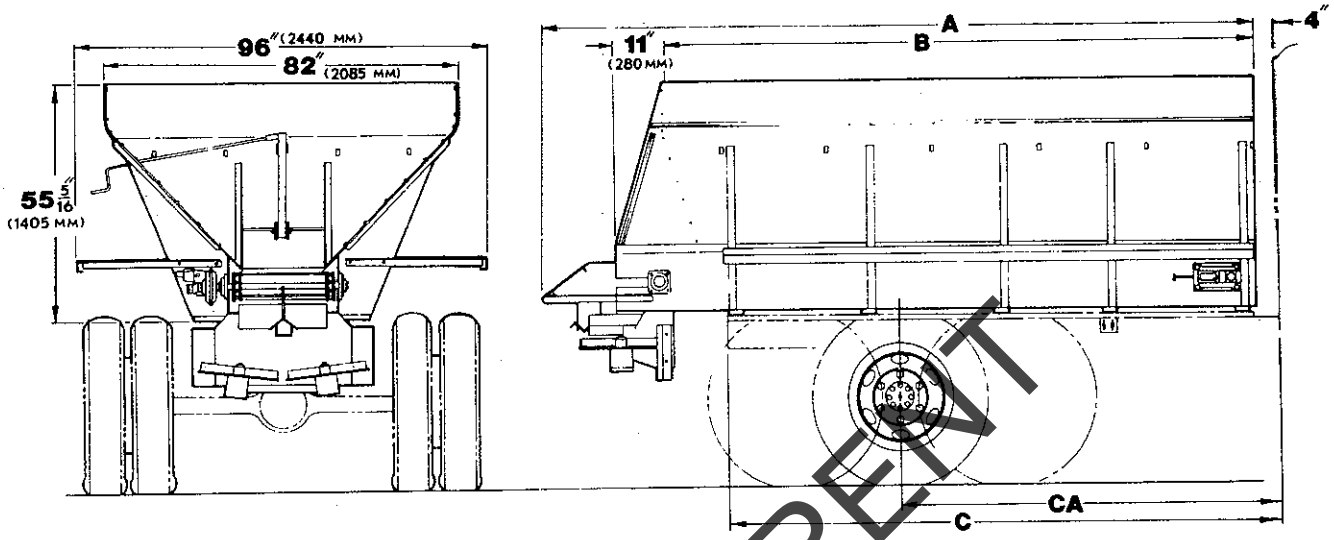
1. Number three chain conveyor with cross-bars every link.
2. Number four type - Belt-over-chain conveyor.
3. Number five type - Straight belt conveyor with stainless steel slatted bottom and inverted "V" over conveyor.

NOTE: Numbers 4 and 5 conveyors are recommended when low application rate materials (fertilizers) are to be spread.

The distributor spinner assembly has two 24 inch diameter discs canted upward at outer edges by 5°. Each disc has three formed and heat treated fins that are adjustable as to radial angle. Spinners are fed through an adjustable material flow divider.

Optional 18 inch mechanical uncanted twin spinners with six heat treated fins for each disc and optional 24 inch hydraulic twin spinners are available. Optional hydraulic-driven discharge elevator is available only with 24 inch hydraulic twin spinners and only for left side discharge.

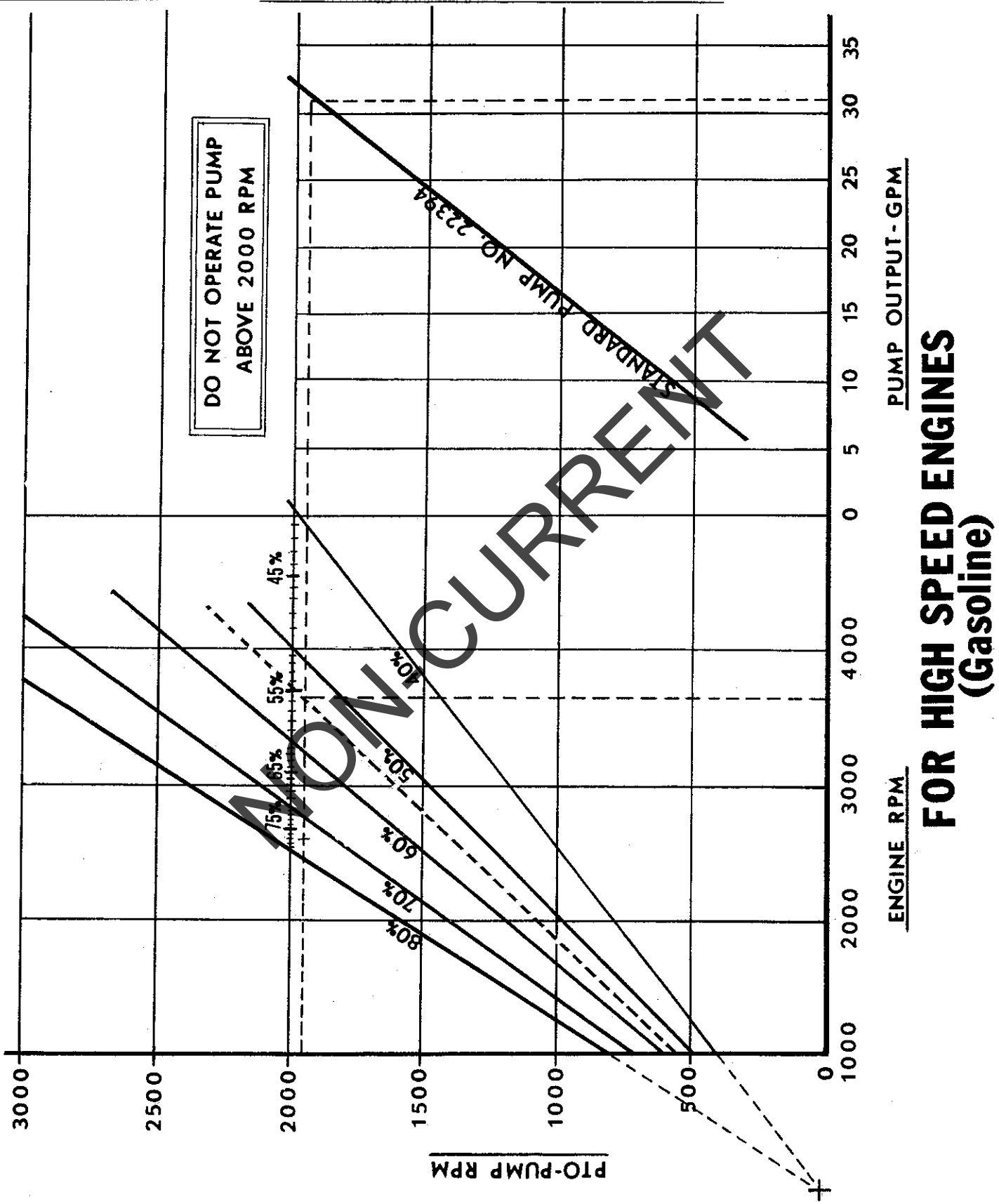
GENERAL DESCRIPTION CONT'D



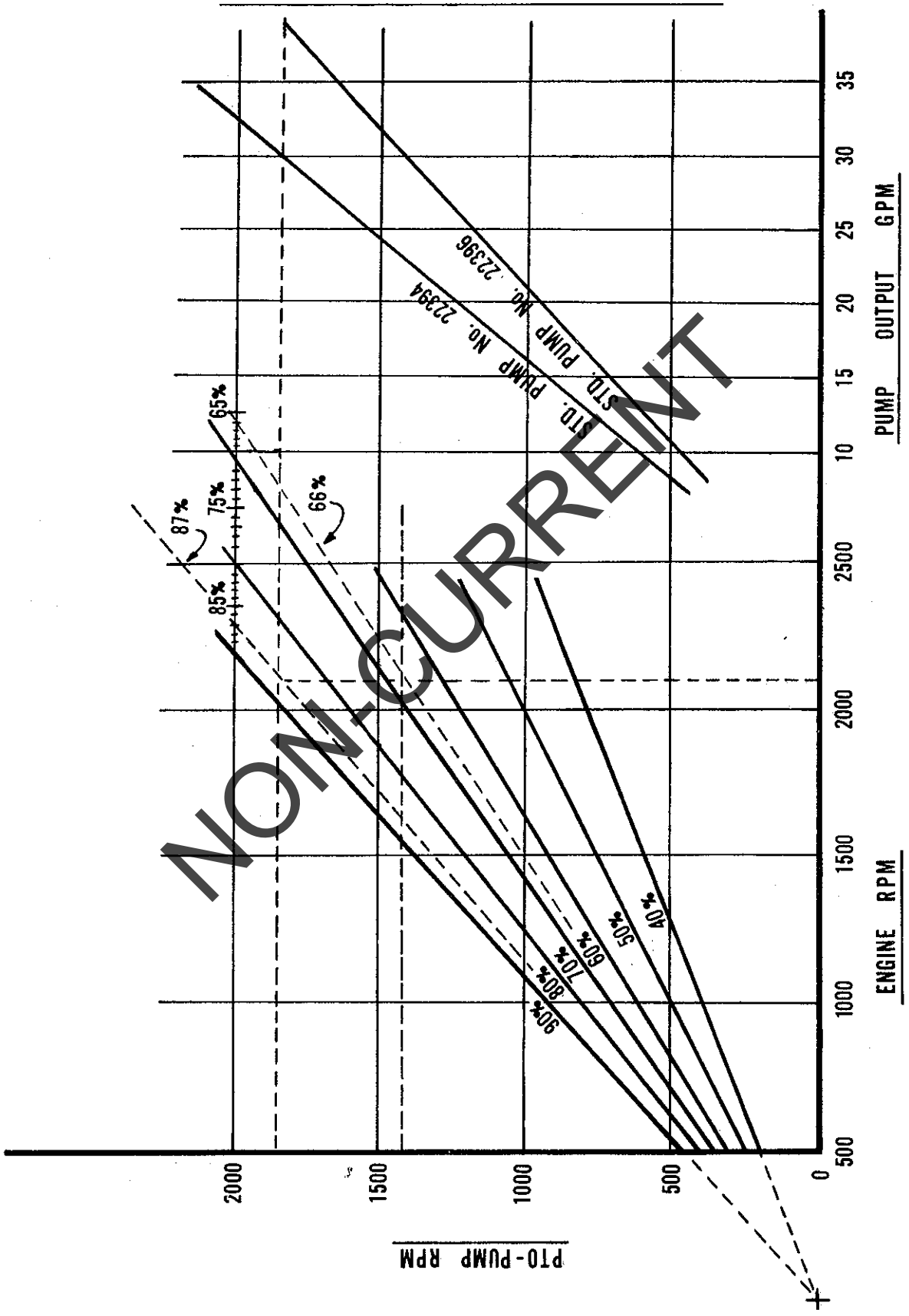
Weights and Dimensions				
Body Length	Over-All A	Inside B	Frame C	Cab to Axle C.A.
10'	148" (3760mm)	120" (3050mm)	111" (2820mm)	84" (2135mm)
11'	160" (4065mm)	132" (3355mm)	123" (3125mm)	84" (2135mm)
12'	172" (4370mm)	144" (3660mm)	135" (3430mm)	102" (2590mm)
13'	184" (4675mm)	156" (3960mm)	147" (3735mm)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

Capacities Struck — Cu. Yds.(CuM)Cu. Ft.				
Body Length	Standard	w/6" Lower Sides	w/6" Higher Sides	Basic Spreader Weight-Approx.
10'	6.3 (4.9) 171	5.1 (3.9) 137	7.6 (5.8) 206	2652 lb. (1203 kg)
11'	7.0 (5.4) 189	5.6 (4.3) 152	8.4 (6.4) 227	2852 lb. (1294 kg)
12'	7.7 (5.9) 207	6.2 (4.7) 166	9.2 (7.0) 248	2952 lb. (1339 kg)
13'	8.4 (6.4) 225	6.7 (5.1) 181	10.0 (7.6) 270	3052 lb. (1384 kg)
14'	9.0 (6.9) 244	7.3 (5.5) 196	10.8 (8.3) 291	3152 lb. (1430 kg)
15'	9.7 (7.4) 262	7.8 (6.0) 210	11.6 (8.9) 313	3352 lb. (1520 kg)
16'	10.4 (7.9) 280	8.3 (6.4) 225	12.4 (9.5) 334	3552 lb. (1611 kg)

INSTALLATION INSTRUCTIONS CONT'D



INSTALLATION INSTRUCTIONS CONT'D



FOR LOW SPEED ENGINES (Diesel)

GENERAL INSTALLATION INSTRUCTIONS CONT'D.

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

2. Is the truck's GAWR (Gross Axle Weight Rating) and 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. [Reference New Leader Spred-O-Gram #23 (Revised)].

Recommended sequence of installation is:

1. Mounting of PTO & Driveline.
2. Mounting of pump and pump drive if equipped with hydraulic spinners.
3. Installation of cab controls.
4. Mounting of spreader.
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.
9. Checking PTO, conveyor and spinner drivelines.

DRIVE LINE INSTALLATION

Drive line installation will vary from truck to truck. Variables such as make, model, year, engine, transmission, and power take-off each require a different installation.

INSTALLATION INSTRUCTIONS CONT'D.

CHECKING INSTALLATION: See "Initial Start-Up" Procedure.

INVERTED VEE INSTALLATION: (Standard on 12, 14 and 16 foot units and 10 and 11 foot units with optional number 5 belt conveyor). See pages 67-68.

FENDER INSTALLATION: See page 66.

CLEARANCE LIGHTS AND REFLECTORS: See page 67.

DISCHARGE ELEVATOR INSTALLATION (Optional):
(Hydraulic Spinners Required)
Refer to your New Leader Dealer for information on this attachment.

MODEL P-250 SPREADING HOOD INSTALLATION (Optional):

CAUTION: In mounting the spreader hood, as some of the parts are fairly heavy, be sure to have suitable hoisting and blocking equipment with a 500 lb. minimum capacity available. A "Come-Along" would be suitable for the hoisting gear provided a suitable overhead attachment is available. Use care when working around heavy components. Do not work under suspended loads unless they are securely blocked against falling or tipping. Do not install belting until all assembly is complete. Refer to end of parts listing for assembly diagram.

1. Remove spinner guard and store it for future use.
2. Bolt R. H. and L. H. Hood Mounting Angles (Items 17 & 18) to the R. H. and L. H. sills using the two 7/16" diameter holes at the rear of each sill. Use 3/8 x 1-1/4 cap screws. The leg of each mounting angle containing the slotted holes should face to the rear with the slotted holes toward the upper end and the legs turned outward.
3. Raise Center Section (Item 5) and block in place. Bolt to R. H. and L. H. Hood Mounting Angles using 1/2" x 1-1/4" capscrews.
4. Bolt Door Extension Weldment (Item 7) to upper edge of Center Section so that it extends over conveyor. Use 1/4" x 1" capscrews.
5. Loosely bolt Extension Panels (Item 14) to Door Extension sides with 1/4" x 1" capscrews. Adjust Extension Panels to fit against spreader rear endgate. Tighten capscrews.
6. Drill two 5/16" diameter holes through endgate using Bolting Ears (Item 13) for alignment. Attach Bolting Ears to Extension Panels and endgate with 1/4" x 1" capscrews.
7. Bolt on Rear Flap (Item 9) and adjust so that there is no opening between Rear Flap and Center Section when flap is hanging straight down. Use 3/8" x 1" carriage bolts.
8. Bolt on Door (Item 6). Use 1/4" x 1" capscrews.

INSTALLATION INSTRUCTIONS CONT'D.

9. Bolt on R. H. and L. H. Drops (Items 10 and 11) and Hood Drop Brace Bars (Item 15) using 3/8" x 1" capscrews.
10. Bolt on Gear Case Filler Plate (Item 10), front Filler Plate (Item 29), and Bearing Filler Plate (Item 20) using 1/4" x 1" capscrews. (These items may need to be trimmed to fit).
11. Bolt Hood Storage Support (Item 35) in place using 3/8" x 1" carriage bolts at the center supports and 3/8" x 1" capscrews at the side braces.
12. Bolt the Front and Rear Guide Lips (Items 25 and 26) with Guide Tabs (Item 27) to the front and rear vertical edges of each Fiberglass Hood (Item 24). Bolt Wing Tip Brace Bars (Item 28) to underside of each Fiberglass Hood at large end. Bolt Wing Skids (Item 16) to inside of each Fiberglass Hood near outer tip. Use 1/4" x 1" capscrews. NOTE: Use 1" diameter flat washers (Item 34) against Fiberglass Hood at all places where bolt head or nut or lockwasher would otherwise bear on fiberglass material to avoid cracking or tearing out of material.
13. Raise Fiberglass Hoods in place and bolt them to the hinge plates at each side of Center Section. Use 1/4" x 1" capscrews and 1" diameter flat washers as required.
14. Bolt Fiberglass Hoods against Hood Storage Support. Locate Wing Rest Weldments (Item 8), drill 9/32" diameter holes in Fiberglass Hoods and bolt in place using 1/4" x 1" capscrews and 1" diameter flat washers as required.
15. Install belting (Item 2) on Rear Flap, (Item 23) front and rear edges of Fiberglass Hoods, and (Item 1) on R. H. and L. H. Drops using 1/8" x 1" Belt Retainer Strips (Items 30, 31, 32 and 33) against belt and 1/4" x 1" capscrews. One-inch dia. flat washers should be used on fiberglass as required. NOTE: In each Fiberglass Hood in the third hole from the center section on the rear face use special Tie Down Bolt Weldments (Item 12) to anchor one end of the Rubber Tension Hook (Item 4). The other Tie Down Bolt Weldments are used on Rear Flap in the second hole from each end. Attach Rubber Tension Hooks. Front Center Belt (Item 3) is bolted to front of spinner frame with 1/4" x 1" capscrews but without 1/8" x 1" retainer strip.

When transporting with P-250 Hood installed, Fiberglass hoods MUST be folded by unhooking the Rubber Tension Hooks from the Rear Flap and swinging hoods against Hood Storage Support. Rear Flap is to be folded up and Rubber Tension Hooks engaged in figure "8" hook on inner face of Rear Flap.

When unfolding hoods for use, be sure that Front and Rear Guide Lips straddle the Rear Flap and Drops, and that the belts lap properly.

INSTALLATION INSTRUCTIONS CONT'D.

CAUTION: If P-250 Spreading Hood is removed, it is essential that Spinner Guard is re-installed.

Figures shown on following page.

CAB SHIELD INSTALLATION (Optional):

Install per page 65.

LADDER INSTALLATION (Optional):

Install per page 68.

TWO-SPEED TRANSMISSION w/SPINNER BYPASS - BODY SIDE MOUNT (Optional):

Install per pages 106-107.

TWO-SPEED TRANSMISSION w/SPINNER BYPASS - TRUCK CHASSIS MOUNT (Optional):

Install per pages 108-109.

TWO-SPEED TRANSMISSION - BODY SIDE MOUNT (Optional):

Install per pages 104-105.

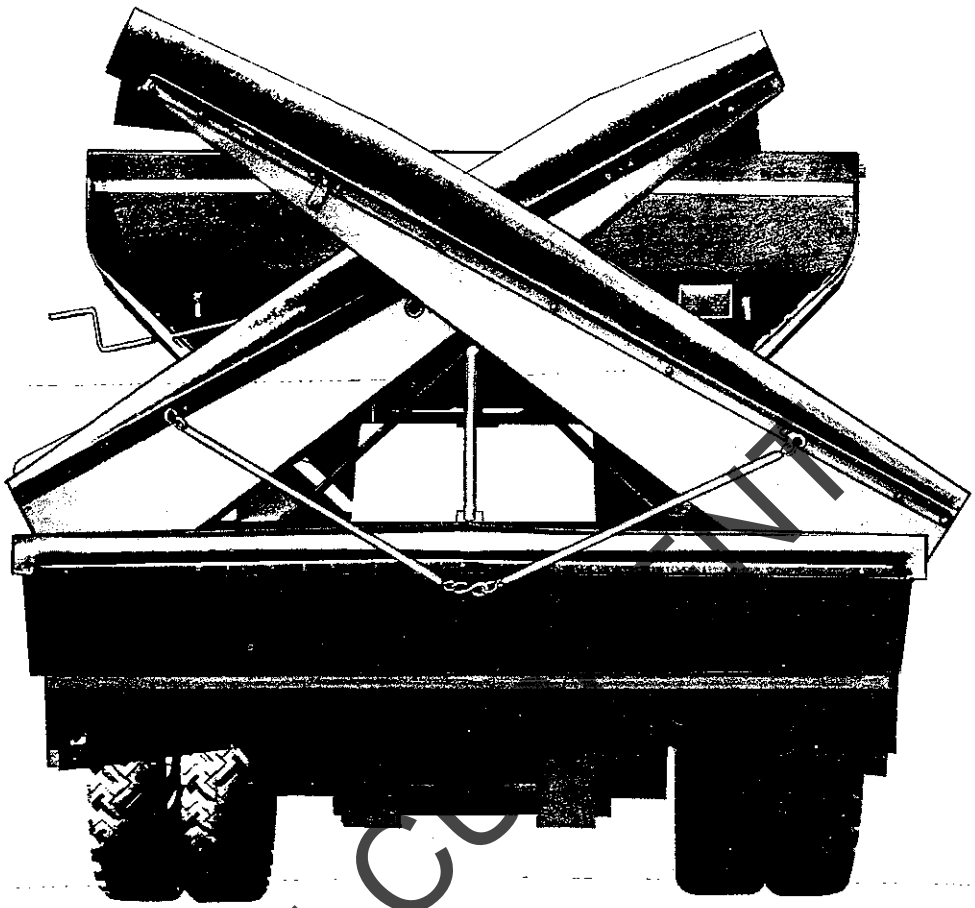
CLUTCH - MUTIPLE DISC TYPE (Optional):

Install per pages 110-111.

CLUTCH-ELECTRIC (OPTIONAL):

Install per pages 124-125.

P - 250 HOOD IN TRANSPORT POSITION



P - 250 HOOD IN SPREADING POSITION

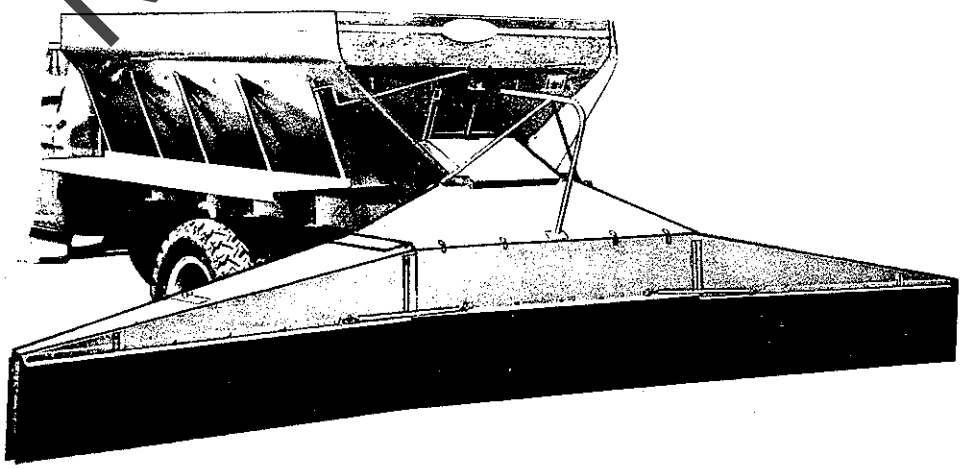


FIGURE 11 - P-250 HOOD ASSEMBLY

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.

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

1. Check to see that no loose parts are in body, on conveyor, or spinner. Be sure to remove any loose pieces.
2. Open feedgate until it is completely clear of conveyor.
3. With optional spinners, fill the hydraulic reservoir with oil. Refer to the "Lubricant Specification" section of this manual for the proper oil. Open gate valve under the reservoir fully (rotate counter-clockwise to open).
4. Start truck engine and set throttle so engine runs at about 1000 RPM. Engage PTO and allow spreader to run for several minutes. When spinner and conveyor are running smoothly, unit is ready for road testing.
5. With optional hydraulic spinners, check hydraulic oil reservoir and refill to "full" mark on dipstick. Unit is now ready for road testing.

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 entanglement.

ROAD TESTING

Prior to first use of machine, prior to each spreading season's use, and following major 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. The following procedure is given as a guide:

1. Be sure machine has been properly serviced. Do not put any load in spreader.
2. Start truck engine, engage PTO and allow to run at fast idle for 5-10 minutes. Spinners should revolve at a moderate speed; conveyor should move smoothly. With optional hydraulic spinners, spinner control valve should be set at position No. 5.

ROAD TESTING CONT'D.

3. Start forward travel.

> CAUTION: 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 vehicle or into moving machinery. Use great care in performing this test.

LUBRICATION AND MAINTENANCE

PREVENTIVE MAINTENANCE PAYS!

The handling and spreading of commercial fertilizers is a most severe operation with respect to metal corrosion. Unless a frequent, periodic preventive 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: (with optional hydraulic spinners):

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

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

SERVICE SCHEDULE: (with optional hydraulic spinners):

1. Check the hydraulic oil daily by means of dipstick. Add oil if required. Periodically inspect the hoses and fittings for leaks.
2. Change the hydraulic oil filter after the first week (or not more than 50 hours) of operation on a new 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 signs of breaking down under continued high-pressure operation. Discoloration of oil is one sign of breakdown.

SERVICE SCHEDULE CONT'D

Points to be lubricated by means of a grease gun have standard grease fittings.

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

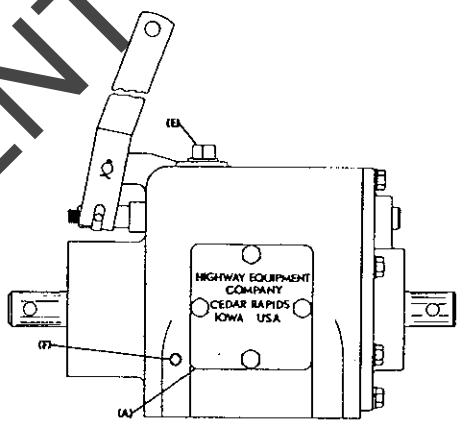
The spreader should be regularly lubricated with the lubricants recommended in this manual in accordance with the chart on the following page.

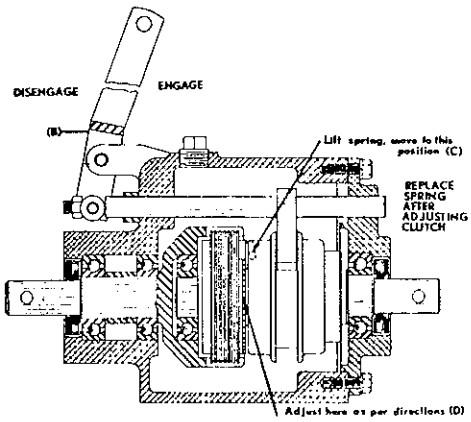
OIL CLUTCH ADJUSTMENT:

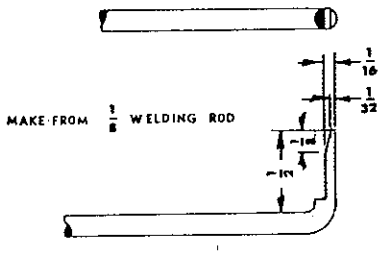
The oil clutch may need adjusting when new as the clutch plates seal.

1. Take off the cover plate (A).
2. Disengage clutch by moving shifter fork (B) to left.
3. Lift the lock spring (C) with the special tool illustrated.
4. Adjust set collar (D) by rotating it up or down as needed. To tighten, turn up or away from you. To loosen, turn down or toward you.
5. Reset lock spring.
6. Engage clutch by pulling the shift fork (B) to the right. If properly set, a definite snap should be heard as the mechanism moves over center. If set too loose, the shifter will seem to slide into place easily. If too tight, it will be impossible to move shift fork over center and no sound or snapping into place will be heard.
7. Repeat if necessary until clutch is properly adjusted.
8. Replace cover plate with a new gasket. Use only genuine New Leader parts.

NOTE: Check oil level at point (F). Oil refill hole is at point (E).







TOOL TO LIFT LOCK SPRING

LUBRICATION CHART

	DESCRIPTION	LOCATION	NO. OF POINTS	*METHOD OF LUBRICATION	FREQUENCY DAILY	WEEKLY	MONTHLY	ANNUALLY
Hydraulic Pump System Drive	Transmission PTO	Slip Yoke	1	Grease Gun		x		
		Universal Joint	2	Grease Gun			x	
	Reservoir		1		Check			Change
	Filter		1		Check Indicator. Change element when indicated (RED)			
Drive Line	Transmission PTO	Slip Yoke	1	Grease Gun		x		
		Universal Joints	2	Grease Gun			x	
	Two-Speed Transmission w/orw/o Spinner Bypass	Housing	1	Gear Box Lubricant			Check	Change
	Driveline Bearings	Along Driveline	As Req'd.	Grease Gun			x	
	Oil Clutch	Housing	1	SAE10 Oil Non-Detergent			Check	Change
	Chain Drive	Chain	1	Spray Oil	x			
	Conveyor Gear Case	Housing	1	Gear Box Lubricant			Check	Change
	Mechanical Spinners	Gear Case	2	Gear Box Lubricant			Check	Change
		Double U-Joint	2	Grease Gun			x	
		Flange Bearing	1	Grease Gun			x	
		Overrunning Clutch	1	Grease Gun		x		
Conveyor	All Except #5 Conveyor	Dragshaft Brgs.	2	Grease Gun		x		
		Idler Shaft Spkts.	2	Grease Gun	x			
		Idler Adjusting	2	Hand Grease		x		
		Chain	2 Strands	Spray Oil		x		
		Chain Oiler (if so Equipped)	1	Oil	x			
	#5 Conveyor	Dragshaft Brgs.	2	Grease Gun		x		
		Idler Shaft Brgs.	2	Grease Gun		x		
		Snubber Pulley	2	Grease Gun		x		
		Idler Adjusting Screws	2	Hand Grease		x		
	Gear Case		1	Gear Box			Check	Change
Feed-gate	Jack Assembly	Gears	1	Hand Grease				x
		Tube	1	Grease Gun			x	
Screw Con. Discharge Elevator		Outer Bearing	1	Grease Gun		x		

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.

LUBRICATION AND MAINTENANCE CONT'D

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

The above recommendations cover the normal system operating temperatures. For system temperatures above or below those shown in the charts above, contact the **Service** Department of Highway Equipment Company. For additional information contact your Highway Equipment Company Dealer. (Refer to Hi-Way-New Leader Bulletin H-24 NL-32).

GEAR BOX LUBRICANT:

Lubricate these assemblies with a non-corrosive type SAE 90 EP (extreme pressure) gear oil conforming to MIL-L 2105B multi-purpose gear lubricating oil requirements (API Service GL 4) with ambient temperatures from 40 to 100 degrees F. Ambient temperatures below 40°F require an SAE 80 EP lubricant; above 100° use an SAE 140 EP grade oil.

PRESSURE GUN LUBRICANT:

Use a ball and roller bearing lithium base lubricant with a minimum melting point of 300°F. This lubricant should have a viscosity which assures easy handling in the pressure gun atprevailing atmospheric temperatures. The lubricant must be waterproof. The grease should conform to NLGI number 2 consistency.

CHAIN OILER LUBRICANT:

Use a mixture of 75% number 1 or number 2 Diesel fuel or kerosene mixed with 25% SAE 10W oil.

LUBRICATION OF 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 4-1/2 pints (2.12 liters) of recommended lubricant. After the initial change, the oil should be changed every 2000 hours of operation or annually, whichever occurs first.

Check the level in the gear cases monthly.

LUBRICATION AND MAINTENANCE CONT'D

LUBRICATION OF BEARINGS:

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

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

Be sure that all fittings are thoroughly cleaned before grease is injected.

CLEAN UP:

For maintaining a minimum maintenance operation, this equipment should be thoroughly washed every day during the operating season. Hose the unit down under pressure. Pay special attention on number 5 conveyors to front and rear conveyor pulleys.

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

FASTENERS:

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

CONVEYOR CHAIN MAINTENANCE:

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 on the material instead of the bottom panel. The more material allowed to build, the closer the chain will come to the chain shields. If the chain should catch a chain shield, it could permanently distort the chain, the chain shields,

B. Start truck engine, engage PTO driving conveyor, and allow it to run at normal operating speed (about 3/4 of maximum engine speed.

CAUTION: As conveyor is running, exercise great care to avoid entanglement with any moving part.

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

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

PROBLEM 1: (See Illustration)

Belt tracks to one side, contacts side of conveyor. Contact is more severe at the front and may not quite touch at the rear.

SOLUTION:

Tighten idler bearing at the side in contact with the belt. Move this adjustment 1 turn at a time. Operate conveyor 10 to 15 minutes at a high speed to allow the belt to react to the adjustment. Repeat if necessary.

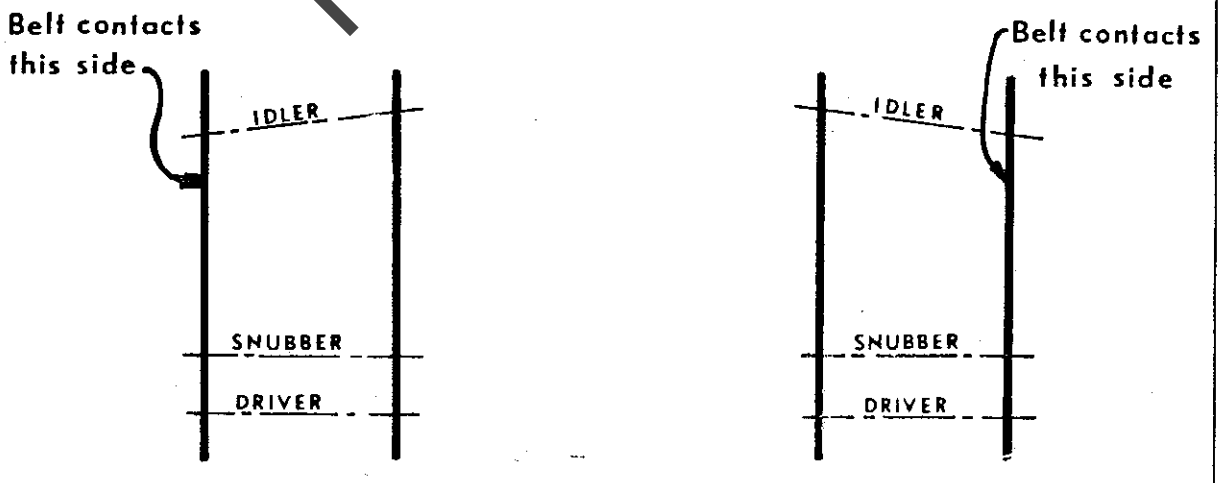


FIGURE 13 - BELT TRACKING

LUBRICATION AND MAINTENANCE CONT'D

exact number of turns previously loosened. Operate the conveyor 10 to 15 minutes to allow the belt to react to the adjustment. Refer to Problem 1, and readjust. If the readjustment does not compensate, repeat.

If the adjustments do not correct the situation, sight down the body under the belt shields. The only point which should come close or slightly contact the belt, is the lowest most point on the shield. If the belt should contact the shield firmly at any other point, tracking will be impossible. See your dealer immediately. Only your dealer can correct this situation.

If there is no contact between the belt shields and the conveyor belt and the belt does not track despite continued adjustment, remove the belt and check it for squareness in the following manner:

Measure in from the sides and establish a center line at least eight (8) feet long. Use an accurate two (2) foot square to mark the belt. Cut the minimum amount off the ends of the belt, square with the eight (8) foot center line. Replace using a new lacing kit. Do this only as a last resort. Use only genuine New Leader parts.

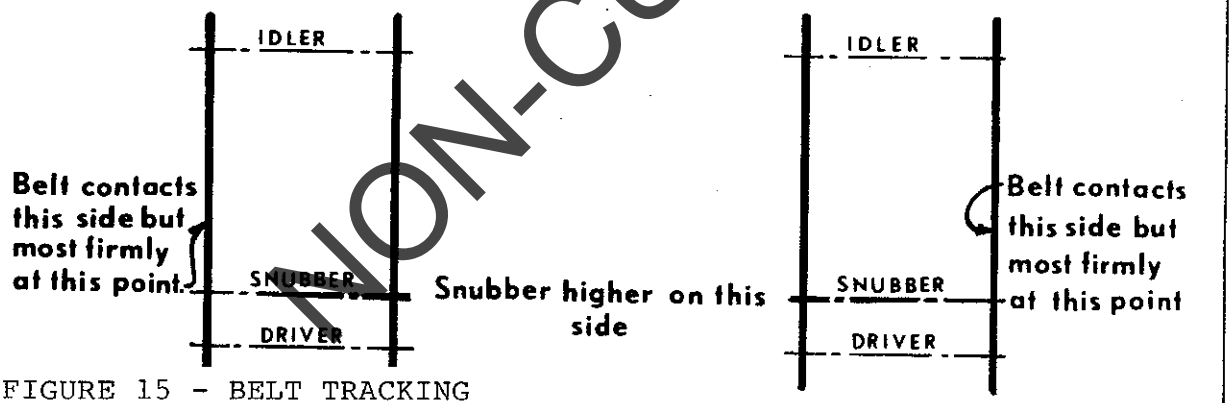


FIGURE 15 - BELT TRACKING

#5 Belt Conveyor Belt Shield Fit:

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

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

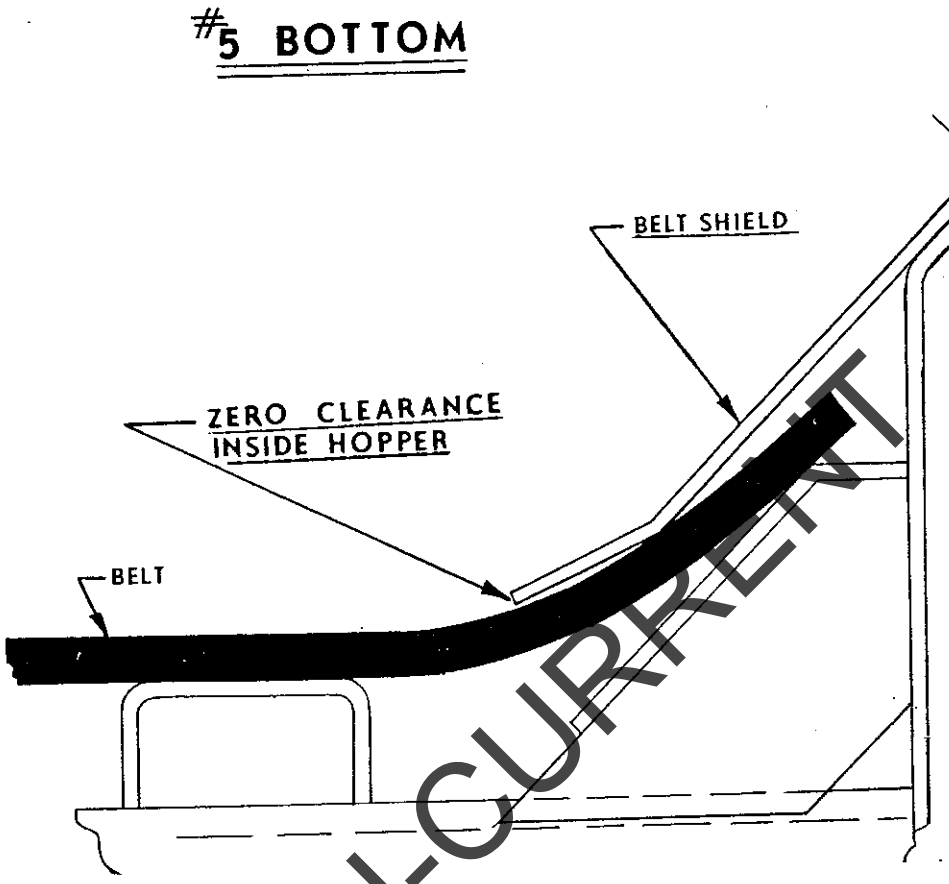


FIGURE 16 - NUMBER 5 BOTTOM

LUBRICATION AND MAINTENANCE CONT'D

CONVEYOR BELT - REMOVAL & REPLACEMENT:

TOOLS & EQUIPMENT REQUIRED:

1. 1-1/2" Hex Wrench.
2. 25-30 feet of 1/4" - 3/8" rope.
3. Wood block, approximately 1" x 3" x 16" long.
4. 3 or 4 pieces of 2 x 4 lumber about 3 feet long.
5. 10 feet of 14 gauge or 16 gauge soft iron wire.

HINT: Best results are achieved if two men are used to remove and replace the belt.

PARTS REQUIRED: (See Page 71 & 72).

PROCEDURE:

1. Shut down engine so that machinery does not move.
2. Remove both belt shields, clean thoroughly and repaint.
3. Start engine and run slowly until conveyor belt splice is exposed at rear face of drive pulley. Shut down engine.
4. Move the front idler adjustment bolts to extreme rear position.
5. Pull out splice pin to separate belt splice.
6. Operate conveyor slowly while one man stands on the drive pulley thus "walking" the old belt out of the machine.

WARNING: Use extreme care to avoid entanglement. Hold on to endgate to maintain balance. One man must stay at control to stop conveyor instantly if required.

7. Shut down spreader. Using any suitable tool at hand, remove any caked material from the drive pulley, snubber pulley, idler pulley and from inside the frame channels. Clean and repaint as required.
8. Lace the 16" wood block to one end of the belt splice with wire. Wire the belt lacing to the block in at least 4 places across the splice.
9. Thread the rope along the top of the belt channel, around the front idler pulley, over the snubber pulley, and under the drive pulley.

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

10. Tie the end of the rope which is under the drive pulley to the center of the 16" wood block. Wrap the other end of the rope once around the drive pulley and out to the rear.
11. Start conveyor drive to cause drive pulley to turn slowly. With one man pulling on the rope, and another feeding the belt into the machine from the rear, pull the new belt under the drive pulley, over the

LUBRICATION AND MAINTENANCE CONT'D.

snubber pulley, along the frame channels, around the front idler pulley, and back to the drive pulley.

CAUTION: Use extreme care to avoid entanglement. Stand well back of drive pulley.

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

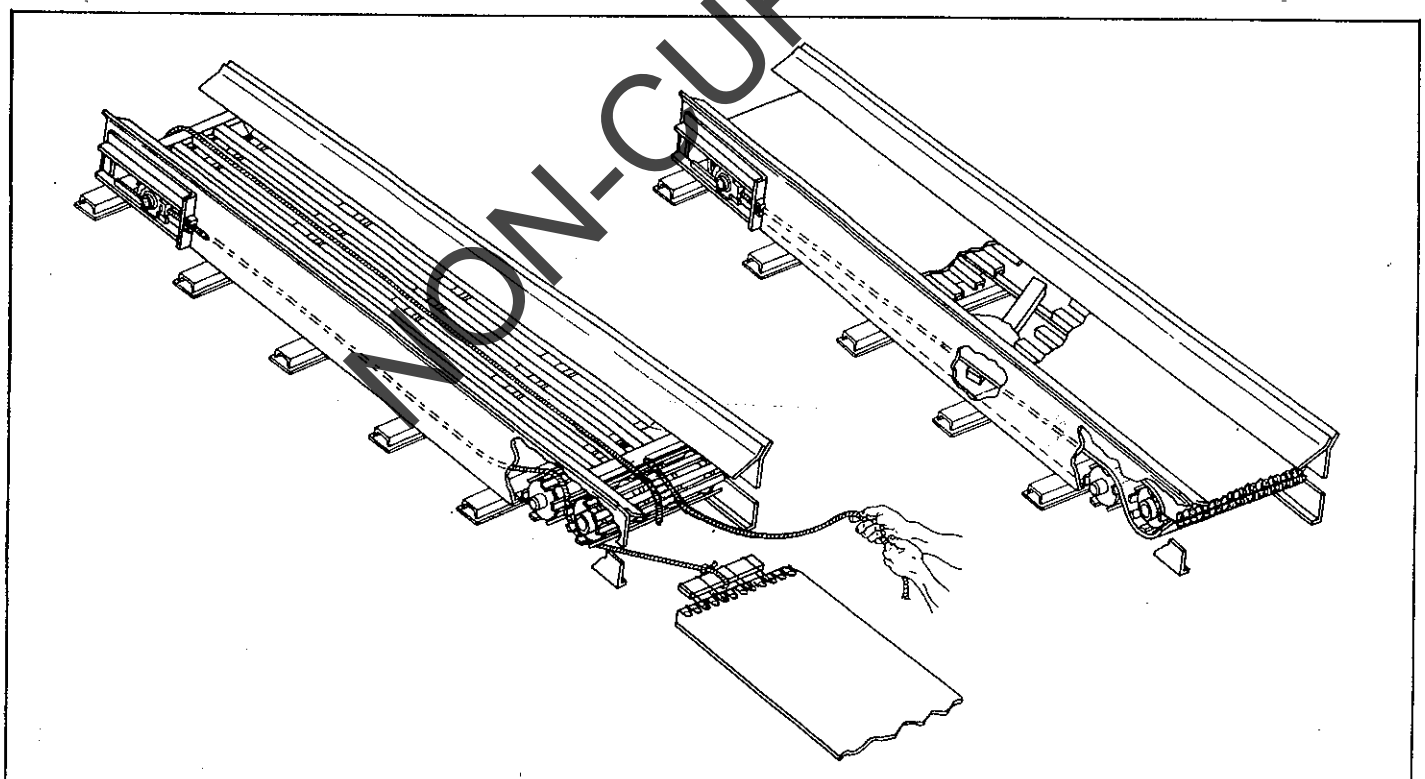


FIGURE 17 - INSTALLING NUMBER 5 BELT

TROUBLE SHOOTING PROCEDURES

SYMPTOM	REASON	CORRECTION
Conveyor does not run.	PTO disengaged.	Engage PTO.
	With belt #5, belt too loose.	Adjust take-ups to tighten belt.
	PTO damaged.	Repair PTO.
	Driveline damaged.	Repair Driveline.
	Two-speed in neutral.	Shift to desired gear.
	Oil clutch slipping.	Adjust clutch.
	Drag shaft key sheared or drag shaft sprocket keys sheared.	Replace Keys.
	Conveyor jammed	Conveyor chain too loose - adjust take-ups.
		Conveyor chain kinked - free and lubricate.
		Set inverted V lower (not furnished with 10' chain conveyor units).
		Remove obstruction.
		Chain guard bent - straighten or replace.
Heavy vibration throughout unit.	U-joints in driveline not properly timed.	Time U-joints per instructions in this manual.
	Gear tooth damage in gear box.	Replace damaged gears.
	Dry gear teeth.	Add proper lubricant to gear box.
	Driveline - whipping.	Add additional bearings near mid-points of long shafts.
	Driveline angles too great.	Reposition driveline to reduce angles.
		Replace single U-joints with double joints.
	Damaged driveline bearings.	Replace damaged bearings.
	Damaged PTO.	Repair or replace PTO.
	Damaged truck transmission.	Repair transmission.
	Spinners unbalanced.	Clean fins and discs. Tighten bolts at hub and at fins. Replace damaged or worn fins.
Mechanical spinners will not turn.	PTO disengaged.	Engage PTO.
	PTO damaged.	Repair or replace PTO
	Driveline damaged.	Repair driveline.
	Chain drive broken.	Repair chain drive. Check sprocket alignment and correct as required. Lubricate chain.
	Gear box key sheared.	Replace key.
	Gear box pins sheared.	Replace pins.
	Two-speed in neutral.	Shift into desired gear.
	Overrunning clutch not engaging.	Disassemble clutch and clean. Remove any burrs.
		Use lighter weight grease.

TROUBLE SHOOTING PROCEDURES CONT'D.

Hydraulic spinners will not turn or turn too slowly.	Hydraulic oil level low.	Add hydraulic oil to reservoir to proper fill level.
	Shut-off valve on oil reservoir not open.	Open valve fully by turning counter-clockwise to stop.
	Hydraulic pump is not rotating.	PTO disengaged - shift into engagement. Drive line has failed - Repair or replace. Pump shaft key has failed.- Replace key, U-joint pin or key has failed - Replace pin or key.
	Spinner control valve defective.	Repair or replace valve.
	Relief valve set too low.	Reset valve to 2000 psi.
	Motors worn out.	Replace motors.
	Pump worn out.	Replace pump.
	Insufficient pump capacity.	Replace pump with one of adequate capacity - See Pump-PTO Match Graph for proper pump.
	Engine speed too low.	Operate spreader with engine running at at least 2/3 of maximum engine speed.
Hydraulic spinners not turning at same speed.	Flow-divider valve defective.	Replace flow-divider valve.
	Slower spinner motor check valve not seated.	Disassemble spinner motor and replace check valve in motor.
Hydraulic oil overheats (200° F. or hotter).	Oil level is low.	Fill oil reservoir to proper level.
	Excessive oil is being pumped	Pump too large - replace with proper size.
		PTO percentage too high - change to lower percent PTO. Engine speed too high - reduce engine speed.
	Worn hydraulic motors.	Motor heats up at excessive rate. Replace motor.
	Improper or deteriorated hydraulic oil.	Replace hydraulic oil with proper specification hydraulic oil and replace filter element.
	Relief valve set too low.	Reset to 2000 psi. Replace if proper setting cannot be attained.
	Pinched or obstructed hose, hydraulic line or fitting.	Clear obstruction or replace part.
	Driving too fast.	Slow down or shift to higher gear to reduce engine speed.

GENERAL OPERATING PROCEDURES

To operate the L-2010 spreader, the following sequence should be followed:

1. Be sure unit has been properly serviced and is in good operating condition.
2. Close feedgate and disengage PTO shifter (both PTOs if equipped with hydraulic spinners). Disengage oil clutch if unit is so equipped.
3. Fill body with material to be spread.
4. Drive to location where spreading is to be done.
5. If the unit has a mechanical spinner drive, no spinner speed adjustment can be made. With hydraulic spinners, set spinner control valve to setting required for material used to give spread width desired. See Hydraulic Spinner Adjustment page 60.
6. Adjust material flow divider or Red-E-Vider to give spread pattern desired. See Spread Pattern Adjustment, pages 47 - 51.
7. Set feedgate opening to obtain yield desired for spread width, material, and material weight per cubic foot. See pages 52 - 57 for spread rate calculations.
8. For spreader equipped with two-speed transmissions, shift into low range for materials requiring low application rates (fertilizers) or into high range for materials requiring high application rates (lime). NOTE: Spreaders without two-speed transmissions are not well adapted for the spreading of very low application rates.
9. If truck has two-speed rear axle, place it in range used to calculate spread rate to be used. See pages 52 - 57 . NOTE: Shifting from rear axle high-range to rear axle low-range will increase spread rate by about 37%.
10. Be sure shut-off valve on hydraulic reservoir (with hydraulic spinners) is fully opened.
11. Start truck engine.
12. Depress clutch pedal, engage driveline PTO and (if equipped with hydraulic spinners) engage pump drive PTO. Shift truck transmission into gear at which spreading is to be done. If equipped with oil clutch, engage oil clutch. Spreading will begin as soon as vehicle moves. Drive at speeds which will allow high speed engine (gasoline) to turn at about 3000 RPM or low speed engine (diesel) to turn at about 2000 RPM.
13. Oil clutch (when so equipped) may be used to momentarily shut-off delivery while turning by disengaging clutch at end of swath. Reengage oil clutch to reestablish

GENERAL OPERATING PROCEDURES CONT'D.

delivery. Do not engage clutch at high engine RPM. NOTE: Shifting to a higher truck transmission gear will reduce volume spread per acre while shifting to a lower gear will increase the volume spread. Moderate changes in speed (while in the same gear) will not materially affect volume spread per acre. With hydraulic spinners, engine speed should not be allowed to drop too much or spinners may slow down and spread pattern will be affected. With mechanical spinners, spinner speed will be directly proportional to engine speed. For consistent spread pattern, drive at engine speeds of 3000 RPM for high speed engines or 2000 RPM for low speed engines.

ADJUSTING THE SPREAD PATTERN:

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

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

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

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

A. SPINNERS:

IMPORTANT: Spinner discs and fins must be kept clean and polished. Even a

small build-up on a spinner fin has disastrous effects on the spread pattern. Rusty, rough fins will produce poor spread patterns.

With hydraulic spinners, fan speed is adjustable from approximately 400 to 900 RPM. This is accomplished by moving the spinner speed control valve lever. See page 60. 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. NOTE: With mechanically driven spinners, fan speed can only be changed by changing engine speed or, when spinners are chain driven, by changing sprockets. See pages 22 - 24.

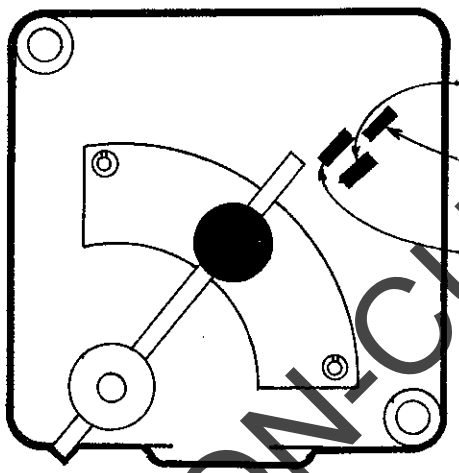


FIGURE 18 - CONTROL VALVE

Maximum pattern width is determined by particle size. This may vary anywhere from 25 feet for very finely ground dry lime up to 80 feet or even 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. See Figure 19.

One way to adjust fan speed is to stand on the fenders and watch the material leaving the fans. At slow speed the material leaves the blades in bands. At medium speed it forms wide bands in the air. At somewhat higher speed, the bands close

GENERAL OPERATING PROCEDURES CONT'D.

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 a blur.

> **WARNING:** Do not stand on fenders while vehicle is in motion.

Pattern: (Figure 19)
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 the fan speed.

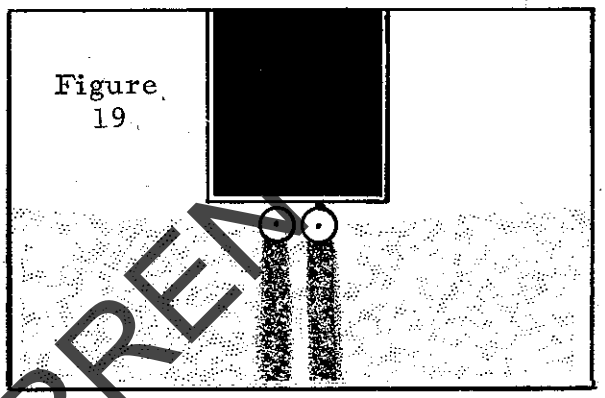


Figure 19

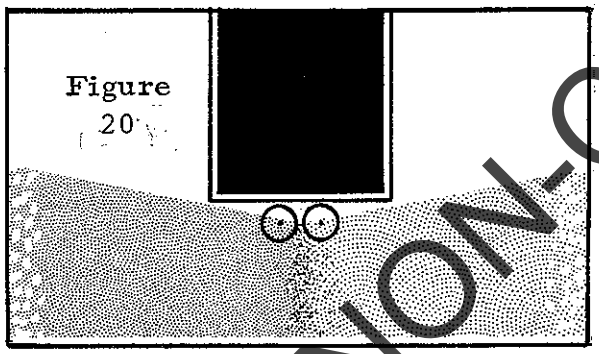


Figure 20

Pattern: (Figure 20)
Pattern is 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.

Pattern: (Figure 21)
Pattern is 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.

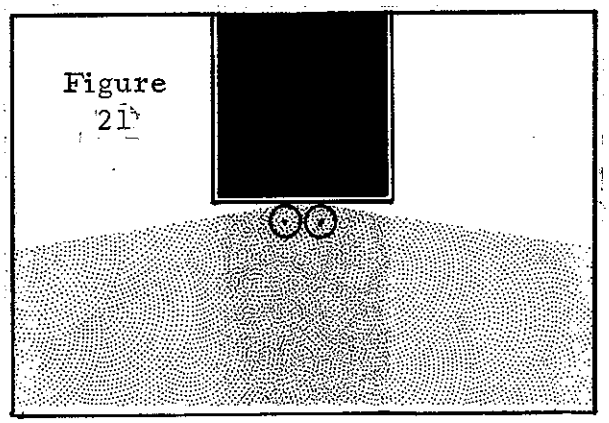


Figure 21

GENERAL OPERATING PROCEDURES CONT'D

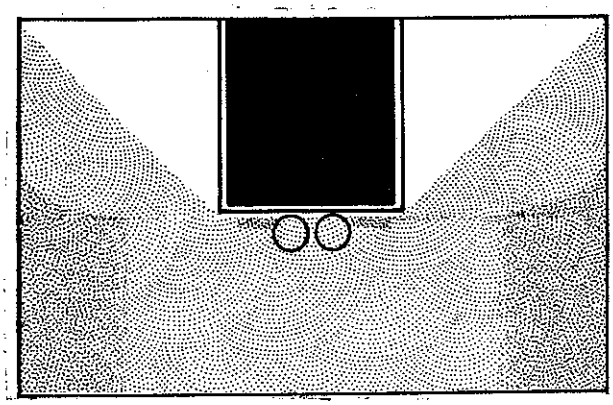


Figure 22

Pattern: (Figure 22)
Pattern is heavy at outer edges. Excessive material strikes front deflector panels.
Cause:
1. Divider is too far rearward. 2. Fan speed too fast. 3. Back plate is too far to rear.
Cure:
1. Adjust divider forward. 2. If adjusting divider does not work, decrease fan speed. 3. Move back plate forward.

B. MATERIAL DIVIDER CENTERING:

Material divider must be properly centered to avoid a pattern which is heavier on one side than on the other. See Figure 10 & 20.

C. MATERIAL DIVIDER ADJUSTMENT:

Moving the divider forward will increase the amount of material deposited behind the truck. Moving to the rear will decrease it. See Figures 20 and 21.

D. DIVIDER BACK PLATE ADJUSTMENT:

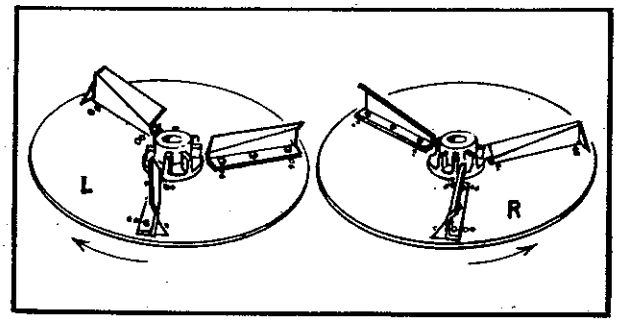
Adjust Material Divider per (C) above first. Then adjusting the divider to a wider position (moving back plate rearward) will throw material to the outside of the pattern. Adjusting to a narrower position (moving back plate forward) will throw it to the center. See Figures 21 and 22.

E. 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.

CAUTION: Be sure capscrews and nuts are in good condition. When tightening, tighten per torque chart in this manual. If fasteners are damaged, worn or corroded, replace immediately with new SAE Grade 5 or Grade 8 fasteners.

GENERAL OPERATING PROCEDURES CONT'D



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 the 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.

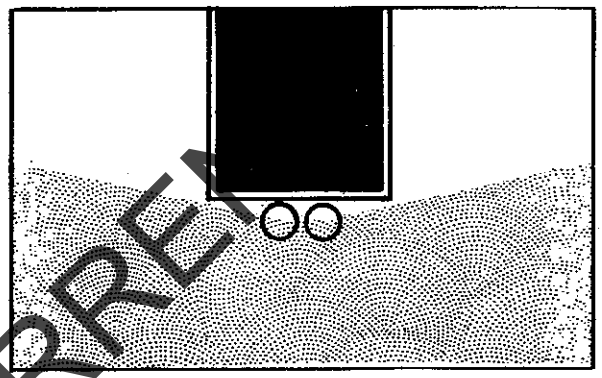


Figure 23

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 on outer 10% each side of total width.

F. PROPER ADJUSTMENT:

With correct spinner speeds and flow divider settings, uniform material distribution should be obtained. See Figure 23.

GENERAL OPERATING PROCEDURES CONT'D.

SPREAD RATE CALCULATIONS:

To determine spread rate quantities in pounds of material spread per acre, use the following formula:

$$\text{Yield (lbs. per acre)} = \frac{43560 \times G \times AR \times TR \times PTO \times 2SPD \times MW \times CFR}{TC \times SW \times CONVR}$$

Where G = Gate opening in inches
AR = Rear axle gear ratio used during spreading
TR = Truck transmission ratio used during spreading
PTO = Truck transmission PTO (driveline) percent/100
2SPD = Two-Speed driveline transmission percent/100
(1.0 for high range)
(.34 for low range)
MW = Weight of material spread in lbs. per cubic foot
TC = Tire circumference in feet
$= \frac{5280}{TRM}$

TRM = Tire revolutions per mile. See table on page 55.
SW = Swath width in feet
CONVR = Conveyor gear case ratio
(Normally = .50)
(Optional = .37)
CFR = Cubic feet of material delivered per drag shaft revolution per inch of gate opening
(with #2, #3 or #4 conveyor = .192)
(with #5 conveyor = .237)

A typical example would be:

TRUCK: Ford F-700 Series
Rear axle - Eaton 2-speed 6.17/8.58
Transmission - Clark 285V 5-speed,
ratios 6.99, 4.06, 2.24, 1.47 and 1.00
Tire size - 9.00 x 20 10 ply rating tube type
PTO Model 41CD-C6G (46% Eng. rotation)
SPREADER: L-2010 10 foot body
Drive: Two-speed with spinner bypass
Gear Box: 50 to 1 ratio
Conveyor: #2
MATERIAL: Fertilizer - 55 lbs. per cu. ft.
Swath width - 40 ft.

If spreading is to be done in second gear (4.06) in rear axle low range with driveline two-speed in low range and with a 1" gate opening, values for terms in the

GENERAL OPERATING PROCEDURES CONT'D.

formula would be:

G = 1.0	2SPD = .34	SW = 40
AR = 8.58	MW = 55	CONVR = 50
TR = 4.06	TRM = 523	CFR = .192
PTO = .46		

$$TC = \frac{5280}{523} = 10.1$$

$$Y = \frac{43560 \times 1.0 \times 8.58 \times 4.06 \times .46 \times .34 \times 55 \times .192}{10.1 \times 40 \times 50} = 124 \text{ lbs. / acre}$$

(G) (AR) (TR) (PTO) (2SPD) (MW) (CFR)

(TC) (SW) (CONVR)

NOTE: If spreader is not equipped with a two-speed driveline transmission, value for 2SPD will be 1.0.

Using the same truck and spreader but spreading in third gear (2.24), rear axle in high range, with driveline two-speed in high range, a 4" gate opening, and spreading 100 lbs. per cubic foot material over a 50 foot swath, the yield would be:

$$Y = \frac{43560 \times 4 \times 6.17 \times 2.24 \times .46 \times 1.0 \times 100 \times .192}{10.1 \times 50 \times 50} = 842 \text{ lbs. / acre}$$

(G) (AR) (TR) (PTO) (2SPD) (MW) (CFR)

(TC) (SW) (CONVR)

The following formula is left blank for use with values that apply to the actual truck, spreader and material used. The open parentheses are to filled in and the formula

GENERAL OPERATING PROCEDURES CONT'D.

solved for the particular values that actually apply:

$$Y = \frac{43560 \times (G) \times (AR) \times (TR) \times (PTO) \times (2SPD) \times (MW) \times (CRR)}{(TC) \times (SW) \times (CONVR)} = (\quad) \frac{\text{lbs.}}{\text{acre}}$$

HYDRAULIC SPINNER SPEED CHART:

Spinner control Valve Setting	0	1	2	3	4	5	6	7	8	9
Spinner Speed (Approximate) RPM	0*	0*	0*	150	300	450	600	750	850⊠	900⊠

* Spinner may creep or revolve slowly at these settings.
⊠ Operation at these speeds is not recommended for normal applications.

NOTE: Spinners should be run at the lowest speed setting that will give a good spread pattern with the particular material being used.

GENERAL OPERATING PROCEDURES CONT'D

This table lists typical values of tire revolutions per mile. Specific tire makes and types may have somewhat different values. Refer to the tire distributor to obtain actual tire revolutions per mile for make, type and size of tires actually used.

HIGHWAY TIRES		
Tube Type	Tubeless Type	Tire Revolutions Per Mile
8.25 x 20	9.00 x 22.5	543
9.00 x 20	10.00 x 22.5	523
10.00 x 20	11.00 x 22.5	507
11.00 x 20		492
10.00 x 22	11.00 x 24.5	488
HIGH FLOTATION TIRES		
	16.5 x 19.5	511
	18.5 x 19.5	498
	15 x 22.5	495
18.00 x 20		457
	48 x 25	420
	48 x 31	415
	66 x 43	315
	67 x 34	310

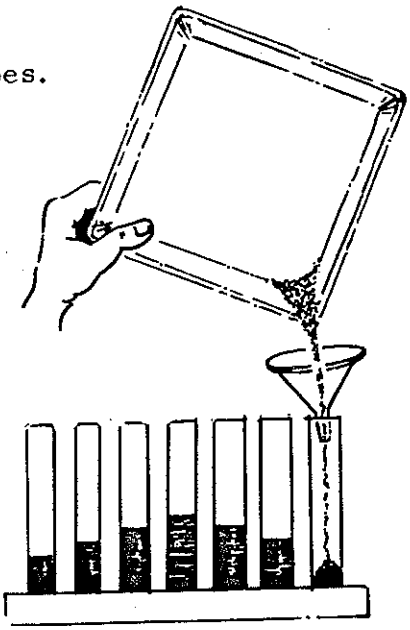
GATE OPENING (INCHES)	LB. PER CU. FT. MATERIAL SPREAD WIDTH				LB. PER CU. FT. MATERIAL SPREAD WIDTH				LB. PER CU. FT. MATERIAL SPREAD WIDTH				LB. PER CU. FT. MATERIAL SPREAD WIDTH				LB. PER CU. FT. MATERIAL SPREAD WIDTH			

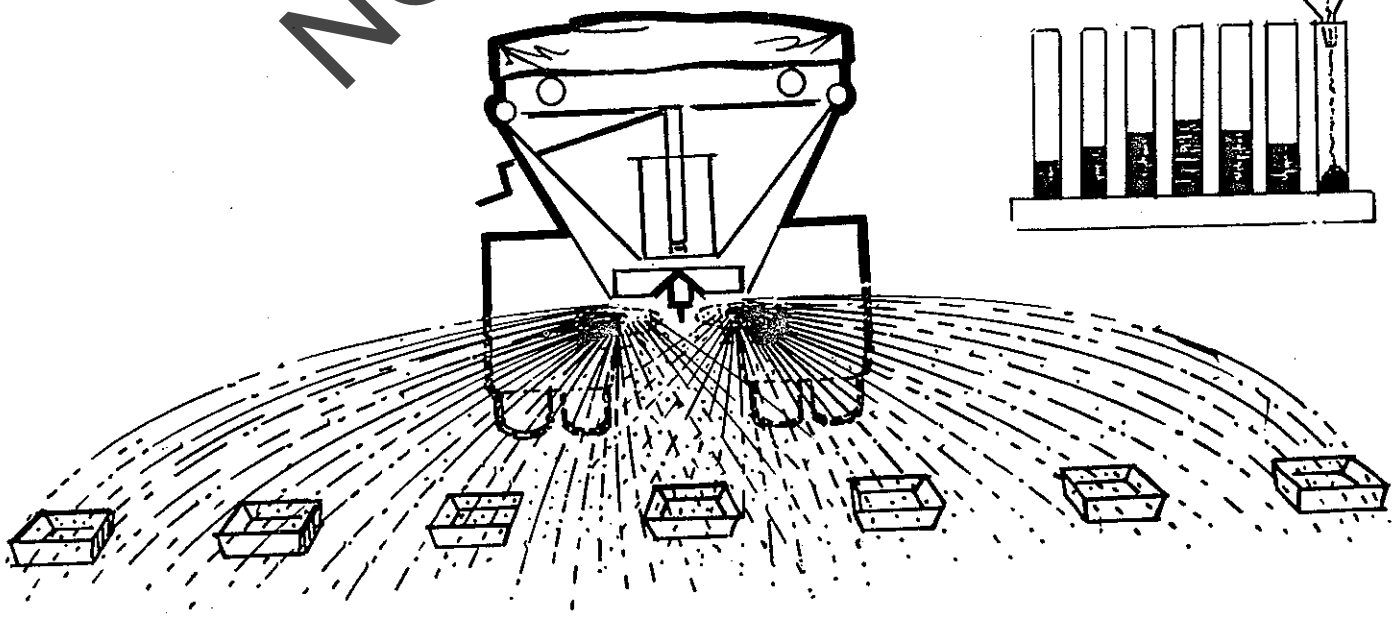
GATE OPENING (INCHES)	LB. PER CU. FT. MATERIAL SPREAD WIDTH				LB. PER CU. FT. MATERIAL SPREAD WIDTH				LB. PER CU. FT. MATERIAL SPREAD WIDTH				LB. PER CU. FT. MATERIAL SPREAD WIDTH				LB. PER CU. FT. MATERIAL SPREAD WIDTH			

HOW TO CHECK YOUR SPREAD PATTERN:

1. Secure seven (7) egg divider trays.
2. Find seven (7) rain gauge tubes or similar clear plastic or glass test tubes.
3. Arrange your trays evenly in a line as wide as your spread pattern. Make sure the ground is flat, free from plant growth higher than the trays, and trays are perfectly level.
4. Drive over and between your trays at your usual speed, spreading your regular fertilizer material at one of your usual settings. Straddle the center tray. Do this several times in each direction, until you have enough material in one or more of the trays to at least half fill a tube.
5. Pour tray number one in pan and then into tube number one, tray number two into tube number two, etc.
6. Set your tubes in a row. You can see which tubes have more than others. The amount you see in each tube is an indication of what you are putting on the ground.

Figure what the average height of material should be in all tubes. Compare this average with what you have in each tube. This tells you how far each portion of your swath is off-also how close together you must drive on each pass. Make a record of each pattern you check. Note the application rate and material so that you can compare it against future spread pattern checks.





STANDARD TORQUES

CAPSCREW GRADE IDENTIFICATION - Capscrew heads are marked as follows:

SAE GRADE 2  NO MARKS

SAE GRADE 5  THREE MARKS - 120° APART

SAE GRADE 8  SIX MARKS - 60° APART

The following torques are for threads lubricated with oil.

CAPSCREW SIZE	POUNDS - FOOT - TORQUE					
	GRADE 2		GRADE 5		GRADE 8	
	NC	NF	NC	NF	NC	NF
1/4"	5-7	6-8	9-11	11-13	12-14	14-16
5/16"	11-13	13-15	18-20	21-23	25-27	28-30
3/8"	18-21	19-22	28-33	30-35	41-46	43-48
7/16"	30-33	32-35	44-49	50-55	69-74	72-77
1/2"	45-50	45-50	68-73	68-73	95-105	95-105
9/16"	60-65	60-65	95-105	95-105	130-140	130-140
5/8"	75-85	75-85	125-135	125-135	170-190	170-190
3/4"	105-115	105-115	210-230	210-230	290-310	290-310
7/8"	125-135	125-135	290-310	290-310	450-500	450-500
1"	140-150	140-150	380-410		600-630	

When replacing hardware on unit, use Grade 5 or Grade 8 capscrews and always use a plated washer between aluminum and capscrew head and/or nut.

TABLE OF WEIGHTS AND MEASURES

Dry Measure

2 pints = 1 quart
1 quart = 67.2 cu. in.
1 British bushel = 1.032 U.S. bushel
8 quarts = 1 peck
4 pecks = 1 bushel

Liquid Measure

4 gills = 1 pint
16 fluid ounces = 1 pint
2 pints = 1 quart
4 quarts = 1 gallon
1 British Imperial gallon = 1.2 U.S. gals.
1 cu. ft. of water contains 7.48 gallons and weighs 62.321 lbs.
1 gallon = 231 cubic inches
31-1/2 gallons = 1 barrel
2 barrels = 1 hogshead

Weight of:

1 gal. water = approx. 8.33 lbs.
1 gal. gasoline = approx. 6.1 lbs.
1 gal. L.P.G. = approx. 4.25 lbs.
1 gal. Diesel Fuel = approx. 7.0 lbs.

Linear Measure

1 mil. = 0.001 inch
12 inches = 1 foot
3 feet = 1 yard
5-1/2 yards = 1 rod
40 rods = 1 furlong
8 furlongs = 1 statute mile
5280 feet = 1 statute mile
3 miles = 1 league

Square Measure

1 circular mil. = 0.7854 square mils
1,000,000 sq. mils = 1 square inch
144 square inches = 1 sq. ft.
9 sq. ft. = 1 sq. yard
30-1/4 sq. yds. = 1 sq. rod
40 sq. rods = 1 rood
4 roods - 1 acre = 43560 sq. ft.
640 acres = 1 sq. mile

Surveyor's Measure

7.92 inches = 1 link
25 links = 1 rod
4 rods = 1 chain
10 sq. chains or 160 sq. rods = 1 acre
36 sq. miles (6 miles square) = 1 township
43560 sq. ft. = 1 acre
640 acres = 1 sq. mile

Cubic Measure

1 cu. cm. = .061 cu. in.
27 cu. ft. = 1 cu. yd.
40 cu. ft. = 1 ton (shipping)
231 cu. in. = 1 U.S. gallon
1728 cu. in. = 1 cu. ft.
128 cu. ft. = 1 cord (wood)
2150.42 cu. in. = 1 std. bushel
1 cu. ft. = 4/5 of a bushel

Linear Measure

1 millimeter = 0.03937 inches
1 centimeter = 0.3937 inches
1 decimeter = 3.937 in. = 0.328 ft.
1 meter = 39.37 in. = 1.0936 yards
1 dekameter = 1.9884 rods
1 kilometer = 0.62137 mile
1 inch = 2.54 centimeters
1 foot = 3.048 decimeters
1 rod = 9.5029 dekameters
1 yard = 0.9144 meter
1 mile = 1.6093 kilometers

Square Measure

1 sq. cm. = 0.1550 sq. in.
1 sq. decimeter = 0.1076 sq. ft.
1 sq. meter = 1.196 sq. yds.
1 hectare = 2.47 acres
1 sq. kilometer = 0.386 sq. miles
1 sq. in. = 6.452 sq. cm.
1 sq. ft. = 9.2903 sq. decimeters
1 sq. yd. = 0.8361 sq. meter
1 sq. mile = 2.59 sq. kilometers

Weights

1 gram = 0.03527 ounces
1 kilogram = 2.2046 lbs.
1 metric ton = 2205 lbs.
1 pound = 0.4536 kilograms
1 metric ton = 1.1023 short tons
1 ounce = 28.35 grams = 437.5 grains

CONVERSION TABLES

DECIMAL AND METRIC EQUIVALENTS

Inches				Inches			
Fractions	Decimals	*Nom. Dec.	Milli-meters	Fractions	Decimals	*Nom. Dec.	Milli-meters
1/64	.015625	.02	.397	33/64	.515625	.52	13.097
1/32	.03125	.03	.794	17/32	.53125	.53	13.494
3/64	.046875	.05	1.191	35/64	.546875	.55	13.891
1/16	.0625	.06	1.588	9/16	.5625	.56	14.288
5/64	.078125	.08	1.984	37/64	.578125	.58	14.684
3/32	.09375	.09	2.381	19/32	.59375	.59	15.081
7/64	.109375	.11	2.778	39/64	.609375	.61	15.478
1/8	.125	.12	3.175	5/8	.625	.62	15.875
9/64	.140625	.14	3.572	41/64	.640625	.64	16.272
5/32	.15625	.16	3.969	21/32	.65625	.66	16.669
11/64	.171875	.17	4.366	43/64	.671875	.67	17.066
3/16	.1875	.19	4.763	11/16	.6875	.69	17.463
13/64	.203125	.20	5.159	45/64	.703125	.70	17.859
7/32	.21875	.22	5.556	23/32	.71875	.72	18.256
15/64	.234375	.23	5.953	47/64	.734375	.73	18.653
1/4	.250	.25	6.350	3/4	.750	.75	19.050
17/64	.265625	.27	6.747	49/64	.765625	.77	19.447
9/32	.28125	.28	7.144	25/32	.78125	.78	19.844
19/64	.296875	.30	7.541	51/64	.796875	.80	20.241
5/16	.3125	.31	7.938	13/16	.8125	.81	20.638
21/64	.328125	.33	8.334	53/64	.828125	.83	21.034
11/32	.34375	.34	8.731	27/32	.84375	.84	21.431
23/64	.359375	.36	9.128	55/64	.859375	.86	21.828
3/8	.375	.38	9.525	7/8	.875	.88	22.225
25/64	.390625	.39	9.922	57/64	.890625	.89	22.622
13/32	.40625	.41	10.319	29/32	.90625	.91	23.019
27/64	.421875	.42	10.716	59/64	.921875	.92	23.416
7/16	.4375	.44	11.113	15/16	.9375	.94	23.813
29/64	.453125	.45	11.509	61/64	.953125	.95	24.209
15/32	.46875	.47	11.906	31/32	.96875	.97	24.606
31/64	.484375	.48	12.303	63/64	.984375	.98	25.003
1/2	.500	.50	12.700	1	1.000	1.00	25.400

VOLUME AND WEIGHT CONVERSION CONSTANTS — U.S. TO METRIC

Pints x .4732 = Liters
Quarts x .9463 = Liters
Gallons x 3.7853 = Liters
Pounds x .4536 = Kilograms
Cubic Yards x .7645 = Cubic Meters

LENGTH CONVERSION CONSTANTS — U.S. TO METRIC

Inches x 25.400 = Millimeters
Inches x .0254 = Meters
Feet x .3048 = Meters
Statute Miles x 1.60935 = Kilometers

*Nominal decimals are used in place of fractions of an inch, with exception of such items as bolts, screws, washers, tubing, wire, etc.

ALWAYS GIVE PART NAME, NUMBER AND MACHINE SERIAL NUMBER WHEN ORDERING PARTS

Printed in U.S.A.

INSTRUCTIONS FOR ORDERING PARTS

Order parts from the authorized dealer covering your area.

ALWAYS GIVE THE PERTINENT MODEL AND SERIAL NUMBER.

To obtain parts promptly, give part name and part number.

Give post office address, town, county, and state where parts are to be shipped. Also specify whether material is to be shipped by freight, express, parcel post, or United Parcel Service.

Confirm all telephone or telegraph orders in writing.

Credit for new parts not needed must be obtained from the dealer from whom they were purchased.

Unless claims for shortages or errors are made immediately upon receipt of goods, they will not be considered.

Inspect all goods received immediately upon receipt. When damaged goods are received, insist that a full description of the damage be made by the carrier agent on the freight bill. If this description is insisted upon, full damage can be collected from the transportation company.

No responsibility is assumed for delay or damage to merchandise while in transit. Dealer's 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 the dealer.

ASSEMBLY - FEEDGATE & JACK

ITEM	PART NO.		DESCRIPTION	QTY.
1	2884		Slide - Feedgate, L.H.	1
2	2885		Slide - Feedgate, R.H.	1
3	13812		Assembly - Feedgate Consisting of:	1
		13813	Weldment - Feedgate	1
		13816	Belt - Sealer	1
		7084	Retainer - Sealer	1
		20619	Screw - Machine	5
		20642	Nut - Hex	5
		20710	Washer - Lock	5
	38755		Assembly - Feedgate (409 Stainless Steel) Consisting of:	1
		38757	Weldment - Feedgate	1
		13816	Belt - Sealer	1
		38756	Retainer - Sealer	1
		36405	Screw - Machine	5
		36412	Nut - Hex	5
		36418	Washer - Lock	5
	36387		Assembly - Feedgate (304 Stainless Steel) Consisting of:	1
		36389	Weldment - Feedgate	1
		13816	Belt - Sealer	1
		36388	Retainer - Sealer	1
		36405	Screw - Machine	5
		36412	Nut - Hex	5
		36418	Washer - Lock	5
4	28553		Assembly - Jack	1
5	23799		Handle	1
6	20916		Pin - Roll	1
7	20005		Screw - Cap	6
	36395		Screw - Cap (Stainless Steel)	6
8	20074		Screw - Cap	1
	36296		Screw - Cap (Stainless Steel)	1
9	20135		Screw - Cap	1
	36297		Screw - Cap (Stainless Steel)	1
10	20642		Nut - Hex	6
	36412		Nut - Hex (Stainless Steel)	6
11	20678		Nut - Lock	1
12	20680		Nut - Lock	1
13	20710		Washer - Lock	6
	36418		Washer - Lock (Stainless Steel	6
14	*13898		Indicator - Feedgate	1
	*36392		Indicator - Feedgate (Stainless Steel)	1

* Not Shown

ALWAYS GIVE PART NAME. NUMBER AND MACHINE SERIAL NUMBER WHEN ORDERING PARTS

Printed in U.S.A.

ASSEMBLY - FEEDGATE & JACK CONT'D

ITEM	PART NO.	DESCRIPTION	QTY.
15	1785	Kit - Repair, Jack Assembly (Consists of items 16 - 26)	1
16	23792	Pinion Gear	1
17	24497	Face Gear	1
18	24496	Bushing	2
19	23786	Plug	2
20	12438	Dust Cap	1
21	23793	Retaining Washer	1
22	12437	Pivot Handle, Weldment	1
23	12080	Thrust - Bearing	1
24	20916	Self-Lock Pin	4
25	11393	Pivot Bar	1
26	12081	Spacer	1
		GROUP - CAB PROTECTOR	
	31786	Assembly Group - Cab Protector 57" Cab Height	
	39811	Assembly Group - Cab Protector 63" Cab Height	
	39817	Assembly Group - Cab Protector 69" Cab Height	
27	31787	Panel - Shield 57" Cab Height	1
	39812	Panel - Shield 63" Cab Height	1
	39818	Panel - Shield 69" Cab Height	1
28	31788	Weldment - R. H. Support 57" Cab Height	1
	39813	Weldment - R. H. Support 63" Cab Height	1
	39819	Weldment - R. H. Support 69" Cab Height	1
29	31789	Weldment - L. H. Support 57" Cab Height	1
	39815	Weldment - L. H. Support 63" Cab Height	1
	39821	Weldment - L. H. Support 69" Cab Height	1
30	20067	Screw - Cap 3/8-16 UNC x 1	A. R.
31	20644	Nut - Hex 3/8-16 UNC	A. R.
32	20693	Washer - Flat 3/8	A. R.
33	20712	Washer - Lock 3/8	A. R.
		GROUP - MUDFLAPS	
	46564	Assembly Group - Mudflaps	
34	7793	Mudflap - NEW LEADER	2
35	*36844	Rod - Mudflap	2
36	20067	Screw - Cap 3/8-16 UNC x 1	8
37	20644	Nut - Hex 3/8-16 UNC	8
38	20693	Washer - Flat 3/8	8
39	20712	Washer - Lock	8

* Not Shown

ALWAYS GIVE PART NAME, NUMBER AND MACHINE SERIAL NUMBER WHEN ORDERING PARTS

Printed in U.S.A.

GROUP - LIGHTS

	39830	Kit - Lights	
62	6114	Lamp - Cluster, Red	1
63	3824	Mount - Belt, Reflector	4
64	6107	Reflector - Red	4
65	6108	Clearance Lamp - Amber	2
66	6110	Clearance Lamp - Red	2
67	*21580-600	Wire - 14 Ga. (Black)	1
68	3775	Bracket - Clearance Lamp	2
69	38611	Bracket - Clearance Lamp	2
70	20003	Screw - Cap 1/4-20 UNC x 3/4	24
71	20572	Screw - Machine 3/16-UNC x3/4	33
72	20641	Nut - Hex 3/16-UNC	33
73	20642	Nut - Hex 1/4-20 UNC	24
74	20691	Washer - 1/4	24
75	20709	Washer - Lock	33
76	20710	Washer - Lock	8
77	6198	Clip - Wire	21
78	21986	Grommet - Rubber 3/16	10

GROUP - INVERTED VEE

	54934	Assembly - Inverted Vee (10' Unit)	
	54935	Assembly - Inverted Vee (11' & 12' Unit)	
	54936	Assembly - Inverted Vee (13' & 14' Unit)	
	54937	Assembly - Inverted Vee (15' & 16' Unit)	
	38760	Assembly - Inverted Vee 409 Stainless Steel (10' Unit)	
	38761	Assembly - Inverted Vee 409 Stainless Steel (11' Unit)	
	38761	Assembly - Inverted Vee 409 Stainless Steel (12' Unit)	
	38762	Assembly - Inverted Vee 409 Stainless Steel (13' & 14' Unit)	
	46982	Assembly - Inverted Vee 409 Stainless Steel (15' & 16' Unit)	
	36488	Assembly - Inverted Vee 304 Stainless Steel (10' Unit)	
	36489	Assembly - Inverted Vee 304 Stainless Steel (11' Unit)	
	36489	Assembly - Inverted Vee 304 Stainless Steel (12' Unit)	
	36490	Assembly - Inverted Vee 304 Stainless Steel (13' & 14' Unit)	
	54183	Assembly - Inverted Vee 304 Stainless Steel (15' & 16' Unit)	
79	54938	Weldment - Adjustable Vee (10' Unit)	1
	54939	Weldment - Adjustable Vee (11' & 12' Unit)	1
	54940	Weldment - Adjustable Vee (13' & 14' Unit)	1
	54941	Weldment - Adjustable Vee (15' & 16' Unit)	1

* - Not Show

GROUP - INVERTED VEE CONT'D

ITEM	PART NO.	DESCRIPTION	QTY.
	38763	Weldment - Adjustable Vee, 409 Stainless Steel (10' Unit)	1
	38770	Weldment - Adjustable Vee, 409 Stainless Steel (11' Unit)	1
	38770	Weldment - Adjustable Vee, 409 Stainless Steel (12' Unit)	1
	38772	Weldment - Adjustable Vee, 409 Stainless Steel (13' & 14' Unit)	1
	43983	Weldment - Adjustable Vee, 409 Stainless Steel (15' & 16' Unit)	1
	36491	Weldment - Adjustable Vee, 304 Stainless Steel (10' Unit)	1
	36492	Weldment - Adjustable Vee, 304 Stainless Steel (11' Unit)	1
	36492	Weldment - Adjustable Vee, 304 Stainless Steel (12' Unit)	1
	36493	Weldment - Adjustable Vee, 304 Stainless Steel (13' & 14' Unit)	1
	54187	Weldment - Adjustable Vee, 304 Stainless Steel (15' & 16' Unit)	1
80	19686	Weldment - Hanger	A.R.
	38766	Weldment - Hanger (409 Stainless Steel)	A.R.
	36494	Weldment - Hanger (304 Stainless Steel)	A.R.
81	20067	Screw - Cap 3/8-16 UNC x1	A.R.
	36398	Screw - Cap 3/8-16 UNC x1 (Stainless Steel)	A.R.
82	*20128	Screw - Cap 1/2-13 UNC x 1-1/4	A.R.
	*36402	Screw - Cap 1/2-13 UNC x 1-1/4 (Stainless Steel)	A.R.
83	20644	Nut - Hex 3/8-16 UNC	A.R.
	36414	Nut - Hex 3/8-16 UNC (Stainless Steel)	A.R.
84	*20646	Nut - Hex 1/2-13 UNC	A.R.
	*36416	Nut - Hex 1/2-13 UNC (Stainless Steel)	A.R.
85	20712	Washer - Lock 3/8	A.R.
	36420	Washer - Lock 3/8 (Stainless Steel)	A.R.
86	*20714	Washer - Lock 1/2	A.R.
	*36422	Washer - Lock 1/2 (Stainless Steel)	A.R.

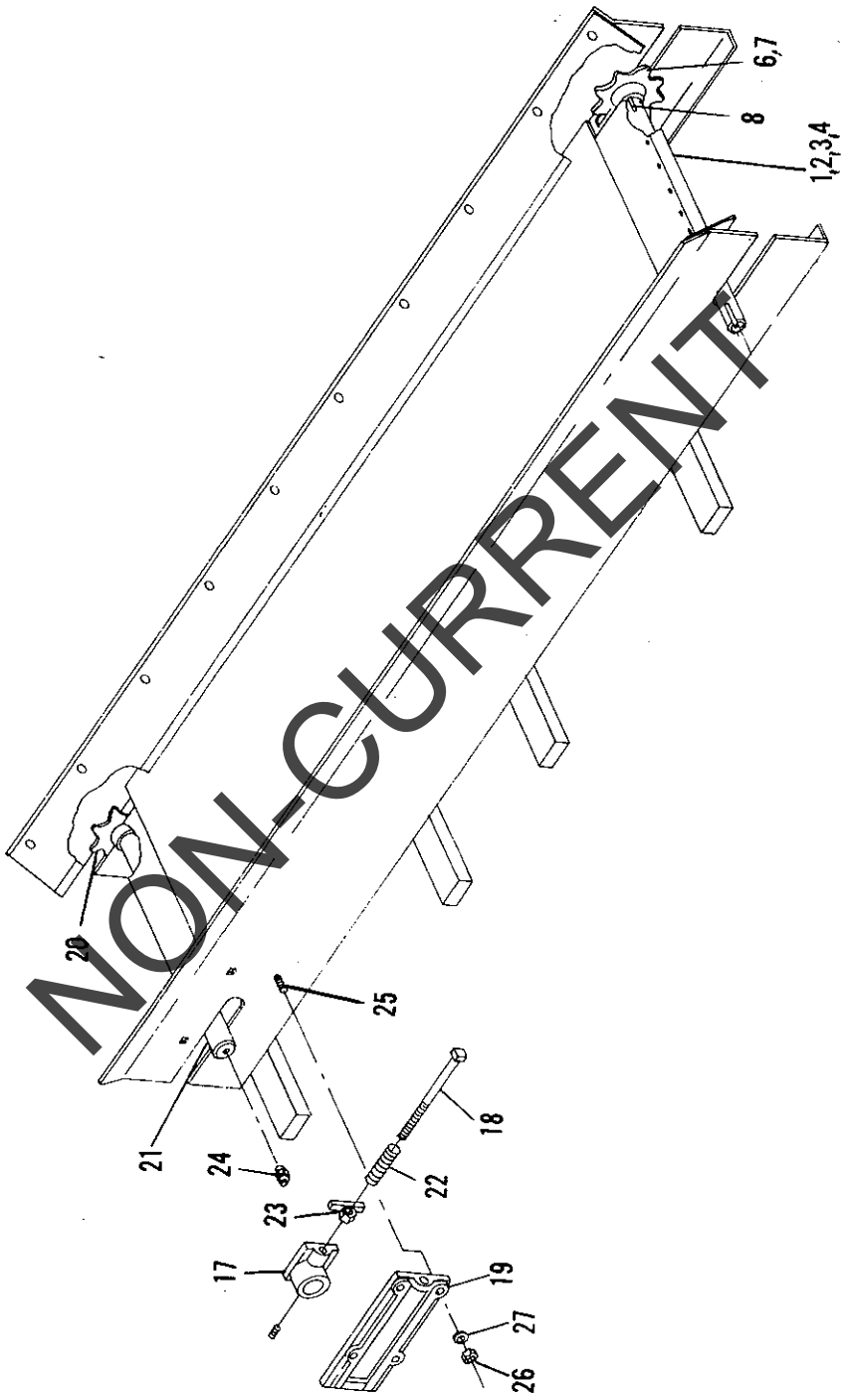
GROUP - LADDER

	46458	Group - Ladder	
	53955	Group - Ladder for 96" wide Units	
87	72797	Ladder - Upper	1
	72779	Ladder - Upper for 96" wide Units	1
88	72795	Ladder - Lower	1
89	*46459	Hardware Group	1

* - Not Shown

ASSEMBLY GROUPS

GROUP CONVEYOR DRIVE, GROUP CONVEYOR IDLER,



ASSEMBLY GROUP - CHAIN WIPER

ITEM	PART NO.	DESCRIPTION	QTY.
1	3735	Belt - Wiper	1
2	20619	Screw - Machine	1
3	20642	Nut - Hex	1
4	20691	Washer - Flat	1
5	*33207	Belt - Sealer	2

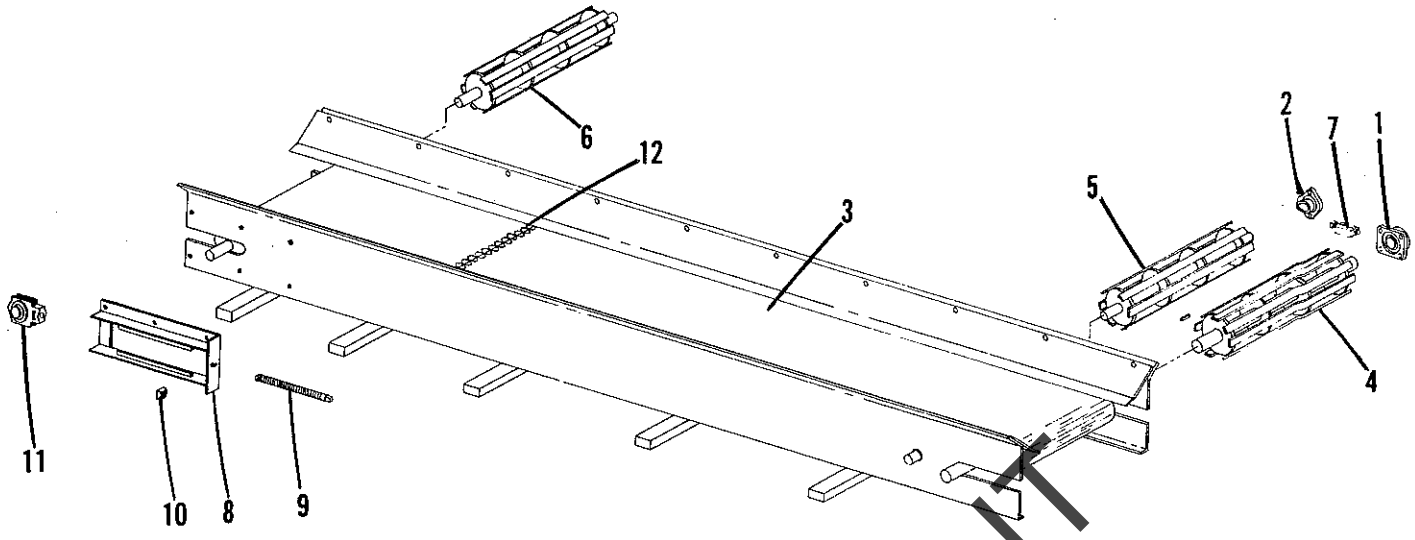
ASSEMBLY GROUP - CONVEYOR DRIVE #2, #3 & #4

	46289	Assembly Group - Conveyor Drive #2, #3 & #4	
6	27275	Sprocket - Drive, 8 Tooth	2
7	20748	Screw - Set, Allen Head	2
8	6131	Key - Square	2
9	* 6465	Bearing - Flange	1
10	*20436	Bolt - Carriage 1/2-13 UNC x 1-1/2	4
11	*20437	Nut - Hex 1/2-13 UNC	4
12	*20438	Washer - Lock 1/2	4
13	*20262	Screw - Cap 5/8-11 UNC x 1-3/4	4
14	*20648	Nut - Hex 5/8-11 UNC	4
15	* 4730	Shim	2

ASSEMBLY GROUP - CONVEYOR IDLER #2, #3 & #4

	19704	Assembly Group - Conveyor Idler (Chain)	
	43795	Ass'y Grp. - Conveyor Idler (Chain, Stn. Stl.)	
16	*20836	Pin - Cotter 1/4 x 2-1/2	2
17	2121	Bearing Idler	2
18	2124	Bolt - Machine	2
19	2126	Bracket - Bearing	2
20	2130	Sprocket - Idler 8T-1-1/2" Bore	2
21	2134	Shaft - Idler	1
22	2704	Spring - Take-up	2
23	3908	Weldm't - Tightener Nut	2
	43797	Weldm't - Tightener Nut (Stn. Stl.)	2
24	6071	Zerk - Grease	2
25	20294	Bolt - Carriage 5/16-18 UNC x 1-1/2"	8
	8804	Bolt - Carriage 5/16-18 UNC x 1-1/2" Stn. Stl.	8
26	20643	Nut - Hex 5/16-18 UNC	8
	36413	Nut - Hex 5/16-18 UNC Stn. Stl.	8
27	20711	Washer - Lock 5/16	8
	36419	Washer - Lock 5/16 Stn. Stl.	2

* Not Shown



ASSEMBLY GROUP - #5 BOTTOM

ITEM	PART NO.	DESCRIPTION	QTY.
	53982	Assembly - #5 Belt (10' Unit)	
	53983	Assembly - #5 Belt (11' Unit)	
	53984	Assembly - #5 Belt (12' Unit)	
	53985	Assembly - #5 Belt (13' Unit)	
	NOTE: The above assemblies include Item 3 & 12.		
1	6465	Bearing	2
2	32468	Bearing	2
3	39597	Belt Only (10' Unit)	1
	39598	Belt Only (11' Unit)	1
	39599	Belt Only (12' Unit)	1
	39600	Belt Only (13' Unit)	1
4	39572	Pulley - Drive	1
	43793	Pulley - Drive (Stainless Steel)	1
5	33875	Pulley - Snub	1
	36366	Pulley - Snub (Stainless Steel)	1
6	33878	Pulley - Idler	1
	36368	Pulley - Idler (Stainless Steel)	1
7	20800	Screw - Adjusting	2
	36372	Screw - Adjusting (Stainless Steel)	2
	40349	Assembly - Take-up	2
	36507	Assembly - Take-up (Stainless Steel)	2
	NOTE: The above assemblies include Items 8 - 11.		
8	7895	Bracket	1
9	30726	Screw - Adjusting	1
	36508	Screw - Adjusting (Stainless Steel)	1
10	20260	Nut	1
	36509	Nut (Stainless Steel)	1
11	22511	Bearing	1

ASSEMBLY GROUP - #5 BOTTOM CONT'D

ITEM	PART NO.	DESCRIPTION	QTY.
12	53995	Assembly Group - Belt Splicing Kit Consisting of:	1
	53992	Fastener - Hinge 1 Bolt	4
	53993	Fastener - Hinge 2 Bolt	2
	53994	Fastener - Hinge 3 Bolt	4
	33884-23	Tape - Belt Stiffener	2
	33884-17	Tape - Belt Stiffener	2
	39603	Pin - Hinge	1
	39604-23	Tube - Sealer	2
13		Belt Only for Assembly with #1 Type Lacing For:	
	44878	10' Unit	1
	44879	11' Unit	1
	44880	12' Unit	1
	44881	13' Unit	1
14	33882	Assembly Group -Belt Splicing Kit #1 Type	1

ASSEMBLY GROUP - CONVEYOR CHAIN CONT'D

ITEM	PART NO.	DESCRIPTION	QTY.
9	6244	Rivet	A.R.
10	20816	Pin - Cotter	A.R.
11		Belt - Conveyor (Specify Body Length)	1
12	*20624	Screw - Machine, Truss Head	32
13	*20617	Screw - Machine, Flat Head	4

GROUP - CHAIN AND BELT SHIELD

D		Assembly - Chain Shield #4 Chain Only for:	
	37367	10' Unit	1
	43816	10' 409 Stainless Steel Unit	1
	54143	10' 304 Stainless Steel Unit	1
	37368	11' Unit	1
	43818	11' 409 Stainless Steel Unit	1
	54144	11' 304 Stainless Steel Unit	1
	37369	12' Unit	1
	43820	12' 409 Stainless Steel Unit	1
	54145	12' 304 Stainless Steel Unit	1
	37370	13' Unit	1
	43824	13' 409 Stainless Steel Unit	1
	54146	13' 304 Stainless Steel Unit	1
	39625	14' Unit	1
	43827	14' 409 Stainless Steel Unit	1
	54147	14' 304 Stainless Steel Unit	1
	37371	15' Unit	1
	46993	15' 409 Stainless Steel Unit	1
	54148	15' 304 Stainless Steel Unit	1
	46302	16' Unit	1
	46994	16' 409 Stainless Steel Unit	1
	54149	16' 304 Stainless Steel Unit	1
E		Chain & Belt Shield for:	
	39615	10' Unit	1
	43697	10' 409 Stainless Steel Unit	1
	54119	10' 304 Stainless Steel Unit	1
	39616	11' Unit	1
	43698	11' 409 Stainless Steel Unit	1
	54120	11' 304 Stainless Steel Unit	1
	39617	12' Unit	1
	43699	12' 409 Stainless Steel Unit	1
	54121	12' 304 Stainless Steel Unit	1
	39618	13' Unit	1
	43700	13' 409 Stainless Steel Unit	1

* Not Shown A.R. - As Required

ALWAYS GIVE PART NAME, NUMBER AND MACHINE SERIAL NUMBER WHEN ORDERING PARTS

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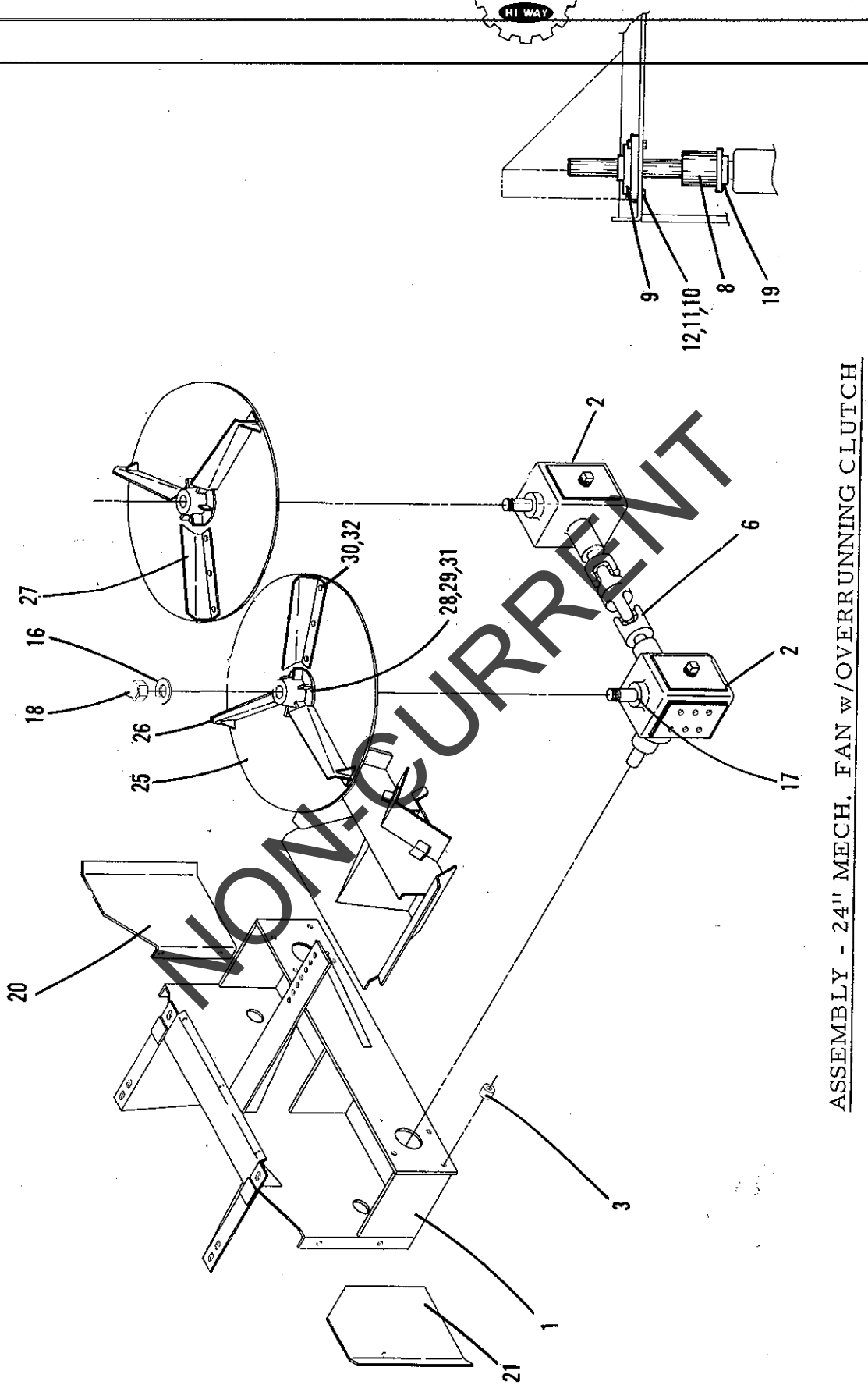
GROUP - CHAIN AND BELT SHIELD CONT'D

ITEM	PART NO.	DESCRIPTION	QTY.
	54122	13' 304 Stainless Steel Unit	1
	39619	14' Unit	1
	43701	14' 409 Stainless Steel Unit	1
	54123	14' 304 Stainless Steel Unit	1
	46297	15' Unit	1
	46987	15' 409 Stainless Steel Unit	1
	54124	15' 304 Stainless Steel Unit	1
	46298	16' Unit	1
	46988	16' 409 Stainless Steel Unit	1
	54125	16' 304 Stainless Steel Unit	1
14		Belt - Sealer for:	
	7687-132	10' Unit	1
	7687-144	11' Unit	1
	7687-156	12' Unit	1
	7687-168	13' Unit	1
	7687-180	14' Unit	1
	7687-192	15' Unit	1
	7687-204	16' Unit	1
15	6245	Rivet	A.R.
16	*20318	Bolt - Carriage 3/8 - 16 UNC x 1	A.R.
	*36408	Bolt - Carriage 3/8 - 16 UNC x 1 Stainless Steel	A.R.
17	*20644	Nut - Hex 3/8 - 16 UNC	A.R.
	*36414	Nut - Hex 3/8 - 16 UNC Stainless Steel	A.R.
18	*20712	Washer - Lock 3/8	A.R.
	*36420	Washer - Lock 3/8 Stainless Steel	A.R.

* Not Shown A.R. - As Required



ASSEMBLY - 24" MECH. FAN w/OVERRUNNING CLUTCH

ASSEMBLY - 24" MECH. FAN w/OVERRUNNING CLUTCH

ITEM	PART NO.	DESCRIPTION	QTY.
	47066	Assy. - 24" Mech. Fan RH #4 & #5 Conv.	
	47067	Assy. -24" Mech. Fan LH #4 & #5 Conv.	
	47068	Assy. - 24" Mech. Fan RH #1, #2&#3 Conv.	
	47069	Assy. - 24" Mech. Fan LH #1, #2&#3 Conv.	
1	47096	Weldmt. - Distributor Frame	1
2	31764	Assy. - Gear Case Use w/47066 & 47068	1
	31765	Assy. - Gear Case Use w/47067 & 47069	1
	19528	Assy. - Gear Case Use w/47066 & 47068	1
	19529	Assy. - Gear Case Use w/47067 & 47069	1
3	19518	Spacer	8
4	*20131	Screw - Cap 1/2-13 UNC x 2"	8
5	*20714	Washer - Lock 1/2"	8
6	22490	U-Joint, Double Pivot	1
7	6136	Key - Square 1/4" x 1/4" x 2"	1
8	13049	Clutch - Overrunning	1
9	942	Bearing - Flange 1-1/8"	1
10	20099	Screw - Cap 7/16" - 14 UNC x 1-1/4	4
11	20645	Nut - Hex 7/16" - 14 UNC	4
12	20713	Washer - Lock 7/16"	4
13	19450	Assy. - Fan RH	1
14	19451	Assy. - Fan LH	1
15	*20700	Washer - Flat 1"	2
16	21010	Washer - Shake Proof	2
17	22749	Cup - Leather	2
18	22799	Nut - Acorn 1" - 14 UNC	2
19	21055	Collar - Set 1-1/8" Dia.	1
20	19456	Shield - Deflector, RH	1
21	19457	Shield - Deflector, LH	1
22	*20068	Screw - Cap 3/8-16 UNC x 1-1/4	4
23	*20644	Nut - Hex 3/8-16 UNC	4
24	*20712	Washer - Lock 3/8	4
25	27056	Disc	2
26	25870	Fin - RH	3
27	25871	Fin - LH	3
28	19526	Hub	2
29	20004	Screw - Cap 1/4"-20 UNC x 7/8"	6
30	20034	Screw - Cap 5/16-18 UNC x 3/4"	9
31	20676	Nut - Lock 1/4-20 UNC	6
32	20677	Nut - Lock 5/16-18 UNC	9

*Not Shown

ALWAYS GIVE PART NAME, NUMBER AND MACHINE SERIAL NUMBER WHEN ORDERING PARTS

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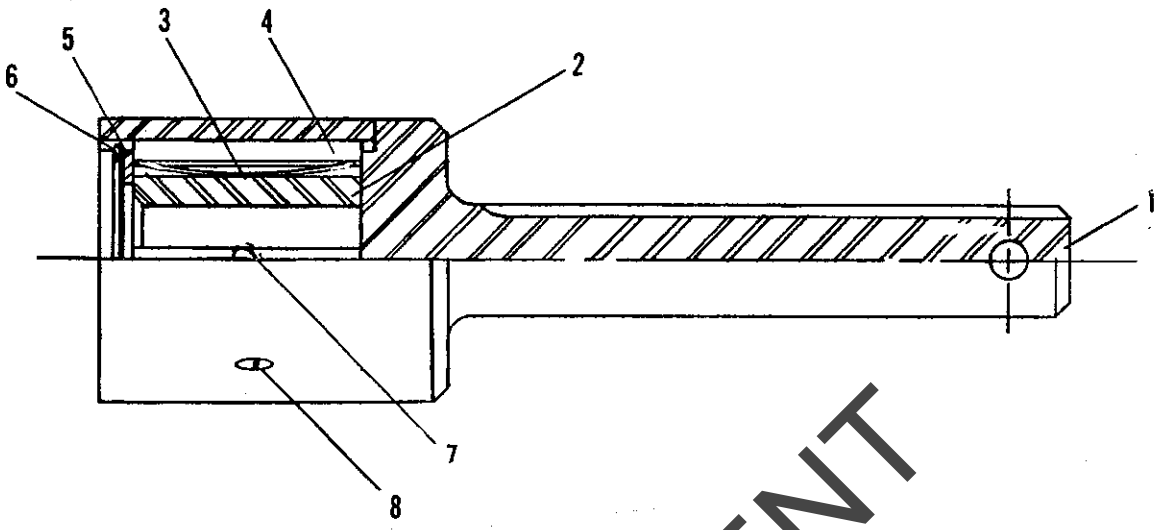
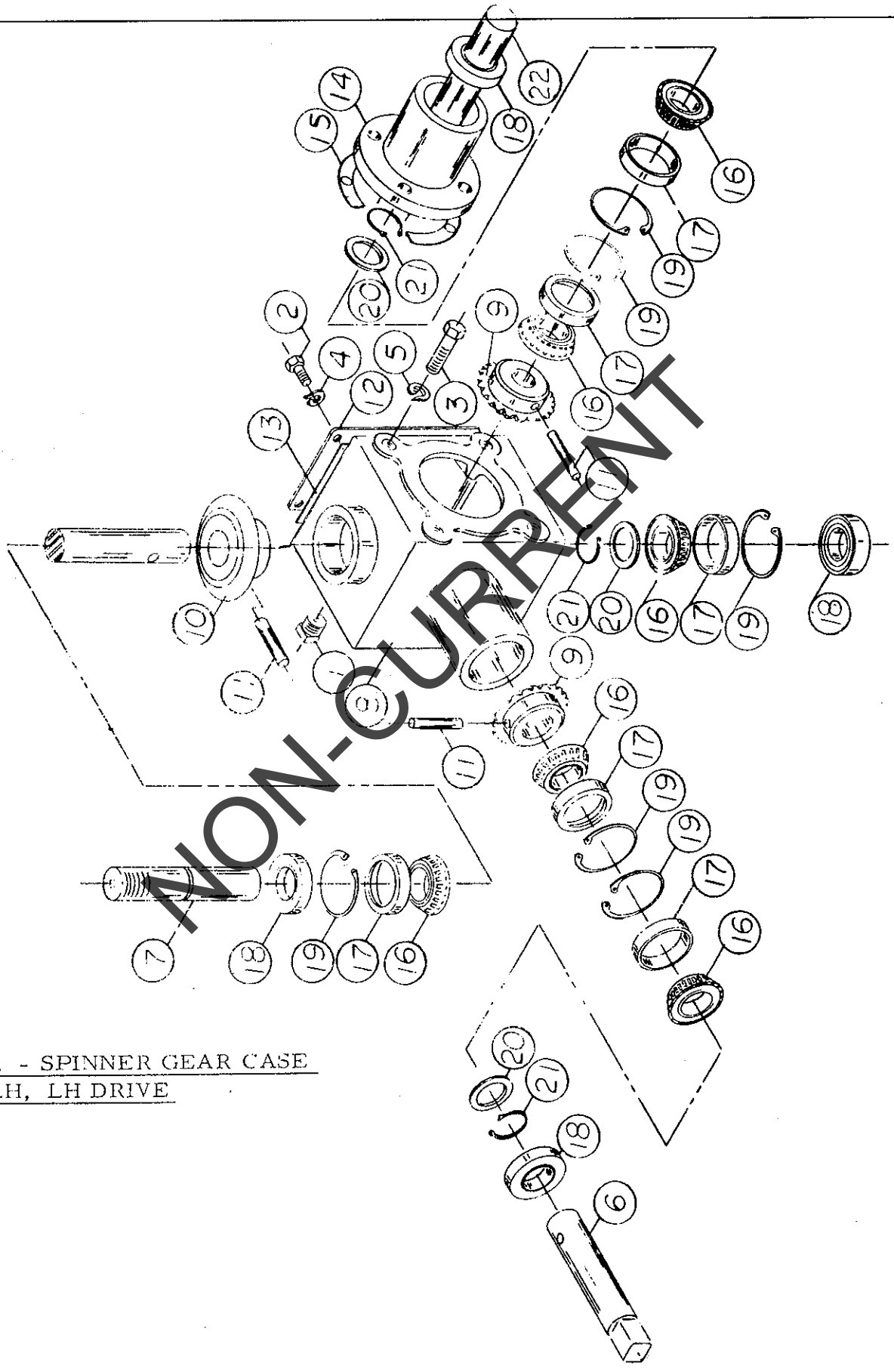


ASSEMBLY - CLUTCH, OVERRUNNING

ITEM	PART NO.	DESCRIPTION	QTY
	13049	Ass'y-Overrunning Clutch (Engine Rotation)	1
	38570	Ass'y-Overrunning Clutch (Opp. Engine Rotation)	1
1	7845	Housing-Coupler, Engine Rotation	1
	39001	Housing-Coupler, Opp. Engine Rotation	1
2	7846	Sleeve-Drive, Engine Rotation	1
	7884	Sleeve-Drive, Opp. Engine Rotation	1
3	7866	Spring	2
4	7859	Key-Drive	2
5	7857	Cover-Retainer	1
6	7858	Ring-Snap	1
7	7867	Screw-Set, Nylock 5/16 x 3/8	1
8	7869	Plug-Pipe	1
9	6069	Zerk-Grease	1



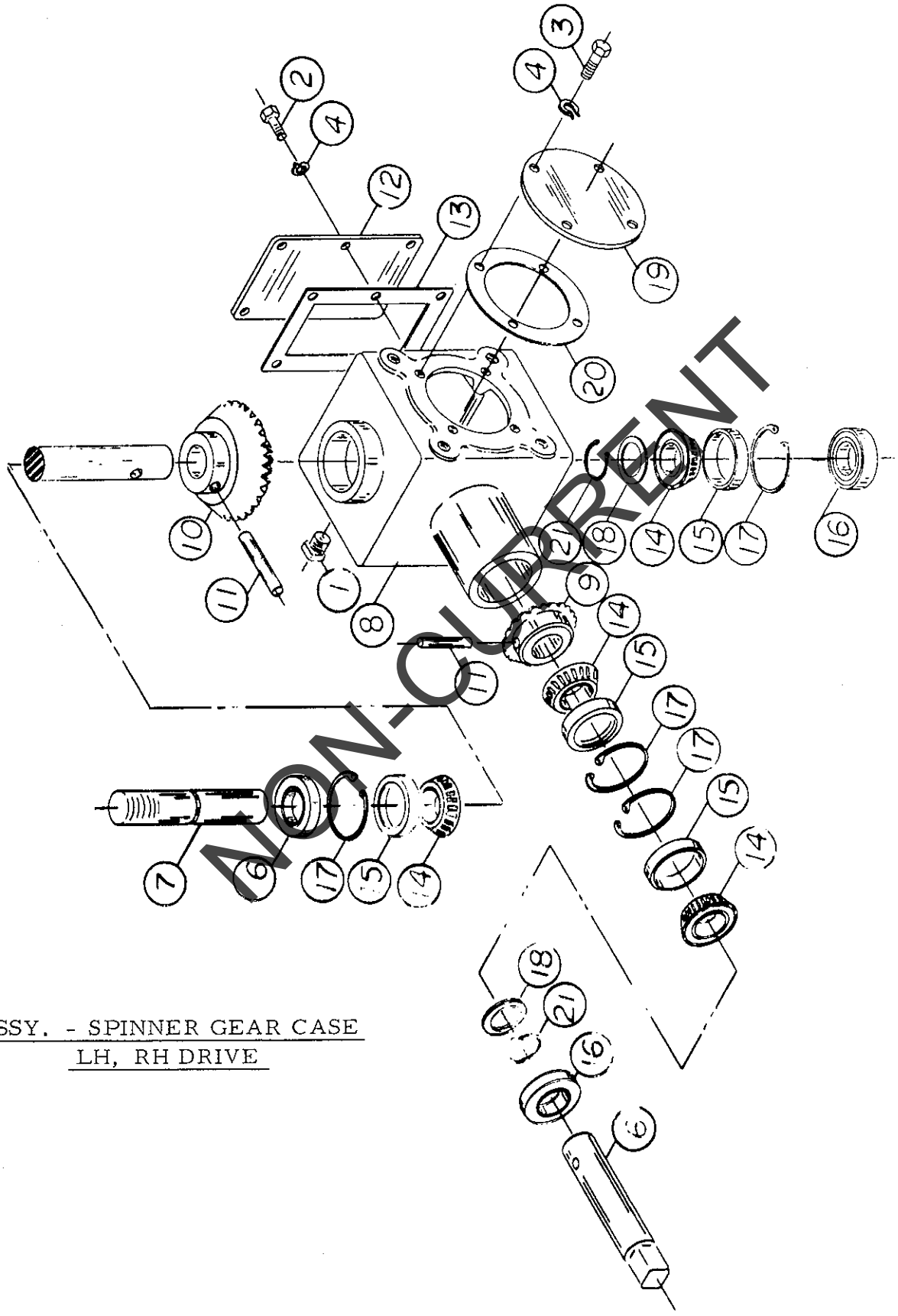
ASSY. - SPINNER GEAR CASE
LH, LH DRIVE

ASSY. - SPINNER GEAR CASE, LH, LH DRIVE

ITEM	PART NO.	DESCRIPTION	QTY.
*	21794	Assy. - Spinner Gear Case, LH, LH Drive	1
**	31765	Assy. - Spinner Gear Case, LH, LH Drive	1
1	6032	Plug - Pipe, 1/2	1
2	20002	Screw - Cap, 1/4-20 NC x 5/8	6
3	20068	Screw - Cap, 3/8-16 NC x 1-1/4	4
4	20710	Washer - Lock, 1/4	6
5	20712	Washer - Lock, 3/8	4
6	27395	Shaft - Output	1
7	27396	Shaft - Spinner	1
8	43483	Gear Box	1
9	21705	Gear - Bevel, 18T	2
10	21706	Gear - Bevel, 27 T.	1
11	21707	Pin	3
12	21708	Plate - Cover	1
13	21709	Gasket - Cover Plate	1
14	21710	Hub	1
15	21711	Gasket - Hub	1
16	21712	Bearing - Cone	6
17	21713	Bearing - Cup	6
18	21714	Seal - Oil	3
19	21715	Ring - Retainer	7
20	21716	Spacer	A. R.
21	27399	Ring - Snap	3
22	*27398	Shaft - Drive, Standard	1
	**31766	Shaft - Drive, Widespread	1

Complete Assembly Includes Items 1 - 22.

* Used on Standard 18" Fan Assembly.
** Used on Widespread Fan Assembly Only.



ASSY. - SPINNER GEAR CASE
LH, RH DRIVE

SPINNER GEAR CASE ASSY. LH, RH DRIVE

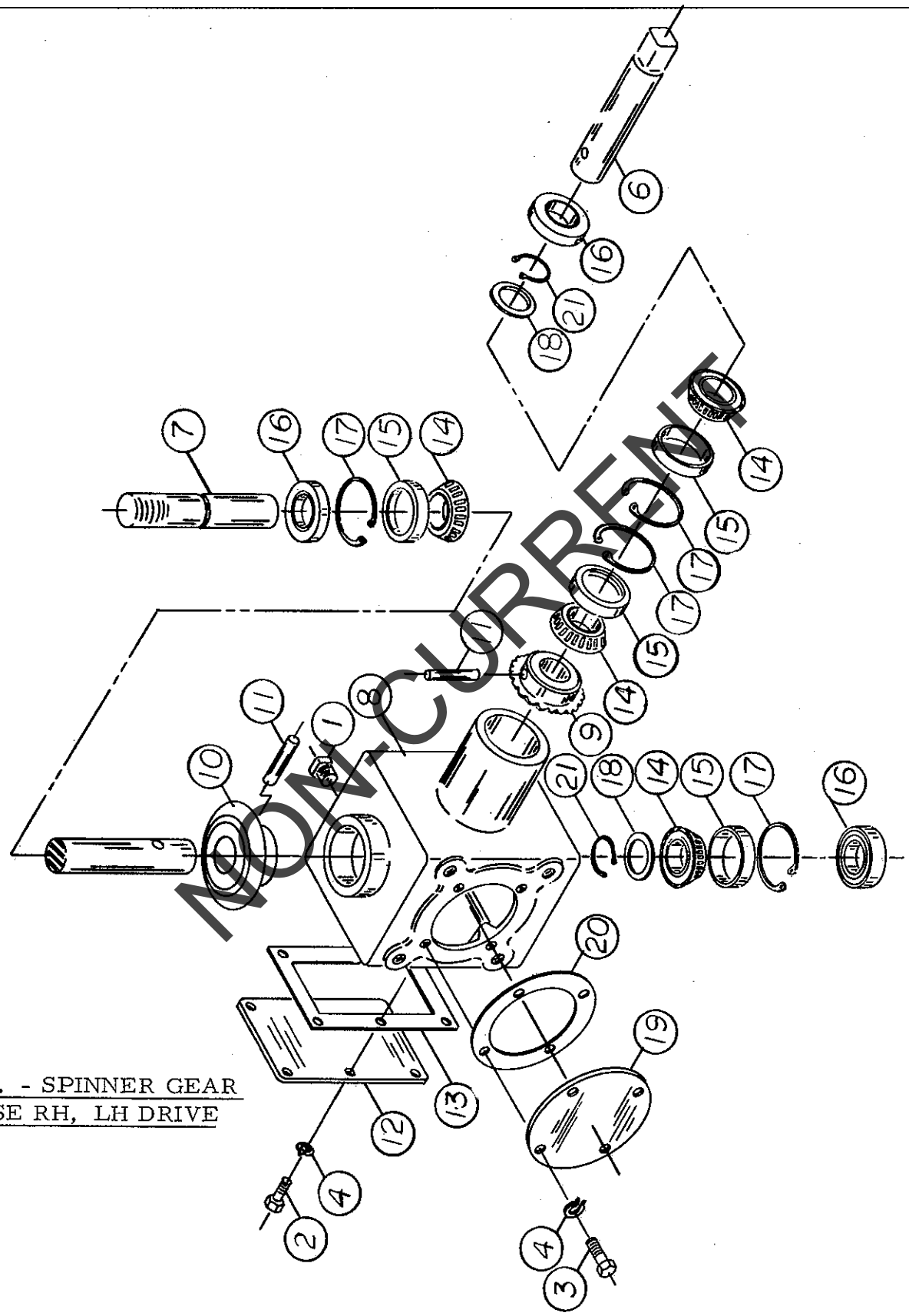
ITEM	PART NO.	DESCRIPTION	QTY.
*	19528	Spinner Gear Case Assy. LH, RH Drive	1
1	6032	Plug - Pipe, 1/2	1
2	20002	Screw - Cap, 1/4 - 20 NC x 5/8	6
3	20065	Screw - Cap, 3/8- 16 NC x 3/4	4
4	20710	Washer - Lock, 1/4 Std.	6
5	20712	Washer - Lock, 3/8 Std.	4
6	27395	Shaft - Input	1
7	27396	Shaft - Spinner	1
8	43483	Gear - Box	1
9	21705	Gear - Bevel, 18T	1
10	21706	Gear - Bevel, 27T	1
11	21707	Pin	2
12	21708	Plate - Cover	1
13	21709	Gasket - Cover Plate	1
14	21712	Bearing - Cone	4
15	21713	Bearing - Cup	4
16	21714	Seal - Oil	3
17	21715	Ring - Retainer	4
18	21716	Spacer	A. R.
19	21717	Disc - Cover Plate	1
20	21718	Gasket	1
21	27399	Ring - Snap	2

* Complete Assembly includes Items 1 through 21.

ASSY. - SPINNER GEAR CASE, RH, RH DRIVE

ITEM	PART NO.	DESCRIPTION	QTY.
*	21793	Assembly - Spinner Gear Case, RH, RH Drive	1
**	31764	Assembly - Spinner Gear Case, RH, RH Drive	1
1	6032	Plug - Pipe, 1/2	1
2	20002	Screw - Cap, 1/4-20 NC x 5/8	6
3	20068	Screw - Cap, 3/8-16 NC x 1-1/4	4
4	20710	Washer - Lock, 1/4	6
5	20712	Washer - Lock, 3/8	4
6	27395	Shaft - Output	1
7	27396	Shaft - Spinner	1
8	21704	Gear Box	1
9	21705	Gear - Bevel, 18 T.	2
10	21706	Gear - Bevel, 27 T.	1
11	21707	Pin	3
12	21708	Plate - Cover	1
13	21709	Gasket - Cover Plate	1
14	21710	Hub	1
15	21711	Gasket - Hub	1
16	21712	Bearing - Cone	6
17	21713	Bearing - Cup	6
18	21714	Seal - Oil	4
19	21715	Ring - Retainer	6
20	21716	Spacer	A. R.
21	27399	Ring - Snap	3
22	*27398	Shaft - Drive, Standard	1
	**31766	Shaft - Drive, Widespread	1

Complete Assembly Includes Items 1 - 22.
* Used on Standard 18" Fan Assembly.
** Used on Widespread Fan Assembly Only.

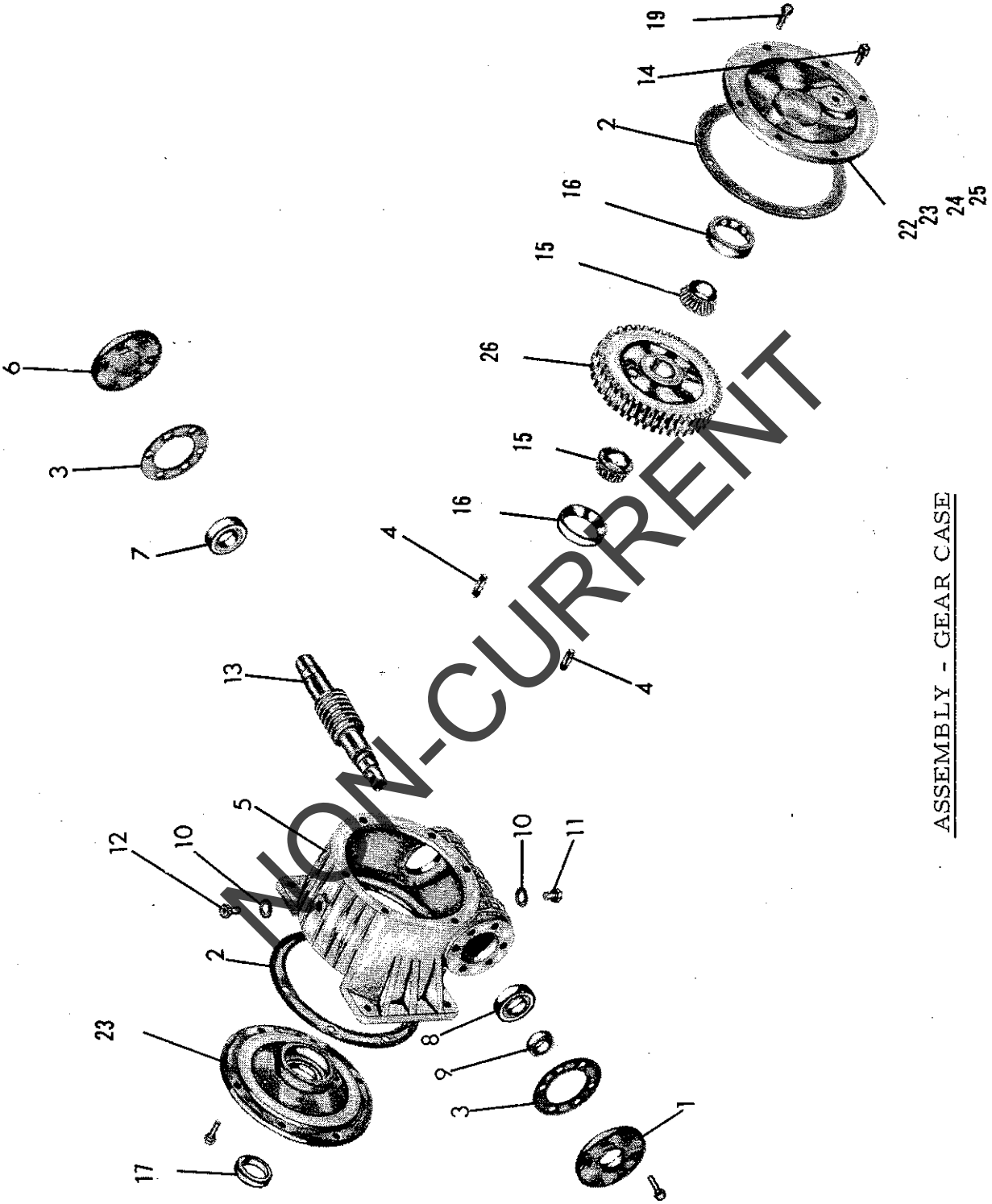


ASSY. - SPINNER GEAR CASE RH, LH DRIVE

ASSY. - SPINNER GEAR CASE RH, LH DRIVE

ITEM	PART NO.	DESCRIPTION	QTY.
*	19529	Spinner Gear Case RH, LH Drive	1
1	6032	Plug - Pipe 1/2	1
2	20002	Screw - Cap, 1/4-20 NC x 5/8	6
3	20065	Screw - Cap, 3/8-16 NC x 3/4	4
4	20710	Washer - Lock, 1/4 Std.	6
5	20712	Washer - Lock, 3/8 Std.	4
6	27395	Shaft - Input	1
7	27396	Shaft - Spinner	1
8	21704	Gear - Box	1
9	21705	Gear - Bevel, 18T	1
10	21706	Gear - Bevel, 27T	1
11	21707	Pin	2
12	21708	Plate - Cover	1
13	21709	Gasket - Cover Plate	1
14	21712	Bearing - Cone	4
15	21713	Bearing - Cup	4
16	21714	Seal - Oil	3
17	21715	Ring - Retainer	4
18	21716	Spacer	A. R.
19	21717	Disc - Cover Plate	1
20	21718	Gasket	1
21	27399	Ring - Snap	2

* Complete Assembly includes Items 1 through 21.



ASSEMBLY - GEAR CASE

ASSEMBLY GROUP - CONV. GEAR CASE

ITEM	PART NO.	DESCRIPTION	QTY.
	35005	Assy. - Conv. Gear Case RH #2, #3&#4	
	35004	Assy. - Conv. Gear Case LH #2, #3&#4	
	35070	Assy. - Conv. Gear Case RH #5	
	35071	Assy. - Conv. Gear Case LH #5	
1	2092	Cap - Open - End	1
2	2140	Gasket - Large	2
3	2150	Gasket - Small	2
4	2153	Key - Square 3/8 x 1-15/16	2
5	2156	Case - Gear	1
6	2158	Cap - Closed, End	1
7	2672	Bearing - Thrust	1
8	2673	Bearing - Ball	1
9	2690	Seal - Oil	1
10	2819	Gasket - Copper	2
11	2820	Plug - Barrel	1
12	2823	Plug - Vent	1
13	2905	Worm	1
14	6030	Plug - Pipe	1
15	11554	Cone - Bearing	2
16	11720	Cup - Bearing	2
17	11731	Seal - Oil	1
18	20032	Screw - Cap 5/16 NC x 1/2	4
19	20099	Screw - Cap 7/16 NC x 1-1/4	24
20	20711	Washer - Lock 5/16	4
21	*27019	Shaft - Drag (Chain Conv.)	1
	*34693	Weldmt. - Drive Pulley (#5 Conv.)	1
22	27310	Plate - Cover	1
23	27311	Cover - Plate	1
24	27312	Bearing - Cover, Plate	1
25	27313	Gasket - Cover, Plate	1
26	27320	Gear - Bronze	1

*Not Shown

ASSEMBLY - FAN DRIVE SPROCKET

ITEM	PART NO.	DESCRIPTION	QTY.
	31752	Ass'y - Drive Sprocket, 14T for Std. & H.D. PTO w/50:1 Gear Case	
	31754	Ass'y - Drive Sprocket, 14 T for Body Side Mt'd 2-Speed w/Bypass & H.D. PTO Drive Line	
1	2641	Sprocket - 14T 1" Bore Use w/31752	1
2	31755	Sprocket - 14T 1-1/8" Bore Use w/31754	1
3	2211	Key-Square 1/4 x 1/4 x 1-1/4	1

KIT - SHIPPING SPROCKET - DRIVEN, FAN

	31780	Kit - Shipping Sprocket, Driven	
1	7275	Sprocket - 20T 1-1/8" Bore	1
2	31781	Ass'y - Chain	1
3	2211	Key - Square 1/4 x 1/4 x 1-1/4"	1
4	3752	Ass'y - Chain Tightener	1
5	20318	Bolt - Carriage 3/8-16 UNC x 1	2
6	20644	Nut - Hex 3/8 - 16 UNC	2
7	20712	Washer - Lock 3/8"	2

ASSEMBLY - 24" MECH. FAN w/OVERRUNNING CLUTCH

ITEM	PART NO.	DESCRIPTION	QTY.
	35092	Assy. - 24" Mech. Fan RH #4 & #5 Conv.	
	35093	Assy. -24" Mech. Fan LH #4 & #5 Conv.	
1	47096	Weldmt. - Distributor Frame	1
2	32797	Assy. - Gear Case Use w/35092	1
	48504	Assy. - Gear Case Use w/35093	1
			1
			1
3	19518	Spacer	8
4	*20131	Screw - Cap 1/2-13 UNC x 2"	8
5	*20714	Washer - Lock 1/2"	8
6	22490	U-Joint, Double Pivot	1
7	6136	Key - Square 1/4" x 1/4" x 2"	1
8	38570	Clutch - Overrunning	1
9	942	Bearing - Flange 1-1/8"	1
10	20099	Screw - Cap 7/16" - 14 UNC x 1-1/4	4
11	20645	Nut - Hex 7/16" - 14 UNC	4
12	20713	Washer - Lock 7/16"	4
13	19450	Assy. - Fan RH	1
14	19451	Assy. - Fan LH	1
15	*20700	Washer - Flat 1"	2
16	21010	Washer - Shake Proof	2
17	22749	Cup - Leather	2
18	22799	Nut - Acorn 1" - 14 UNC	2
19	21055	Collar - Set 1-1/8" Dia.	1
20	19456	Shield - Deflector, RH	1
21	19457	Shield - Deflector, LH	1
22	*20068	Screw - Cap 3/8-16 UNC x 1-1/4	4
23	*20644	Nut - Hex 3/8-16 UNC	4
24	*20712	Washer - Lock 3/8	4
25	27056	Disc	2
26	25870	Fin - RH	3
27	25871	Fin - LH	3
28	19526	Hub	2
29	20004	Screw - Cap 1/4"-20 UNC x 7/8"	6
30	20034	Screw - Cap 5/16-18 UNC x 3/4"	9
31	20676	Nut - Lock 1/4-20 UNC	6
32	20677	Nut - Lock 5/16-18 UNC	9

*Not Shown

ALWAYS GIVE PART NAME. NUMBER AND MACHINE SERIAL NUMBER WHEN ORDERING PARTS

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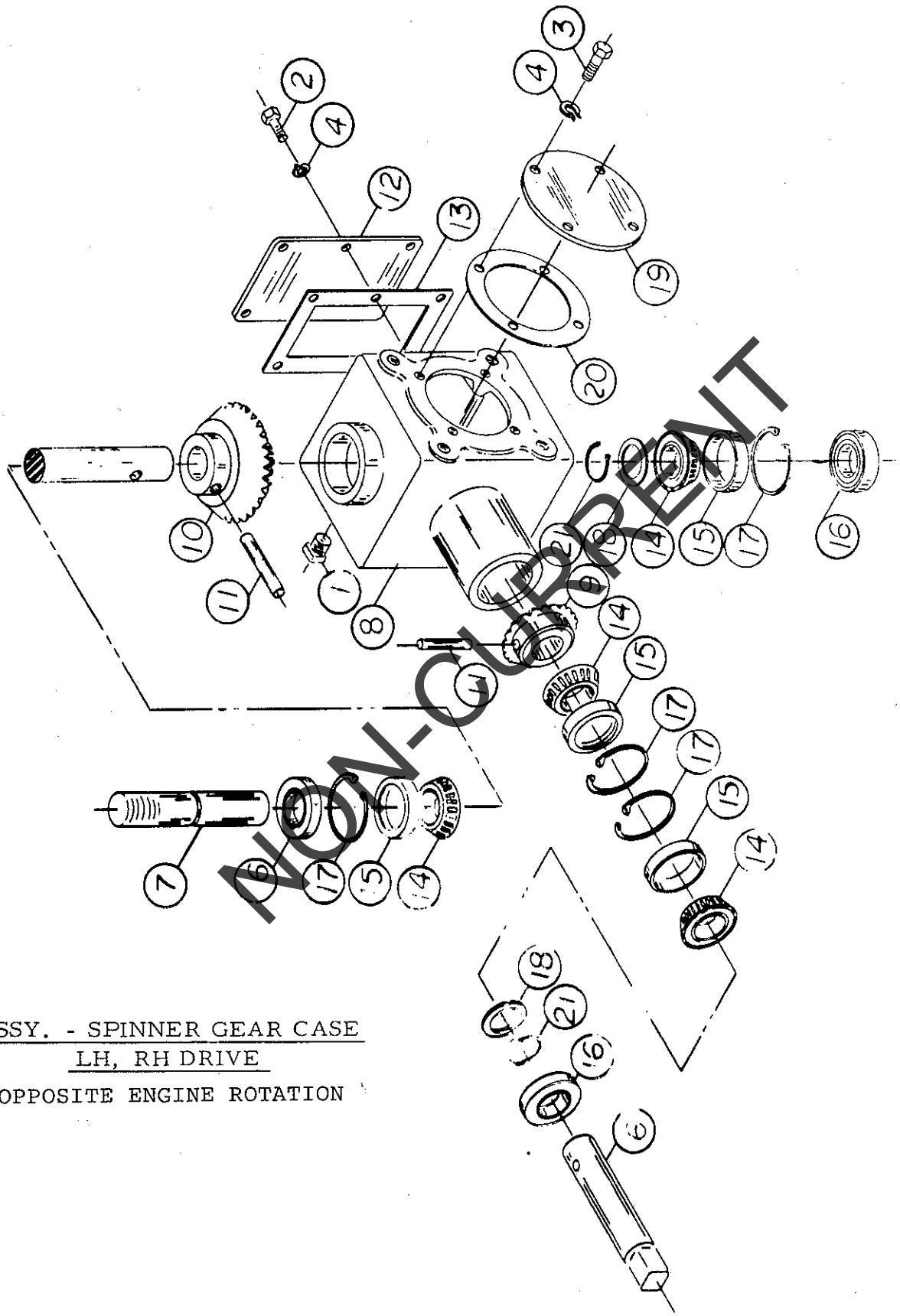


ASSY. - SPINNER GEAR CASE
LH, RH DRIVE
OPPOSITE ENGINE ROTATION

SPINNER GEAR CASE ASSY. LH, RH DRIVE

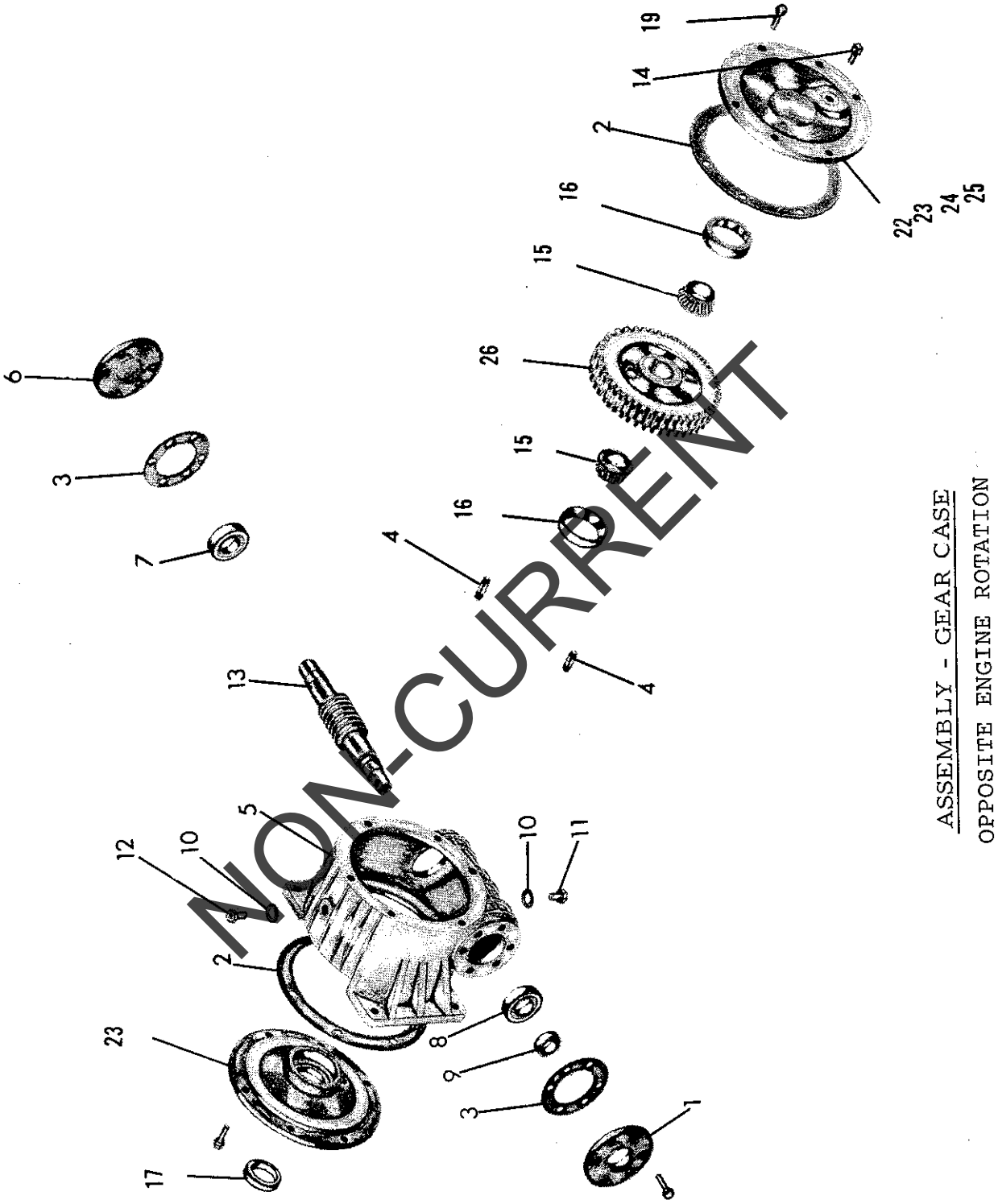
ITEM	PART NO.	DESCRIPTION	QTY.
*	48504	Spinner Gear Case Assy. LH, RH Drive	1
1	6032	Plug - Pipe, 1/2	1
2	20002	Screw - Cap, 1/4 - 20 NC x 5/8	6
3	20065	Screw - Cap, 3/8- 16 NC x 3/4	4
4	20710	Washer - Lock, 1/4 Std.	6
5	20712	Washer - Lock, 3/8 Std.	4
6	27395	Shaft - Input	1
7	27396	Shaft - Spinner	1
8	43483	Gear - Box	1
9	21705	Gear - Bevel, 18T	1
10	21706	Gear - Bevel, 27T	1
11	21707	Pin	2
12	21708	Plate - Cover	1
13	21709	Gasket - Cover Plate	1
14	21712	Bearing - Cone	4
15	21713	Bearing - Cup	4
16	21714	Seal - Oil	3
17	21715	Ring - Retainer	4
18	21716	Spacer	A. R.
19	21717	Disc - Cover Plate	1
20	21718	Gasket	1
21	27399	Ring - Snap	2

* Complete Assembly includes Items 1 through 21.

ASSY. SPINNER GEAR CASE, RH, RH DRIVE

ITEM	PART NO.	DESCRIPTION	QTY.
	32797	Assembly - Spinner Gear Case, RH, RH Drive	1
1	6032	Plug - Pipe, 1/2	1
2	20002	Screw - Cap, 1/4-20 NC x 5/8	6
3	20068	Screw - Cap, 3/8-16 NC x 1-1/4	4
4	20710	Washer - Lock, 1/4	6
5	20712	Washer - Lock, 3/8	4
6	27395	Shaft - Output	1
7	27396	Shaft - Spinner	1
8	21704	Gear Box	1
9	21705	Gear - Bevel, 18 T.	2
10	21706	Gear - Bevel, 27 T.	1
11	21707	Pin	3
12	21708	Plate - Cover	1
13	21709	Gasket - Cover Plate	1
14	21710	Hub	1
15	21711	Gasket - Hub	1
16	21712	Bearing - Cone	6
17	21713	Bearing - Cup	6
18	21714	Seal - Oil	4
19	21715	Ring - Retainer	6
20	21716	Spacer	A. R.
21	27399	Ring - Snap	3
22	31766	Shaft - Drive,	1

Complete Assembly Includes Items 1 - 22.



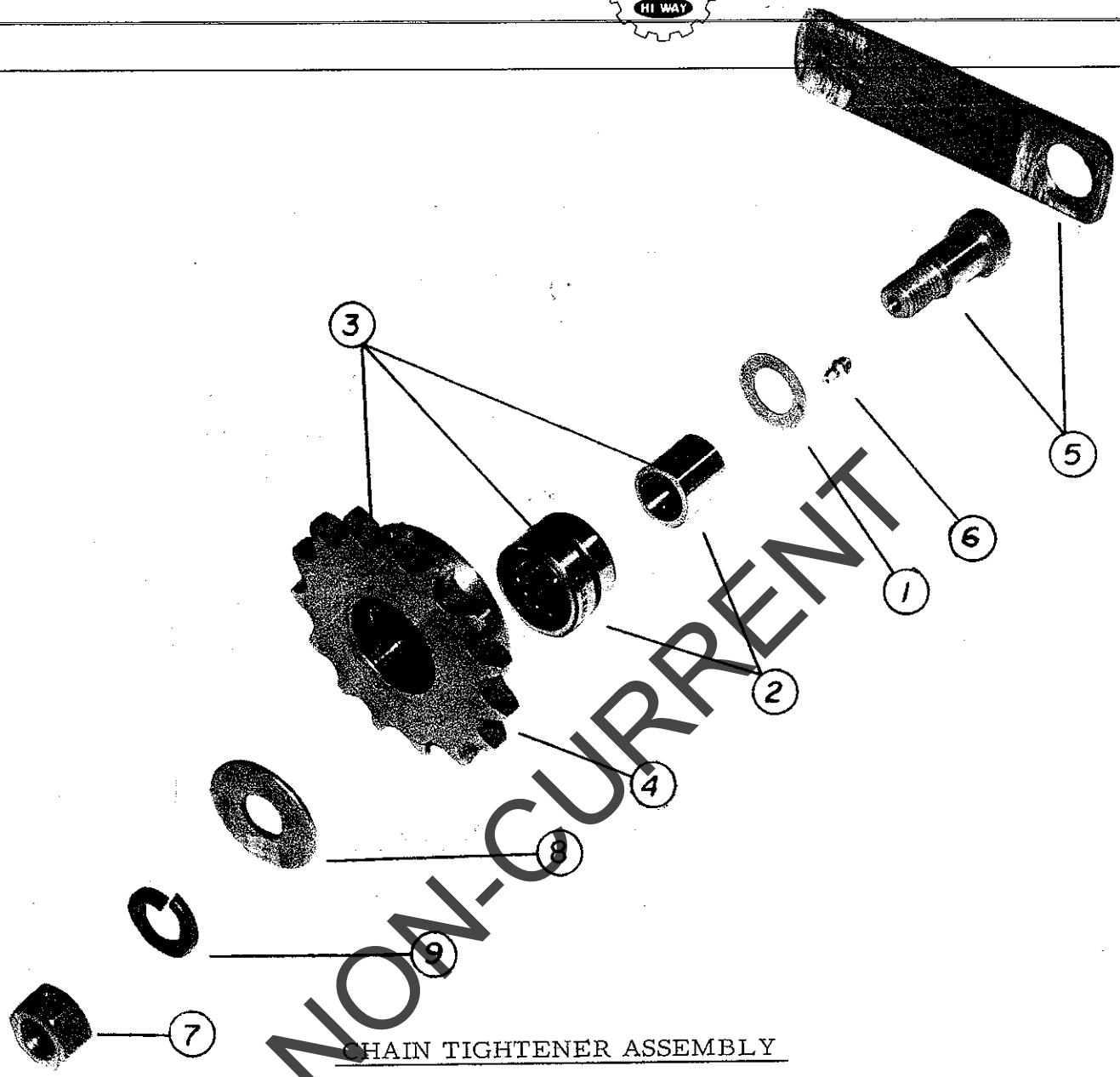
ASSEMBLY - GEAR CASE

OPPOSITE ENGINE ROTATION

ASSEMBLY GROUP - CONV. GEAR CASE

ITEM	PART NO.	DESCRIPTION	QTY.
	35074	Assy. - Conv. Gear Case RH #5	
1	2092	Cap - Open - End	1
2	2140	Gasket - Large	2
3	2150	Gasket - Small	2
4	2153	Key - Square 3/8 x 1-15/16	2
5	2156	Case - Gear	1
6	2158	Cap - Closed, End	1
7	2672	Bearing - Thrust	1
8	2673	Bearing - Ball	1
9	2690	Seal - Oil	1
10	2819	Gasket - Copper	2
11	2820	Plug - Barrel	1
12	2823	Plug - Vent	1
13	37444	Worm	1
14	6030	Plug - Pipe	1
15	11554	Cone - Bearing	2
16	11720	Cup - Bearing	2
17	11731	Seal - Oil	1
18	20032	Screw - Cap 5/16 NC x 1/2	4
19	20099	Screw - Cap 7/16 NC x 1-1/4	24
20	20711	Washer - Lock 5/16	4
21	*27019	Shaft - Drag (Chain Conv.)	1
22	27310	Plate - Cover	1
23	27311	Cover - Plate	1
24	27312	Bearing - Cover, Plate	1
25	27313	Gasket - Cover, Plate	1
26	34696	Gear - Bronze	1
27	* 6138	Key-Square	1
	*20749	Screw-Set	2
	* 2147	Spacer-Worm	2
	*37450	Shaft-Input	1

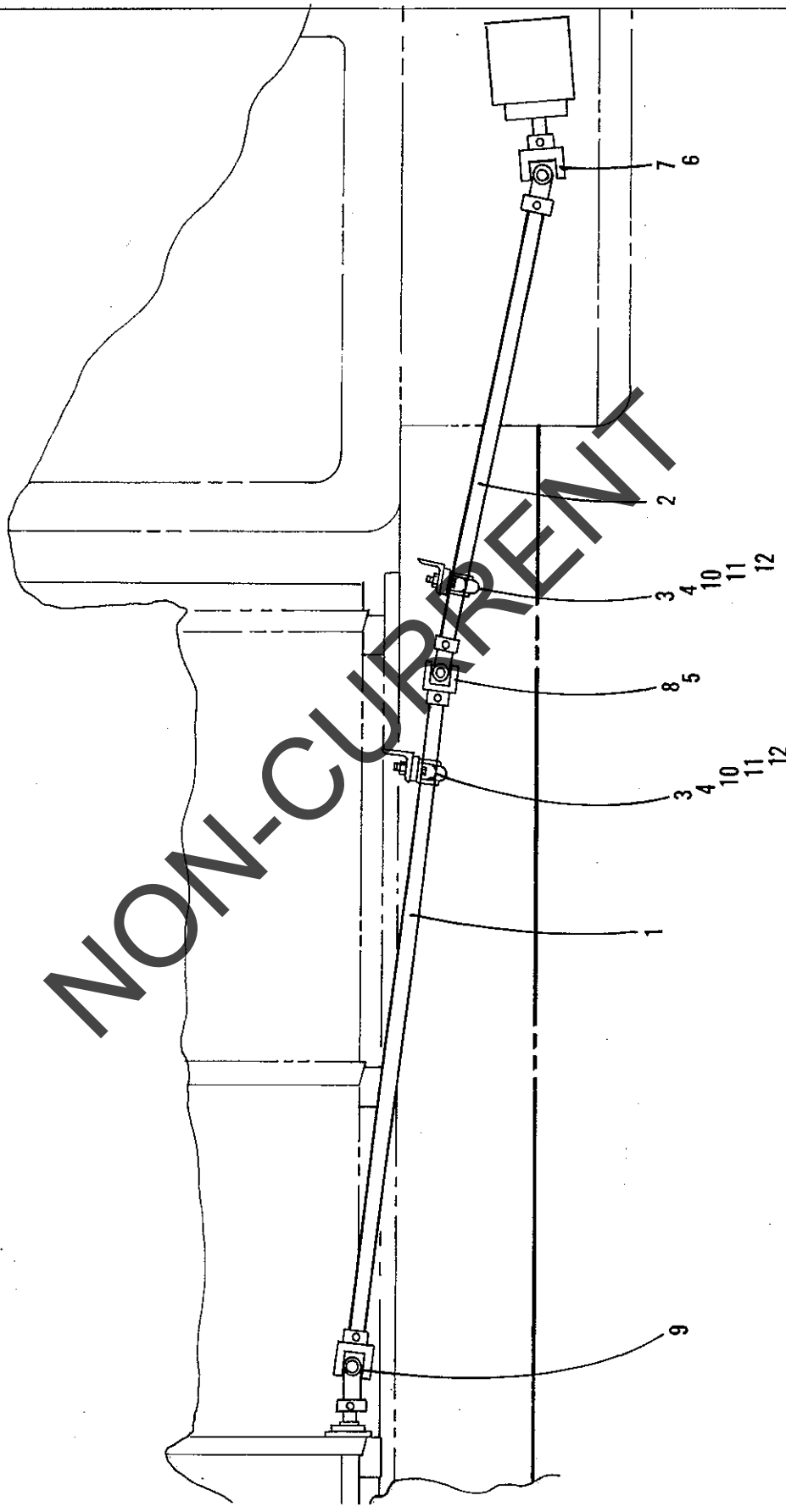
*-Not Shown



CHAIN TIGHTENER ASSEMBLY

ITEM	PART NO.	DESCRIPTION	QTY.
*	3752	Chain Tightener Assembly	1
1	2715	Washer	1
2	3755	Bearing (With Bushing)	1
3	**3753	Sprocket Assembly	1
4	3754	Sprocket	1
5	3756	Bracket Weldment	1
6	6072	Fitting - Grease	1
7	20648	Nut - Hex	1
8	20697	Washer - Flat	1
9	20716	Washer - Lock	1

* - Complete Assembly
** - Includes Part Nos. 3755 and 3754



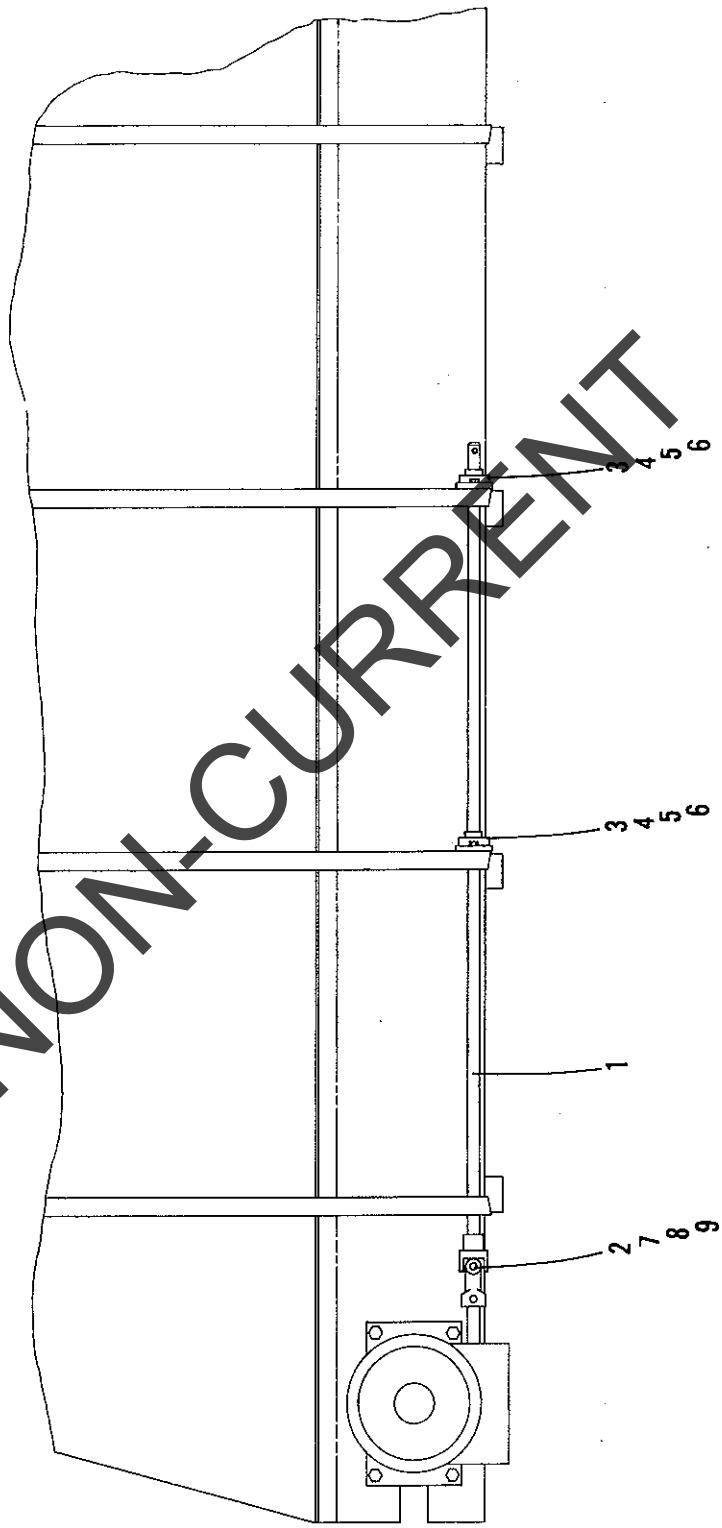
ASSEMBLY GROUP - PTO DRIVE

ASSY. GROUP - PTO DRIVE

ITEM	PART NO.	DESCRIPTION	QTY.
1	2253	Shaft - Upper	1
	1978	Shaft - Upper H. D.	1
2	56743	Shaft - Lower	1
	56744	Shaft - Lower H. D.	1
3	2684	Bearing - Pillow Block 1"	2
	2630	Bearing - Pillow Block 1-1/8"	2
4	3438	Hanger - Bearing	2
	1981	Hanger - Bearing	2
5	6136	Key - Square 1/4x1/4x2	1
6	6138	Key - Square 1/4 x 1/4 x 3	1
	21452	Key - Square 5/16x 5/16x 3-1/4	1
7	56745	Slip - Joint	1
	56746	Slip - Joint H. D.	1
8	5649	Slip - Joint	1
	6449	Slip - Joint H. D.	1
9	22464	U-Joint 1x1 P. H. xP. H.	1
	2631	U-Joint 1-1/8 x 1-1/8 - P. H. -P. H.	1
10	20069	Screw - Cap 3/8 - 16 UNC x 1-1/2	4
	20129	Screw - Cap 1/2-13 UNC x 1-1/2 H. D.	4
11	20644	Nut - Hex 3/8-16 UNC	4
	20646	Nut - Hex 1/2-13 UNC H. D.	4
12	20712	Washer - Lock 3/8	4
	20714	Washer - Lock 1/2	4
13	6069	*Zerk - Grease	2
14	20951	*Pin - Roll	2

H. D. = Heavy Duty.

* Not Shown

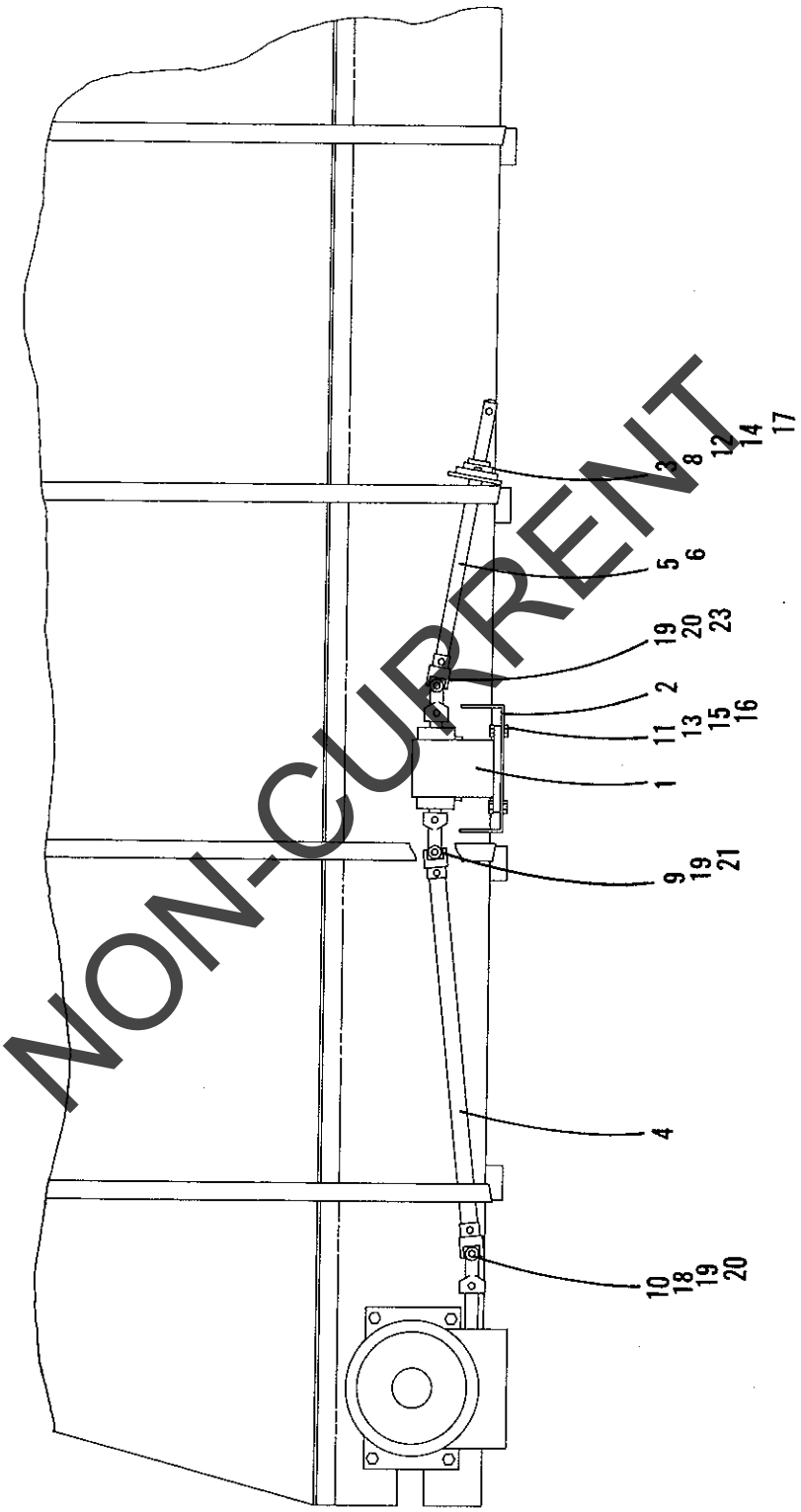


ASSEMBLY - GROUP, SIDE SHAFT

ASSEMBLY - GROUP, SIDE SHAFT

ITEM	PART NO.	DESCRIPTION	QTY.
1	46355	Shaft - Side 1" Dia. for 10' Unit	1
	46362	Shaft - Side 1-1/8" Dia. for 10' Unit	1
	46356	Shaft - Side 1" Dia. for 11' Unit	1
	46363	Shaft - Side 1-1/8" Dia. for 11' Unit	1
	46357	Shaft - Side 1" Dia. for 12' Unit	1
	46364	Shaft - Side 1-1/8" Dia. for 12' Unit	1
	46358	Shaft - Side 1" Dia. for 13' Unit	1
	46365	Shaft - Side 1-1/8" Dia. for 13' Unit	1
	46359	Shaft - Side 1" Dia. for 14' Unit	1
	46366	Shaft - Side 1-1/8" Dia. for 14' Unit	1
	46360	Shaft - Side 1" Dia. for 15' Unit	1
	46367	Shaft - Side 1-1/8" Dia. for 15' Unit	1
	46361	Shaft - Side 1" Dia. for 16' Unit	1
	46368	Shaft - Side 1-1/8" Dia. for 16' Unit	1
2	6122	Pin - Shear 3/8" x 2"	1
3	22563	Bearing - Flange 1"	A. R.
	22568	Bearing - Flange 1-1/8"	A. R.
4	20038	Screw - Cap 5/16 - 18 UNC x 1-1/2"	A. R.
	20069	Screw - Cap 3/8 - 16 UNC x 1-1/2"	A. R.
5	20643	Nut - Hex 5/16 - 18 UNC	A. R.
	20644	Nut - Hex 3/8 - 16 UNC	A. R.
6	20711	Washer - Lock 5/16"	A. R.
	20712	Washer - Lock 3/8"	A. R.
7	20817	Pin - Cotter 1/8" x 1"	1
8	20951	Pin - Roll 3/8" x 2"	1
9	22464	U-joint 1" x 1" P. H. x P. H.	1
	2659	U-joint 1" x 1-1/8" P. H. x P. H.	1

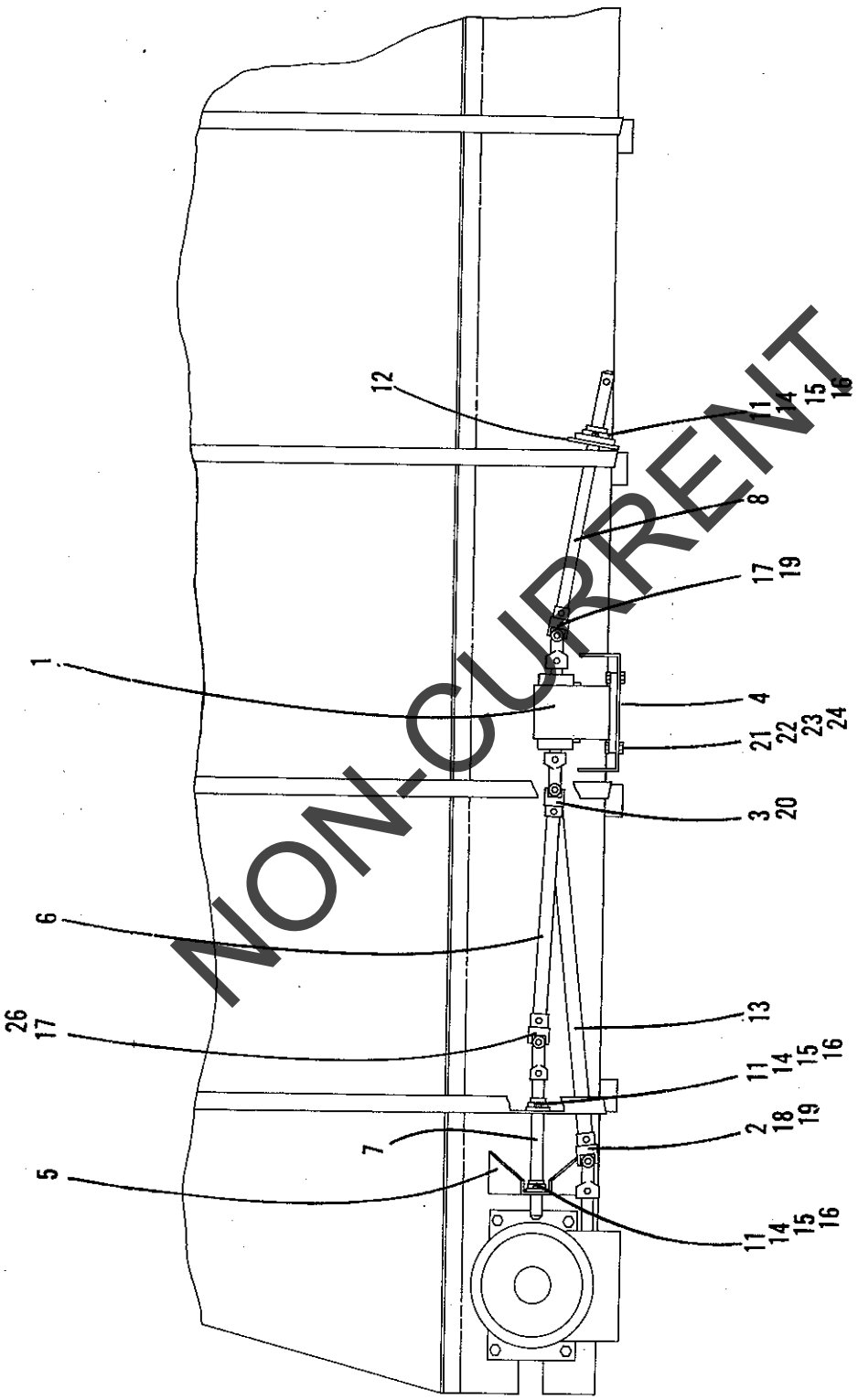
A. R. - As Required



ASSEMBLY - TRANSMISSION, 2-SPEED

ASSEMBLY - GROUP, 2-SPEED W/O BYPASS

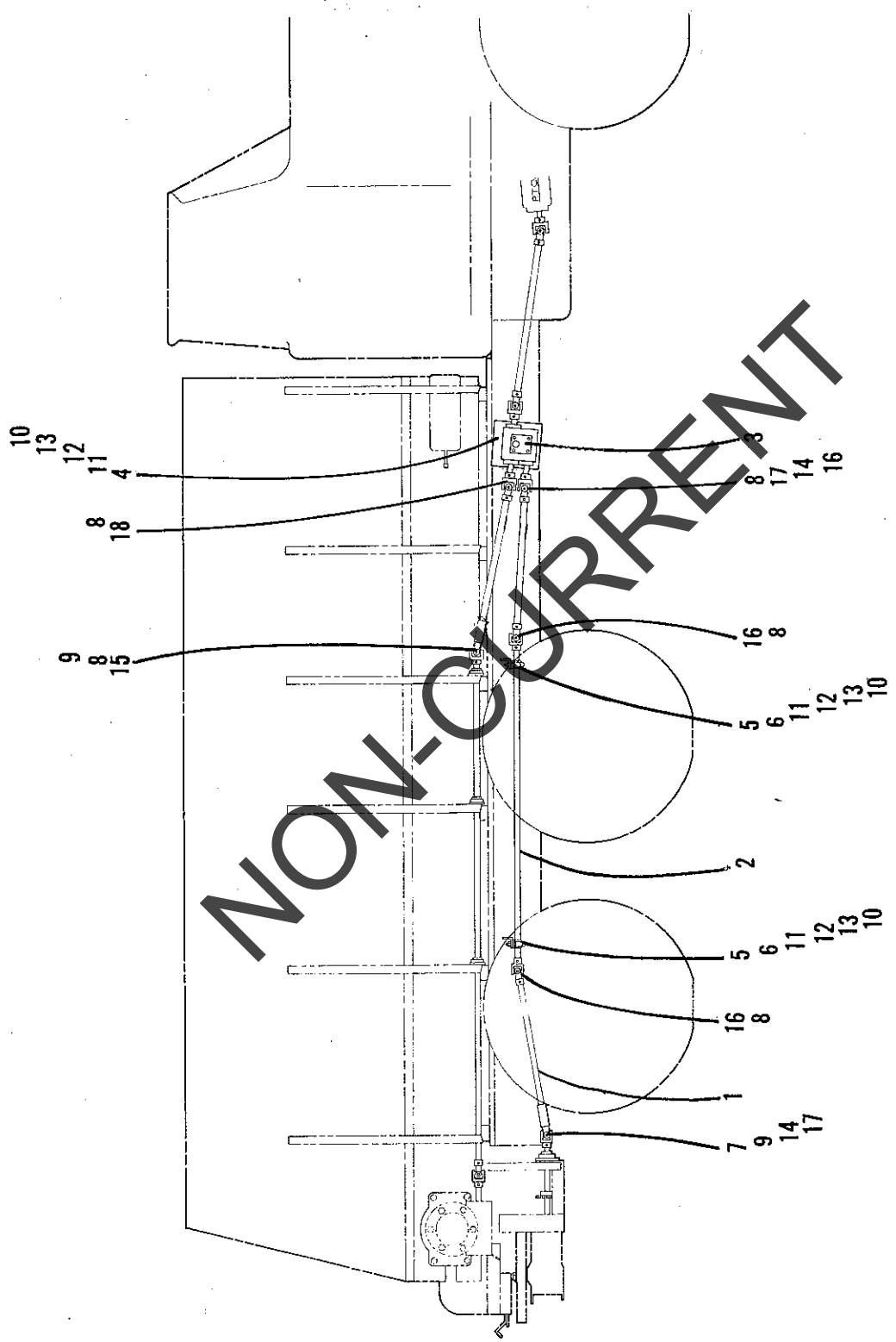
ITEM	PART NO.	DESCRIPTION	QTY.
1	2533	Ass'y - 2-Speed Trans. for LH Units.	1
	2534	Ass'y - 2-Speed Trans. for RH Units	1
2	44303	Bracket - Mounting, 2-Speed	1
3	22563	Bearing - Flange, 2-Bolt 1"	1
	22568	Bearing - Flange, 2-Bolt 1-1/8"	1
4	44312	Shaft - Jack 1"	1
	44313	Shaft - Jack 1-1/8"	1
5	56731	Shaft - Drive 1" for 10' & 11' Units	1
	56732	Shaft - Drive 1-1/8" for 10' & 11' Units	1
6	56733	Shaft - Drive 1" for 12' thru 16' Units	1
	56734	Shaft - Drive 1-1/8" for 12' thru 16' Units	1
7	-----		
8	55143	Spacer - Flange 1"	1
9	6137	Key - Square 1/4" x 1"	1
10	6122	Pin - Shear 3/8" x 2"	1
	6123	Pin - Shear 3/8" x 2-1/4"	1
11	20069	Screw - Cap 3/8"-16 UNC x 1-1/2"	4
12	20038	Screw - Cap 5/16"-18 UNC x 1-1/2"	2
	20069	Screw - Cap 3/8"-16 UNC x 1-1/2"	2
13	20644	Nut - Hex 3/8-16 UNC	4
14	20643	Nut - Hex 5/16-18 UNC	2
	20644	Nut - Hex 3/8-16 UNC	2
15	20693	Washer - Flat 3/8"	4
16	20712	Washer - Lock 3/8"	4
17	20711	Washer - Lock 5/16"	2
	20712	Washer - Lock 3/8"	2
18	20817	Pin - Cotter 1/8" x 1"	1
19	20951	Pin - Roll 3/8" x 2"	4
20	22464	U-Joint 1" x 1" P.H. x P.H.	2
	2659	U-Joint 1-1/8" x 1" P.H. x P.H.	2
21	22465	U-Joint 1" x 1" P.H. x K.W.	1
	22474	U-Joint 1-1/8" x 1" P.H. x K.W.	1



ASSEMBLY - GROUP, 2-SPEED W/BYPASS

ASSEMBLY GROUP - 2-SPEED W/BYPASS

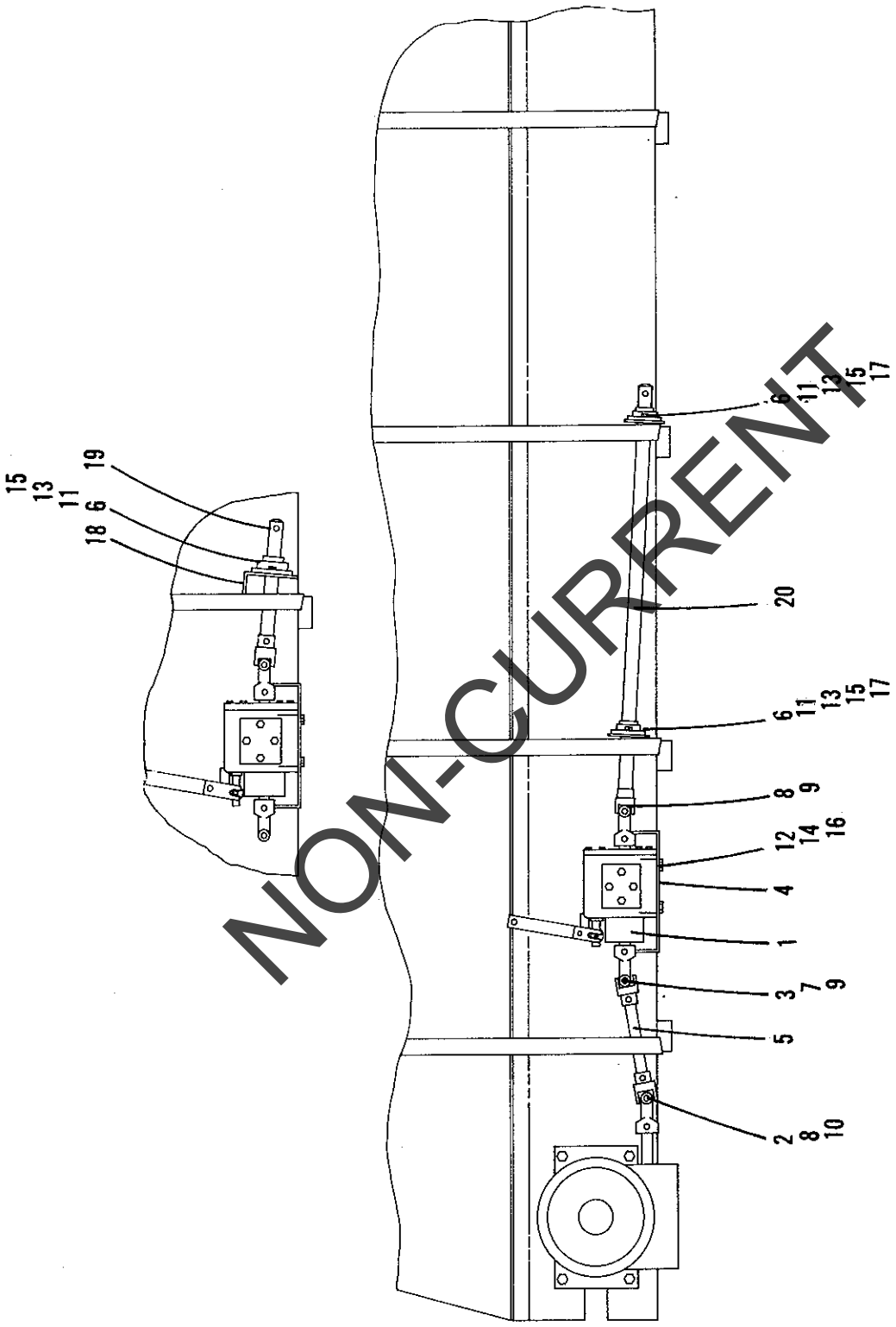
ITEM	PART NO.	DESCRIPTION	QTY.
1	44302	Ass'y - 2-Speed Trans. w/Bypass for RH Units	1
	44301	Ass'y - 2-Speed Trans. w/Bypass for LH Units	1
2	6122	Pin - Shear 3/8" x 2"	1
	6123	Pin - Shear 3/8" x 2-1/4"	1
3	2211	Key - Square 1/4" x 1-1/4"	1
4	44303	Bracket - Mounting, 2-Speed	1
5	44327	Bracket - Mounting, Bearing	1
6	44321	Shaft - Bypass 1"	1
	44323	Shaft - Bypass 1-1/8"	1
7	44322	Shaft - Bypass 1"	1
	44324	Shaft - Bypass 1-1/8"	1
8	56731	Shaft - Drive 1"	1
	56732	Shaft - Drive 1-1/8"	1
9	-----		-
10	-----		-
11	22563	Bearing - 2-Bolt 1"	3
	22568	Bearing - 2-bolt 1-1/8"	3
12	55143	Spacer - Flange	1
13	44312	Shaft - Jack 1"	1
	44313	Shaft - Jack 1-1/8"	1
14	20038	Screw - Cap 5/16-18 UNC x 1-1/2"	6
	20069	Screw - Cap 3/8-16 UNC x 1-1/2"	6
15	20643	Nut - Hex 5/16-18 UNC	6
	20644	Nut - Hex 3/8-16 UNC	6
16	20711	Washer - Lock 5/16"	6
	20712	Wahser - Lock 3/8"	6
17	20951	Pin - Roll 3/8" x 2"	8
18	20817	Pin - Cotter 1/8" x 1"	1
19	22464	U-Joint 1" x 1" P.H. x P.H.	3
	2659	U-Joint 1" x 1-1/8" P.H. x P.H.	2
	2631	U-Joint 1-1/8" x 1-1/8" P.H. x P.H.	1
20	22465	U-Joint 1" x 1" P.H. x K.W.	2
	22474	U-Joint 1" x 1-1/8" K.W. x P.H.	2
21	20069	Screw - Cap 3/8"-16 UNC x 1-1/2"	4
22	20644	Nut - Hex 3/8"-16 UNC	4
23	20712	Washer - Lock 3/8"	4
24	20693	Washer - Flat 3/8"	4



ASSEMBLY GROUP - CHASSIS MT'D. TWO-SPEED W/BYPASS

ASSY. GROUP - CHASSIS MT'D. TWO-SPEED W/BYPASS

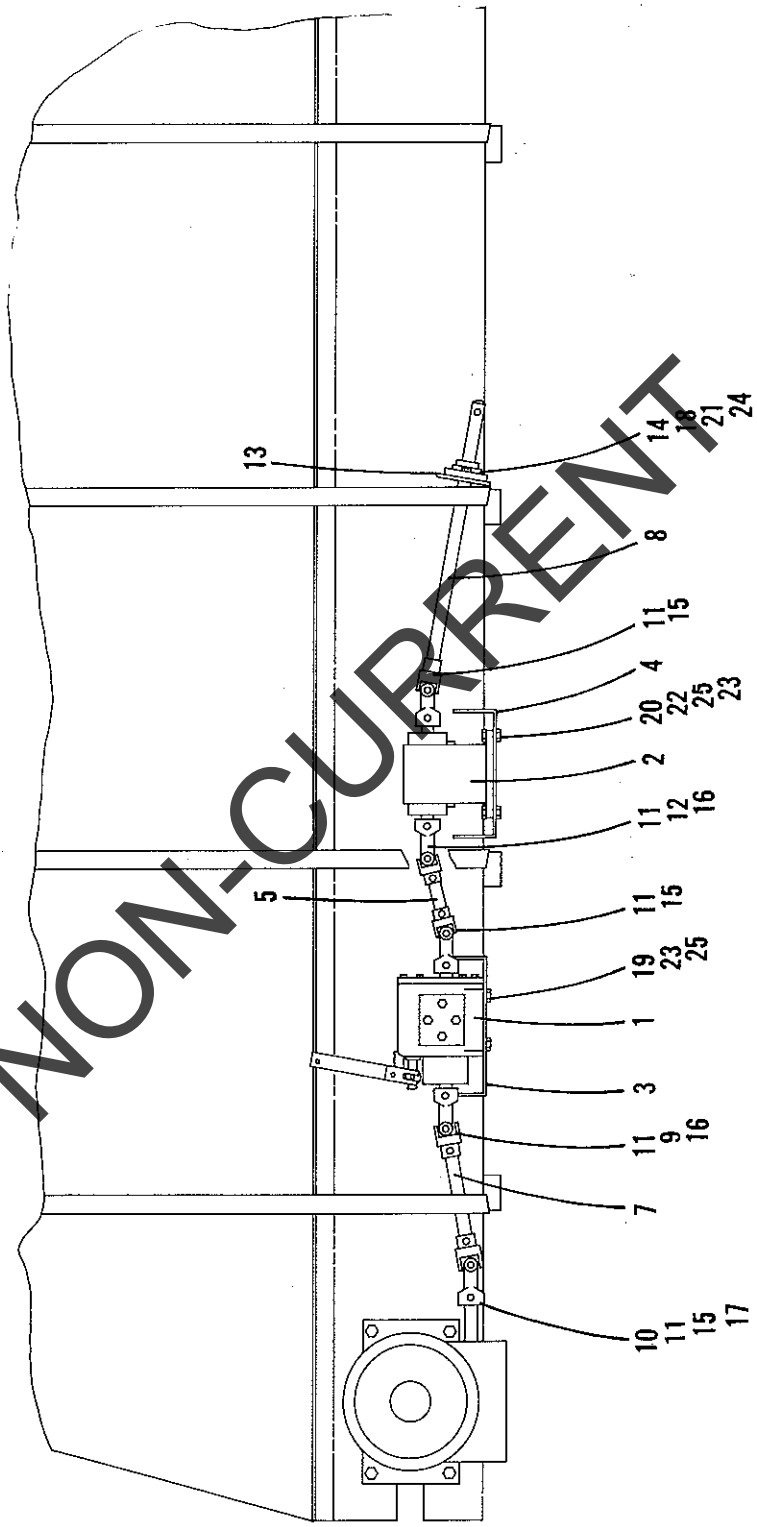
ITEM	PART NO.	DESCRIPTION	QTY.
1	19895	Shaft - Drive	1
	14955	Shaft - Drive H.D.	1
2	55154	Shaft - Spinners Use on 10' Units	1
	55161	Shaft- Spinners H.D. Use on 10' Units	1
	55155	Shaft- Spinners Use on 11' Units	1
	55162	Shaft - Spinners H.D. Use on 11' Units	1
	55156	Shaft - Spinners Use on 12' Units	1
	55163	Shaft - Spinners H.D. Use on 12' Units	1
	55157	Shaft - Spinners Use on 13' Units	1
	55164	Shaft - Spinners H.D. Use on 13' Units	1
	55158	Shaft - Spinners Use on 14' Units	1
	55165	Shaft - Spinners H.D. Use on 14' Units	1
	55159	Shaft - Spinners Use on 15' Units	1
	55166	Shaft - Spinners H.D. Use on 15' Units	1
	55160	Shaft - Spinners Use on 16' Units	1
	55167	Shaft - Spinners H.D. Use on 16' Units	1
3	44301	Trans. - 2-Speed Use on R.H. Units	1
	44302	Trans. - 2-Speed Use on L.H. Units	1
4	44303	Bracket - Mounting, 2-Speed	1
5	3438	Angle - Bearing Hanger	A.R.
	1981	Angle - Bearing Hanger H.D.	A.R.
6	2684	Bearing - Pillow Block 1"	A.R.
	2630	Bearing - Pillow Block 1 1/8"	A.R.
7	57838	U-Joint 1-1/8" x 1" (P.H. x K.W.) Slip	1
	22498	U-Joint 1-1/8" x 1-1/8" (P.H. xK.W.) Slip	1
8	20951	Pin - Roll 3/8"x2"	7
9	6138	Key - Square 1/4" x 1/4" x 3"	2
10	20069	Screw - Cap 3/8" - 16 UNCx 1-1/2"	A.R.
	20129	Screw - Cap 1/2" - 13 UNC x 1-1/2"	A.R.
11	20644	Nut - Hex 3/8" - 16 UNC	A.R.
	20646	Nut - Hex 1/2" - 13 UNC	A.R.
12	20693	Washer - Flat 3/8"	A.R.
	20695	Washer - Flat 1/2"	A.R.
13	20712	Washer - Lock 3/8"	A.R.
	20714	Washer - Lock 1/2"	A.R.
14	20817	Pin - Cotter 1/8" x 1"	2
15	5649	U-Joint 1" x1" (K.W. x P.H.) Slip	1
	22498	U-Joint 1-1/8"x 1-1/8" (K.W. x P.H.) Slip	1
16	22464	U-Joint 1" x 1" (P.H. x P.H.)	3
	2631	U-Joint 1-1/8" x 1-1/8 (P.H. x P.H.)	2
	2659	U-Joint 1"x 1-1/8" (P.H.x P.H.)	1
17	6123	Pin - Shear	2
18	22465	U-Joint 1"x1" (P.H. x K.W.)	1
	22474	U-Joint 1-1/8 x 1" (P.H. x K.W.)	1



ASSEMBLY - GROUP, OIL CLUTCH

ASSEMBLY - GROUP, OIL CLUTCH

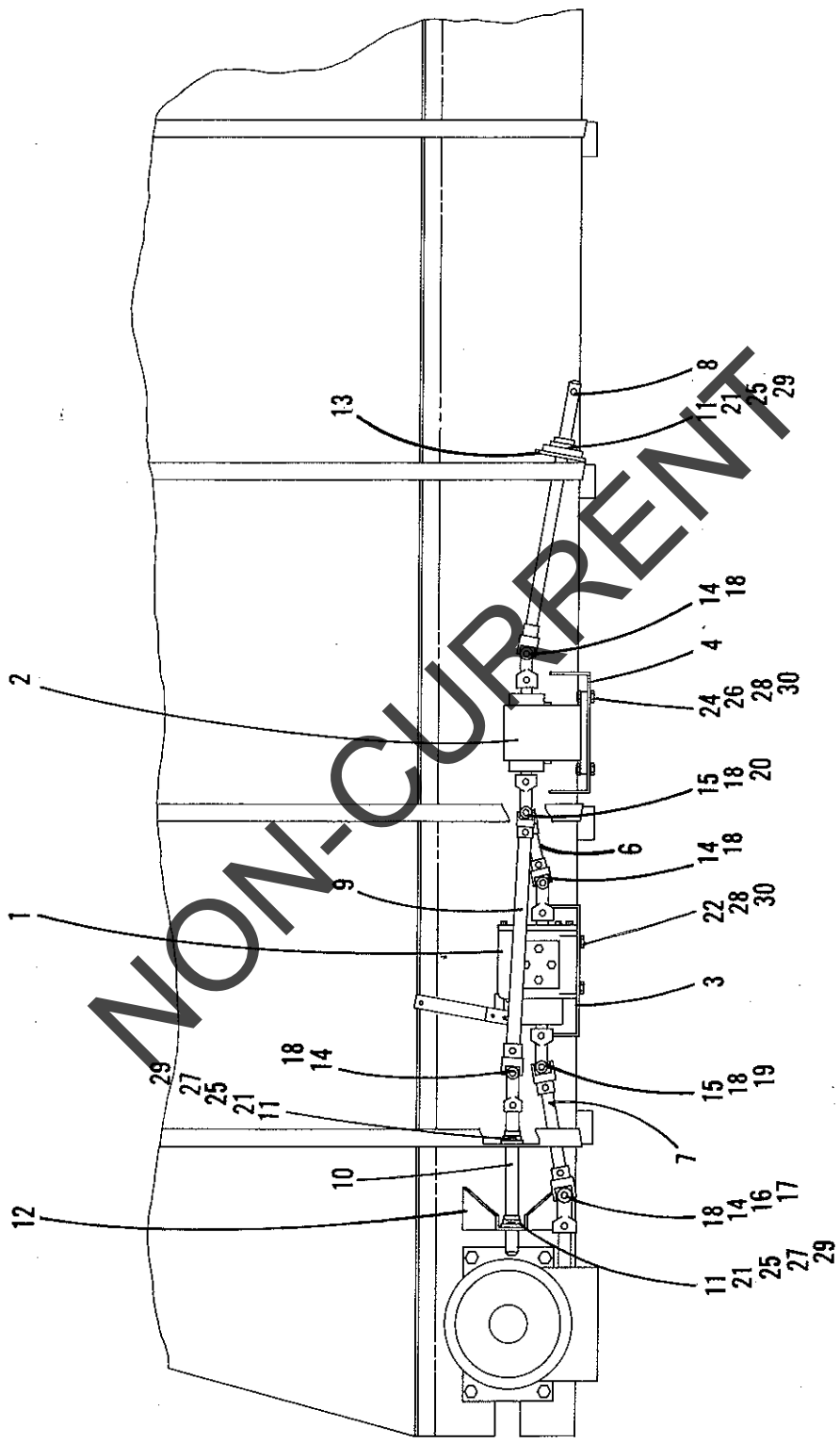
ITEM	PART NO.	DESCRIPTION	QTY.
1	2515	Clutch - Oil	1
2	6122	Pin - Shear 3/8" x 2"	1
	6123	Pin - Shear 3/8" x 2-1/4"	1
3	6136	Key - Square 1/4" x 2"	1
4	44325	Bracket - Mounting, Oil Clutch	1
5	44331	Shaft - Jack 1"	1
6	44335	Shaft - Jack 1-1/8"	1
6	22563	Bearing - Flange, 2-Bolt 1"	A.R.
	22568	Bearing - Flange, 2-Bolt 1-1/8"	A.R.
7	22465	U-Joint 1" x 1" P.H. x K.W.	1
	2837	U-Joint 1" x 1-1/8" P.H. x K.W.	1
8	22464	U-Joint 1" x 1" P.H. x P.H.	2
	2659	U-Joint 1" x 1-1/8" P.H. x P.H.	2
9	20951	Pin - Roll 3/8" x 2"	A.R.
10	20817	Pin - Cotter 1/8" x 1"	1
11	20038	Screw - Cap 5/16-18 UNC x 1-1/2"	A.R.
	20069	Screw - Cap 3/8-16 UNC x 1-1/2"	A.R.
12	20065	Screw - Cap 3/8-16 UNC x 3/4"	4
13	20643	Nut - Hex 5/16-18 UNC	A.R.
	20644	Nut - Hex 3/8-16 UNC	4
14	20693	Washer - Flat 3/8"	4
15	20711	Washer - Lock 5/16"	A.R.
	20712	Washer - Lock 3/8"	A.R.
16	20712	Washer - Lock 3/8"	4
17	55142	Bracket - Bearing, 2-Bolt	1
18	55143	Bracket - Bearing, 2-Bolt	1
19	56731	Shaft - Drive 1" for 10' & 11' Units	1
	56732	Shaft - Drive 1-1/8" for 10' & 11' Units	1
20	56733	Shaft - Drive 1" for 12' thru 16' Units	1
	56734	Shaft - Drive 1-1/8" for 12' thru 16' Units	1



ASSEMBLY - GROUP, 2-SPEED TRANS. W/OIL CLUTCH

ASS'Y - GROUP, 2-SPEED TRANS. W/OIL CLUTCH

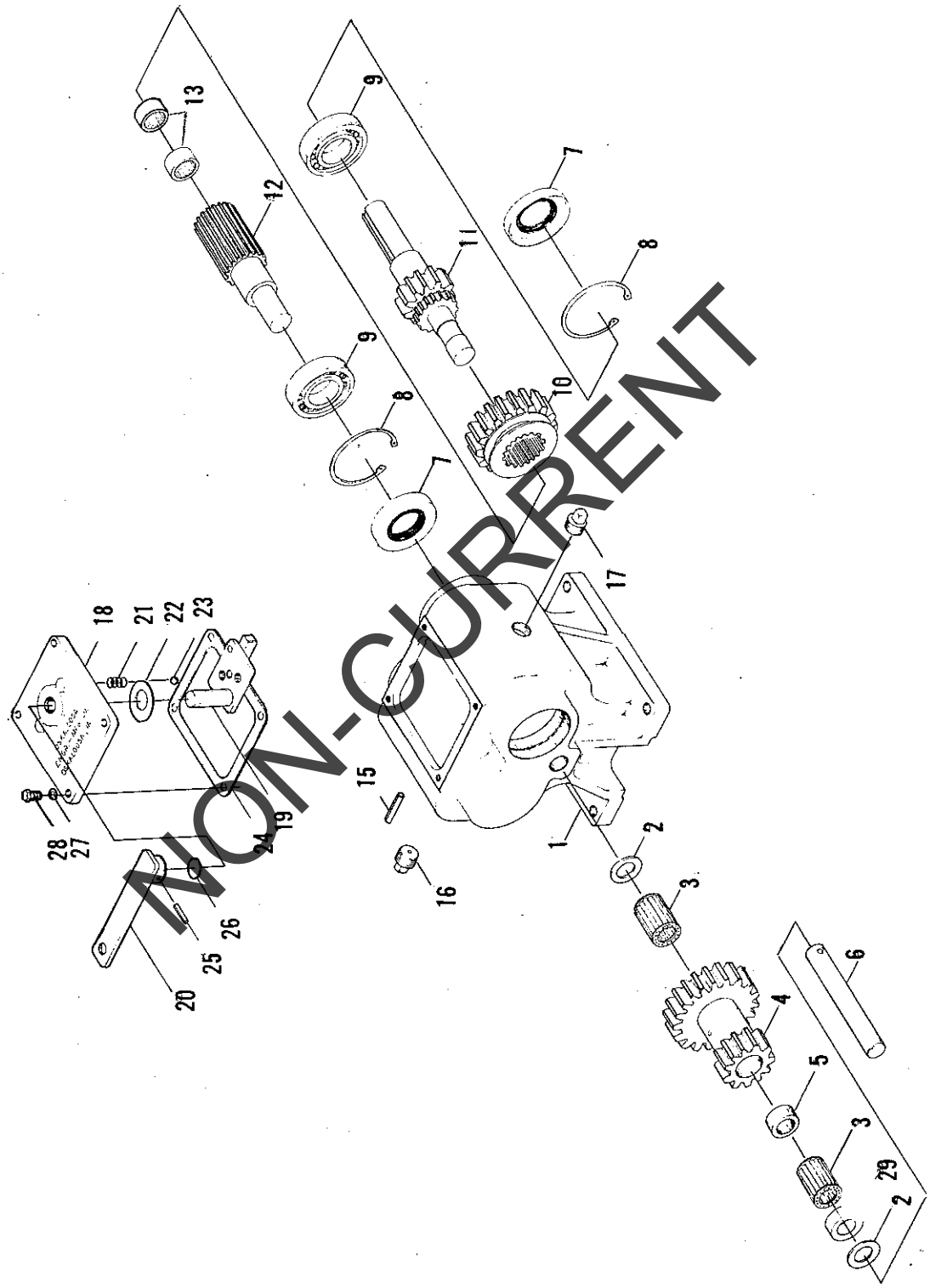
ITEM	PART NO.	DESCRIPTION	QTY.
1	2515	Oil - Clutch	1
2	2534	Ass'y - Trans. Use with RH Units	1
	2533	Ass'y-- Trans. Use with LH Units	1
3	44325	Bracket - Mounting, Oil Clutch	1
4	44303	Bracket - Mounting, 2-Speed	1
5	44336	Shaft - Connecting 1"	1
	44337	Shaft - Connecting 1-1/8"	1
6	-----		
7	44331	Shaft - Jack 1"	1
	44335	Shaft - Jack 1-1/8"	1
8	56731	Shaft - Drive 1"	1
	56732	Shaft - Drive 1-1/8"	1
9	6136	Key - Square 1/4" x 2"	1
10	6122	Pin - Shear 3/8"	1
	6123	Pin - Shear 3/8" x 2-1/4"	1
11	20951	Pin - Roll 3/8" x 2"	7
12	6137	Key - Square 1/4" x 1"	1
13	55143	Spacer - Bearing	1
14	22563	Bearing - Flange 1"	1
	22568	Bearing - Flange 1-1/8"	1
15	22464	U-Joint 1" x 1" P.H. x P.H.	3
	2659	U-Joint 1" x 1-1/8" P.H. x P.H.	3
16	22465	U-Joint 1" x 1" P.H. x K.W.	2
	22474	U-Joint 1-1/8" x 1" P.H. x K.W.	1
	2837	U-Joint 1-1/8" x 1" K.W. x P.H.	1
17	20817	Pin - Cotter 1/8" x 1"	1
18	20038	Screw - Cap 5/16-18 UNC x 1-1/2"	2
	20069	Screw - Cap 3/8-16 UNC x 1-1/2"	2
19	20065	Screw - Cap 3/8-16 UNC x 3/4"	4
20	20069	Screw - Cap 3/8-16 UNC x 1-1/2"	4
21	20643	Nut - Hex 5/16"-18 UNC	2
	20644	Nut - Hex 3/8"-16 UNC	2
22	20644	Nut-- Hex 3/8"-16 UNC	4
23	20693	Washer - Flat 3/8"	8
24	20711	Washer - Lock 5/16"	2
	20712	Washer - Lock 3/8"	2
25	20712	Washer - Lock 3/8"	8



ASSEMBLY - GROUP, 2-SPEED W/BYPASS & OIL CLUTCH

ASS'Y - GROUP 2-SPEED W/BYPASS & OIL CLUTCH

ITEM	PART NO.	DESCRIPTION	QTY.
1	2515	Oil - Clutch	1
2	44302	Trans. - 2-Speed w/bypass Use on RH Units	1
	44301	Trans. - 2-Speed w/bypass Use on LH Units	1
3	44325	Bracket - Mounting, 2-Speed	1
4	44303	Bracket - Mounting, Oil Clutch	1
6	44336	Shaft - Connecting 1"	1
	44337	Shaft - Connecting 1-1/8"	1
7	44331	Shaft - Jack 1"	1
	44335	Shaft - Jack 1-1/8"	1
8	56731	Shaft - Drive 1"	1
	56732	Shaft - Drive 1-1/8"	1
9	44321	Shaft - Bypass 1"	1
	44323	Shaft - Bypass 1-1/8"	1
10	44322	Shaft - Bypass 1"	1
	44324	Shaft - Bypass 1-1/8"	1
11	22563	Bearing - 2-Bolt 1"	3
	22568	Bearing - 2-Bolt 1-1/8"	3
12	44327	Bracket - Mounting, 2-Bolt	1
13	55143	Spacer - Flange	1
14	22464	U-Joint 1" x 1" P.H. x P.H.	4
	2631	U-Joint 1-1/8" x 1-1/8" P.H. x P.H.	1
	2659	U-Joint 1" x 1-1/8" P.H. x P.H.	3
15	22465	U-Joint 1" x 1" P.H. x K.W.	3
	2837	U-Joint 1" x 1-1/8" P.H. x K.W.	1
	22474	U-Joint 1-1/8" x 1" P.H. x K.W.	2
16	6122	Pin - Shear 3/8" x 2"	1
	6123	Pin - Shear 3/8" x 2-1/4"	1
17	20817	Pin - Cotter 1/8" x 1"	1
18	20951	Pin - Roll 3/8" x 2"	10
19	6136	Key - Square 1/4" x 2"	1
20	2211	Key - Square 1/4" x 1-1/4"	1
21	20038	Screw - Cap 5/16-18 UNC x 1-1/2"	6
	20069	Screw - Cap 3/8-16 UNC x 1-1/2"	6
22	20065	Screw - Cap 3/8-16 UNC x 3/4"	4
23	-----		
24	20069	Screw - Cap 3/8-16 UNC x 1-1/2"	4
25	20643	Nut - Hex 5/16-18 UNC	6
25	20644	Nut - Hex 3/8-16 UNC	6
26	20644	Nut - Hex 3/8-16 UNC	4
27	20692	Washer - Flat 5/16"	4
	20693	Washer - Flat 3/8"	4
28	20693	Washer - Flat 3/8"	8
29	20711	Washer - Lock 5/16"	6
	20712	Washer - Lock 3/8"	6
30	20712	Washer - Lock 3/8"	8

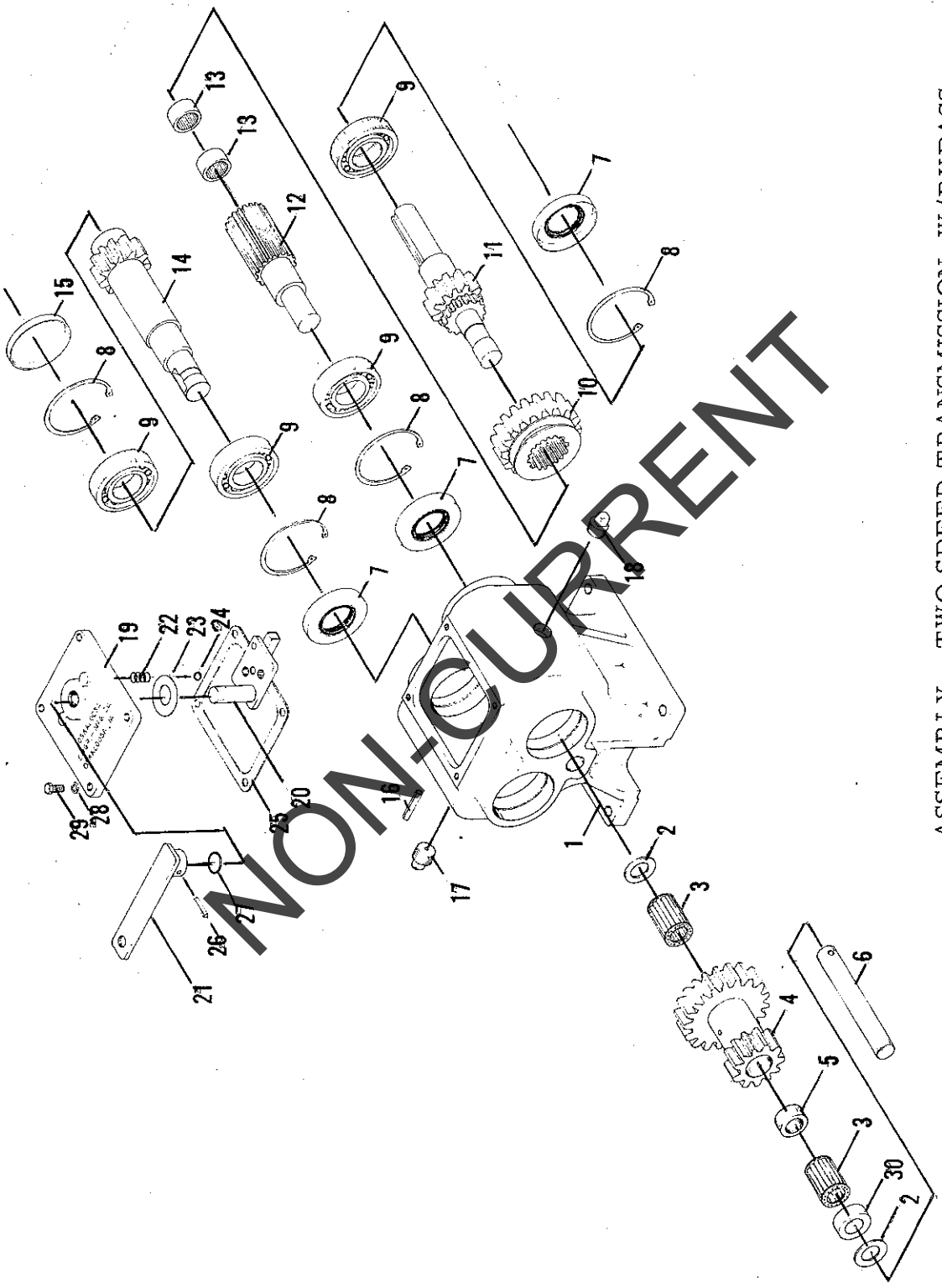


ASSEMBLY - TWO SPEED TRANSMISSION W/O BYPASS

ASSEMBLY - TWO SPEED TRANSMISSION W/O/BYPASS

ITEM	PART NO.	DESCRIPTION	QTY.
	2533	Assy. - Two Speed Trans. R.H.	
	2534	Assy. - Two Speed Trans. L.H.	
1	21732	Housing	1
2	21745	Spacer	2
3	44371	Bearing - Needle	2
4	44372	Gear - Change	1
5	44373	Spacer - Needle Bearing	1
6	21750	Shaft - Idler	1
7	21759	Shaft - Seal	2
8	21742	Ring - Snap	2
9	21741	Bearing	2
10	44378	Clutch - Gear	1
11	44379	Input Gear Shaft	1
12	44380	Output - shaft	1
13	21747	Bearing - Needle	2
14	*44381	Plug - Expansion	2
15	20924	Pin - Roll	1
16	6507	Plug - Vent	1
17	6032	Plug - Pipe	1
18	21733	Cover	1
19	21754	Assy. - Shift Lever R.H.	1
	21760	Assy. - Shift Lever L.H.	1
20	21755	Lever - Shift	1
21	21752	Spring	1
22	21757	Washer	1
23	21753	Ball	1
24	21734	Gasket	1
25	21758	Pin - Roll	1
26	21756	"O" Ring	1
27	20711	Washer - Lock	4
28	20036	Screw - Cap	4
29	21743	Spacer	1

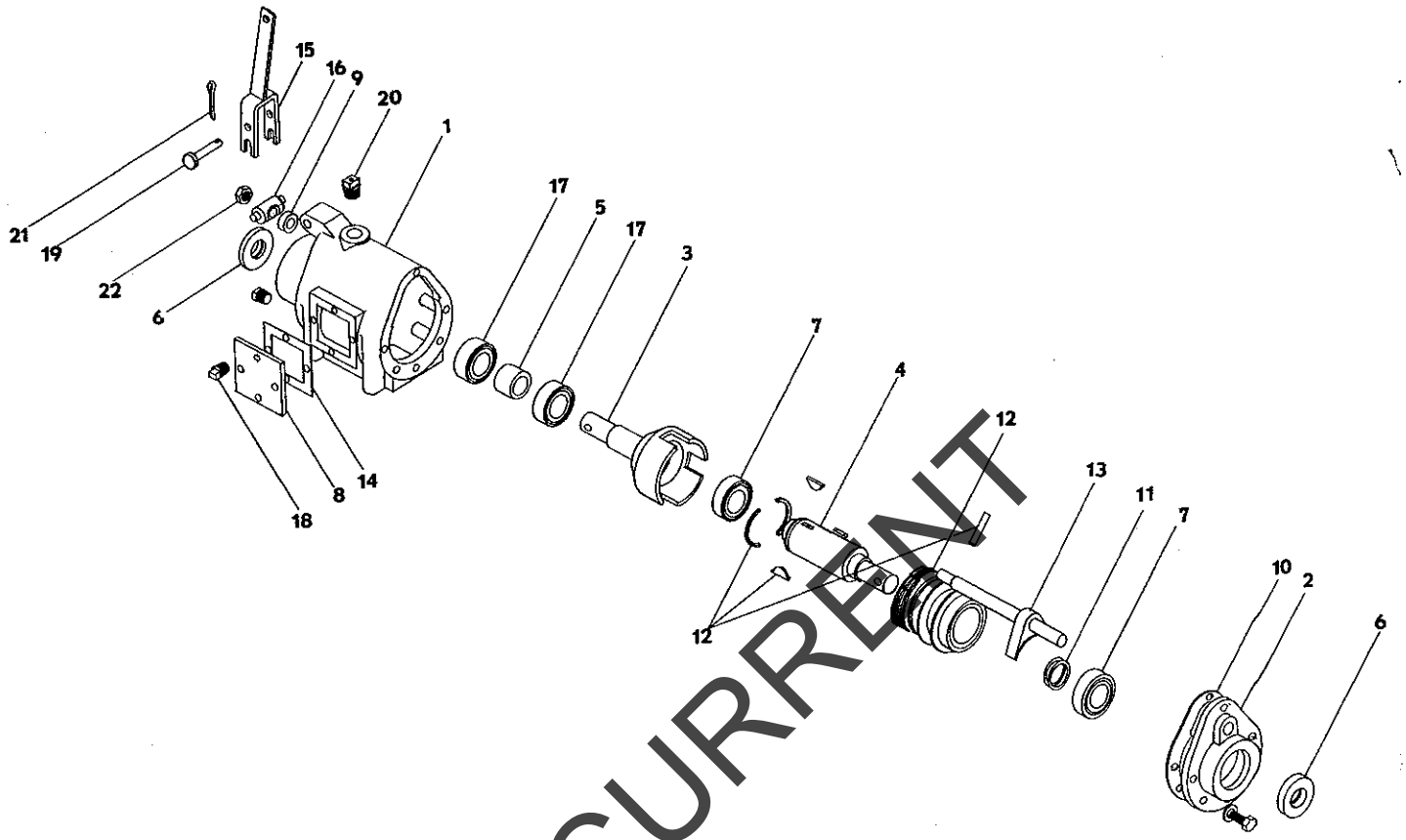
* - Not Shown



ASSEMBLY - TWO SPEED TRANSMISSION W/BYPASS

ASSEMBLY - TWO SPEED TRANSMISSION W/BYPASS

ITEM	PART NO.	DESCRIPTION	QTY.
	44301	Assembly - Two Speed Transmission R. H.	
	44302	Assembly - Two Speed Transmission L. H.	
1	44369	Housing	1
2	21745	Spacer	2
3	44371	Bearing - Needle	2
4	44372	Gear - Change	1
5	44373	Spacer - Needle Bearing	1
6	21750	Shaft - Idler	1
7	21759	Shaft - Seal	3
8	21742	Ring - Snap	4
9	21741	Bearing	4
10	44378	Clutch - Gear	1
11	44379	Input - Gear Shaft	1
12	44380	Output - Shaft	1
13	21747	Bearing - Needle	2
14	44382	Output - Gear Shaft	1
15	44383	Cap - Expansion	1
16	20924	Pin - Roll	1
17	6507	Plug - Vent	1
18	6032	Plug - Pipe	1
19	21733	Cover	1
20	21754	Assembly - Shift Lever R. H.	1
	21760	Assembly - Shift Lever L. H.	1
21	21755	Lever - Shift	1
22	21752	Spring	1
23	21757	Washer	1
24	21753	Ball	1
25	21734	Gasket	1
26	21758	Pin - Roll	1
27	21756	"O" Ring	1
28	20711	Washer - Lock	4
29	20036	Screw - Cap	4
30	21743	Spacer	1



ASSEMBLY - OIL CLUTCH

ITEM	PART NO.	DESCRIPTION	QTY.
*	2515	Assy. Oil Clutch	1
1	2516	Case-Clutch	1
2	2518	Cap-End	1
3	2520	Cup-Drive	1
4	2522	Shaft-Driven	1
5	2523	Spacer-Bearing	1
6	2524	Seal-Oil	2
7	2525	Bearing-Thrust	2
8	2527	Cover-Side	1
9	2528	Spacer	1
10	2529	Shim .002	AR
	2530	Shim .003	AR
	2531	Shim .005	AR
11	2535	Shim .010	AR
	49230	Shim .0075	AR
	49231	Shim .005	AR
12	2728	Clutch-Oil	1
	**	Key-Hipro #15	3
	**	Pin	1

ALWAYS GIVE PART NAME, NUMBER AND MACHINE SERIAL NUMBER WHEN ORDERING PARTS

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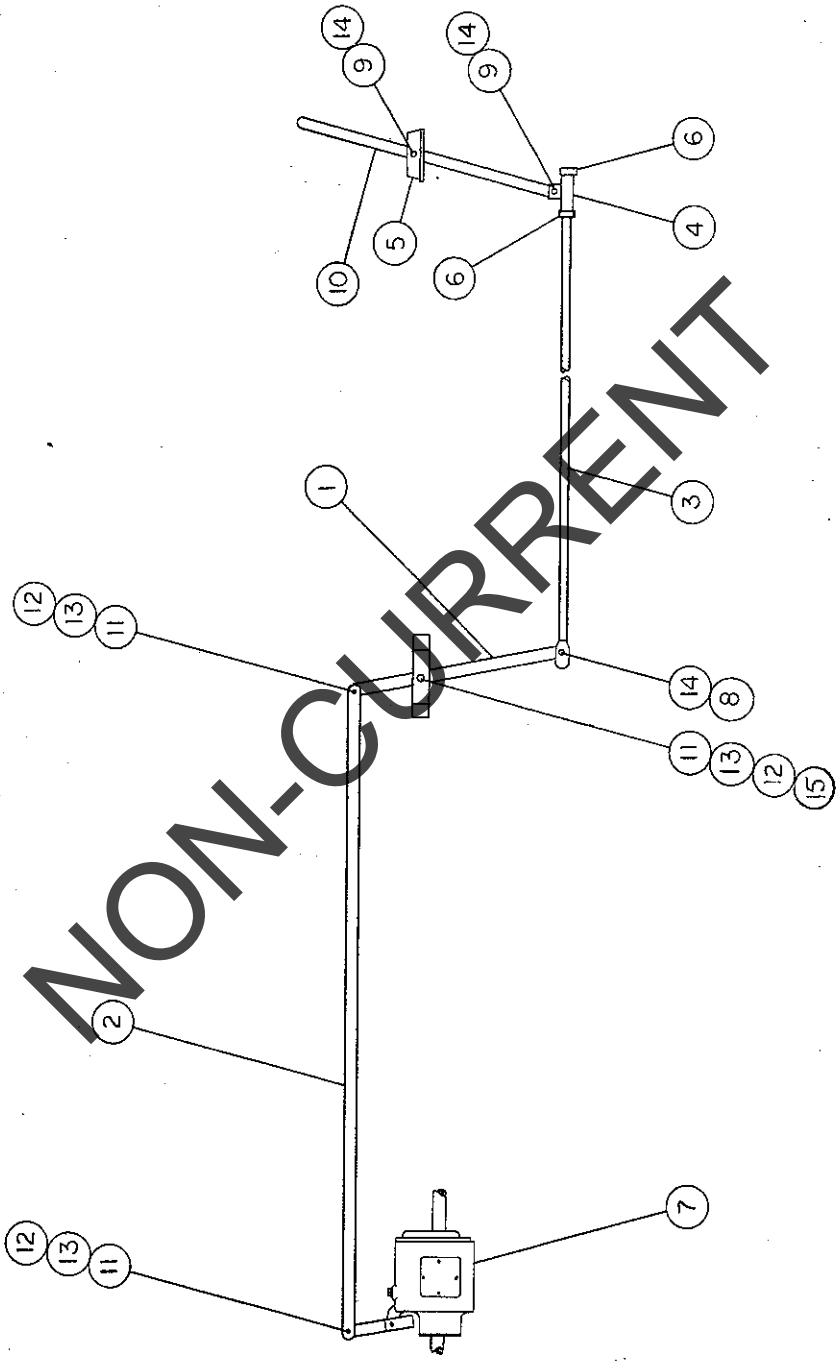
ITEM	PART NO.	DESCRIPTION	QTY.
	**	Ring-Split	1
13	2730	Yoke-Shift	1
14	2733	Gasket-Cover	1
15	2735	Yoke-Lever	1
16	2736	Block Pin	1
17	2740	Bearing-Ball	2
18	6029	Plug-Pipe	2
19	6123	Pin-Shear	1
20	6507	Plug-Vent	1
21	20817	Pin-Cotter	1
22	21000	Nut-Lock	1

* Includes Items 1 - 22
** Included in Item 12

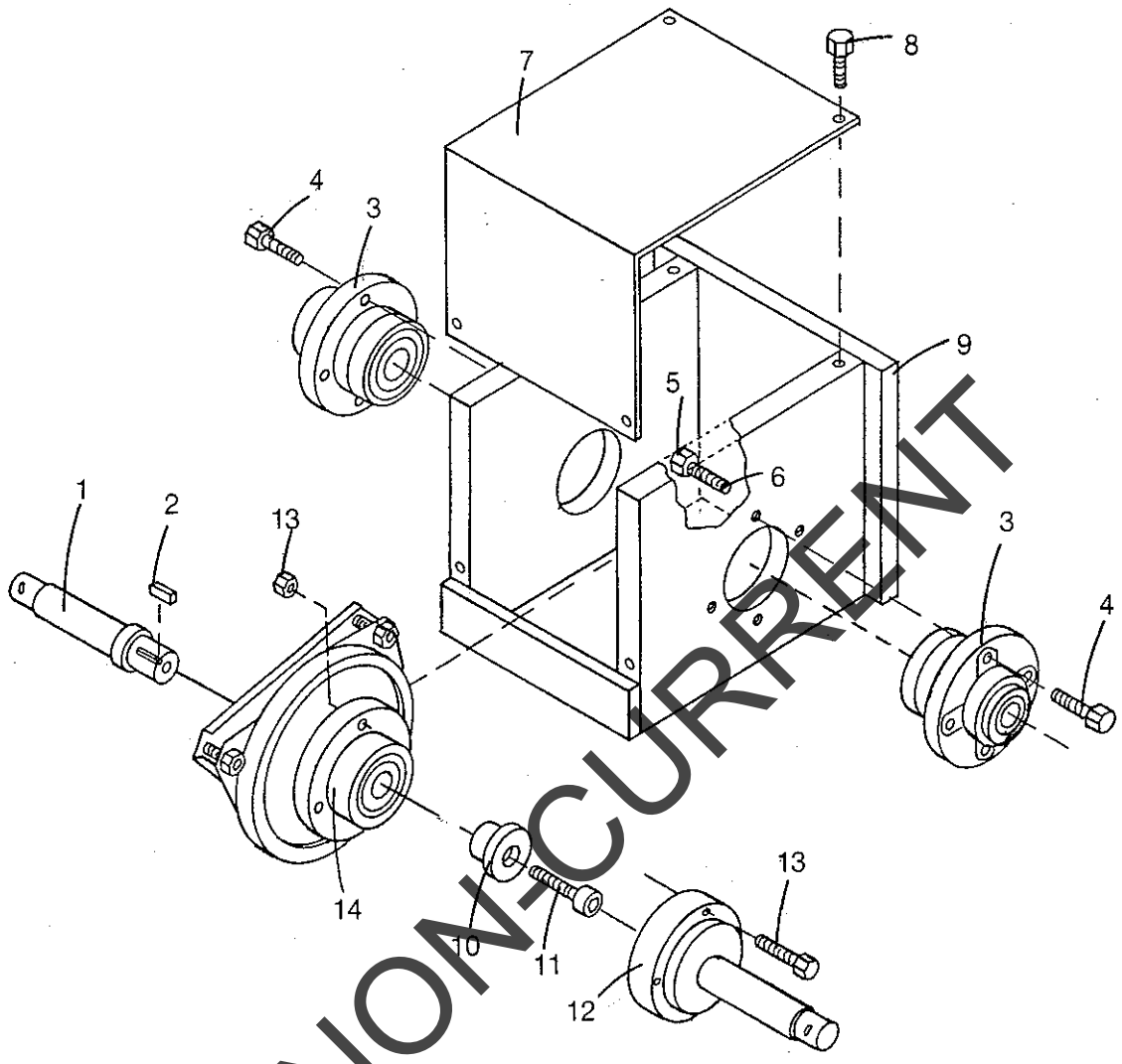


GROUP - OIL CLUTCH LINKAGE

ASSEMBLY - GROUP, OIL CLUTCH LINKAGE

ITEM	PART NO.	DESCRIPTION	QTY.
1	797	Lever - Clutch Case Linkage	1
2	19936	Link - Connecting	1
3	44338	Weldmt - Connecting Link for 10' Units	1
	19945	Weldmt - Connecting Link for 11' Units	1
	44339	Weldmt - Connecting Link for 12' Units	1
	19946	Weldmt - Connecting Link for 13' Units	1
	44340	Weldmt - Connecting Link for 14' Units	1
	44341	Weldmt- Connecting Link for 15' Units	1
	44342	Weldmt - Connecting Link for 16' Units	1
4	2612	Weldmt - Adjusting Sleeve	1
5	2617	Weldmt - Pivot	1
6	2695	Collar - Set, 3/4"	2
8	6125	Pin - Shear, 1/2"x1-7/16"	1
9	6323	Pin - Shear, 3/8"x 1-1/8"	2
10	7174	Lever - Control	1
11	20069	Screw - Cap 3/8-16 UNCx 1-1/2"	3
12	20678	Nut - Lock 3/8-16 UNC	3
13	20693	Washer - Flat 3/8"	3
14	20818	Pin - Cotter, 1/8"x 1-1/2"	3
15	19639	Weldmt. - Bracket	1

ASS'Y - ELECTRIC CLUTCH

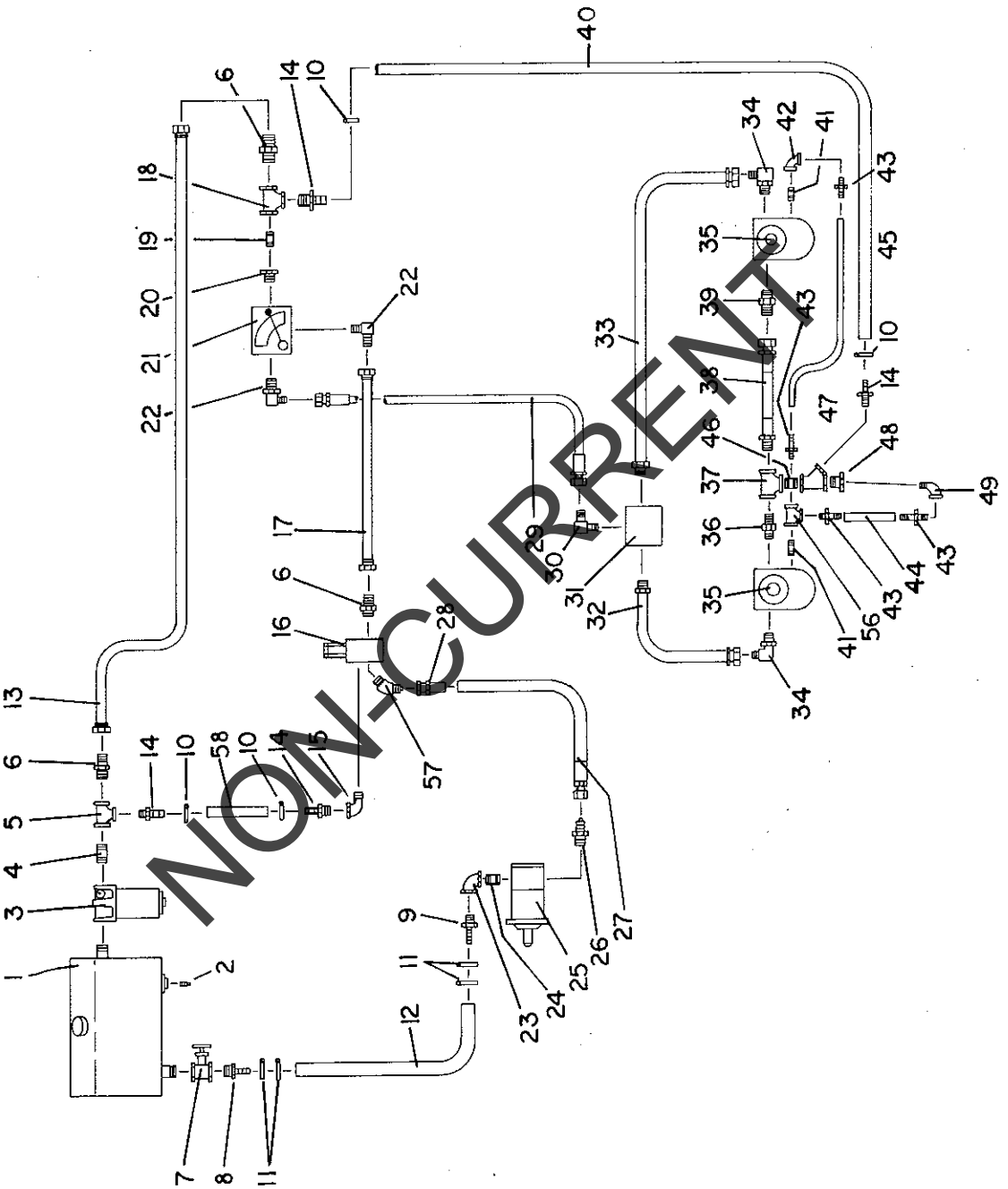


ITEM	PART NO.	DESCRIPTION	QTY
	76755	Ass'y - Electric Clutch	
1	76761	Shaft - Output	1
2	6137	Key - Square	1
3	76768	Ass'y - Bearing	2
4	20068	Screw - Cap, 3/8 x 1 1/4	8
5	20643	Nut - Hex, 5/16	2
6	76787	Stud	1
7	76786	Cover	1
8	20001	Screw - Cap, 1/4 x 1/2	4
9	76757	Weldment - Clutch Support	1
10	76766	Retainer	1
11	42427	Screw - Socket Head, 3/8 x 2 1/4	1
12	76763	Shaft - Input	1
13	20006	Screw - Cap, 1/4 x 1 1/4	4
	20622	Nut - Hex, 1/4	4

ASS'Y - ELECTRIC CLUTCH CONT'D

ITEM	PART NO.	DESCRIPTION	QTY
14	76762	Ass'y - Electric Clutch	1
15	21580-12*	Wire - Black	2
16	31572*	Terminal - Ring	1
17	75661*	Connector - 2-Way	1
18	75662*	Terminal - Male	2

* Not Shown



HYDRAULIC SCHEMATIC

HYDRAULIC SCHEMATIC

ITEM	PART NO.	DESCRIPTION	QTY.
1	31140	Ass'y - Hyd. Tank	1
2	6033	Plug - Pipe	1
3	39845	Filter - Oil	1
4	6028	Nipple	1
5	6318	Tee	1
6	29751	Adapter	3
7	22155	Valve - Gate	1
8	16582	Nipple-Hose End Use on 1-1/4" &1-1/2" Pumps	1
	24502	Nipple-Hose End Use on 2", 2-1/4" & 2-1/2" Pumps	1
9	16572	Nipple-Hose End Use on 1-1/4" & 1-1/2" Pumps	1
	24502	NIpple-Hose End Use on 2", 2-1/4" & 2-1/2" Pumps	1
10	6335	Clamp-Hose	4
11	6335	Clamp-Hose Use on 1-1/4" & 1-1/2" Pumps	4
	6288	Clamp-Hose Use on 2", 2-1/4" & 2-1/2" Pumps	4
12	23184-72	Hose-Suction Use on 1-1/4" & 1-1/2" Pumps	1
	23178-72	Hose-Suction Use on 2", 2-1/4" & 2-1/2" Pumps	1
13	43525	Ass'y - Tube Use on 10' Bodies	1
	43526	Ass'y - Tube Use on 11' Bodies	1
	43527	Ass'y - Tube Use on 12' Bodies	1
	43528	Ass'y - Tube Use on 13' Bodies	1
	43529	Ass'y - Tube Use on 14' Bodies	1
	46530	Ass'y - Tube Use on 15' Bodies	1
	46531	Ass'y - Tube Use on 16' Bodies	1
14	22426	Nipple - Hose	4
15	6016	Pipe - Street Ell	1
16	22147	Valve Relief	1
17	43538	Ass'y - Tube Use on 10' Bodies	1
	43539	Ass'y - Tube Use on 11' Bodies	1
	43540	Ass'y - Tube Use on 12' Bodies	1
	43541	Ass'y - Tube Use on 13' Bodies	1
	43542	Ass'y - Tube Use on 14' Bodies	1
	46532	Ass'y - Tube Use on 15' Bodies	1
	46533	Ass'y - Tube Use on 16' Bodies	1
18	18598	Pipe - Tee	1
19	6026	Nipple - Close	1
20	22021	Adapter - Bushing	1
21	32485	Valve - Control	1
22	29838	Adapter - Connector 90°	1
23	6010	Elbow - 90° Use on 1-1/4" & 1-1/2" Pumps	1
	6011	Elbow - 90° Use on 2", 2-1/4" & 2-1/2" Pumps	1
24	6027	Nipple - Close Use on 1-1/4" & 1-1/2" Pumps	1
	6028	Nipple - Close Use on 2", 2-1/4" & 2-1/2" Pumps	1
25	22393	Ass'y - Pump 1-1/4"	1

HYDRAULIC SCHEMATIC cont'd

ITEM	PART NO.	DESCRIPTION	QTY.
25	22394	Ass'y - Pump 1-1/2"	1
	22396	Ass'y - Pump 2"	1
	22397	Ass'y - Pump 2-1/4"	1
	22398	Ass'y - Pump 2-1/2"	1
26	29751	Adapter Use on 1-1/4" & 1-1/2" Pumps	1
	34724	Adapter Use on 2", 2-1/4" & 2-1/2" Pump	1
27	29610	Ass'y - Hose	1
	56509	Fitting - Hose End	1
29	29756	Ass'y - Hose	1
30	29764	Adapter - 90°	1
31	22238	Valve - Flow Divider	1
32	29521	Ass'y - Hose	1
33	29528	Ass'y - Hose	1
34	29761	Adapter - 90°	2
35	23800	Ass'y - Motor, Spinner	2
36	14378	Adapter	1
37	22286	Tee	1
38	29529	Ass'y - Hose	1
39	29760	Adapter	1
40	16521-60	Hose - Return	1
41	4343	Nipple - Close	2
42	6007	Elbow	1
43	26565	Fitting - Socketless	4
44	26544-8	Hose - Drain	1
45	26544-29	Hose - Drain	1
46	6027	Nipple - Close	1
47	22221	Y-Branch	1
48	23708	Bushing - Pipe	1
49	6013	Elbow - Street	1
50	*20908	Screw- Self Drilling	A. R.
51	*20067	Screw - Cap	4
52	*20644	Nut - Hex	4
53	*21994	Clamp - Conduit	A. R.
54	-----		
55	-----		
56	2793	Tee	1
57	29796	Elbow - 45°	1
58	16521-18	Hose - Return	1

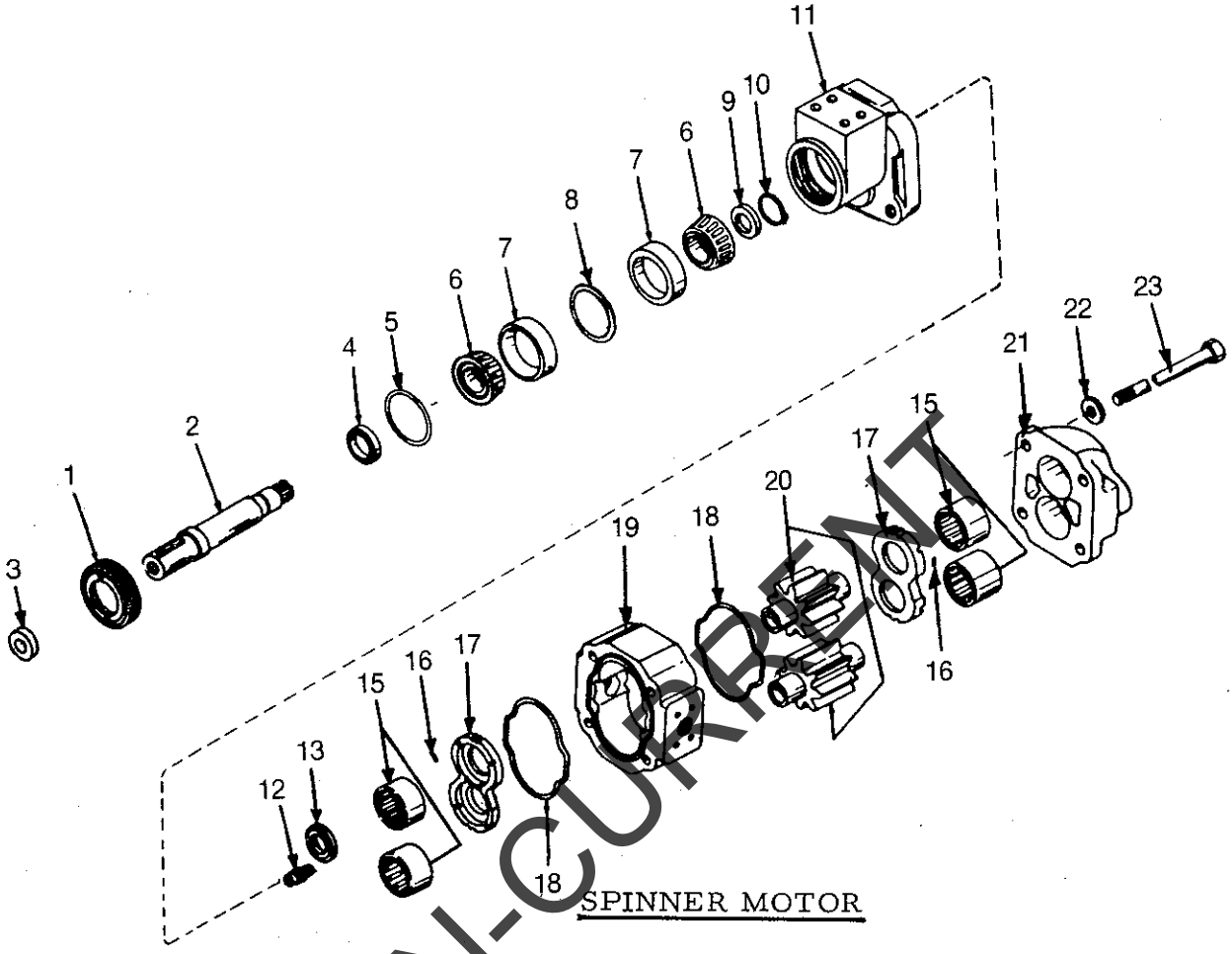
* Not Shown

24" HYDRAULIC FAN ASSEMBLY

ITEM	PART NO.	DESCRIPTION	QTY.
	31110	Assembly Group-Hydraulic Fan	
1	2793	Tee	1
2	4343	Nipple-Close	2
3	6007	Elbow	1
4	6013	Elbow-Street	1
5	6026	Nipple	1
6	6027	Nipple-Close	1
7	14340	Weldment-Frame	1
8	14359	Shield-Ext., R.H.	1
9	14360	Shield-Ext., L.H.	1
10	14372	Assembly-Fan, R.H.	1
12	10877	Hub	1
13	20677	Nut-Lock	9
14	20873	Rivet	6
15	20034	Screw-Cap, Grade #5	9
16	27056	Disc-Distributor	1
17	25870	Fin-R.H.	3
11	14373	Assembly-Fan, L.H.	1
12	10877	Hub	1
13	20677	Nut-Lock	9
14	20873	Rivet	6
15	20034	Screw-Cap, Grade #5	9
16	27056	Disc-Distributor	1
18	25871	Fin-L.H.	3
19	14378	Adapter-Male	1
20	14394	Plate-Adapter, L.H.	1
21	14395	Plate-Adapter, R.H.	1
*22	16521-60	Hose	1
23	19470	Weldment-Flow Divider	1
24	-----		
25	21653	Grommet-Rubber	2
26	22221	Y-Branch	1
27	22238	Valve-Flow Divider	1
*28	22426	Fitting-Hose End	2
29	-----		
30	23708	Bushing	1
31	23800	Motor-Hydraulic	2
32	26544-8	Hose	1
33	26544-18	Hose	1
34	26565	Fitting-Socketless	4
35	29521	Assembly-Hose	1
36	29528	Assembly-Hose	1

ITEM	PART NO.	DESCRIPTION	QTY.
37	29529	Assembly-Hose	1
*38	29576	Assembly-Hose	1
39	29760	Adapter	1
40	29761	Adapter	2
41	29764	Elbow-Street	1
42	22286	Tee	1

* Items Not Included In Assembly 31110.



SPINNER MOTOR

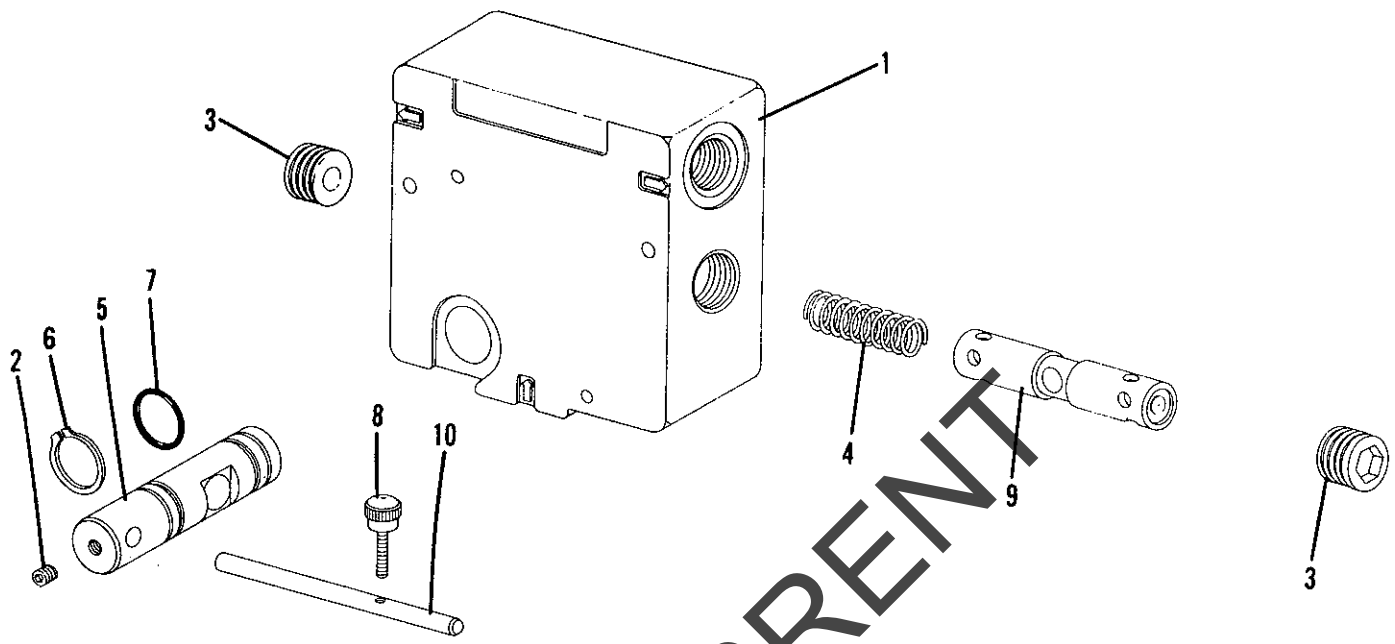
ITEM	PART NO.	DESCRIPTION	QTY.
*	23800	Hydraulic Motor	
1 **	33777	Retainer Ring	1
2	28485	Shaft	1
3	33809	Seal, Excluder	1
4 **	28493	Seal	1
5 **	28494	"O" Ring	1
6 **	28491	Bearing Cone	2
7		Bearing Cup	2
8	28486	Spacer	1
9 **	28486	Spacer (Kit)	1
10	28499	Snap Ring	1
11	28490	Shaft End Plate	1
12	23805	Check Assembly	2
13**	28495	Bushing	1
14			
15	23806	Bearings	4

SPINNER MOTOR CONT'D.

ITEM	PART NO.	DESCRIPTION	QTY
16 **	23819	Pocket Seals (Makes 12 Seals)	1
17	23818	Plate	2
18 **	23820	Gasket	2
19	28498	Housing	1
20	23822	Gear Set	1
21	23812	Port End Cover	1
22		Washer	4
23	23833	Cap Screws	4

23940 Tool - Seal Installation (Required for installation of Item 4) — 1

* Complete Assembly
** 28482 Seal Kit



SPINNER CONTROL VALVE

ITEM	PART NO.	DESCRIPTION	QTY.
	32485	Valve - Hydraulic	
1	*	Body - Adjustable Divider	1
2	20735	Screw - Set, 1/4 - 20 NC x 1/4	1
3	24555	Plug	2
4	24556	Spring	1
5	24557	Spool - Rotary	1
6	24559	Snap Ring	2
7	24563	"O" Ring	2
8	24566	Screw - Thumb	1
9	24574	Spool	1
10	24558	Handle	1

* Not Serviced

PUMP ASSEMBLY CONT'D

ITEM	PART NO.	DESCRIPTION	QTY.
9	23821	Drive Shaft	1
10	23827	Thrust Washer	1
11	23801	Shaft End Cover	1
12	23805	Check Assembly	2
13	**23808	Shaft Bushing	1
14	23807	Spring	1
15	23806	Roller Bearing	4
16	**23819	Pocket Seal (Make 12 Seals)	1
17	23818	Thrust Plate	2
18	**23820	Gasket	2
19	23813	Housing - Gear 1-1/4"	1
	23814	Housing - Gear 1-1/2"	1
	23815	Housing - Gear 2"	1
	23816	Housing - Gear 2-1/4"	1
	23817	Housing - Gear 2-1/2"	1
20	*	Gear - Drive	1
21	*	Gear - Driven	1
22	23812	Port End Cover	1
23		Washer	4
24		Capscrew	4

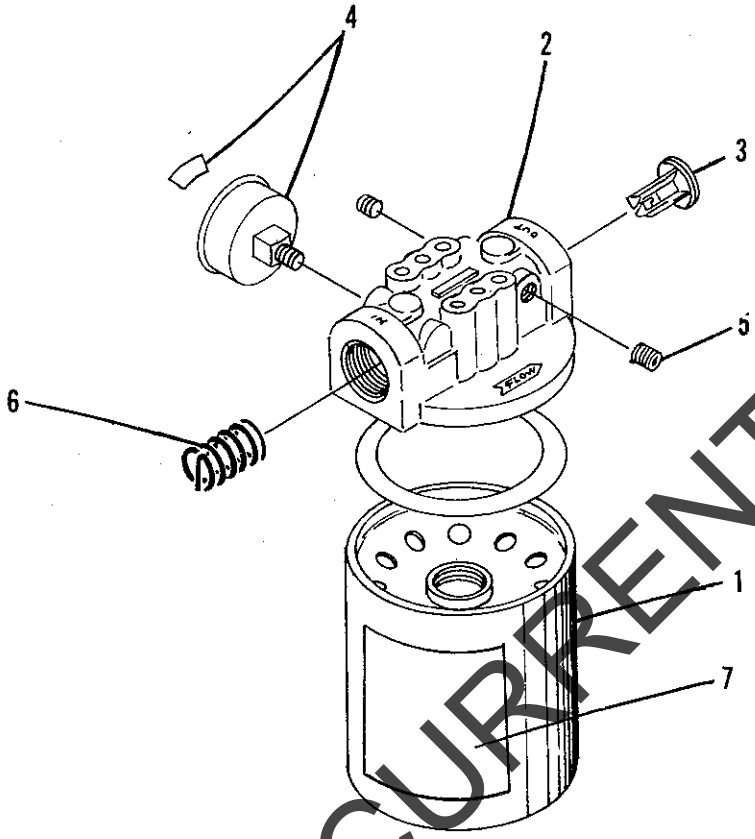
* Items 20 and 21 come only as a Matched Set:

23822	Gear Set 1-1/4"	1
23823	Gear Set 1-1/2"	1
23824	Gear Set 2"	1
23825	Gear Set 2-1/4"	1
23826	Gear Set 2-1/2"	1

** Seal Kit 27490

COMPLETE PUMP ASSEMBLY

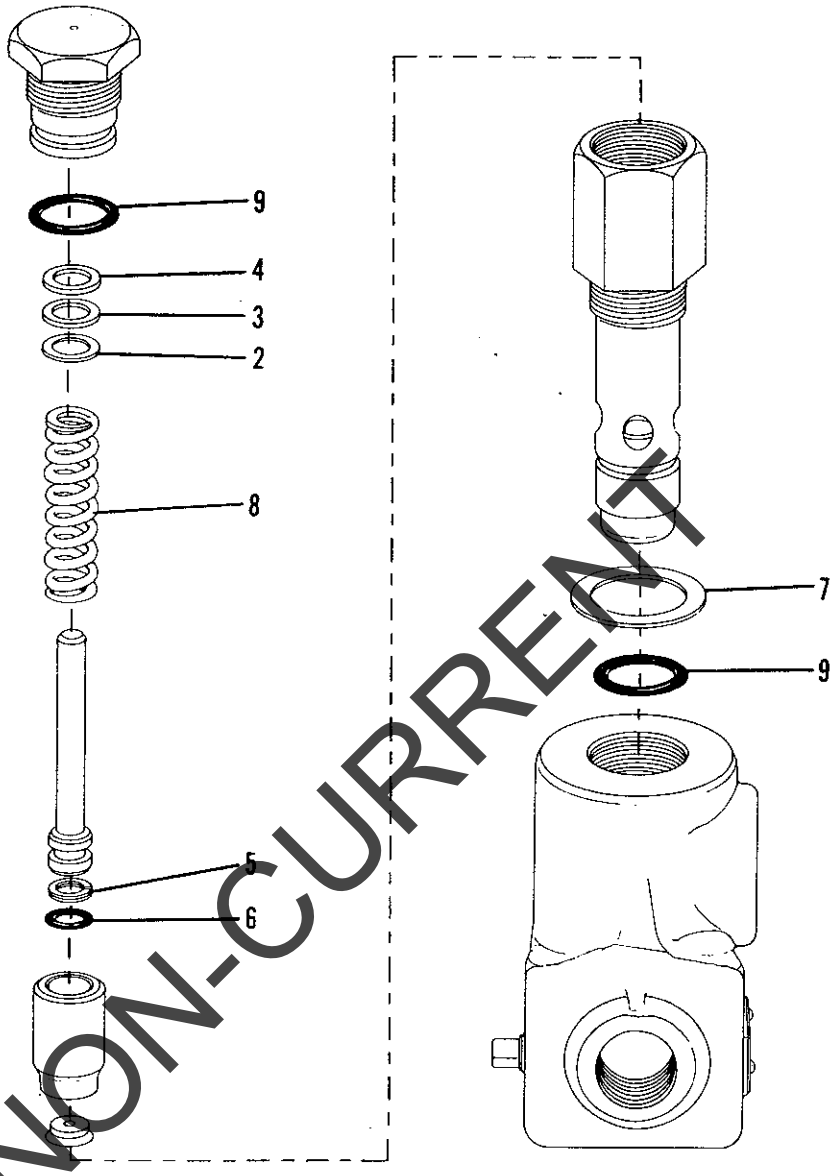
22393	1-1/4" Gear Pump
22394	1-1/2" Gear Pump
22396	2" Gear Pump
22397	2-1/4" Gear Pump
22398	2-1/2" Gear Pump



FILTER - HYDRAULIC, WITH INDICATOR

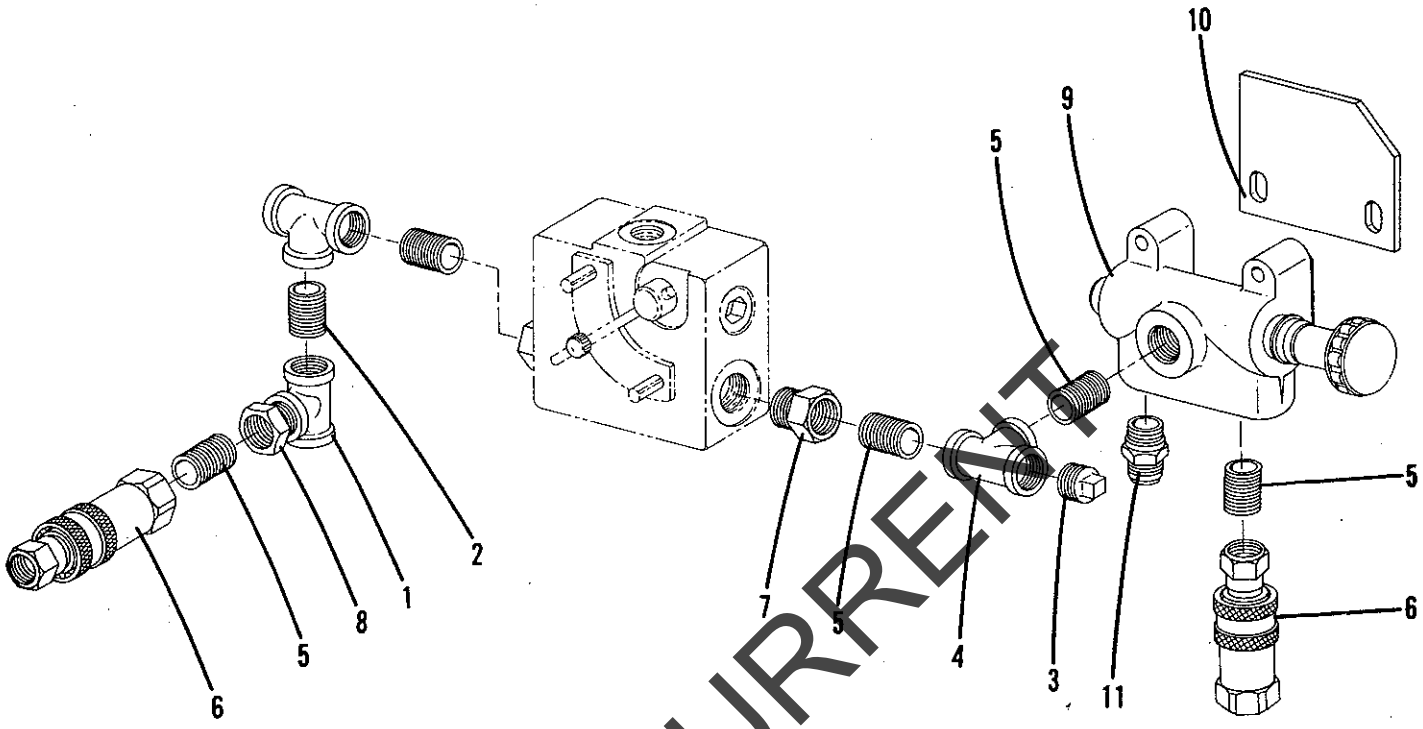
ITEM	PART NO.	DESCRIPTION	QTY.
	39845	Filter - Hydraulic with Indicator	
1	43530	Filter - Element Kit	1
2	N.S.	Head Casting	1
3	43533	Relief Valve Poppet	1
4	43534	Indicator with Decal	1
5	6029	Pipe - Plug, 1/8"	1
6	43537	Relief Valve Spring	1
7	39379	Decal	

N.S. - Not Serviced



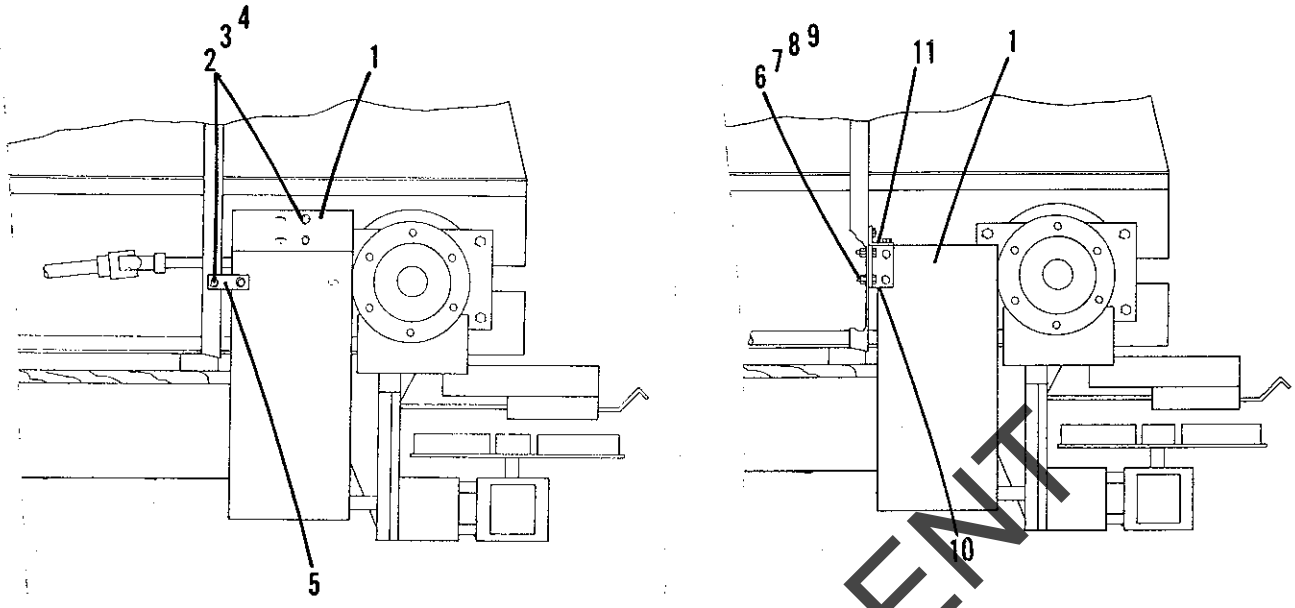
RELIEF VALVE

ITEM	PART NO.	DESCRIPTION	QTY.
	22147	Assembly-Relief Valve	1
1	22699	Cartridge-Relief Valve	1
	Each Cartridge Consists Of Items 2 - 9		
2	5689	Shim, .015 Thickness	As Req'd.
3	5690	Shim, .030 Thickness	As Req'd.
4	5691	Shim, .060 Thickness	As Req'd.
5	21113	Back-Up Ring	1
6	21114	O'Ring	1
7	21115	Washer	1
8	21116	Spring	1
9	22691	O'Ring	2



AUXILIARY HYDRAULICS

ITEM	PART NO.	DESCRIPTION	QTY.
	24488	Auxiliary Hydraulics Kit	1
1	6021	Tee	1
2	6027	Nipple - Close	1
3	6033	Plug - Pipe	1
4	16356	Tee	1
5	16362	Nipple - Close	4
6	22000	Coupler - Quick Disconnect	2
7	22022	Adapter	1
8	22208	Bushing - Reducing	1
9	22169	Valve - Selector	1
10	31208	Bracket	1
11	29752	Adapter	1

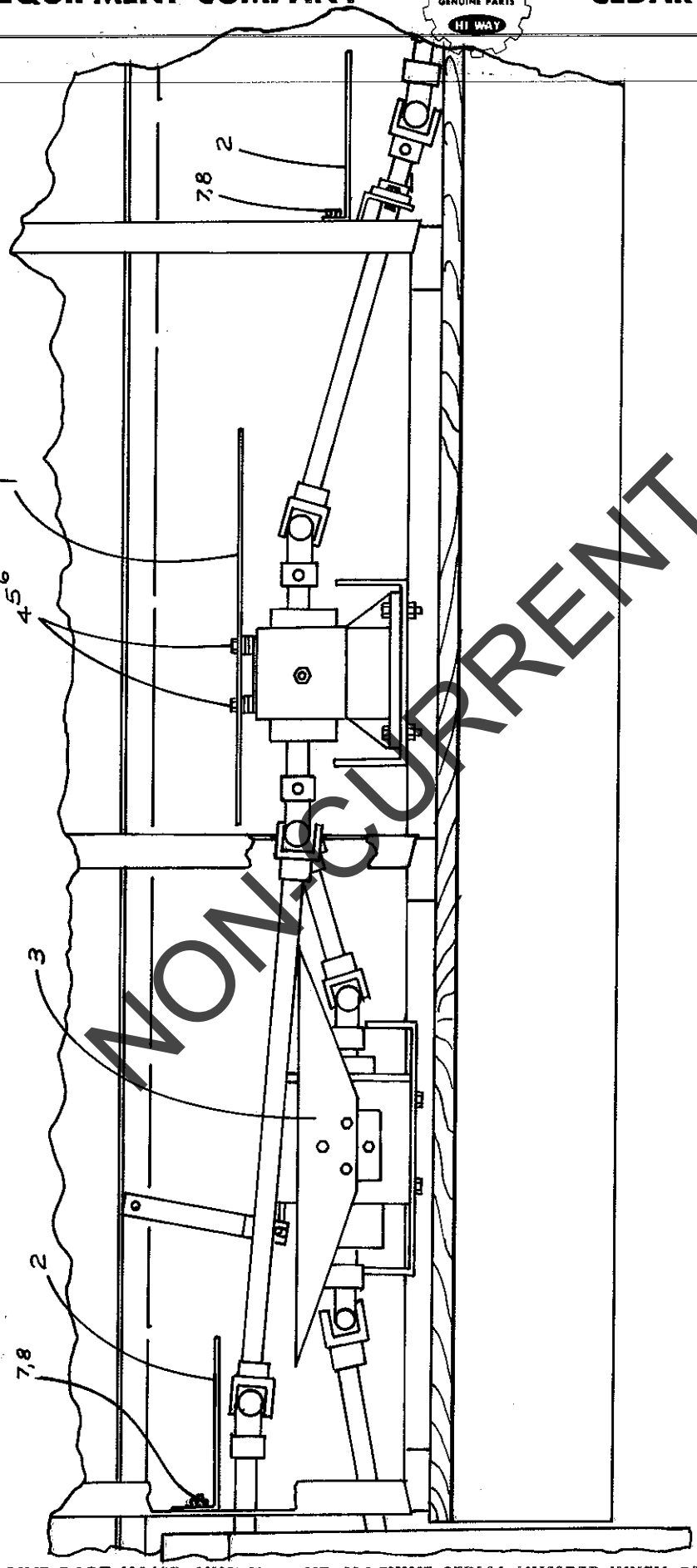


KIT - SHIPPING SHIELD

ITEM	PART NO.	DESCRIPTION	QTY.
	55170	* Kit - Shipping Shield	
	55172	Kit - Shipping Shield RH	
	55173	Kit - Shipping Shield LH	
1	34321	* Weldment - Shield	1
	55689	Weldment - Shield RH	1
	55690	Weldment - Shield LH	1
2	20067	* Screw - Cap 3/8-16 UNC	4
3	20644	* Nut - Hex 3/8-16 UNC	2
4	20712	* Washer - Lock 3/8	4
5	34322	* Bracket	1
6	20034	Screw - Cap 5/16-18 UNC x 3/4	8
7	20692	Washer - Flat 5/16	8
8	20711	Washer - Lock 5/16	8
9	20643	Nut - Hex 5/16-18 UNC	8
10	55694	Angle - Guard	1
11	55695	Angle - Guard	1

* Use on Body Side Mounted 2-Speed Trans. With Bypass Only.

NOTE: Guards shown are intended to reduce hazard of entanglement with machinery and injury. All guards MUST be installed per these drawings before spreader is put into operation.



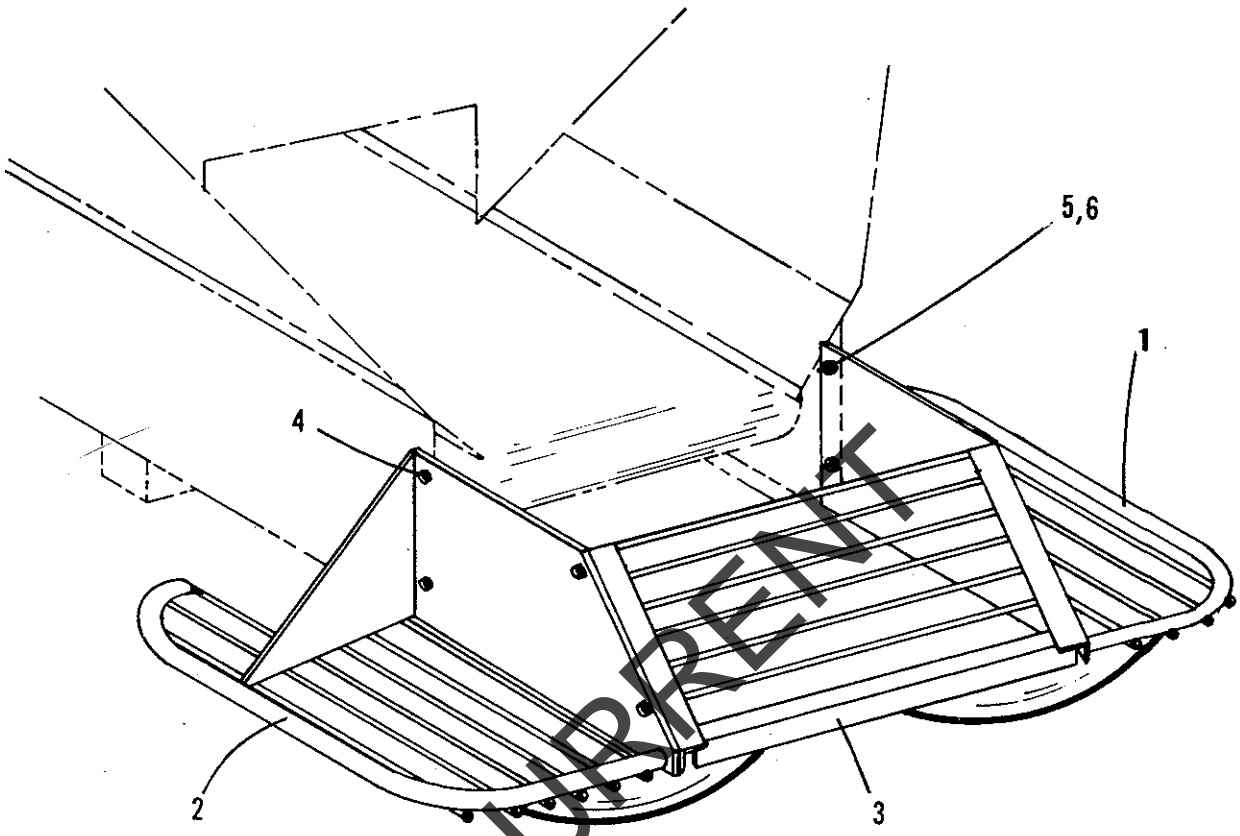
NOTE:

Guards shown are intended to reduce hazard of entanglement with machinery and injury. All guards MUST be installed per these drawings before spreader is put into operation.

KIT - SHIPPING, GUARDS

KIT - SHIPPING, GUARDS

ITEM	PART NO.	DESCRIPTION	QTY.
1	55327	Plate - Shield	1
2	55325	Shield	A. R.
3	55329	Weldmt. - Guard	1
4	20036	Screw - Cap 5/16-UNC x 1	4
5	20711	Washer - Lock 5/16	4
6	20692	Washer - Flat 5/16	20
7	20678	Nut - Lock 3/8	2
8	20067	Screw - Cap 3/8-UNC x 1	2

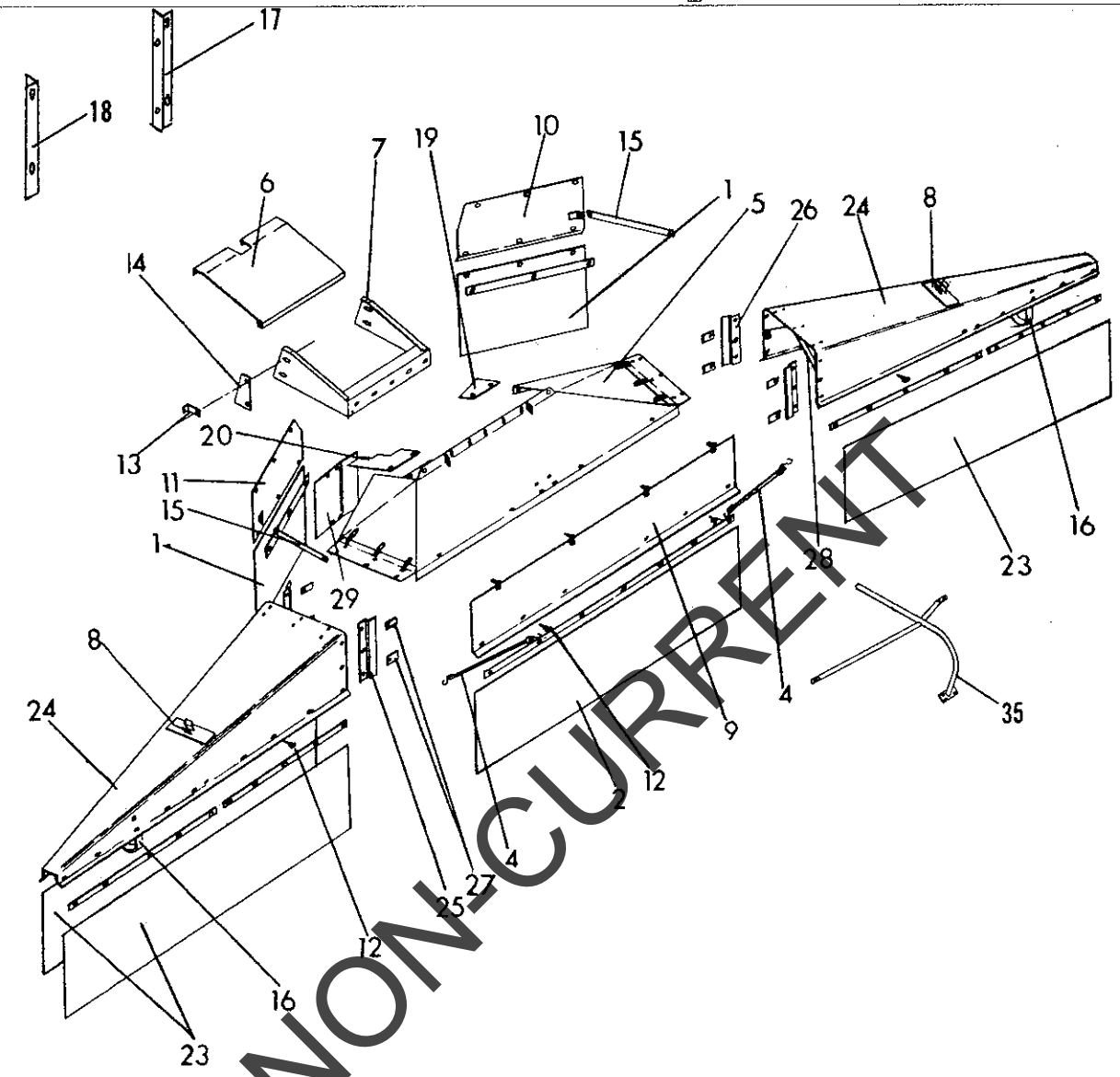


KIT - SHIPPING, SPINNER GUARD

ITEM	PART NO.	DESCRIPTION	QTY.
*	47346	Kit - Shipping, Spinner Guard L. H.	
**	47347	Kit - Shipping, Spinner Guard R. H.	
1	**47328	Weldmt - Guard R. H.	1
	*47326	Weldmt - Guard R. H. Opening	1
2	*47327	Weldmt - Guard L. H.	1
	**47325	Weldmt - Guard L. H. Opening	1
3	47336	Weldmt - Guard, Center Section	1
4	20067	Screw - Cap 3/8-16 UNC X 1	8
5	20644	Nut - Hex 3/8-16 UNC	8
6	20714	Washer - Lock 3/8	8

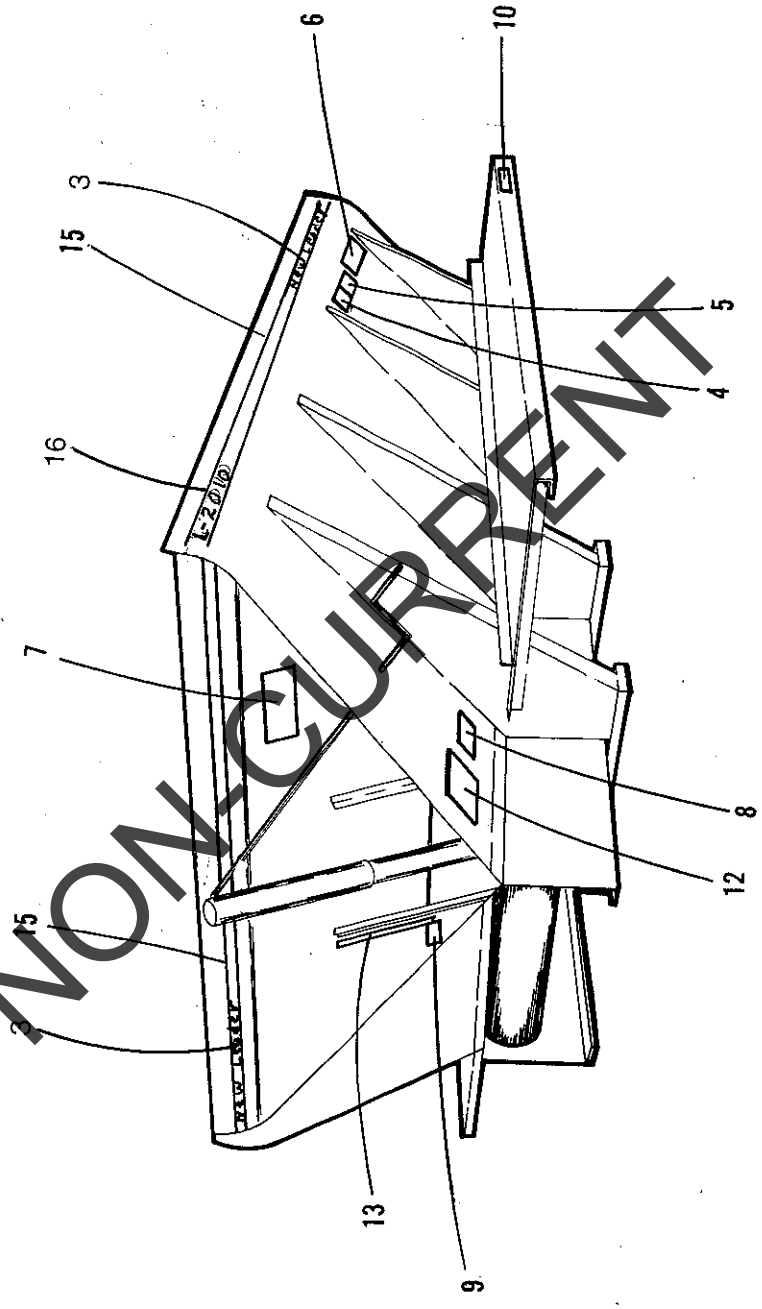
NOTE:

Guards shown are intended to reduce hazard of entanglement with machinery and injury. All guards MUST be installed per these drawings before spreader is put into operation.



GROUP - P250 HOOD

ITEM	PART NO.	DESCRIPTION	QTY.
	31961	Group - P250 Hood	
1	3494	Belt - Rear Platform Drop	2
2	3495	Belt - Rear Flap	1
3	3496	Belt - Front Center	1
4	6280	Hook - Tension, Rubber	2
5	15383	Weldment - Center Section	1
6	15384	Weldment - Door	1
7	15385	Weldment - Door Extension	1
8	15386	Weldment - Wing Rest	2



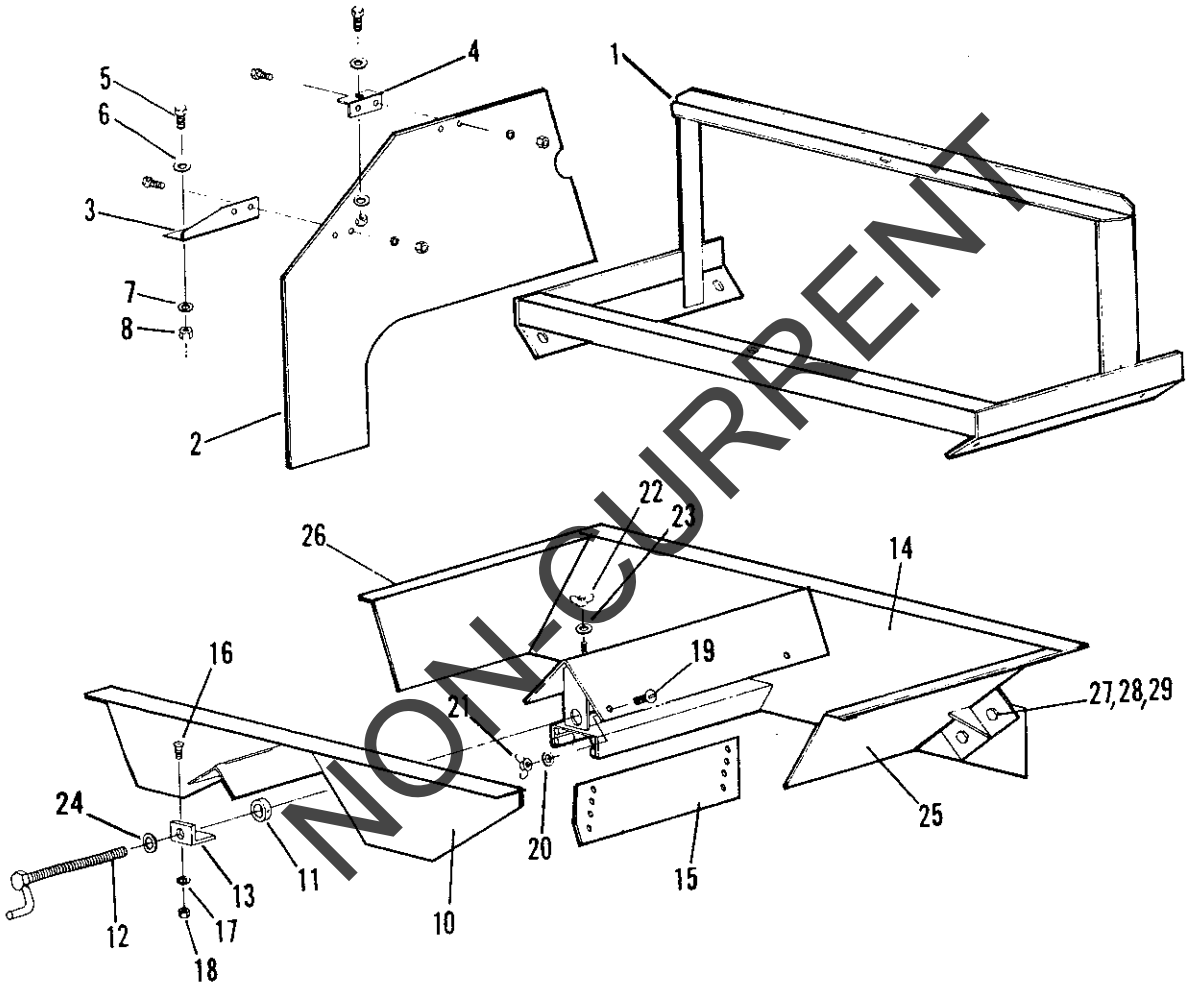
GROUP - DECALS

GROUP - PAINT & DECAL

ITEM	PART NO.	DESCRIPTION	QTY.
1	*37285	Plate - Serial Number	1
2	*6276	Screw - Drive	4
3	21722	Decal - New Leader	3
4	150034	Decal - Caution, Improper Operation	1
5	321	Decal - Caution, Mat'l to be Spread	1
6	364	Decal - Warning, Stayout of Box	2
7	368	Decal - Flying Material	1
8	6541	Decal - Oil Lube Chart	1
9	21476	Decal - Important Conv. Chain Life (Use w/Chain Conveyor)	1
	21477	Decal - Important Belt Conv. Life (Use w/Belt Conveyor)	1
10	39200	Decal - FENDER CAPACITY	2
11	*55630	Decal - Warning No Step	2
12	55631	Decal - Warning Guard	2
13	23769	Decal - Feedgate Scale	1
14	*365	Decal - Moving Machinery	1
15	21725	Decal - Scotchcal White	A. R.
	38977	Decal - Scotchcal Red	A. R.
16	38665	Decal - L-2010 White	2
	38672	Decal - L-2010 Red	2
17	*8664	Decal - Caution Keep Valve Open	1
18	*8665	Decal - Hydraulic Oil Only	1

* Not Shown

ASSEMBLY - HILLSIDE FLOW DIVIDER AND RED-E-VIDER



ASSEMBLY - HILLSIDE FLOW DIVIDER & RED-E-VIDER CONT'D

ITEM	PART NO.	DESCRIPTION	QTY.
19	32446	Screw - Truss Head, 1/4-20 NC x 3/4"	4
20	36418	Washer - Lock, 1/4"	4
21	32445	Nut - Wing, 1/4-20 NC	4
22	37786	Nut - Wing, 5/16-18 NC	1
23	36424	Washer - Flat, 5/16	1
24	20697	Washer - Flat, 5/8"	1
	56857	Washer - Flat, 5/8" (S.S.)	1
25	56891	Weldment - Side Plate, R.H.	1
	56898	Weldment - Side Plate, R.H. (409 S.S.)	1
	56910	Weldment - Side Plate, R.H. (304 S.S.)	1
26	56927	Weldment - Side Plate, L.H.	1
	56899	Weldment - Side Plate, L.H. (409 S.S.)	1
	56911	Weldment - Side Plate, R.H. (304 S.S.)	1
27	56858	Capscrew - 5/16-18 NC x 3/4	4
28	36419	Washer - Lock, 5/16"	4
29	36413	Nut - Hex, 5/16-18 NC	4

* - Not Shown
S.S. - Stainless Steel