



**LST-3420**



**LS-3420**

# **SPREADER**

## **Owner/ Operator Manual & Parts Reference Guide**

**Do not operate or work on this spreader without first reading and understanding this manual.**

**Keep this manual with the spreader at all times.**

# **WARNING**

**DO NOT EXCEED  
25 MPH**

**FAILURE TO COMPLY WITH THE  
WHEEL MANUFACTURER'S  
RECOMMENDATIONS MAY RESULT IN  
THE LUG NUTS BECOMING LOOSE.  
THE LUG NUTS MUST BE KEPT  
TORQUED TO 180 FT/ LBS. CHECK NUT  
TIGHTNESS PRIOR TO EACH USE.**

**LST ONLY**

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# **CAUTION**

**Keep all guards in place.**

**Before serving, disengage PTO and wait for all moving parts to stop.**

**Do not use spinners disc for step.**

**Keep all loose clothing away from shafts and spinners.**

**Keep hands and feet away from conveyor when in operation.**

## **PREFACE**

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This Owner/ Operator Manual & Parts Reference Guide is to assist in the correct operation and maintenance of this spreader by providing information for installation, operation, service and maintenance. Please read this manual thoroughly before proceeding to use the equipment.

The economic life of any piece of equipment is directly related to the care and maintenance it receives. Use this manual as a reference in seeing that this unit receives proper care and is correctly operated.

The use of genuine Warren parts is recommended for best equipment service as well as insuring that our warranty policy is not voided.

If additional information is required or should you desire to have a qualified service facility work on this spreader, contact your Warren Distributor.

## **ORDERING REPAIR PARTS**

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Contact the authorized dealer who services your area. If unknown contact Warren, Inc.

In ordering parts, be sure to have spreader model and serial number. Also have description and part number of parts required. Be able to specify the method of shipping if parts are not to be picked up such as UPS, Truck Line, Air Freight, or Parcel Post. If parts are ordered by phone, be sure to confirm in writing to insure an understanding of what you need.

Inspect parts shipments immediately and notify delivering carrier as well as dealer damage or shortage. If carrier loses or damages parts you should file a claim with them – not the dealer. The dealer responsibility for shipment ceases when goods are turned over to the carrier.

When possible, it is good to anticipate parts requirements by having a good preventive maintenance program having some parts on hand to take of minor requirements could be a great convenience and could save valuable time.

<p><b>Warren, Inc reserves the right to make changes in our equipment at any time without any obligation whatsoever to change units already in the field.</b></p>
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# WARRANTY

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## Spreaders

**WARRANTY. WARREN, INC.**, (here in after called Warren) warrants each new spreader and item of hydraulic equipment manufactured by it to be free from defects in material and workmanship under normal use and service with loads not exceeding the vehicle manufacturer's rated capacity for a period of 12 months after delivery to the original purchaser direct or by and authorized distributor.

**Exclusions from Warranty:** This Warranty shall not apply to:

- (1) components manufactured by persons other than Warren (such as hydraulics pumps, motors, valve, bearings, etc.) beyond warranty, if any, which may be made by such manufacturer,
- (2) any unit which shall have been subject to misuse, negligence, alteration or accident or which shall have been repaired by anyone other than Warren or its authorized service distributor in any way so as in the judgment of Warren to affect adversely its performance or reliability, or
- (3) normal maintenance services.

**Purchaser's Exclusive Remedies.** Warren's sole obligation under this warranty will be to repair or replace. At its option, any warranted unit or part as described above which shall be returned to Warren's factory or authorized service distributor and which examination shall disclose to Warren's satisfaction to have been defective. Freight or other transportation costs to and from the factory or authorized service distributor must be paid by the purchaser. Warren will not assume any charges for repairs made by anyone other than Warren or its authorized service distributor.

**Exclusion of other Warranties.** No other warranty is made by Warren and in particular Warren makes NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. Warren neither assumes nor authorizes any person to assume for it any liability other than described herein.

**Limitations of Actions.** Without extending the period of warranty stated above, any action for breach of warranty must be commenced within one year of the breached claimed or forever barred.

**Limitations of Damages.** The purchaser's remedy stated above shall be exclusive for any claims against Warren whether based on contract, negligence, tort, or any other theory. In no event shall Warren be liable for any consequential damages which may result from any defect or failure of a unit or part.

**Warren, Inc.**

**707 North Fir Ave., P.O. Box 1719, Collins MS 39428**

**Phone: (601) 765-4554 Fax: (601) 765-4554**

## **GENERAL DESCRIPTION**

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The Warren Model LS-3420 is an all-hydraulically powered hopper type bulk material spreader designed for truck chassis installation. The LST-3420 is designed for use with farm tractors. They will spread dry, free flowing materials such as chicken litter, saw dust, shavings and rice hulls at popular application rates for agricultural purposes.

LS-3420 is powered by a heavy-duty gear type hydraulic pump which is driven by a truck transmission power take-off (PTO). The PTO should run at approximately 1500 RPM when spreader is being operated. If engine speed during operation is 3000 RPM, then PTO should be run at 5096. The standard pump is bi-directional, so PTO may rotate either direction. LST-3420 uses 540 RPM pump as standard.

The heavy-duty hopper body has a full length bar flight type conveyor chain as standard which conveys the material through an adjustable metering gate to the twin distributor spinner assembly. The conveyor is powered by a low-speed hi-torque hydraulic motor integrally mounted to the 6:1 reduction conveyor gear box.

The spinners are directly mounted to hydraulic motors which have output shafts and a variable speed control valve. An electric dump valve provides in-cab "On-Off" control. Conveyor speed is a function of the hydraulic pump speed which provides a ground speed relationship by means of the transmission PTO.

Rigid catwalks have mud-flaps and brackets which incorporate combination clearance light/reflector mounting.

**Table 1: Dimensions and Capacities**

### **LS-3420/LST-3420 SPECIFICATIONS:**

<b>Spreader Length (Feet)*</b>	<b>Cab to Axle (Inches)</b>	<b>Capacity (cu. yd.)</b>	<b>Weight lbs. LS/LST</b>
14	102	11.3	2850/5562
16	115	12.9	3155/6200
18	120	14.6	3460/6838
20	132	16.2	3765/7776
22	156	17.8	4070/9114
24	180	19.4	4375/9752

## **INSTALLATION**

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### **POWER TAKE OFF SELECTION AND INSTALLATION**

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(for spreaders equipped with a transmission P.T.O. driven pump)

The P.T.O. should run between 1450 RPM and 1500 RPM when spreader is being operated. Determine truck engines normal maximum operating speed then use the P.T.O. speed selection chart to pick the desired P.T.O. Install the P.T.O. according to manufacturer's recommendations.

**BE SURE TO REFILL THE TRANSMISSION WITH THE CORRECT LUBRICANT!**

*For P.T.O. Speed Selection Table, See page 8.*

### **SELECTION OF TRUCK CAB TO AXLE (C.A.) DIMENSION**

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Be Sure that the spreader length is compatible with the truck C.A. dimension for chassis mount unit or dump body for dump body mount unit. Refer to *Dimension and Capacities Table on page 6* for suggested C.A. or dump body length for each size spreader. Also consult your truck dealer for their recommendations.

The complete loaded spreading units desired distribution is the main reason the best C.A. dimension or dump body length must be selected. To determine the spreaders unloaded center of gravity for weight distribution calculation add a foot to half of the top spreader length from the front of the spreader.

**EXAMPLE:** On a 10' spreader the center of gravity of empty spreader is 5' (1/2 the spreader hopper length) plus 1' or 6' from the front of the spreader. The center of gravity for the payload is the center of the hopper length or 5' from the front of a 10' spreader.



**Table 2: P.T.O. Speed Selection Table**



**PTO TORQUE & HORSEPOWER RATINGS**

Intermittent service refers to an On-Off operation under load. If maximum HP and/or torque is used for extended periods of time, (5 min. or more every 15 min.) this is considered "Continuous Service" and HP rating of PTO should be reduced by multiplying intermittent value below by .70. Applications with PTO output shaft speeds above 2000 RPM, regardless of duration, are to be considered "Continuous" duty. MAX rated output shaft speed for all Muncie PTOs is 2500 RPM.

Fire Pump applications are calculated within a different category listed on page 3 and are derated by multiplying intermittent value below by .80.

Below is a chart showing the Intermittent and calculated continuous Torque rating of the PTOs included in this catalog. The Application pages may have lower ratings for these PTOs listed. The Application page rating may be adjusted to limit the PTO output to a rating which will not exceed the transmission manufacturers rating. The transmission manufacturer does not differentiate between Intermittent and Continuous; therefore, the Application page rating is never to be exceeded. Refer to this page when there is a question of the rating (Intermittent or Continuous) for the PTO as it is manufactured.

PTO SERIES	SPEED RATIO	INTERMITTENT HP@1000 RPM	INTERMITTENT TORQUE LBS. FT.	CONTINUOUS TORQUE LBS. FT.	INTERMITTENT (KW)@1000 RPM	INTERMITTENT TORQUE (NM)	CONTINUOUS TORQUE (NM)
SG	10	25	130	91	[19]	[176]	[123]
TG	04	54	285	200	[40]	[386]	[270]
	05	51	270	189	[38]	[366]	[256]
	06	47	245	172	[35]	[332]	[232]
	07	44	230	161	[33]	[312]	[218]
	08	44	230	161	[33]	[312]	[218]
	09	39	205	144	[29]	[278]	[195]
	12H	40	180	126	[30]	[244]	[171]
	13H	40	180	126	[30]	[244]	[171]
	15H	37	195	137	[28]	[264]	[185]
	18H	33	175	123	[25]	[237]	[166]
CS6/8	03	57	300	210	[43]	[407]	[285]
	04	57	300	210	[43]	[407]	[285]
	05	57	300	210	[43]	[407]	[285]
	06	57	300	210	[43]	[407]	[285]
	07	57	300	210	[43]	[407]	[285]
	09	52	275	193	[39]	[373]	[261]
	12	52	275	193	[39]	[373]	[261]
	14	52	275	193	[39]	[373]	[261]
SH6/8	05	76	400	280	[57]	[542]	[379]
	07	76	400	280	[57]	[542]	[379]
	09	71	375	263	[53]	[508]	[356]
	12	62	325	228	[46]	[441]	[309]
	13	62	325	228	[46]	[441]	[309]
RG	13	26	140	N/A	[19]	[190]	N/A
RL	03	38	200	N/A	[28]	[271]	N/A
	05	38	200	N/A	[28]	[271]	N/A
82	05	95	500	350	[71]	[678]	[475]
	08	85	450	315	[63]	[610]	[427]
	10	78	410	287	[58]	[556]	[389]
	12	71	375	263	[53]	[508]	[356]
	13	71	375	263	[53]	[508]	[356]
	15	67	350	245	[50]	[475]	[332]
	19	57	300	210	[43]	[407]	[285]

PTO SERIES	SPEED RATIO	INTERMITTENT HP@1000 RPM	INTERMITTENT TORQUE LBS. FT.	CONTINUOUS TORQUE LBS. FT.	INTERMITTENT (KW)@1000 RPM	INTERMITTENT TORQUE (NM)	CONTINUOUS TORQUE (NM)
83	05	95	500	N/A	[71]	[678]	N/A
	06	95	500	N/A	[71]	[678]	N/A
	12	71	375	N/A	[53]	[508]	N/A
FR62	06	29	150	105	[22]	[203]	[142]
FR63	06	36	190	133	[27]	[258]	[181]
FR64	06	36	190	133	[27]	[258]	[181]
GA6B	05	30	158	111	[22]	[214]	[150]
GM6B	05	30	158	111	[22]	[214]	[150]
GB10	06	42	220	154	[31]	[298]	[209]
	07	36	190	133	[27]	[258]	[181]
	09	29	150	105	[22]	[203]	[142]
CD10	05	76	400	280	[57]	[542]	[379]
	06	73	385	270	[54]	[522]	[365]
	07	68	360	252	[51]	[488]	[342]
	08	64	336	235	[48]	[456]	[319]
	10	59	310	217	[44]	[420]	[294]
	12	50	260	182	[37]	[352]	[246]
	15	43	225	158	[32]	[305]	[214]
	CD40	07	114	600	420	[85]	[813]
	12	93	490	343	[70]	[664]	[465]
CS10 /11	05	95	500	350	[71]	[678]	[475]
	06	91	480	336	[68]	[651]	[456]
	07	86	450	315	[64]	[610]	[427]
	08	80	420	294	[60]	[569]	[398]
	10	73	385	270	[54]	[522]	[365]
CS20 /21	06	62	325	228	[46]	[440]	[308]
	07	58	305	214	[43]	[414]	[290]
	08	56	295	207	[42]	[400]	[280]
	10	55	290	203	[41]	[393]	[275]
	12	48	250	175	[36]	[338]	[237]
	15	38	200	140	[28]	[271]	[190]
CS41	07	114	600	420	[85]	[813]	[569]
	10	103	545	382	[76]	[739]	[517]
	12	93	490	343	[70]	[664]	[465]

The HC, PZ, and RS Series PTOs vary in their torque and horsepower ratings and are based on the transmission on which they are mounted. The torque rating of these PTOs are shown on their respective application pages or you may contact Muncie Power Products, Inc. Product Engineering Dept. for this information.

## **MINIMUM TRUCK FRAME REQUIREMENT**

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There is a minimum frame length required for the mounting of each size spreader, In order that the unit can be adequately supported at each cross sill refer to *Dimensions and Capacities Table on page 6* in the column headed Frame Required “RF” for each length spreader when mounted 4” behind truck cab.”

## **TRUCK FRAME PREPARATION**

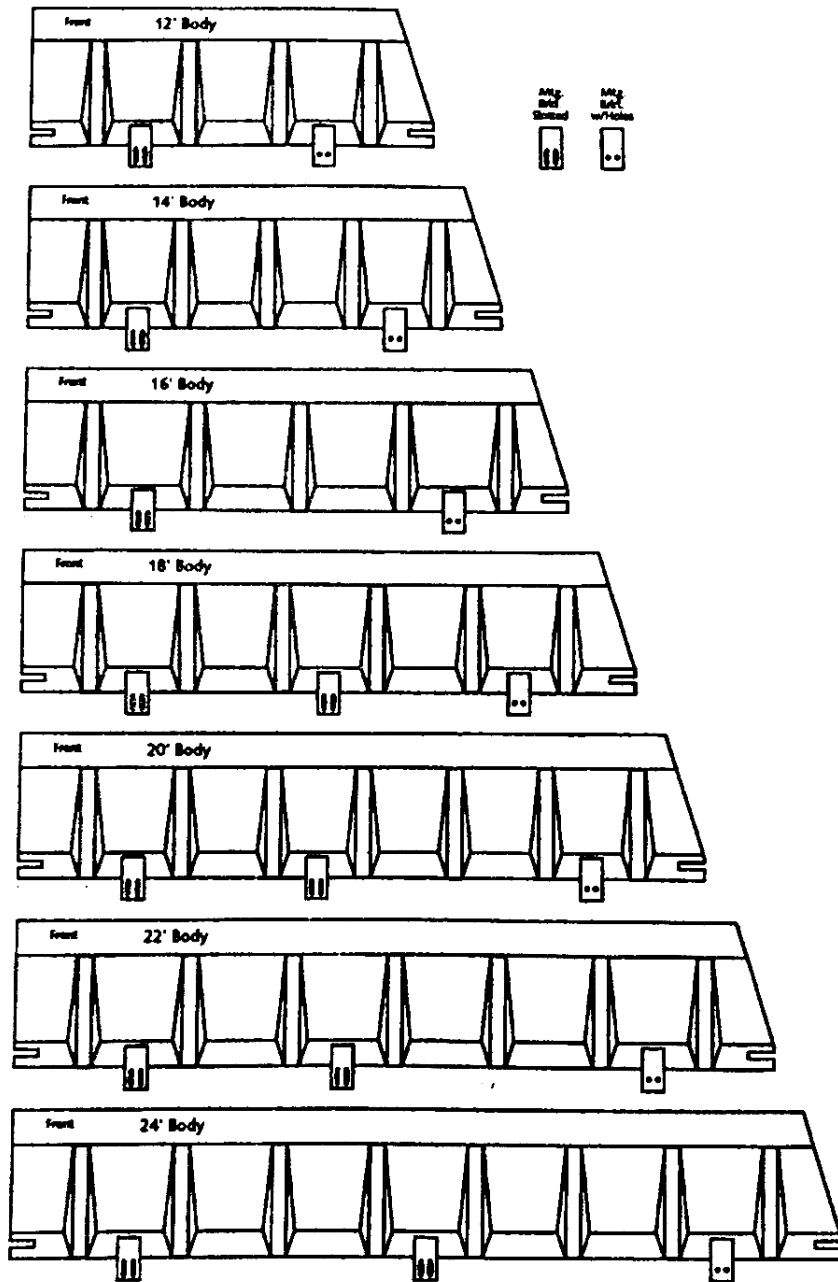
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If truck frame is not level, which sometimes is the case when frame has been reinforced by fish plating, steel flat bars, the thickness needed to level up frame must be added to the top of the upper frame flange - if rivet heads keep bar from laying flat then holes must be made in bar for clearance. If truck frame is too long to provide correct spreader location (assuming truck has proper C.A. dimensions) then frame rails must be cut off. Be sure to replace any cross members cut off if they are necessary to maintain the frames integrity (consult your truck dealer or manufacturer if there is any question in your mind as to the correct thing to do). When truck frame is leveled and has the correct length, then place the body mount strips (furnished with spreader) on top of the frame.

Outer edges should be flush with outside edge of frame. If there are rivet heads on top of frame rails, take a hammer and tap the filler strips lightly at each rivet. This will locate position of rivets so that strips can be drilled enough to provide clearance for each rivet head. When body mount strips lay flat on the frame rails top flanges, then wire or band strips to the frame in order to hold them in position as spreader is mounted.

## SPREADER MOUNTING LS-3420

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### HOPPER BODY TIE DOWN (CHASSIS MOUNTED)

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Set spreader down on top of truck frame positioned 4" behind truck cab and centered on truck frame rails. Measure overhang at first and last cross sill on each side to be sure spreader is square with truck frame. Using U-bolt type tie downs provided with spreader, proceed to tie down spreader to truck frame.

## **HYDRAULIC PUMP INSTALLATION**

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### **Direct PTO Mount Hydraulic Pump - FHP-500399**

(Bidirectional, SAE Type "8" 2-bolt flange with 7/8" diameter, 13 tooth Involute Spline Shaft)

P.T.O. must be prepared to receive a direct mount hydraulic pump. Install P.T.O. to transmission following P.T.O. manufacturer's instructions. Then bolt the hydraulic pump up to P.T.O. Put grease of a "Never Seize" type compound on shaft so that when it must be removed it will not have seized up.

### **WELDING TO TRUCK FRAME COULD VOID TRUCK MANUFACTURERS WARRANTY**

## **INSTALLATION OF DISTRIBUTOR SPINNER ASSEMBLY**

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Lift assembly (preferably with hydraulic or chain hoist if available) and slide in rear of spreader conveyor housing so that mounting angles rest on top of lower sill flange. **CAUTION:** Assembly is not balanced and will tip to the rear. Start front bolts in mounting angles first putting them down from the top and through the sill lower flange.

Hold up rear of spinner assembly so that nuts can be started. Place rear bolts in holes, center assembly to conveyor (to ensure both spinner receive equal amounts of material), then tighten bolts. Now mount spinner guard. Be sure all bolts are secure and that the guard has adequate spinner clearance. Install flow divider. Be sure that it is straight and centered over the conveyor, so spinners receive equal amounts of material.

## **INSTALLATION OF HYDRAULIC HOSE**

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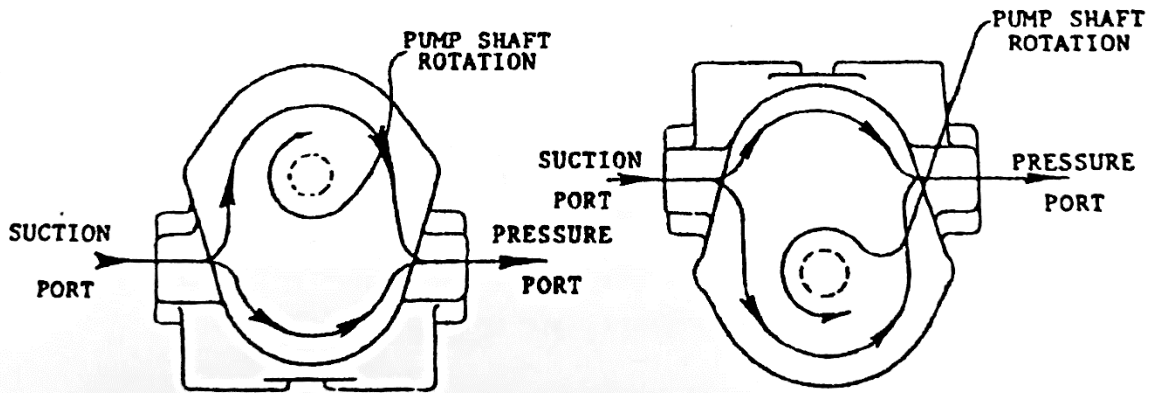
Refer to hydraulic schematic parts diagram for installation of hose and fittings. Those not normally mounted at the factory include

### **Hydraulic pump--suction line (Item 59):**

Install King Nipple (4) in gate valve (4) and Elbow (37) in hydraulic pump suction side. Install Street Elbow (3) and the King Nipple (4) into Elbow. Cut suction hose to fit, then install using hose clamps at each end.

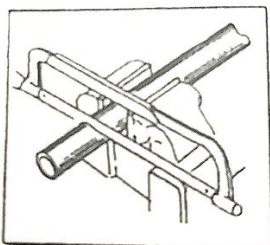
### **Pressure line (Item 48):**

Connect fitting (19, 34, 8) to pressure port of pump (9). Route hose to pressure relief valve (12). In hooking up hoses to hydraulic pump use sketch below to determine which is suction and which is the pressure port.

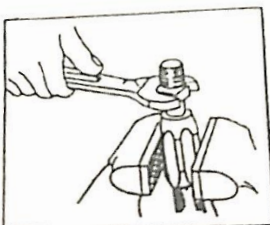
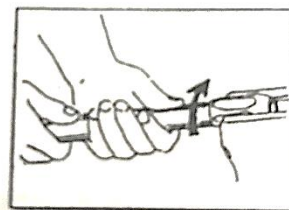


### INSTALLATION OF REUSABLE HOSE FITTINGS

Cut hose to length making square cut with fine tooth hacksaw or cut off saw.



Screw hose into coupling body in clockwise rotation until it bottoms out.



Then back out 1/4 turn using a wrench to fit hex on insert, screw insert into coupling body and hose until it bottoms out.

**CAUTION:** Avoid sharp bends in hydraulic hose that would restrict oil flow. Whenever possible, keep hoses from rubbing against metal part of spreader and/or truck frame. When contact cannot be prevented, put some type of wear protection on hoses such as old pieces of hose, belting, etc. Don't let hoses hang down in such a way as to catch on something on the ground.

Use thread sealer on all fittings except O Rings but in using it be careful not to sure keeping it out of get it inside of system and don't put it on first three threads to the oil flow.

**Distributor Spinner Assembly:**

- Pressure Line (Item 45). Screw Ring End into Hydraulic Motor (37).
- Connect swivel end to Elbow (13). Return Line (Item 54). Connect O Ring End into Hyd. Motor (37) and other end to Pipe Adapter (74).
- Bleeder Lines (Item 60). Connect to press an fittings at Tee (18) and Elbow (21). See illustration below for push-on fitting assembly.

**Assembly & Disassembly of Push on Couplings**

- To disassemble: Slit hose from protective cap to end of insert. Bend hose and remove with a quick jerk.
- To assemble: Push hose on fitting until seated under protective cap. Lubricate hose and end for easy assembly.

**FILLING HYDRAULIC RESERVOIR**

Fill reservoir with approximately 25 gallons of hydraulic oil to start. Use Premium Grade Anti wear hydraulic fluids having the correct viscosity index, high film strength and proper lubrication, high oxidation resistance, good water separating ability, good anti rust property, and good resistance to foaming. See below for temperature and viscosity operating range.

<b>Operating Temp. Range</b>	<b>Viscosity Range at Operating Temp.</b>	<b>Viscosity Grade Industry Ident.</b>
84 F-122 F	200-100 SSU	150 SSU
107 F-140 F	200-100 SSU	225 SSU
116 F-1 50 F	200-100 SSU	300 SSUJ
130 F-165 F	200-100 SSU	450 SSU
145 F-182 F	200-100 SSU	600 SSU

Most all oil companies have Premium Grade Hydraulic Fluids that will meet the above required specifications. Multi-Grade Automotive Engine Oils having SAE service quality level SC can also be used but could also require more frequent filter replacement.

See below for Automotive Engine Oil Temperature and Viscosity operating range.

<b>Operating Temp. Range</b>	<b>Viscosity Range at Operating Temp.</b>	<b>Viscosity Grade SAE</b>
100 F-1 30 F	200-100 SSU	10W-30
140 F-170 F	200-100 SSU	10W-40

## **INSTALLATION OF ACCESSORIES**

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Light and reflectors are combination units and are mounted in rubber shock-resistant grommets. Put grommets into mounting holes, then attach wiring pig tail to light. Thread pig tail through hole in grommet and press light into grommet. Mud flap brackets are bolted to catwalks and are equipped to hold clearance lights/ reflectors. Attach mud flaps with bolts provided.

## **SPREADER OPERATION & MAINTENANCE**

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### **INITIAL START-UP**

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1. Check to see that all bolts are properly tightened, pins are in U-Joints, set screws are tight, conveyor chain is evenly adjusted, hose clamps are tight, fittings, and hoses are tight.
2. Remove any loose material in hopper or on distributor spinner assembly.
3. See that gear box has adequate lubricant and that bearings and U-Joints are
4. Be sure hydraulic reservoir has been filled up. Open gate valve under reservoir
5. Set spinner speed control fully left to the zero position. Switch conveyor control to the "off" position.
6. Start truck and let it warm up when engine is warm enough to operate at its lubricated fully turning counter-clockwise minimum idle speed, engage clutch and put Power Take-Off in gear gradually ease out on clutch pedal until pump starts running. Let truck run at high idle for several minutes to circulate oil from reservoir to the hydraulic pump and back through the hydraulic oil filter to the reservoir. **MAKE SURE NO ONE IS STANDING AT REAR OF SPREADER!!**
7. Move Spinner Valve Control to "four" and turn spreader on running spinner slowly until the spinner is operating smoothly and all air is purged from the hydraulic lines to the spinner.
8. Turn spinner off then put conveyor speed control in "low" and run conveyor for several minutes observing conveyor chain operation to be sure it is running properly. The put speed control in "hi" and run for several more minutes.
9. With conveyor in "hi", turn spinners on and put control lever in "six" Gradually increase engine speed up to field operating speed and run system for several minutes. Shut down system.
10. Make complete inspection of all fittings and hoses for leaks. DO NOT check high pressure leaks while system is in operation.
11. Check hydraulic oil level in reservoir and fill

### **CONVEYOR CHAIN MAINTENANCE**

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INITIAL SPREADER START UP AND OPERATION IS CRITICAL TO CHAIN LIFE AND CHAIN LINKS MUST BE KEPT FREE FROM FREEZING UP BY PROPER CLEANING, LUBRICATION AND ADJUSTMENT.

**CLEANING:** Spreader should be washed regularly to fully remove excess corrosive material-daily if spreading salt, calcium chloride and mixtures-weekly if spreading straight sand. Use ample water to ensure that all chemicals are dissolved and flushed from the spreader. When the inside of the hopper is clean (all material is removed from conveyor floor) stand at rear and spray chain links while chain is running to get corrosive material flushed out of chain.

**LUBRICATION:** After chain is flushed out with water continue to run chain until excess water is removed then spray links with a mixture of 25% crankcase oil and 75% diesel fuel while chain is still running until mixture thoroughly penetrates conveyor chain links.

**ADJUSTMENT:**

Initial adjustment of conveyor at factory is tight because of the stretch that occurs in the first few days of operation. However, after initial stretch occur chain should be adjusted so that it contacts lower flange of body sill at 36" to 40" from rear of body sill. Also make sure chain is adjusted equally on each side.

**CAUTION:** If chain is allowed to become stiff and is not kept properly adjusted the chain is liable to kink up forcing the crossbars up under the chain shields. This can overload conveyor drive as well as cut into crossbars and damage chain shields. On #4 belt over chain conveyor units, this will damage the belt sealer strips and pull rivets out of crossbars. Proper conveyor chain maintenance is a worthwhile investment.

**LUBRICATION CHART**

Description	Service Location	No. of Points	Method of Lubrication	Daily	Weekly	Monthly	Semi Annual
<b>Gear Boxes</b> Conveyor	Plug side of case	1	Lube Oil				X
<b>Universal Joints</b> PTO Drive Line to Hyd. Pump	Beneath Truck	3	Grease Gun		X		
<b>Bearings</b> Conveyor Drive	Both side of conveyor drive shaft at rear	2	Grease Gun		X X		
Conveyor Idler	Both side of conveyor idler shaft at front	2	Grease Gun				
<b>Chain</b> Conveyor	Chain 2 strand	2	Spray Oil	X			
<b>Spinner</b>	Bearing on drive shaft	1	Grease Gun		X		



**Lubrication Recommended:**

- Gearbox - SAE 90 EP Gear Lube non-corrosive MIL - L2105B Multi-Purpose
- Grease Gun - Ball and Roller Bearings Lithium Base Grease - conforming to NLG1 number 2 consistency - Waterproof
- Spray Oil - for chain - make up of 75% #1 or #2 diesel fuel, 25% SAE 10W-40

**SETTING UP TO SPREAD**

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After truck is loaded with material to be spread and you are traveling to where you are to start spreading, reduce speed to a minimum when road surface is rough for this causes material to pack down excessively on conveyor-particularly at railroad crossings. When you arrive at your "start point", select your transmission and rear axle gear and *refer* to the Spread Rate Chart (supplied by your dealer) to determine the *feed gate* setting needed for the application rate required. You must know the weight of the material (in pounds per square foot) prior to going to spread.

Test spread a small amount of material and adjust feed gate opening as necessary to achieve desired spread width.

When gate setting is established, you may start spreading. Avoid shifting transmission or rear axle as it will change your application rate. After spreading approximately ½ of the field, check amount of material in the hopper to verify application rate and adjust feed gate opening accordingly.

**NEVER LET ANYONE STAND ON CATWALK (FENDER) WHEN UNIT IS IN MOTION**

**NEVER STAND AT REAR OF UNIT WHEN SPREADER IS IN OPERATION**

**SPREAD RATE CHARTS**

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Charts will be supplied by your dealer. The following information is required by the dealer to prepare your chart:

- Truck make and model
- Truck engine field operating speed
- Truck transmission make and model
- Rear axle reduction
- Truck auxiliary transmission make and model (if so equipped)

- Rear tire size
- transmission PTO make and model

Spreader rate charts provide only approximate gate settings and actual operation may require adjustment.

## **SPREAD PATTERN ADJUSTMENT**

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The following considerations and adjustments (and combinations of these) will assist you in optimizing your spread pattern.

- A. **Spinner Speed** - The spinners are powered hydraulically, and their speed can be adjusted within limits. To maintain a constant width of spread, it is best to maintain as constant an engine speed as possible. At low engine speed, spinners slow up, spread pattern narrows and the application rate goes up. Spinner speed is normally best between 550 and 650 RPM (valve setting of 5 to 7). If spinners run too fast it causes a concentration of material directly to the rear as well as premature wearing of the fins. Spinners and fins should be kept clean at all times. **DO NOT ALLOW BUILDUP ON SPINNERS AND FINS.**
- B. **Material Weight** - the heavier materials generally carry farther resulting in a wider spread pattern. Knowing material weight helps accurate spreading.
- C. **Material Particle Size** - larger particles generally carry farther.
- D. **Material Moisture Content** - the wetter the material, the heavier it is and farther it spreads.
- E. **Application Rate** - Changing feed gate settings changes the material contact point on spinner. Changing gears (transmission or axle) affects engine speed causing uneven application rates.
- F. **Point of Material Contact on Spinner** - Material contact near the front of the spinner increases amount of material spread to the rear. Material contact toward the center and rear of the discs decreases rearward spread. The flow divider helps control material contact point on the spinner.
- G. **Division of Material to Each Spinner** - equal distribution insures better pattern. Be sure feed gate is level and flow divider is centered over conveyor.
- H. **Angle of Spinner Fin** - Retarding fin angle (moving outer edge towards direction of spinner rotation) increases material directly to rear of spreader. Moving fin outer edge forward increases spread to the sides.
- I. **Material Contamination of Spinner Discs and Fins** - Buildup causes fluctuating spinner speeds and changes the effective angle of the fins, both of which affect spread pattern.

- J. **Uneven Surfaces** - Spreading on uneven surfaces creates special problems. You spread farther downhill than uphill. Dips and ridges interrupt the spread pattern causing uneven spreading. In most cases there is little you can do except be aware of the problem.
- K. **Wind** - If it is very windy, avoid spreading if possible. Gusting wind will play havoc on any hope of accurate spreading. Spread into the wind if possible.
- L. **Swath Spacing** - This is in most instances a driver judgement. Spread patterns should overlap, but not so far as to double application.

# **TROUBLESHOOTING**

<b>PROBLEM</b>	<b>ACTION</b>	<b>CHECK</b>
Conveyor or Spinner doesn't run.	Is PTO disengaged?	Engage PTO.
	Is PTO Driveline damaged?	Check to see if Pin fell out, Key slipped out or U-joint broke. If so, repair.
	Is Spinner Valve turned on?	Turn valve to desired position, usually "5" or "6".
	Is Conveyor Control Lever in the "off" position? Is it fully shifted?	Shift to desired position, "hi" or "lo" to be sure Lever is in proper position.
	Is Hydraulic Oil level too low?	Fill Reservoir.
	Is Hyd. Reservoir Shut-off Valve in the "off" position?	Open Valve fully by turning in a counter-clockwise direction.
	Is Relief Valve set too low?	See test at the bottom of page 19.
	Is Hydraulic Pump worn?	See test at the bottom of page 19.
	Is Conveyor jammed? Is Conveyor motor or Spinner Motor frozen?	Free up Chain. Free up Motors. If unable, replace Motors.
Spinner speed does not hold constant	Is Pump speed adequate to provide sufficient oil for constant speed?	Increase engine RPMs by selecting lower operating gear at same speed.
	Is Hydraulic Pump worn?	See test at the bottom of page 19.
	Is Relief Valve set too low?	See test at the bottom of page 19.
	Is Spinner Control Valve defective?	Replace Spool Spring. If no change, replace Valve.
Spinners run, but do not when Conveyor Control is "on".	Is Conveyor frozen or jammed?	Free up Conveyor Chain.
	Is Conveyor Motor frozen?	Replace Motor.
	Is Motor Shaft Key sheared?	Replace Key

## TROUBLESHOOTING CONT'D

PROBLEM	ACTION	CHECK
Hydraulic Oil is overheating (over 180°)	Is Hydraulic Pump worn?	Replace or install properly.
	Are Check Valves in Control Valve missing or installed improperly?	See test at the bottom of this page
	Is too much oil being supplied to system?	PTO may be too fast. Hydraulic Pump may have too high a capacity, Change PTO or Pump.
	Is oil level too low?	Add oil to sight glass or fill line.
	Is Hydraulic Motor worn?	Excessive heating of Motor poor to system heating indicates worn. Motor. Replace Motor.
	Is Relief Valve set too low?	See test at the bottom of this page
	Is Hydraulic Hose obstructed or kinked?	Remove obstruction, reroute or replace Hose.
	Is application rate too high?	Reduce load on system by using a smaller Feed gate opening and lower gear for the same application rate.
To test for a worn Pump;	Install Flow Meter inline before the Relief Valve. Set Spinner Control Valve full off. With Relief Valve set properly, and with system at normal operating temperature, gradually turn Control Valve to full open at 2,500 to 3,000 RPM, and system at 2,500 PSI, flow should not drop of more than 3 GPM If it does, replace pump.	

**PART LISTS AND  
ILLUSTRATIONS**

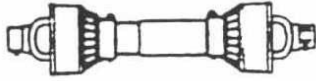
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**SEE THE LS AND  
LST PARTS MANUAL**



## PTO ADJUSTMENT

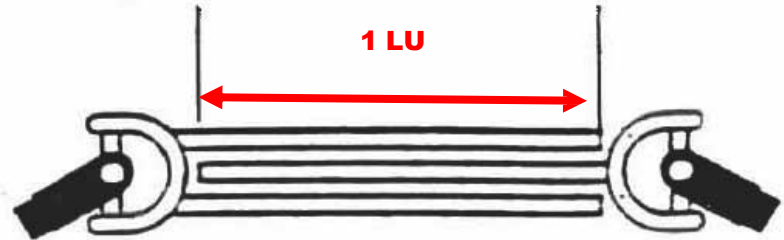
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**LU = Overlapping Length**

Make sure the drive shaft length is compatible with the different working positions of the implement. If the PTO shaft is too long it might bind, and damage may occur to unit/PTO/tractor. In the collapsed position, the driveline should be approximately 2" from bottoming out.

Minimum Working Length  
is total overlap.

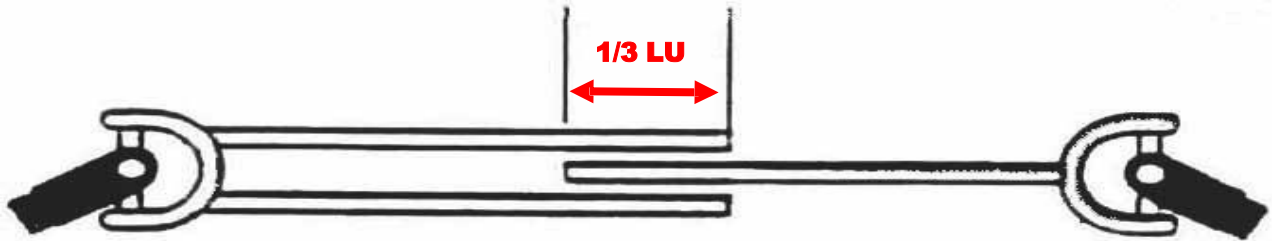


**To measure & trim the PTO:** Read and follow the instructions in the operator's manual from the PTO manufacturer. If the PTO is too long, **both** PTO Halves must be shortened by equal amounts.

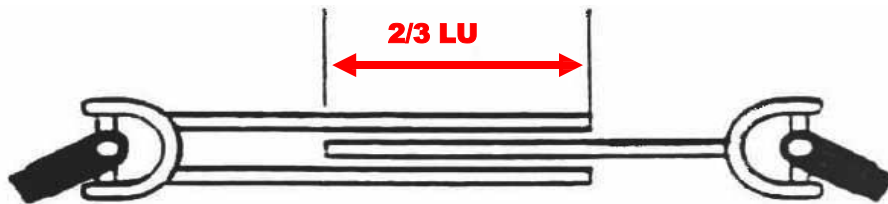
**Danger!**

To prevent accidental engagement, cut the engine and REMOVE the keys while handling the PTO.

Maximum Working Length is overlap of at least 1/3 LU—Verify using manufacturer's specifications of PTO used.



Suggested Working Length is overlap of 2/3 LU.



**Failure to make these adjustments will damage the unit and/or cause personal injury.**