WARREN

AC-620A
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.

9/2018

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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

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

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.

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.

WARRANTY

Spreaders

WARRANTY. WARREN, INC., (herinafter 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 MERCHANABILITY 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.
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Phone: (601) 765-4554 Fax: (601) 765-4554

GENERAL DESCRIPTION

The Warren Model AC-620A is a hydraulic powered under the tailgate type spreader and is designed to spread chemicals and/or abrasives for ice and dust control. Unit does not have to be removed to use truck for regular hauling jobs because material may be dumped with tailgate hinged at the top or bottom. The auger trough is formed of 3⁄16" (7 ga.) steel with 1⁄4" steel plate end panels. The cover panel is 3⁄16" (7 ga.) steel and is easily positioned in the vertical or horizontal position. Trough design permits easy cleaning or removal of lodged oversize material. Mounting to dump body is by quick attaching pins. Standard paint is Omaha Orange.

A 6" overall diameter full pitch bidirectional auger with 3⁄8" helicoid flighting conveys material to discharge port. Discharge end has double flighting for more even delivery of material to spinner. Flighting is welded to 2" H.D. pipe with 1 1⁄4" dia. idler shaft. Auger is mounted in flange type ball bearings with a thrust collar at one end. Direct drive motor located at right curb end of auger, directly coupled to auger pipe.

A single 18" dia. spinner with 6 replaceable formed fins has integral hub that mounts directly to hydraulic spinner motor shaft. Motor mounted to formed channel that is hinged to auger trough and incorporates spinner position adjustment to the right or left for spread pattern control. A self-leveling bracket and rod are provided to keep spinner level at different dump elevation angles.

OPTIONAL ATTACHMENTS

Hydraulic Pump—for Trans PTO Drive
Hydraulic Pump—for C/S V-belt Drive
Hydraulic Pump—for direct C/S Drive
Hydraulic Reservoir and Filter
Hydraulic Hose and Fitting Kits for truck and spreader
Hydraulic Control Valve
Hydraulic Quick Disconnect Couplings
Baffle-curved type
Windrow Chute
Dual 4 1/2" dia. Augers
5:1 reduction Gearbox Auger Drive
Type 304 Stainless Steel
Polyurethane Spinner
Special Paint Colors
Twin Spinners on AC-620A-2 model

INSTALLATION

POWER TAKE OFF SELECTION AND INSTALLATION

(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 7.

MOUNTING OF SPREADER TO DUMP BODY

Position spreader on floor under dump body tailgate with discharge port to the left hand or drivers side of truck. Measure overall width of dump body at rub rails—then measure overall width and inside width of spreader (this will vary from spreader to spreader due to manufacturing tolerances) at top of spreader. You can then determine how much spacing will be required to align mounting channel and mounting plate. (Spacers not included in mounting kit.) Raise spreader and position just below tailgate tight up against rear of dump body. Leave enough clearance between bottom of tailgate and top of spreader to permit hinging tailgate at either the top or bottom.

Locate channel type mounting brackets on each side of dump body rub rails in such a position that "L" shaped mounting plates can slide into channels and be bolted to the spreader end plates. Drill holes in rub rails and channels and bolt them to side of dump body. Then insert lock pins in channel brackets to hold spreader in position tight against rear of dump body with flanged end of "L" shaped bracket hooked behind locking *pin.* Spacers may be required to properly align channel brackets and "L" shaped bracket--these are not included in mounting kit. BE SURE SPREADER IS SQUARE WITH DUMP BODY.

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.

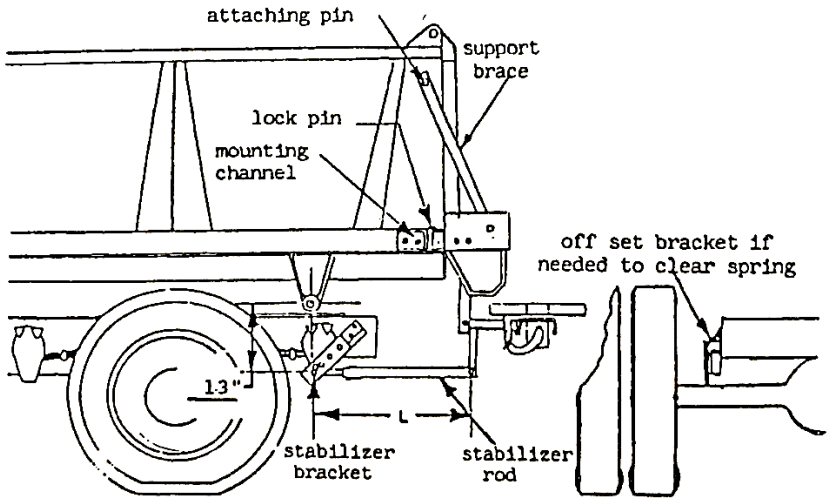
Below is a chart showing the Intermittent and calculated continuous Torque rating of the PTOs included in this catalog. The Application pages may have lower ratings for these PTOs listed. The Application page rating may be adjusted to limit the PTO output to a rating which will not exceed the transmission 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]	[569]
	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.

Now take diagonal support braces and use them to locate the upper attaching pin position on the dump body rear corner posts and bolting position on spreader end panels. Install attaching pins, bolt braces to end panels, and attach to pins-now basic spreader is mounted. The distributor spinner assembly is installed by inserting the large hinge pin through the mounting brackets on bottom of auger trough and distributor spinner assembly frame brackets--install spacer/adjusting pipe on pin when inserting through mounting holes. Positioning of pipe permits lateral adjustment of the spinner and changing position material lands on spinner and thus the material spread pattern. To install the spinner leveling device the truck frame bracket must be located so that the center of the rod hole is directly below the center of the dump body hinge pin 13" and in line with rod hole in distributor frame. Measure distance from center of dump body hinge pin to center of distributor spinner assembly hinge pin hole--then make stabilizer rod the same length. Install stabilizer rod and elevate dump body---spinner should remain level as dump body is elevated.

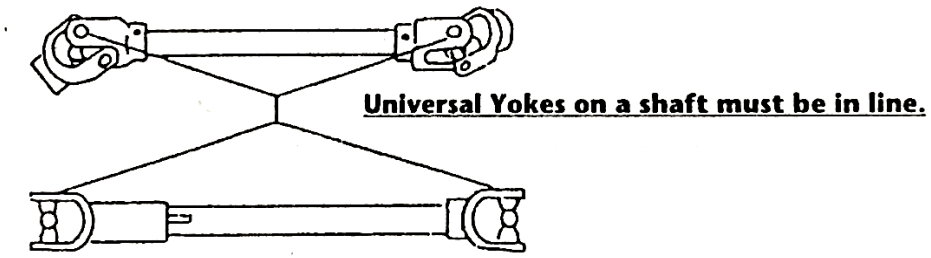


HYDRAULIC PUMP INSTALLATION OPTION

Transmission PTO Driven

A mounting bracket for the hydraulic pump is supplied with spreader--it will have to be assembled and may require a Certain amount of modification in order to make it fit properly. Locate bracket in as straight a line as possible with truck PTO shaft. Bracket should be bolted to either the frame rail or a crossmember.

The hydraulic pump is furnished with two universal joints for installation in an existing PTO driveline to a dump body hydraulic pump. Existing driveline has to be broken and hydraulic pump positioned between PTO and dump body pump. When this is done then driveline must be modified to connect driveline from PTO to spreader pump and then from spreader pump to dump body pump. Be sure U-1oints are installed correctly as shown in illustration below:



V Belt Driven w/Electric Clutch

Truck engine crankshaft must be equipped with a two V-belt pulley that can be used to power the hydraulic pump. A location on the engine block must be determined where a pump mounting bracket can be installed. Pump is equipped with a foot type mounting base and pump mounting bracket must be made to take this base and fit to engine block. When pump bracket is installed to engine block and pump is mounted to bracket, V-belt length can be determined.

Make sure bracket is designed to provide V-belt tension adjustment. Sometimes air conditioning compressor mounting brackets designed for truck engine can be easily modeled to serve as pump bracket-contact your truck dealer for the availability of these brackets. Pump will be equipped with 2-1 /2" A-Section pulleys approximately 7" in diameter. Pulleys on crankshaft should be close to this same diameter. When hooking up hydraulic hose and electrical wiring protect both from hot surfaces and provide adequate length so that hydraulic pump can be adjusted for belt tension.

HYDRAULIC RESERVOIR AND FILTER INSTALLATION OPTION

The hydraulic reservoir is designed for installation to the outside of the truck frame rails on the driver's side between back of cab and rear wheel. The further forward is generally best to keep reservoir away from rear wheel splatter. Set reservoir up to side of frame to locate holes to be drilled in frame. Make sure that adequate access is permitted to reservoir filler cap and that nothing interferes with drilling holes in frame. Before bolting reservoir to truck frame with hardware provided install filter assembly making an arrow into filter is pointing toward tank and replaceable element is down.

CAB HYDRAULIC CONTROL VALVE INSTALLATION

Take the valve and find a location in the cab where operator can easily reach it to adjust control knobs and turn it off and on. Be sure seat is in most forward position and that there is no interference with gear shift lever and parking brake operation.

Valve should be bolted directly to cab floor when possible, using a piece of scrap rubber belting as a gasket to seal valve to floor. When best place for valve is determined then check beneath cab floor to determine any interference with transmission. Be careful when cut- ting holes in cab floor to not destroy integrity of the floor. After valve is bolted to floor check to be sure no dust, exhaust fumes, or noise can come up through the area where the valve is mounted.

INSTALLATION OF HYDRAULIC HOSE

Refer to hydraulic schematic parts diagram for installation of hose and fittings.

Hydraulic hoses supplied are:

High pressure hose – all 100R-1

- 3/4" with crimped fitting one end with reusable fitting for -Pump to valve other cut to required length.
- Valve to spinner 1/2" one piece with crimped fitting one end with reusable fitting for other cut to required length to connect to quick disconnect coupler from coupler to spinner hydraulic motor 1/2" hose has fitting crimped each end.
- Valve to Auger – same as spinner.

Low pressure returns line hose

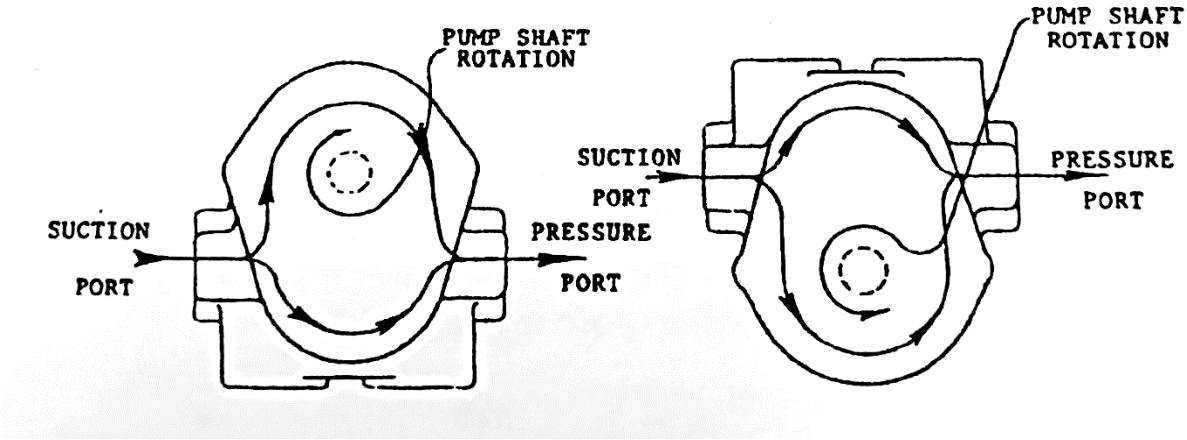
- Valve to hyd-reservoir 3/4" cut to required length with hose clamps each end.
- Spinner Hydraulic Motor to reservoir 1/2" to quick connect.
- Auger Hydraulic Motor to reservoir 1/2" to quick connect

In hooking up hoses to hydraulic pump use sketch below to determine which is the suction and which is the pressure port.

Suction Hose:

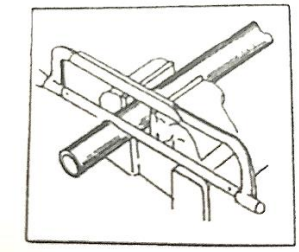
- 1 ¼" cut to required length with hose clamps each end.

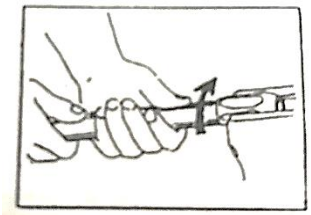
In hooking up hoses to hydraulic pump use sketch below to determine which is



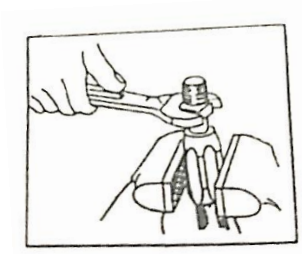
INSTALLATION OF REUSABLE HOSE FITTINGS

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.

Quick disconnect couplers should be installed at the rear of the truck. The rear frame cross member is generally considered the best location.

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.

FILLING HYDRAULIC RESERVOIR

Fill reservoir with approximately 12 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.

Operating Temp. Range	Viscosity Range at Operating Temp.	Viscosity Grade Industry Ident.
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.

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

SPREADER OPERATION & MAINTENANCE

INITIAL START-UP

1. Check to see that all bolts are properly tightened, pins are in U-Joints, set screws are tight, auger 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 auger 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 auger speed control in "low" and run auger for several minutes observing auger chain operation to be sure it is running properly. The put speed control in "hi" and run for several more minutes.
9. With auger 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

NOTE: RPMs based on gasoline powered chassis. Adjust RPMs as appropriate for diesel equipment.

LUBRICATION CHART

Description	Service Location	No. of Points	Method of Lubrication	Daily	Weekly
Universal Joints	Beneath Truck	4	Grease Gun		X
Bearings	Both ends of auger	2	Grease Gun		X
Chain	Auger drive	1	Spray Oil	X	

Lubrication Recommended:

- Grease Gun - Ball and Roller Bearings Lithium Base Grease - conforming to NLG1 number 2 consistency - Waterproof
- Spray Oil - for roller chain - make up of 75% #1 or #2 diesel fuel, 25% SAE 10W-40

SETTING UP TO SPREAD

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 auger-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) poor to going to spread.

Now you are ready to go; keep a look out in your rear-view mirrors to be sure you are getting your desired pattern as you spread and that the public is protected.

Spreader rate charts provide only approximate gate settings and actual operation may require adjustment. The spread rate chart below is a guide to help you get started.

Sample Spread Rate Chart

Auger Hydraulic Valve Setting	Cu. Ft./ Mile/ Inch of Gate Opening		
	15 MPH	30 MPH	45 MPH
1	7.2	3.6	2.4
2	14.4	7.2	4.8
3	20.4	10.2	6.8
4	25.8	13.0	8.6
5	31.6	15.7	10.6
6	36.5	18.2	12.1
7	41.0	20.5	13.7
8	46.0	23.0	15.4
9	49.4	24.7	16.4
10	53.2	26.6	17.8
11	55.8	28.0	18.6

- Above rates are theoretical and are provided as a starting point to establish desired feed gate openings.

- At higher valve settings it is critical that engine speed be sufficient to satisfy the hydraulic pumps requirements for oil flow.

SPREADER CALIBRATION

The spread rate chart shown is theoretical and if you want to be more accurate than it would be better to calibrate the spreader as outlined in the following instructions.

FIRST, we must determine the actual delivery of the material you plan to use for each revolution of the auger drive shaft. So, if you spread an abrasive/chemical mixture you should mix up several cubic yards - if you spread straight chemical only then several cubic yards of the material must be available.

Items required for test area are:

60 Ib. scale
Square yard of canvas with grommets on each corner
Steel file
Stop watch

1. With Steel file make a groove in edge of auger drive shaft (opposite side from gear box) for a shaft reference point also make a groove in bearing casting just opposite shaft groove.

2. Let engine that powers hydraulic pump idle with pump running and spreader turned off until hydraulic oil warms up to operating temperature

3. Set engine speed up at normal operating speed set conveyor valve first setting and engage spreader auger. When marks on auger shaft and bearing line, up start Stop Watch and count shaft R.P.M. using form provided in this manual and repeating for each valve setting.

4. Now load a couple cubic yards of material in spreader hopper that you will be spreading at rear part of body.

5. Place canvas under spinner to catch material coming out of auger. Even better would be to remove spinner completely (KEEP HOSES ATTACHED) so material falls directly on canvas.

6. Engage auger and operate until material comes out of trough opening. If some material has fallen through to canvas remove it. Now run auger for one full revolution of the auger shaft catching material on canvas---then weigh material deducting for the canvas and record. Repeat this procedure several times and take an average to determine the delivery rate for each revolution of the auger shaft.

You now have the data to figure how much you will be spreading over a mile at given truck speeds. Use the formula:

RPM (auger) X Discharge Rate x Truck Speed (in minutes required to go a mile) = Pounds Spread per Mile.

EXAMPLE: You have a auger drive shaft speed of 68 RPM @ valve setting #4 and you deliver 6.7 pounds of material per drive shaft revolution. Thus, the spreader will be delivering 455.6 pounds of material a minute to the road surface. Now if the truck was operating at 30 miles per hour it would take two minutes to go a mile thus you would be spreading 911 .2 pounds of material per mile.

RPM x Discharge Rate x Truck Speed = material per mile; or 68 RPM x 6.7 Pounds x 2 Min/Mile = 911 .2 Pounds per mile.

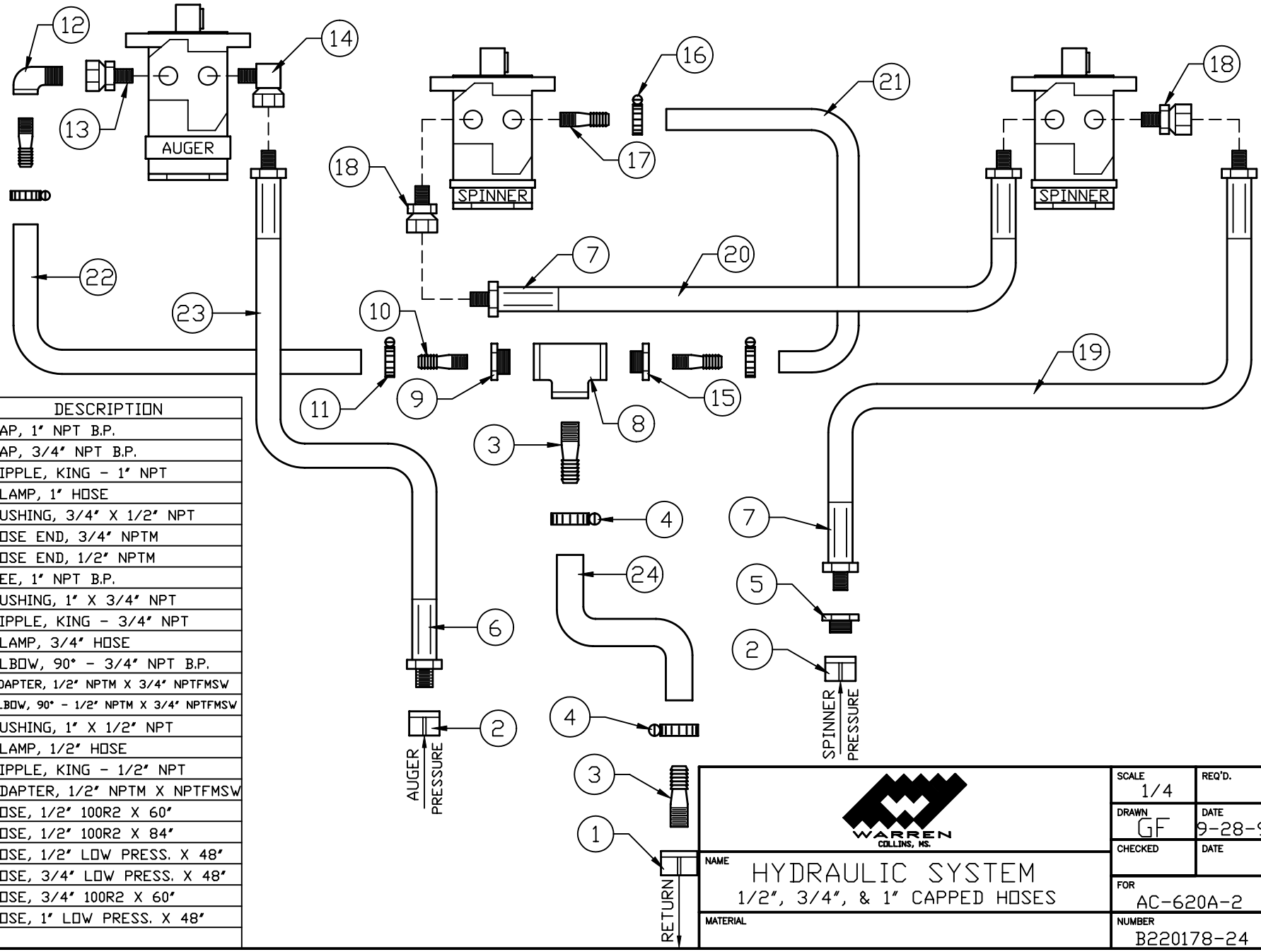
If a higher or lower rate is desired, then a different valve setting, and/or a different truck speed can be selected.

The minutes required to travel one mile at various speeds is as follows:

MPH	Minutes per Mile
55	0.09
50	1.20
45	1.33
40	1.50
35	1.71
30	2.00
25	2.40
20	3.00
15	0.00

Many variables are involved in spreader operation that can influence the calibration of a spreader such as oil temperature and viscosity, hydraulic pump and motor efficiency, control valve accuracy, engine speed, hydraulic hose size and system design and combinations of these. Consequently, a spreader should be calibrated annually to adjust for component wear.

PARTS LIST AND ILLUSTRATIONS



18

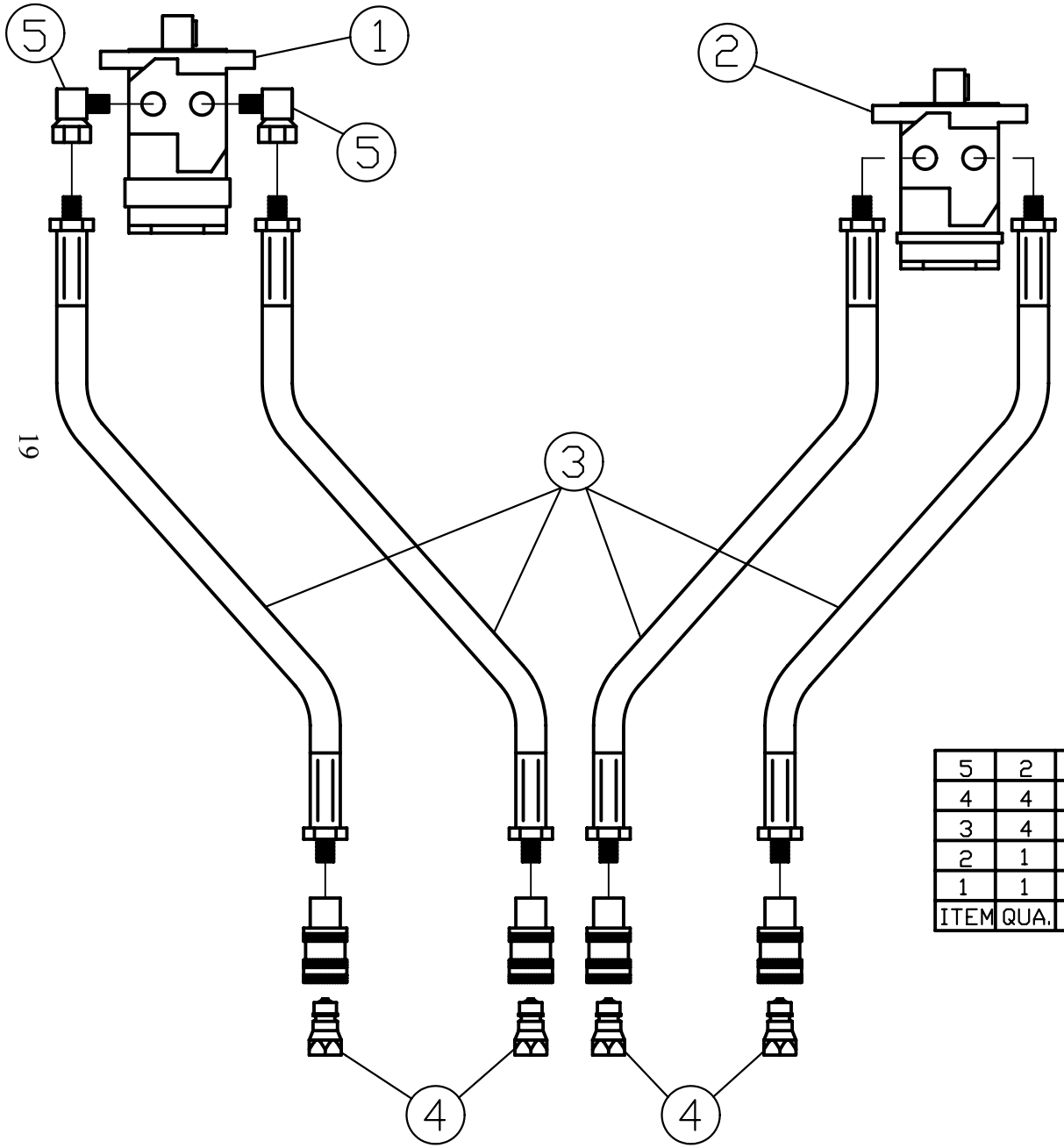
ITEM	QUA.	PART NO.	DESCRIPTION
1	1	FHF-50086	CAP, 1" NPT B.P.
2	2	FHF-50085	CAP, 3/4" NPT B.P.
3	2	FHF-00199	NIPPLE, KING - 1" NPT
4	2	FHF-00227	CLAMP, 1" HOSE
5	1	FHF-50014	BUSHING, 3/4" X 1/2" NPT
6	2	FHF-00443	HOSE END, 3/4" NPTM
7	2	FHF-00442	HOSE END, 1/2" NPTM
8	1	FHF-50055	TEE, 1" NPT B.P.
9	1	FHF-50010	BUSHING, 1" X 3/4" NPT
10	2	FHF-00236	NIPPLE, KING - 3/4" NPT
11	2	FHF-00278	CLAMP, 3/4" HOSE
12	1	FHF-50079	ELBOW, 90° - 3/4" NPT B.P.
13	1	FHF-00318	ADAPTER, 1/2" NPTM X 3/4" NPTFMSW
14	1	FHF-00028	ELBOW, 90° - 1/2" NPTM X 3/4" NPTFMSW
15	1	FHF-50011	BUSHING, 1" X 1/2" NPT
16	2	FHF-00260	CLAMP, 1/2" HOSE
17	2	FHF-00261	NIPPLE, KING - 1/2" NPT
18	2	FHF-50023	ADAPTER, 1/2" NPTM X NPTFMSW
19	1	FHH-00237	HOSE, 1/2" 100R2 X 60"
20	1	FHH-00237	HOSE, 1/2" 100R2 X 84"
21	1	FHH-00117	HOSE, 1/2" LOW PRESS. X 48"
22	1	FHH-00098	HOSE, 3/4" LOW PRESS. X 48"
23	1	FHH-00238	HOSE, 3/4" 100R2 X 60"
24	1	FHH-00095	HOSE, 1" LOW PRESS. X 48"

WARREN
COLLINS, MS.

NAME
HYDRAULIC SYSTEM
1/2", 3/4", & 1" CAPPED HOSES

MATERIAL

SCALE 1/4	REQ'D.
DRAWN GF	DATE 9-28-95
CHECKED	DATE
FOR AC-620A-2	
NUMBER B220178-24	



ITEM	QUA.	PART NO.	DESCRIPTION
5	2	FHF-00266	90° STREET ELBOW - 1/2" H.D.
4	4	FHF-00256	QUICK COUPLER, 1/2"
3	4	FHF-00156	HOSE ASSEM. 1/2" 100R1 1 x 60
2	1	FHM-00114	HYDRAULIC MOTOR, SPINNER
1	1	FHM-00157	HYDRUALIC MOTOR, AUGER

FONTAINE BODY & HOIST CO.
COLLINS, MISSISSIPPI

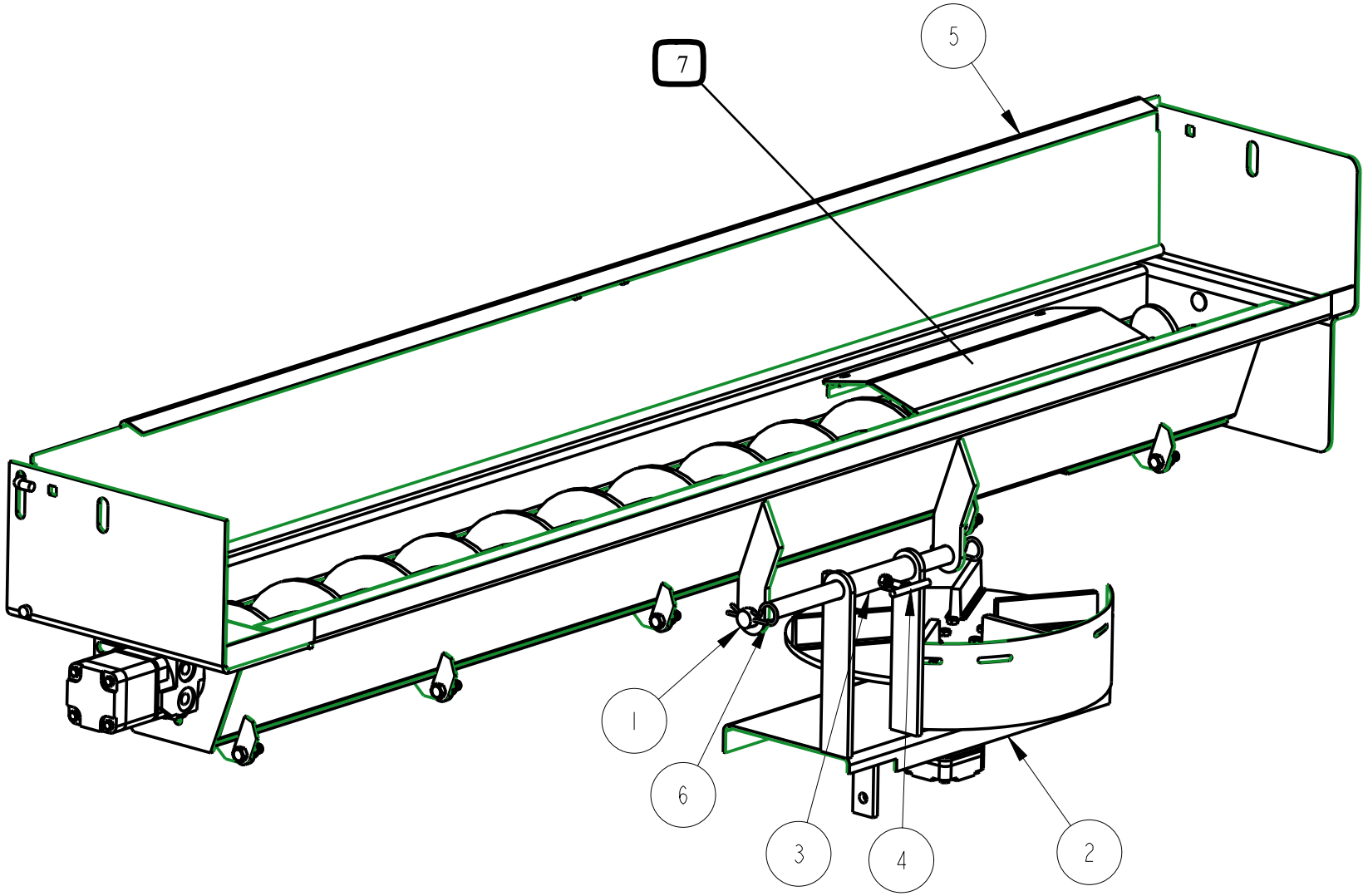
NAME: HYDRAULIC SYSTEM SCHEMATIC ON SPREADER

MATERIAL:

SCALE: 1/4	REQ'D.
DRAWN: LRD	DATE: 1-24-91
CHECKED	DATE
FOR: AC620A	
NUMBER: 220178-12	

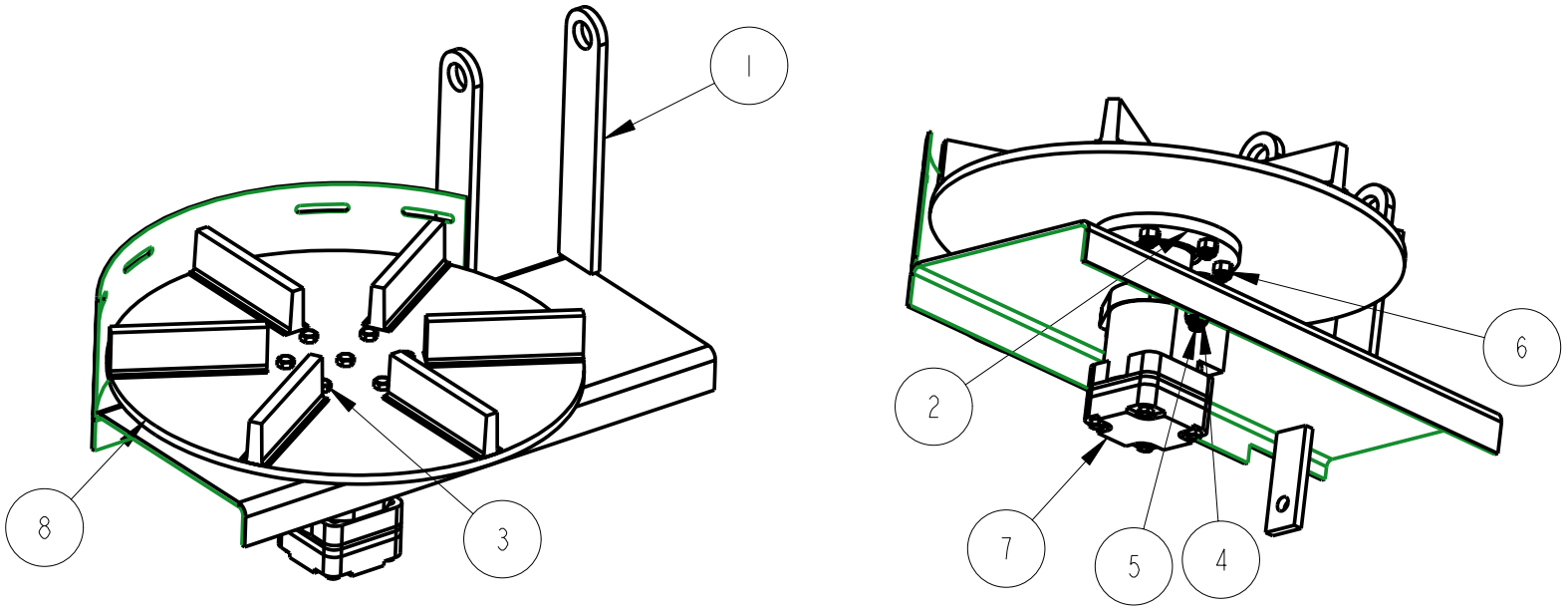
WARREN
COLLINS, MS.

ITEM	QTY.	PART NO.	WARREN PART NO.	DESCRIPTION	WEIGHT
1	1	200215-51	TBD	POSITIONING ROD - 304SS	3.994
2	1	220016-89	TBD	FAN ASSEMBLY - AC620 - POLY DISC	46.990
3	1	220152-51	TBD	POSITIONING PIPE ASSEMBLY - 304SS	0.788
4	1	220152-52	TBD	TEE-BOLT WELDMENT - 304SS	0.164
5	1	220388-94	AC-620-SS	BODY WELDMENT-AC620-DIRECT DRIVE-SS	355.351
6	2	FM-00518	900-80213	PIN - HITCH	0.064
7	1		300-30365	AUGER COVER PLATE - AC620 STD SS	



01-Aug-07	AC-620 SPREADER ASSEMBLY - 304SS	AC-620-SS

ITEM	QTY.	PART NO.	WARREN PART NO.	DESCRIPTION	WEIGHT
1	1	220003-03	TBD	FAN WELDMENT - AC620	20.542
2	1	2000079-04	TBD	SPINNER HUB - DIRECT MOUNT MOTOR	4.057
3	7	FF-00021	900-80123	3/8-16 X 1-1/2 HEX CAP SCREW GR 8 YEL ZN	0.062
4	2	FF-00087	900-80025	1/2-13 NYLON INSERT LOCKNUT ZN	0.045
5	2	FF-00126	900-80039	1/2-13 X 1-3/4 HEX CAP SCREW GR 8 YEL ZN	0.139
6	6	FF-00219	900-80114	3/8-16 NYLON INSERT LOCKNUT ZN	0.030
7	1	FHM-00114	400-30013	WHITE RS 200 SERIES MOTOR	15.792
8	1	FM-00820	700-30093	POLY DISC - 18" - AC-620 - EAC	5.561



UNLESS OTHERWISE SPECIFIED. ALL WELDS TO BE CONTINUOUS. SIZE OF WELD TO BE AT LEAST THE THICKNESS OF THE THINNER OF THE ADJACENT METALS.

TOLERANCE-UNLESS OTHERWISE SPECIFIED.
DECIMAL ± .0625 FRACTIONAL ±1/16 ANGULAR ±1°

OP. #	OPERATION	MACH #	QTY.	CLK #	DATE

W/O#
DATE
QTY.
DEST.

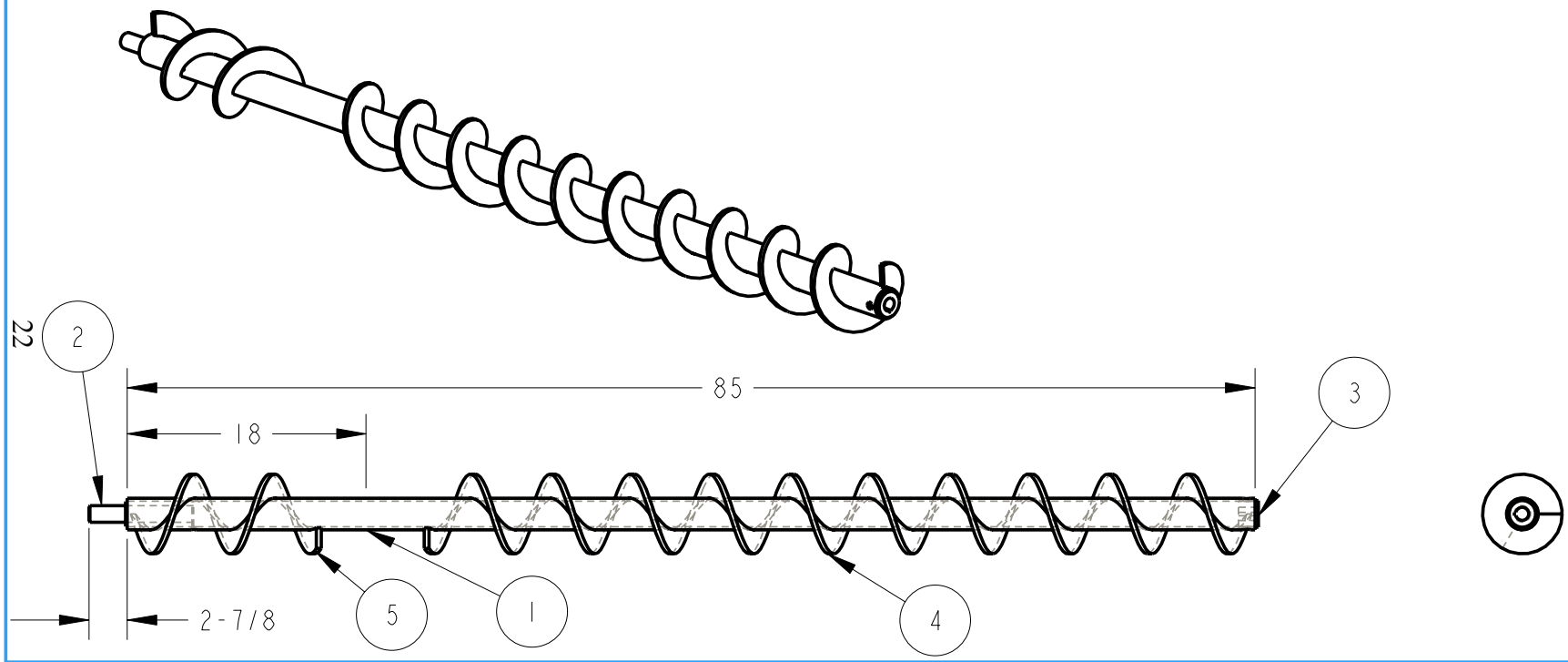
WARREN
COLLINS, MS.

NAME: FAN ASSEMBLY - AC620 - POLY DISC

MATERIAL: NA

SCALE: 5/32
REQ'D.
DRAWN: PK
DATE: 03-Aug-07
WEIGHT: 46.936
WARREN PART NO.: TBD
NUMBER: 220016-39

ITEM	QTY.	PART NO.	WARREN PART NO.	DESCRIPTION	WEIGHT
1	1	200418-37	300-30422	AUGER PIPE	35.566
2	1	220137-07	300-30520	IDLER SHAFT ASSEMBLY	2.847
3	1	A200272-18	300-30553	BUSHING	0.922
4	1	FM-00810-62	700-30081	FLIGHTING - 6" X 3/8" - RH X 62" LG	26.101
5	1	FM-00812-14	700-30092	FLIGHTING - 6" X 3/8" - RH X 14" LG.	5.894



UNLESS OTHERWISE SPECIFIED. ALL WELDS TO BE CONTINUOUS. SIZE OF WELD TO BE AT LEAST THE THICKNESS OF THE THINNER OF THE ADJACENT METALS.

TOLERANCE-UNLESS OTHERWISE SPECIFIED.
DECIMAL ± .0625 FRACTIONAL ±1/16 ANGULAR ±1°

OP. #	OPERATION	MACH #	QTY.	CLK #	DATE

W/O#
DATE
QTY.
DEST.

WARREN
COLLINS, MS.

NAME: AUGER ASSEMBLY - AC620

MATERIAL: NA

SCALE: 27/320
REQ'D.
DRAWN: PK
DATE: 10-Aug-07
WEIGHT: 71.329
WARREN PART NO.: 300-30524
NUMBER: 220195-48