Spinner Drive

Owner's Manual

0996256_D

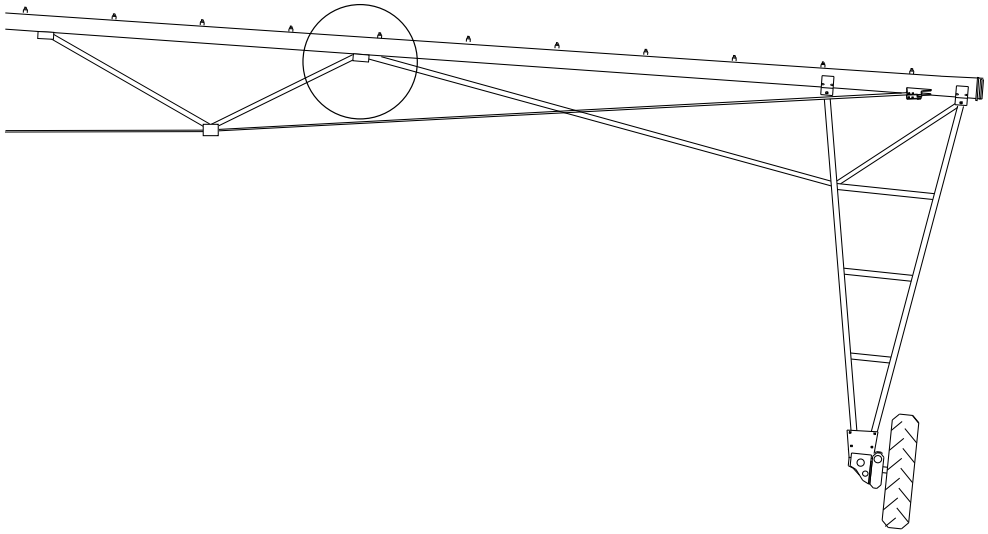
www.valleyirrigation.com

TABLE OF CONTENTS

TABLE OF CONTENTS

SERIES SPAN IDENTIFICATION

8000



8120 (INTERNATIONAL ONLY)

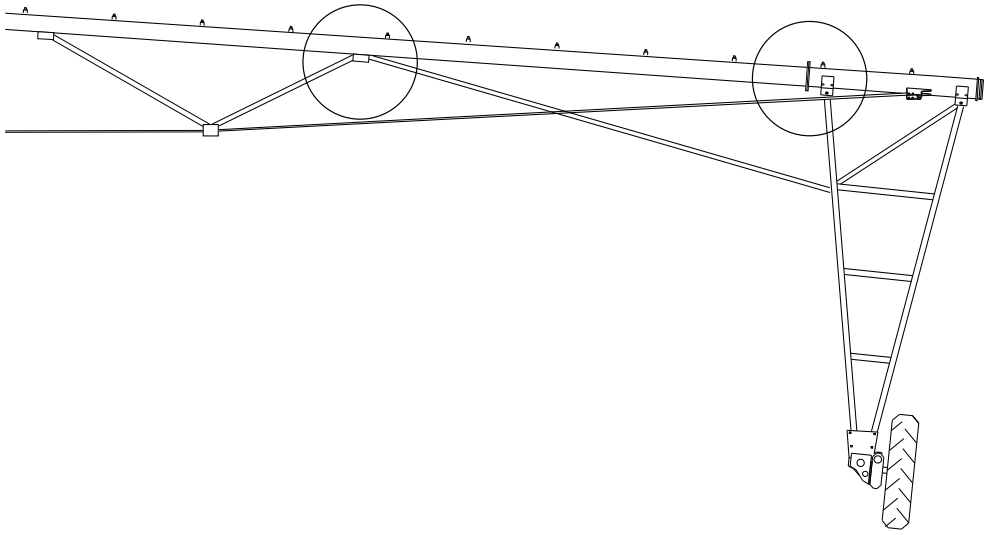


TABLE OF CONTENTS

EC DECLARATION OF CONFORMITY

CE

We: **Valmont Industries, Inc.**
28800 Ida Street
Valley, NE 68064
+1 402.359.6312
+1 402.359.6143 (Facsimile)

Serial Number:

Purchase Order:

declare under our sole responsibility that the product,

Crop Irrigation System

to which this documentation relates, is in conformity with the following documents:

Machinery Directive 2006/42/EC
Low Voltage Directive 2006/95/EC
Electromagnetic Compatibility Directive 2004/108/EC

The above-referenced equipment is in conformity with all safety-related clauses (Not all clauses reflecting commercial preference are met) of the following documents:

EN 60204-1:2006	**Safety of Machinery – Electrical Equipment of Machines**
EN 12100:2010	**Safety of Machinery**
EN 909:1998+A1	**Irrigation Machines**

Statement regarding **Pressure Equipment Directive 97/23/EC:**

The Crop Irrigation System is excluded from the scope of the Pressure Equipment Directive, by the language of Article 1, Sections 3.2, 3.6 & 3.10. This equipment is classified less than Category 1.

Statement regarding **RoHS Directive 2011/65/EC**:

The Crop Irrigation System is excluded from the scope of the RoHS Directive, by the language of Article 2, Section 4(e), being a “Large Scale Fixed Installation.”

Person Authorized to Compile the Technical File in Europe:
Relevant information will be transmitted via e-mail
in response to a reasoned request by national authorities

Philipp Schmidt-Holzmann
Valmont S.A.U.
28840 Mejorada del Campo
Madrid, ES 28840
+34 91 679 4300

Ron Pollak
Senior Electrical Engineer
Valmont Industries, Inc.

Date of Issue: March 9, 2015
Place of Issue: Valley, NE 68064

SAFETY

Recognize Safety Information

This irrigation equipment may be powered by high voltage which can be extremely dangerous if used improperly. For maximum safety and optimum performance of the machine, all owner's operator's and maintenance personnel must read and understand the owner/operator manual(s), all safety messages in this manual and safety signs/decals on the machine before operating this equipment.

Anyone assembling, operating, servicing or maintaining this machine must read and understand all operation, maintenance, troubleshooting, testing, installation, assembly instructions and all safety messages in this manual before operating the machine or beginning any maintenance, troubleshooting, testing, installation or assembly of components.

These instructions alert you to certain things you should do carefully; if you don't, you could hurt yourself or others, hurt the next person who operates the equipment, or damage the equipment.

Safety Messages

Safety messages in this manual are preceded by the hazard symbol and one of three words, danger, warning or caution. These messages alert you to potential hazards that could hurt you or others and or cause property damage.

This HAZARD SYMBOL is used to alert you to information about unsafe actions or situations, and may be followed by the word danger, warning, or caution.

⚠ DANGER

The HAZARD SYMBOL used with the word DANGER, will describe immediate hazards that may result in severe personal injury or death.

⚠ WARNING

The HAZARD SYMBOL used with the word WARNING, will describe unsafe actions or situations that may cause severe injury, death and/or major equipment or property damage.

⚠ CAUTION

The HAZARD SYMBOL used with the word CAUTION, will describe unsafe actions or situations that may cause injury, and/or minor equipment or property damage.

Information Messages

Important information messages in this manual are preceded by the word NOTE.

NOTE

The word NOTE is used to alert you to information that describes procedures or tips to help you install, operate or maintain your equipment properly.

Fall Protection

Identify potential fall hazards and determine if fall protection equipment is appropriate for the task, before beginning the work. Pay attention to hazards associated with routine and non-routine tasks. Inspect fall protection equipment (harnesses, lanyards) and devices (guardrails, tie-off points) before each use. Use fall protection equipment if required for the job. Be sure the fall protection equipment is right for the task, fits properly, and is in good condition. Refer to U.S. Occupational Safety & Health Administration (OSHA) Regulations Standards - 29 CFR 1926.500, 1926.501 and 1926.502, or applicable national, state or local regulations for more information.

- When using scaffolds, make sure there is proper access, full planking, stable footing, and guard railing.
- When using a boom lift, keep feet firmly on the platform of a boom lift, use fall protection equipment tied-off at all times to the guardrail or tie-off point.
- When using a ladder, make sure the ladder is non-conductive and the correct size for the task. Read the ladder user instructions and be sure the ladder is in good condition. Make sure ladder is set on stable footing and at the correct angle.

Minimum Working Clearance

To reduce the risk of injury, all persons require adequate working clearance around the electrical panel or other electrical equipment. The table below identifies the minimum working clearance needed. Refer to U.S. Occupational Safety & Health Administration (OSHA) Regulations (Standards - 29 CFR) Safeguards for personnel protection. -1910.303(g)(1)(i), or any other applicable national, state or local regulations, for additional information.

MINIMUM WORKING CLEARANCE 0-600 VOLTS				
WIDTH OF WORKING CLEARANCE AREA	HEIGHT OF WORKING CLEARANCE AREA	★MINIMUM WORKING CLEARANCE IN FRONT OF ELECTRICAL PANEL/EQUIPMENT		
		EXPOSED LIVE PARTS ON ONE SIDE OF WORK SPACE AND NO LIVE GROUNDED PARTS ON THE OTHER SIDE.	EXPOSED LIVE PARTS ON ONE SIDE OF WORK SPACE AND LIVE GROUNDED PARTS ON THE OTHER SIDE.	EXPOSED LIVE PARTS ON ONE SIDE OF WORK SPACE AND EXPOSED LIVE PARTS ON THE OTHER SIDE.
30in.(76.2cm) MINIMUM OR WIDTH OF ENCLOSURE, WHICH EVER IS GREATER	78in.(198.1cm) MINIMUM OR HEIGHT OF ENCLOSURE, WHICH EVER IS GREATER	36in.(91.4cm) MINIMUM	42in.(107cm) MINIMUM	48in.(122cm) MINIMUM

★Concrete, brick or tile walls shall be considered as grounded.

Qualified Person

A Qualified person is one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his/her ability to solve or resolve problems related to the subject matter, the work, or the project.

Only qualified persons may work on electric circuit parts or equipment that have not been de-energized.

Refer to U.S. Occupational Safety & Health Administration (OSHA) Regulations Standards - 29 CFR 1926.32(m) and 1910.333, or applicable national, state or local regulations for additional information.

Maintain Safely

Overhead Power Lines

Assembling, towing or transporting irrigation machine components such as but not limited to the pivot point, linear cart, span/drive unit assemblies, overhangs and/or corner assemblies underneath or near power lines is extremely dangerous because of the risk of electrocution.

Operating equipment that elevates irrigation machine components, such as but not limited to an aerial lift or crane, near power lines is extremely dangerous because of the risk of electrocution. Only qualified personnel should operate this type of equipment. Before operating the equipment, qualified personnel must read the equipment manufacturers' operating and safety instructions.

Refer to U.S. Occupational Safety & Health Administration (OSHA) Regulations (Standards - 29 CFR) Cranes and derricks. - 1926.550, or any other applicable national, state or local regulations for additional information.

- Always presume that any overhead power line is an energized line unless and until the person(s) owning the line and/or the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded.
- Before operating any equipment near any power line make sure the line has been de-energized and visibly grounded at the point of work.
- Electrocution can occur without touching an electrical power line. Electricity, depending on the magnitude, can jump or become induced into equipment or conductive materials that come in close proximity to, but do not touch a power line. High wind, lightening, wet ground and other environmental conditions will increase the possibility of electrocution and require additional consideration.
- Transmitter towers can induce the equipment or materials being handled with an electrical charge. Before working or operating equipment near transmitter towers make sure the transmitter is de-energized.
- Select the location where the span/drive unit will be assembled to ensure that neither the irrigation machine, or the equipment used during the assembly process, will violate the minimum clearance guidelines.
- Never operate equipment or allow the load, ropes or tag lines within 10 ft (3.05 m) of any power line rated 50 kV or lower whether it is energized or not. For lines rated over 50 kV, the minimum clearance shall be 10 ft plus 0.4 in (1.1 cm) for each kV over 50 kVs.
- Never assemble, tow, transport or allow irrigation machine components underneath or within 10 ft (3.05 m) of any power line rated 50 kV or lower whether it is energized or not. For lines rated over 50 kV, the minimum clearance shall be 10 ft plus 0.4 in (1.1 cm) for each kV over 50 kVs. Overhang support angles, cables and spinner drive components regularly extend 10 ft to 12 ft (3.1 m to 3.7 m) above the irrigation pipeline (span).
- Use barricades to identify areas where interference with overhead power lines could occur. Keep the assembly, towing or transporting of irrigation machine components and the operation of equipment including load, ropes or tag lines away from any power line, in the distances described above, whether the line is energized or not.
- Always designate a person to observe clearance between the power line and all equipment being operated or moved in order to give timely warning for all operations to STOP if the minimum clearance is violated.

Operate Safely

Valley Irrigation machines are designed with safety in mind. However, if this machine is operated incorrectly, it may pose a safety threat to the operator. A good safety program is much like a chain, it is only as strong as its weakest link. The manufacturer, dealer, and operator must maintain and improve all safety programs. Following is a list of safety operating tips which you and all other persons servicing or operating the machine must read and understand.

⚠ CAUTION

- DO NOT operate this machine without first reading the Owner's Manuals for the machine.
- Read all safety messages in this manual and safety signs on the machine.
- DO NOT let anyone operate this machine without proper instructions.
- Unauthorized modifications may impair the function and/or safety of the machine.
- If you do not understand any part of this manual, contact your Valley dealer.

EMPLOYEE INSTRUCTION ON SAFETY

It is very important to instruct your employees on the safe use of this equipment at the time of their initial assignment to operate it. DO NOT let anyone operate this equipment without proper instructions.

Safety training should be presented annually and the service manager should ensure employees fully understand the safety messages and what to do in case of emergencies.

⚠ WARNING

LIGHTNING AND THE MACHINE

Stay away from the machine during an electrical storm. An irrigation machine makes a good path to earth. It is also probably the tallest object in the field, which makes it a good lightning receptor!

⚠ CAUTION

DO NOT OPERATE AT FREEZING TEMPERATURES

Spraying water has a cooling effect and water will freeze even though the air temperature is slightly above freezing.

Shut the machine down at 40 degrees Fahrenheit (4.5 degrees Celsius). Do not operate machine when temperature is below 40° F (4.5° C).

- **DAMAGE TO EQUIPMENT RESULTING FROM FREEZE-UP IS NOT COVERED UNDER WARRANTY.**
- **IT IS IMPORTANT TO MAKE SURE ALL PIPE DRAINS FUNCTION PROPERLY TO PREVENT PIPELINE FREEZE-UP DURING COLD WEATHER.**

⚠ CAUTION

AVOID HIGH PRESSURE WATER STREAMS

Avoid body contact with high pressure water streams.

⚠ WARNING

AVOID CHEMICALS

Avoid exposure to sprinkler spray while chemicals are being injected into the water. Read EPA Label Improvement Program (PR Notice 87-1) and all instructions for chemical applications.

If you plan on chemigating, make certain you have complied with state or local regulations in regard to safety equipment, certification, operation and calibration of the injector pump. Make certain you have first aid and fresh water available in case of an accident. You must also be familiar with the correct cleanup procedures in case of a spill.

- **USE OF PROTECTIVE CLOTHING IS RECOMMENDED WHEN HANDLING CHEMICALS. SAFETY GLASSES, GLOVES, AND PROTECTIVE OUTERWEAR SHOULD BE WORN WHEN HANDLING CHEMICALS.**
- **CONTAMINATION OF THE WATER SUPPLY MAY OCCUR IF EFFECTIVE SAFETY DEVICES ARE NOT INSTALLED/USED IN CONNECTION WITH INJECTION EQUIPMENT FOR CHEMIGATION.**

Operate Safely

⚠ DANGER

DRIVE SHAFTS START WITHOUT WARNING

- DO NOT touch rotating drive shalt or shield, Clothing or limbs may become entangled, resulting in severe injury.
- DO NOT service the machine until the water supply is OFF.
- ALWAYS replace drive shaft shields after servicing.
- DRIVE SHAFT SHIELDS MUST ALWAYS BE IN PLACE WHEN OPERATING THE MACHINE.

⚠ CAUTION

CHECK WHEEL TRACKS BEFORE STARTING

Make sure all objects, livestock or persons are clear of the machine before starting. Drive trains are powerful and can climb over vehicles, equipment, etc.

⚠ CAUTION

KEEP CHILDREN AWAY

Irrigation Machines are NOT playground equipment.

Prevent children from playing or climbing around on the machine. This can be extremely dangerous, especially if the machine is operating.

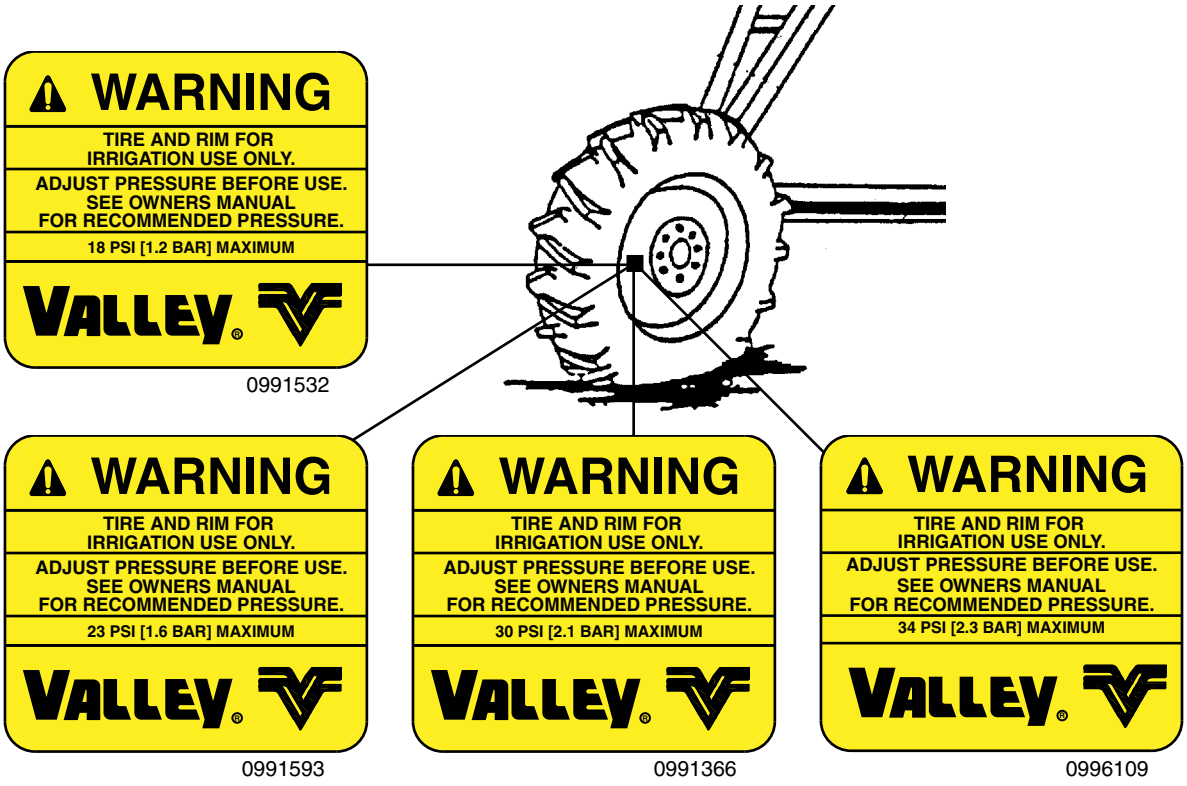
⚠ CAUTION

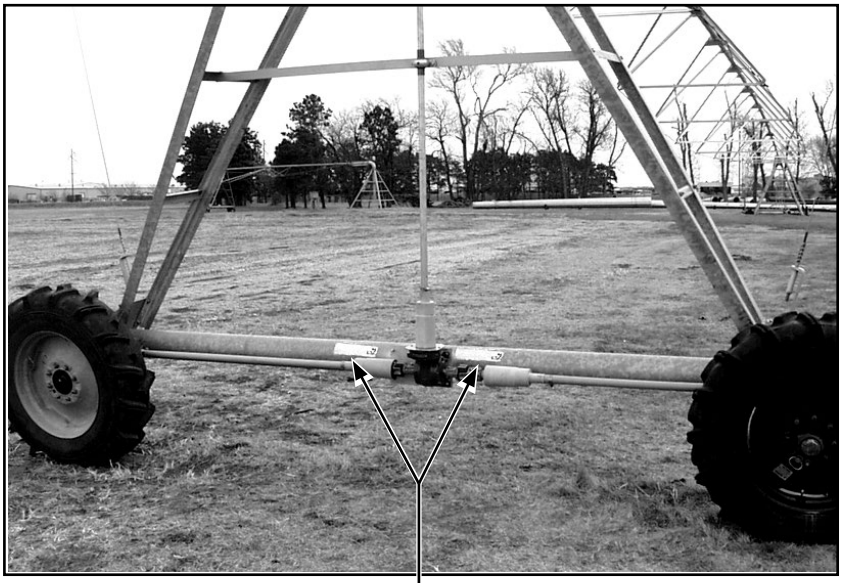
KEEP WATER OFF ROADWAYS

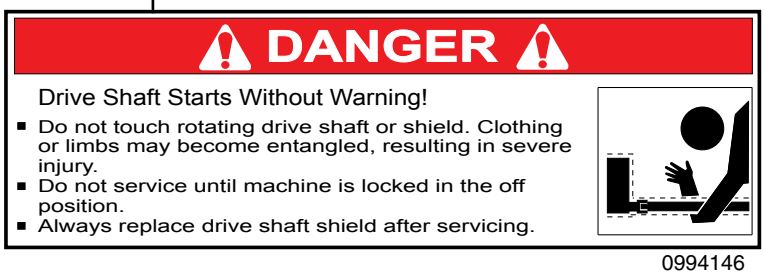
It is against the law in most states to allow water to spray on state and county roadways. This is a serious hazard to passing motorists.

If end guns are used, make sure you read and understand the correct procedures for end gun application.

Safety Decals







SAFETY

Pivot

The center pivot is the structure which the entire machine rotates around. The water entry point for the machine is at the riser pipe. See figure 15-1.

The legs of a conventional center pivot are bolted to a concrete foundation. Some pivots are towable with a pivot point that is equipped with skids or wheels so it can easily be moved from one field to the other. See figure 15-1.

Pivot Flex

A pivot flex allows for flexibility between the pivot point and the first span. A Pivot Flex is required where the first drive unit is 15% above or below the level of the pivot pad. See figure 15-1.

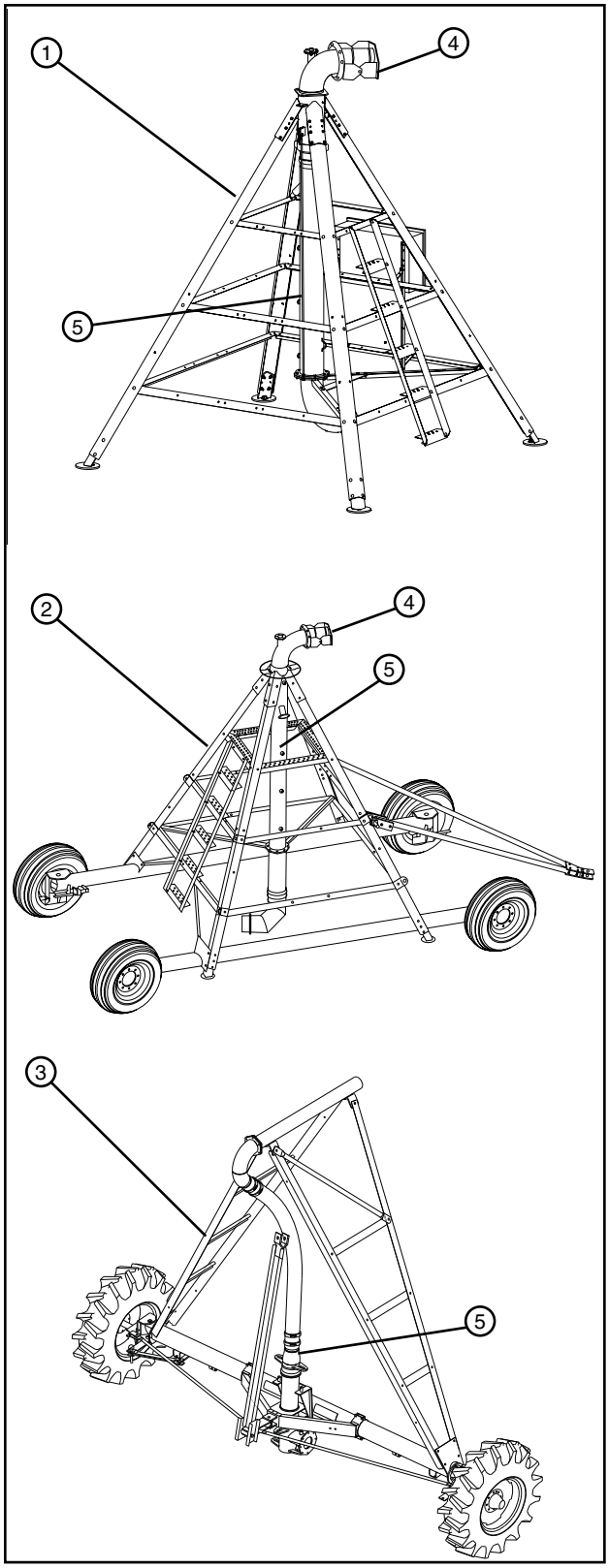


Figure 15-1 1. Conventional Center Pivot 4. Pivot Flex
2. 4 Wheel EZ-Tow Pivot 5. Riser Pipe
3. 2 Wheel EZ-Tow Pivot

OVERVIEW

Spans

Water is transported to the irrigation machine through a hose or underground pipe line. The water is then transported across the field through the span. The span has a drive tower which moves it around the field. See figure 16-1.

A span is a water pipeline supported with a bowstring under truss design. Truss rods are attached to each truss assembly to support and strengthen the span. See figure 16-1.

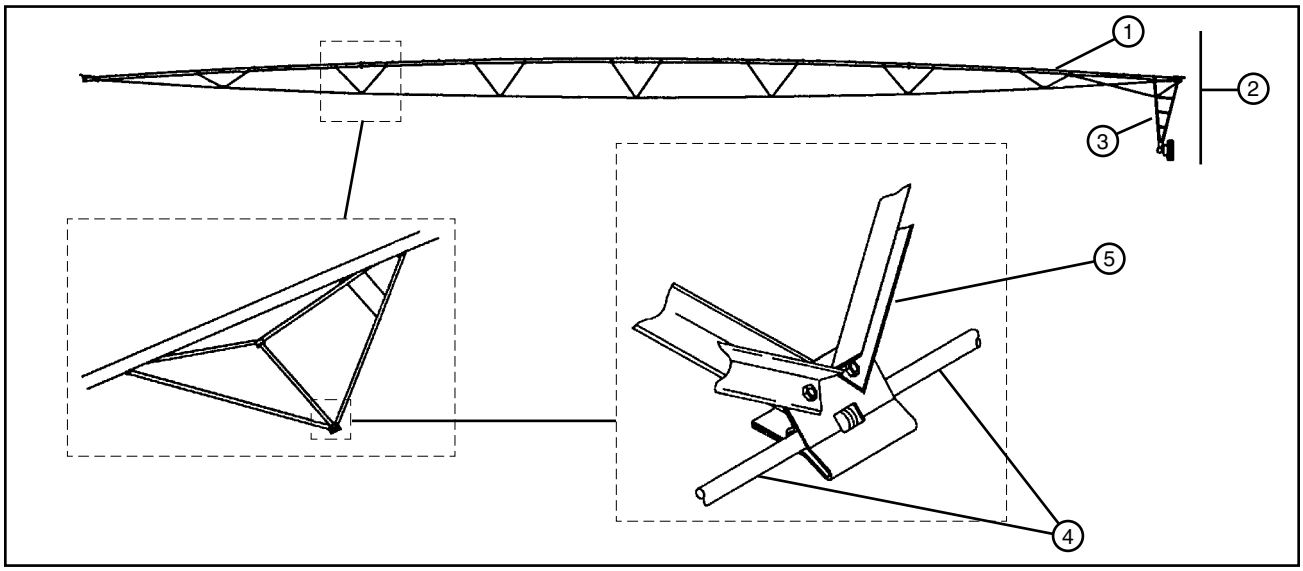


Figure 16-1 1. Pipeline
2. Span
3. Drive Tower
4. Truss Rod
5. Truss Assembly

Overhang (Option)

Typically an overhang is attached to the end of the span pipe and used for irrigation beyond the span/ drive unit. Support ears and cables provide support for the overhang. See figure 16-1.

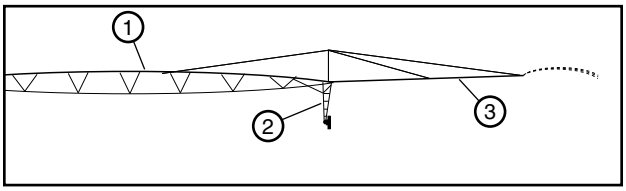


Figure 16-1 1. Span
2. Drive Tower
3. Overhang

End Gun (Option)

Typically an end gun is attached at the end of the overhang and used to increase the area irrigated beyond the end of the machine. See figure 16-2.

The Spinner does not use electricity, there are no controls to regulate the end gun. Take into consideration that the end gun will apply water continuously while the machine is running. The end gun application area is determined by the forward and backward angles, which are referred to as the end gun arc settings. See figure 16-3.

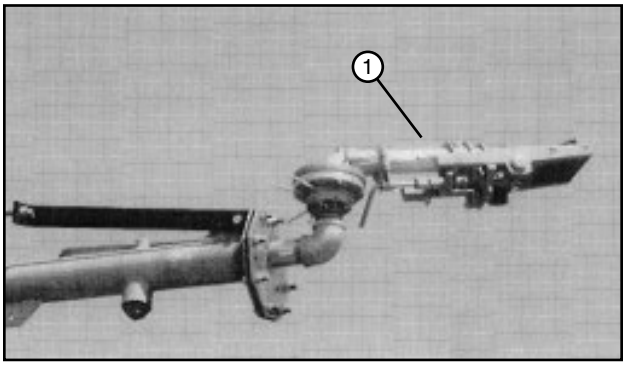


Figure 16-2 1. End Gun

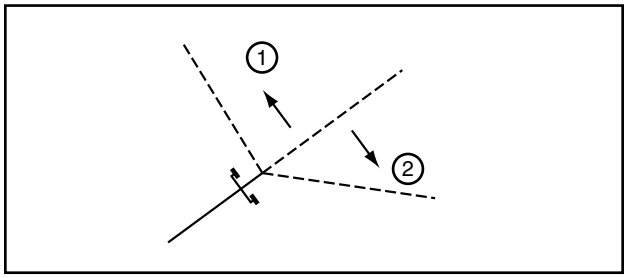


Figure 16-3 1. Backward Angle
2. Forward Angle

Drive Tower

A drive tower is attached to the end of each span. See Figure 15-1.

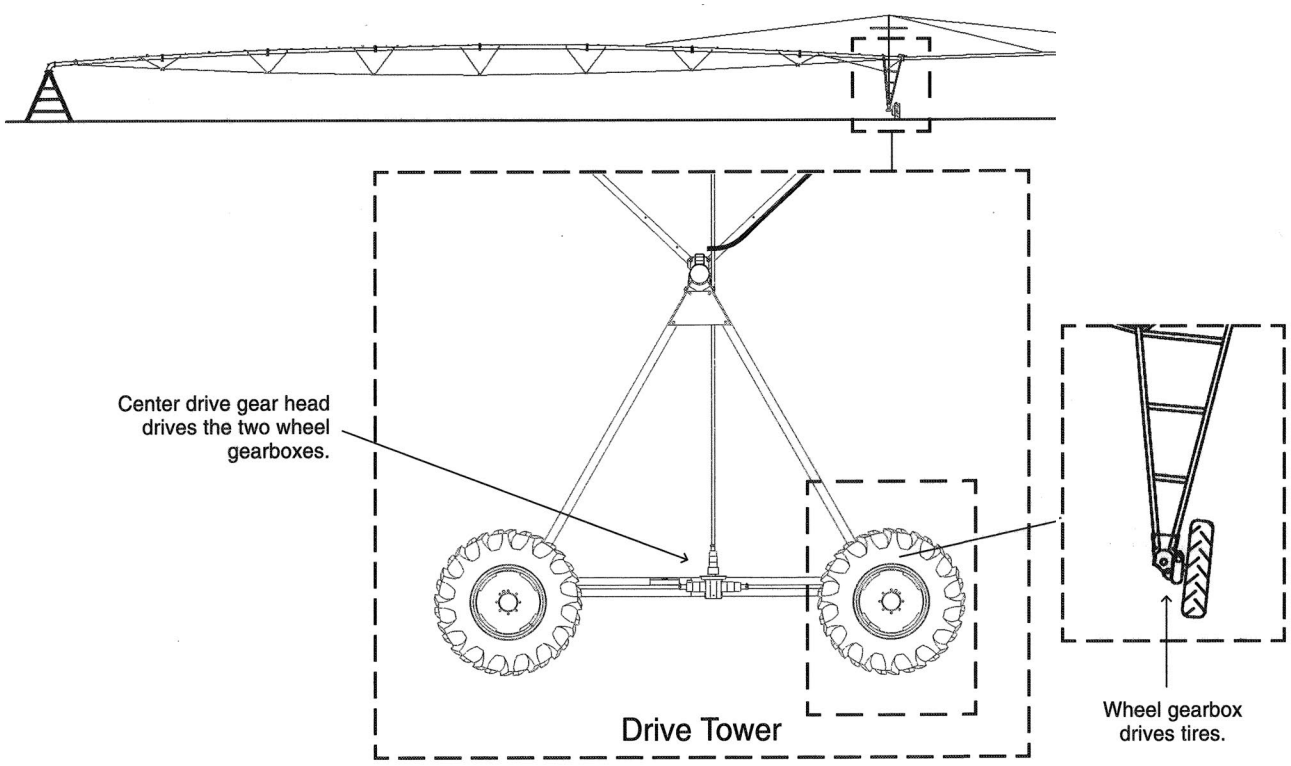


Figure 17-1 1. Drive Tower

Water Application

A sprinkler chart provides the operator with information about water application depths. The nozzle sizes of the sprinklers vary in diameter depending on the distance from the pivot. The sprinklers at the outer end of the machine must utilize larger diameter nozzles since they will cover more area. By taking into account the distance from the pivot, the total quantity of water to be applied, the amount of water distributed by the Spinner nozzles, and how much water pressure is available, a sprinkler can be selected for each point along the pipeline to provide uniform water application at all points in the field.

Water is applied to the field through the sprinklers. Sprinklers can be mounted on top of the pipeline or on drop tubes that hang below the pipeline. See figure 17-2.

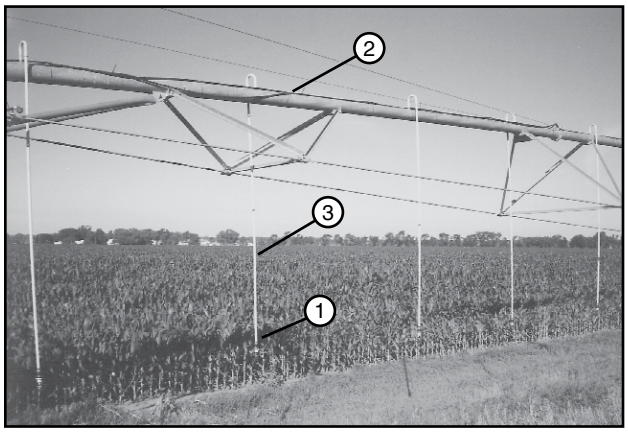


Figure 17-2 1. Sprinkler
2. Pipeline
3. Drop Tube

OVERVIEW

Principle of Operation

The Valley Spinner Drive is a single span water driven machine requiring no electrical power to propel the machine. Propulsion is provided through a 4-arm spinner assembly positioned at the drive unit and above the pipeline. Water under pressure is exhausted through nozzles at the ends of each of the spinner arms causing the spinner and vertical shaft to rotate. The shaft is connected to a center drive gearbox and Valley drive train (wheel-drive gearboxes and rubber tires).

Water enters the machine through the main riser at the pivot point. When the machine pipeline fills, water under pressure is routed to the spinner causing it to rotate and the span/drive unit to move. The speed of the machine and the amount of water applied is based on the operating pressure, the size of the spinner nozzles, the ratio of the center drive and wheel drive gearboxes and the tire size. The maximum operating pressure is 50 psi or 3.3 bars. A 50 psi/3.3 pressure regulator is used in the Spinner Drive supply line if the pipeline pressure exceeds 50 psi or 3.3 bars.

Based on the initial design of the machine, the speed and the amount of water applied per revolution are set. Initial design parameters include the selected sprinkler package/gallonage, the operating pressure, the drive train selection (standard speed, high speed or stow speed) and the tire size. Field factors that will affect the actual speed and application amount include the operating terrain (slopes/ridges), soil conditions and any variance from the design operating pressure.

The application amount can be varied or changed by one of the following means:

- Renozzling the machine sprinkler package/spinner drive mechanism.
- Changing the center drive gearbox.
- Changing the tire size.

Contact your local Valley Dealer/Representative for more information and assistance.

As previously indicated, a number of factors can affect the actual application amounts of the Spinner Drive. Shown below are some adjustments and how they effect spinner performance.. These must be taken into consideration to determine the theoretical water application amount. You must follow the guidelines in the operating section for establishing the actual water application amount.

Adjustments to Spinner Performance:

	Slope Capability	Rotation Time	Application Depth
14.9 x 24" Tires**	Decrease by 4% slope	Multiply values by 0.88	Multiply values by 0.88
9.00 x 20" Tires	Increase by 2% slope	Multiply values by 1.05	Multiply values by 1.05
180 ft. (54.86 m) Span	Increase by 1% slope	Multiply values by 0.89	Slightly less than 199 ft.
205 ft. (62.45 m) Span	Decrease by 1% slope	Multiply values by 1.04	Slightly more than 199 ft.
6" (152 mm) Ridges**	Decrease by 20% slope	Increase up to 20%	Increase up to 20%

Note:

1. *Application uniformity is adversely affected by slopes. Slopes greater than 15% are not recommended.
2. **For best uniformity, it is recommended that 14.9 x 24" tires be used only with larger nozzles and adequate water pressure.
3. ++ Use caution - slope capabilities may be exceeded. Maximum ridge size recommended is 6 inches.

OPERATION

Operating Procedure

Start-Up

1. Insure the 1” ball valve at the last drive unit is fully open.
2. Start the irrigation pump. Once the machine pipeline is filled and pressurized water will flow to the Spinner Drive and the machine to move.

Shutting Off the Machine

Stopping the machine is simply a matter of shutting off the pump. It is critical the Spinner Drive be stopped at the appropriate position to be moved to the next pivot point. Because there is no automatic stopping device, it is necessary to be in the field to stop the machine when it reaches the tow lane.

Direction of Operation

Operation of the Spinner Drive is intended to be in the forward/clockwise direction. In some instances, it may be of benefit to operate the machine in the reverse/counterclockwise direction.

Changing the direction of operation requires loosening the compression/locknuts on the spinner arms, rotating the spinner arms 180° then tightening the compression nuts. See Figure 18-1.

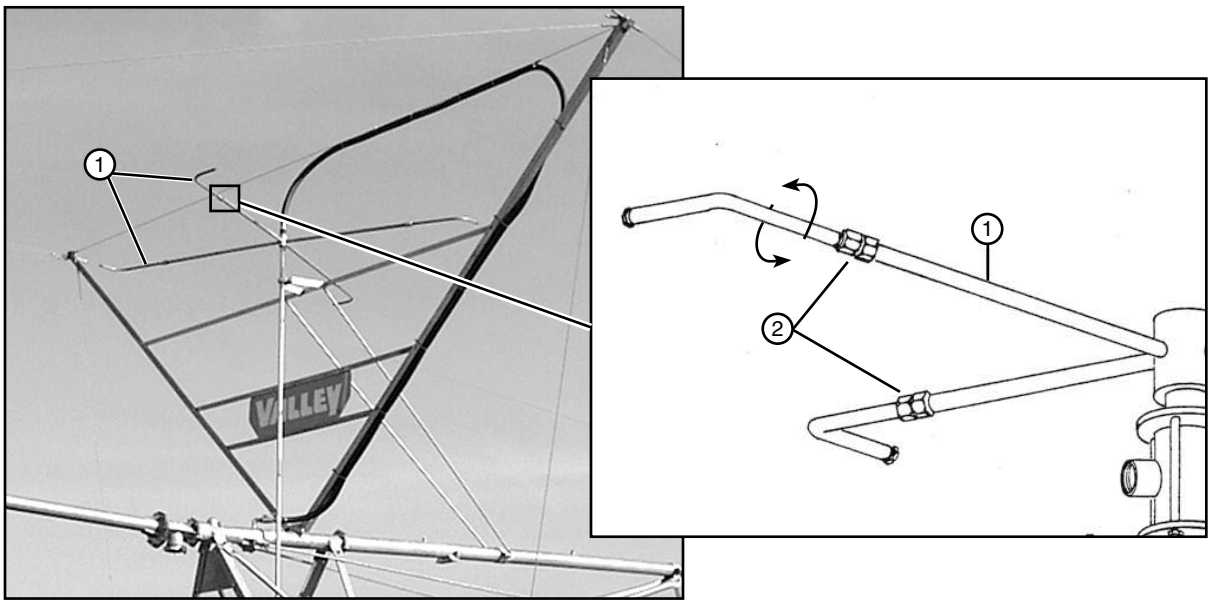


Figure 20-1 1. Spinner Arms
2. Compression/locknut

⚠ WARNING

A man-lift or other device must be used to safely access and adjust the spinner arms! Failure to heed this warning can result in severe injury or death!

Water Application

Water application is based on a number of variables. The following pages show Performance Charts for the Spinner Drive. Tables 1 through 6 indicate the theoretical revolution times, application depths and other data for various machine design configurations and Spinner Drive nozzle sizes. Refer to the appropriate chart/table for data on your particular machine.

For example, if your machine had the following design criteria, you would refer to Spinner Performance Chart/ Table #1.

6 5/8" (168 mm) pipe	11.2 x 24" tires
199' (60.63 m) span	Standard Speed Gearbox - 11.25:1 Ratio
82' (25 m) overhang	11/64" (3.57 mm) Spinner Nozzles

The 11/64" Nozzle Chart/Table #1 indicates if the operating pressure is 45 psi. (3 bars) the revolution time is 12.7 hours and the water application depth is 1.18 inches (30 mm).

The actual application amount for the Spinner Drive may vary slightly from the design criteria. This can be the result of any number of variables including the operating pressure, terrain, soil conditions, etc. The actual application depth can be determined by timing one complete revolution of the machine.

NOTE

•The machine should be operated for two revolutions before the revolution time is checked.

Once the actual revolution time is determined, use the formula below to establish the actual application depth per revolution for your machine.

Actual Revolution Time = _____ hours

Actual Application Depth (inches or mm) =

$$\frac{\text{Machine Flow (gpm or l/sec)} \times \text{Actual Rotation Time (hours)} \times 30.64}{[\text{Span Length (feet or meters)} + \text{Overhang Length (feet or meters)}]^2}$$

Example:

Actual Application Depth (inches) =

$$\frac{[240 \text{ gpm} \times 15.5] \times 30.64}{[199'+82']^2} = \frac{113{,}980}{78961} = 1.44 \text{ inches}$$

Factors Affecting Water Application/Performance Charts

Provided below are adjustments to the Spinner Performance Tables - the amount of water applied for various operational factors associated with the Spinner Drive machine. These should be used in calculating the theoretical application amount for your particular machine and application. Refer to the Water Application for determining/establishing the actual application amount based on the revolution time of the machine.

Adjustments to Spinner Performance:

	Slope Capability	Rotation Time	Application Depth
14.9 x 24" Tires	Decrease by 4% slope	Multiply values by 0.88	Multiply values by 0.88
9.00 x 20" Tires	Increase by 2% slope	Multiply values by 1.05	Multiply values by 1.05
180 ft. (54.86 m) Span	Increase by 1% slope	Multiply values by 0.89	Slightly less than 199 ft.
6" (152 mm) Ridges**	Decrease by 20% slope	Increase up to 20%	Increase up to 20%

Note:

1. *System flow does not include end gun.
2. *Application uniformity is adversely affected by slopes. Slopes greater than 15% are not recommended.
3. ++ Use caution - slope capabilities may be exceeded. Maximum ridge size recommended is 6 inches.
4. # Flow is for 75 feet (22.9 m) effective radius of throw. Flows for other radius must be calculated.
5. The above slopes and rotation times are for average soil conditions. Performance will decrease for soils and increase for hard packed soils.
6. Pressures are measured at the spinner water supply coupling.

OPERATION

Performance Charts

Table 1

Spinner Performance Charts
6 5/8" x 199 ft. (168 mm. X 60.63 m.) span, 82 ft. (25 m.)OH,
11.2 x 24" tires, Standard speed (11.25:1 gearbox)

Spinner nozzles: 9/64" (3.57 mm)

Span: 6 5/8" x 199 ft. (168 mm x 60.63 m.) Tires: 11.2 x 24" Standard tire
Gearbox: Standard speed Overhang: 82 ft. (25 m.)

Pressure	Pressure	Application Variation Best	10%	20%	Flat ground Rotation time	System Flow +		Application Depth		End Gun Flow #	
(bars)	(psi)	Slope Ratings (%)			(hours)	GPM	l./sec.	in.	mm.	GPM	l./sec.
2	30	0	0	0	20.8	135	8,5	1.09	28	82	5,1
2,5	37.5	0	0	0	16.9	149	9,4	0.98	25	90	5,7
3	45	0	0	2	14.3	164	10,3	0.91	23	99	6,3
3,33	50	0	0	3	13.2	173	10,9	0.88	22	104	6,6

Spinner nozzles: 5/32" (3.97 mm)

Span: 6 5/8" x 199 ft. (168 mm x 60.63 m.) Tires: 11.2 x 24" Standard tire
Gearbox: Standard speed Overhang: 82 ft. (25 m.)

Pressure	Pressure	Application Variation Best	10%	20%	Flat ground Rotation time	System Flow +		Application Depth		End Gun Flow #	
(bars)	(psi)	Slope Ratings (%)			(hours)	GPM	l./sec.	in.	mm.	GPM	l./sec.
2	30	0	0	0	19.2	164	10,3	1.22	31	99	6,3
2,5	37.5	0	0	1	15.8	183	11,5	1.12	28	111	7,0
3	45	0	0	3	13.4	198	12,5	1.03	26	120	7,6
3,33	50	0	0	4	12.4	210	13,2	1.01	26	127	8,0

Spinner nozzles: 11/64" (4.37 mm)

Span: 6 5/8" x 199 ft. (168 mm x 60.63 m.) Tires: 11.2 x 24" Standard tire
Gearbox: Standard speed Overhang: 82 ft. (25 m.)

Pressure	Pressure	Application Variation Best	10%	20%	Flat ground Rotation time	System Flow +		Application Depth		End Gun Flow #	
(bars)	(psi)	Slope Ratings (%)			(hours)	GPM	l./sec.	in.	mm.	GPM	l./sec.
2	30	0	0	0	17.8	194	12,2	1.34	34	117	7,4
2,5	37.5	0	0	2	14.8	217	13,7	1.25	32	131	8,3
3	45	0	0	4	12.7	240	15,1	1.18	30	145	9,2
3,33	50	0	1	6	11.7	253	16,0	1.15	29	153	9,6

Spinner nozzles: 3/16" (4.76 mm)

Span: 6 5/8" x 199 ft. (168 mm x 60.63 m.) Tires: 11.2 x 24" Standard tire
Gearbox: Standard speed Overhang: 82 ft. (25 m.)

Pressure	Pressure	Application Variation Best	10%	20%	Flat ground Rotation time	System Flow +		Application Depth		End Gun Flow #	
(bars)	(psi)	Slope Ratings (%)			(hours)	GPM	l./sec.	in.	mm.	GPM	l./sec.
2	30	0	0	2	16.7	227	14,3	1.47	37	138	8,7
2,5	37.5	0	0	4	14	257	16,2	1.39	35	155	9,8
3	45	0	1	6	12	282	17,8	1.31	33	171	10,8
3,33	50	0	2	8	11.1	295	18,6	1.27	32	178	11,2

Table 2

Spinner Performance Charts
6 5/8" x 199 ft. (168 mm. X 60.63 m.) span, 82 ft. (25 m.)OH,
11.2 x 24" tires, Slow speed (21:1 gearbox)

Spinner nozzles: 9/64" (3.57 mm)

Span: 6 5/8" x 199 ft. (168 mm x 60.63 m.) Tires: 11.2 x 24" Standard tire
Gearbox: Slow speed Overhang: 82 ft. (25 m.)

Pressure	Pressure	Application Variation Best	10%	20%	Flat ground Rotation time	System Flow +		Application Depth		End Gun Flow #	
(bars)	(psi)	Slope Ratings (%)			(hours)	GPM	l./sec.	in.	mm.	GPM	l./sec.
2	30	0	0	1	34.6	135	8,5	1.81	46	82	5,1
2,5	37.5	0	0	4	28.8	149	9,4	1.67	42	90	5,7
3	45	0	1	6	24.7	164	10,3	1.57	40	99	6,3
3,33	50	0	2	8	22.9	173	10,9	1.53	39	104	6,6

Spinner nozzles: 5/32" (3.97 mm)

Span: 6 5/8" x 199 ft. (168 mm x 60.63 m.) Tires: 11.2 x 24" Standard tire
Gearbox: Slow speed Overhang: 82 ft. (25 m.)

Pressure	Pressure	Application Variation Best	10%	20%	Flat ground Rotation time	System Flow +		Application Depth		End Gun Flow #	
(bars)	(psi)	Slope Ratings (%)			(hours)	GPM	l./sec.	in.	mm.	GPM	l./sec.
2	30	0	0	3	32	164	10,3	2.04	52	99	6,3
2,5	37.5	0	0	5	27	183	11,5	1.92	49	111	7,0
3	45	0	2	9	23.3	198	12,5	1.79	45	120	7,6
3,33	50	0	3	11	21.7	210	13,2	1.77	45	127	8,0

Spinner nozzles: 11/64" (4.37 mm)

Span: 6 5/8" x 199 ft. (168 mm x 60.63 m.) Tires: 11.2 x 24" Standard tire
Gearbox: Slow speed Overhang: 82 ft. (25 m.)

Pressure	Pressure	Application Variation Best	10%	20%	Flat ground Rotation time	System Flow +		Application Depth		End Gun Flow #	
(bars)	(psi)	Slope Ratings (%)			(hours)	GPM	l./sec.	in.	mm.	GPM	l./sec.
2	30	0	0	5	29.8	194	12,2	2.24	57	117	7,4
2,5	37.5	0	2	8	25.4	217	13,7	2.14	54	131	8,3
3	45	0	4	12	22.1	240	15,1	2.06	52	145	9,2
3,33	50	0	5	14	20.6	253	16,0	2.02	51	153	9,6

Spinner nozzles: 3/16" (4.76 mm)

Span: 6 5/8" x 199 ft. (168 mm x 60.63 m.) Tires: 11.2 x 24" Standard tire
Gearbox: Slow speed Overhang: 82 ft. (25 m.)

Pressure	Pressure	Application Variation Best	10%	20%	Flat ground Rotation time	System Flow +		Application Depth		End Gun Flow #	
(bars)	(psi)	Slope Ratings (%)			(hours)	GPM	l./sec.	in.	mm.	GPM	l./sec.
2	30	0	1	7	27.9	227	14,3	2.46	62	138	8,7
2,5	37.5	0	3	11	24	257	16,2	2.40	61	155	9,8
3	45	0	6	16*	21	282	17,8	2.30	58	171	10,8
3,33	50	0	7	18*	19.7	295	18,6	2.25	57	178	11,2

Performance Charts (continued)

Table 3

Spinner Performance Charts
5" x 199 ft. (127 mm. X 60.63 m.) span, 74 ft. (22.6 m.)OH,
11.2 x 24" tires, Standard speed (11.25:1 gearbox)

Spinner nozzles: 9/64" (3.57 mm)

Span: 5" x 199 ft. (127 mm x 60.63 m.) Tires: 11.2 x 24" Standard tire
Gearbox: Standard speed Overhang: 74 ft. (22.6 m.)

Pressure (bars)	Pressure (psi)	Application Variation Best	10%	20%	Flat ground Rotation time (hours)	System Flow + GPM	l./sec.	Application Depth in.	mm.	End Gun Flow # GPM	l./sec.
		Slope Ratings (%)									
2	30	2	4	6	18.5	127	8,0	0.97	25	79	5,0
2,5	37.5	2	5	8	15.6	141	8,9	0.90	23	88	5,6
3	45	2	6	10	13.4	155	9,8	0.85	22	97	6,1
3,33	50	2	7	11	12.5	163	10,3	0.84	21	102	6,4

Spinner nozzles: 5/32" (3.97 mm)

Span: 5" x 199 ft. (127 mm x 60.63 m.) Tires: 11.2 x 24" Standard tire
Gearbox: Standard speed Overhang: 74 ft. (22.6 m.)

Pressure (bars)	Pressure (psi)	Application Variation Best	10%	20%	Flat ground Rotation time (hours)	System Flow + GPM	l./sec.	Application Depth in.	mm.	End Gun Flow # GPM	l./sec.
		Slope Ratings (%)									
2	30	2	5	7	17.4	155	9,8	1.11	28	97	6,1
2,5	37.5	2	6	9	14.7	173	10,9	1.05	27	108	6,8
3	45	2	7	11	12.7	187	11,8	0.98	25	117	7,4
3,33	50	2	8	12	11.8	199	12,6	0.97	25	124	7,8

Spinner nozzles: 11/64" (4.37 mm)

Span: 5" x 199 ft. (127 mm x 60.63 m.) Tires: 11.2 x 24" Standard tire
Gearbox: Standard speed Overhang: 74 ft. (22.6 m.)

Pressure (bars)	Pressure (psi)	Application Variation Best	10%	20%	Flat ground Rotation time (hours)	System Flow + GPM	l./sec.	Application Depth in.	mm.	End Gun Flow # GPM	l./sec.
		Slope Ratings (%)									
2	30	2	5	8	16.5	183	11,5	1.24	31	114	7,2
2,5	37.5	2	6	10	14	205	12,9	1.17	30	128	8,1
3	45	2	8	13	12.1	226	14,3	1.13	29	142	8,9
3,33	50	2	8	14	11.3	238	15,0	1.10	28	149	9,4

Spinner nozzles: 3/16" (4.76 mm)

Span: 5" x 199 ft. (127 mm x 60.63 m.) Tires: 11.2 x 24" Standard tire
Gearbox: Standard speed Overhang: 74 ft. (22.6 m.)

Pressure (bars)	Pressure (psi)	Application Variation Best	10%	20%	Flat ground Rotation time (hours)	System Flow + GPM	l./sec.	Application Depth in.	mm.	End Gun Flow # GPM	l./sec.
		Slope Ratings (%)									
2	30	2	6	10	15.6	215	13,6	1.38	35	134	8,5
2,5	37.5	2	7	12	13.3	242	15,3	1.32	34	151	9,6
3	45	2	9	14	11.5	266	16,8	1.26	32	166	10,5
3,33	50	2	10	16*	10.7	278	17,5	1.23	31	174	11,0

Table 4

Spinner Performance Charts
5" x 199 ft. (127 mm. X 60.63 m.) span, 74 ft. (22.6 m.)OH,
11.2 x 24" tires, Slow speed (21:1 gearbox)

Spinner nozzles: 9/64" (3.57 mm)

Span: 5" x 199 ft. (127 mm x 60.63 m.) Tires: 11.2 x 24" Standard tire
Gearbox: Slow speed Overhang: 74 ft. (22.6 m.)

Pressure (bars)	Pressure (psi)	Application Variation Best	10%	20%	Flat ground Rotation time (hours)	System Flow + GPM	l./sec.	Application Depth in.	mm.	End Gun Flow # GPM	l./sec.
		Slope Ratings (%)									
2	30	2	6	9	32.4	127	8,0	1.69	43	79	5,0
2,5	37.5	2	7	12	27.3	141	8,9	1.59	40	88	5,6
3	45	2	9	15*	23.7	155	9,8	1.51	38	97	6,1
3,33	50	2	10	16*	22.2	163	10,3	1.48	38	102	6,4

Spinner nozzles: 5/32" (3.97 mm)

Span: 5" x 199 ft. (127 mm x 60.63 m.) Tires: 11.2 x 24" Standard tire
Gearbox: Slow speed Overhang: 74 ft. (22.6 m.)

Pressure (bars)	Pressure (psi)	Application Variation Best	10%	20%	Flat ground Rotation time (hours)	System Flow + GPM	l./sec.	Application Depth in.	mm.	End Gun Flow # GPM	l./sec.
		Slope Ratings (%)									
2	30	2	7	11	30.3	155	9,8	1.93	49	97	6,1
2,5	37.5	2	8	14	25.9	173	10,9	1.84	47	108	6,8
3	45	2	10	17*	22.6	187	11,8	1.73	44	117	7,4
3,33	50	2	11*	19*	21.1	199	12,6	1.72	44	124	7,8

Spinner nozzles: 11/64" (4.37 mm)

Span: 5" x 199 ft. (127 mm x 60.63 m.) Tires: 11.2 x 24" Standard tire
Gearbox: Slow speed Overhang: 74 ft. (22.6 m.)

Pressure (bars)	Pressure (psi)	Application Variation Best	10%	20%	Flat ground Rotation time (hours)	System Flow + GPM	l./sec.	Application Depth in.	mm.	End Gun Flow # GPM	l./sec.
		Slope Ratings (%)									
2	30	2	8	13	28.5	183	11,5	2.14	54	114	7,2
2,5	37.5	2	10	16*	24.6	205	12,9	2.07	53	128	8,1
3	45	2	12	20*	21.5	226	14,3	2.00	51	142	8,9
3,33	50	2	13	22*	20.2	238	15,0	1.97	50	149	9,4

Spinner nozzles: 3/16" (4.76 mm)

Span: 5" x 199 ft. (127 mm x 60.63 m.) Tires: 11.2 x 24" Standard tire
Gearbox: Gearbox Slow speed Overhang: 74 ft. (22.6 m.)

Pressure (bars)	Pressure (psi)	Application Variation Best	10%	20%	Flat ground Rotation time (hours)	System Flow + GPM	l./sec.	Application Depth in.	mm.	End Gun Flow # GPM	l./sec.
		Slope Ratings (%)									
2	30	2	9	15*	26.9	215	13,6	2.37	60	134	8,5
2,5	37.5	2	11	19*	23.4	242	15,3	2.33	59	151	9,6
3	45	2	14	24*	20.6	266	16,8	2.25	57	166	10,5
3,33	50	2	15*	26*	19.3	278	17,5	2.20	56	174	11,0

OPERATION

Performance Charts (continued)

Table 5

Spinner Performance Charts
5" x 199 ft. (127 mm. X 60.63 m.) span, 74 ft. (22.6 m.)OH,
11.2 x 24" tires, High speed (7.5:1 gearbox)

Spinner nozzles: 9/64" (3.57 mm)

Span: 5" x 199 ft. (127 mm x 60.63 m.) Tires: 11.2 x 24" Standard tire
Gearbox: Standard speed Overhang: 74 ft. (22.6 m.)

Pressure (bars)	Pressure (psi)	Application Variation Best (Slope Ratings %)	10% (Slope Ratings %)	20% (Slope Ratings %)	Flat ground Rotation time (hours)	System Flow + GPM	System Flow + l./sec.	Application Depth in.	Application Depth mm.	End Gun Flow # GPM	End Gun Flow # l./sec.
2	30	2	3	5	15.4	127	8,0	0.81	21	79	5,0
2,5	37.5	2	4	6	12	141	8,9	0.70	18	88	5,6
3	45	2	5	7	9.8	155	9,8	0.63	16	97	6,1
3,33	50	2	5	7	9	163	10,3	0.60	15	102	6,4

Spinner nozzles: 5/32" (3.97 mm)

Span: 5" x 199 ft. (127 mm x 60.63 m.) Tires: 11.2 x 24" Standard tire
Gearbox: Standard speed Overhang: 74 ft. (22.6 m.)

Pressure (bars)	Pressure (psi)	Application Variation Best (Slope Ratings %)	10% (Slope Ratings %)	20% (Slope Ratings %)	Flat ground Rotation time (hours)	System Flow + GPM	System Flow + l./sec.	Application Depth in.	Application Depth mm.	End Gun Flow # GPM	End Gun Flow # l./sec.
2	30	2	4	5	13.7	155	9,8	0.87	22	97	6,1
2,5	37.5	2	4	6	10.9	173	10,9	0.77	20	108	6,8
3	45	2	5	8	9	187	11,8	0.69	18	117	7,4
3,33	50	2	6	8	8.3	199	12,6	0.68	17	124	7,8

Spinner nozzles: 11/64" (4.37 mm)

Span: 5" x 199 ft. (127 mm x 60.63 m.) Tires: 11.2 x 24" Standard tire
Gearbox: Standard speed Overhang: 74 ft. (22.6 m.)

Pressure (bars)	Pressure (psi)	Application Variation Best (Slope Ratings %)	10% (Slope Ratings %)	20% (Slope Ratings %)	Flat ground Rotation time (hours)	System Flow + GPM	System Flow + l./sec.	Application Depth in.	Application Depth mm.	End Gun Flow # GPM	End Gun Flow # l./sec.
2	30	2	4	6	12.4	183	11,5	0.93	24	114	7,2
2,5	37.5	2	5	7	10	205	12,9	0.84	21	128	8,1
3	45	2	6	9	8.4	226	14,3	0.78	20	142	8,9
3,33	50	2	6	10	7.7	238	15,0	0.76	19	149	9,4

Spinner nozzles: 3/16" (4.76 mm)

Span: 5" x 199 ft. (127 mm x 60.63 m.) Tires: 11.2 x 24" Standard tire
Gearbox: Standard speed Overhang: 74 ft. (22.6 m.)

Pressure (bars)	Pressure (psi)	Application Variation Best (Slope Ratings %)	10% (Slope Ratings %)	20% (Slope Ratings %)	Flat ground Rotation time (hours)	System Flow + GPM	System Flow + l./sec.	Application Depth in.	Application Depth mm.	End Gun Flow # GPM	End Gun Flow # l./sec.
2	30	2	5	7	11.2	215	13,6	0.99	25	134	8,5
2,5	37.5	2	6	8	9.2	242	15,3	0.92	23	151	9,6
3	45	2	7	10	7.8	266	16,8	0.85	22	166	10,5
3,33	50	2	7	11	7.2	278	17,5	0.82	21	174	11,0

Table 6

Spinner Performance Charts
6 5/8" x 199 ft. (168 mm. X 60.63 m.) span, 82 ft. (25 m.)OH,
11.2 x 24" tires, High speed (7.5:1 gearbox)

Spinner nozzles: 9/64" (3.57 mm)

Span: 6 5/8" x 199 ft. (168 mm x 60.63 m.) Tires: 11.2 x 24" Standard tire
Gearbox: Standard speed Overhang: 82 ft. (25 m.)

Pressure (bars)	Pressure (psi)	Application Variation Best (Slope Ratings %)	10% (Slope Ratings %)	20% (Slope Ratings %)	Flat ground Rotation time (hours)	System Flow + GPM	System Flow + l./sec.	Application Depth in.	Application Depth mm.	End Gun Flow # GPM	End Gun Flow # l./sec.
2	30	0	0	0	18.9	135	8,5	0.99	25	82	5,1
2,5	37.5	0	0	0	13.9	149	9,4	0.80	20	90	5,7
3	45	0	0	0	10.9	164	10,3	0.70	18	99	6,3
3,33	50	0	0	0	9.9	173	10,9	0.66	17	104	6,6

Spinner nozzles: 5/32" (3.97 mm)

Span: 6 5/8" x 199 ft. (168 mm x 60.63 m.) Tires: 11.2 x 24" Standard tire
Gearbox: Standard speed Overhang: 82 ft. (25 m.)

Pressure (bars)	Pressure (psi)	Application Variation Best (Slope Ratings %)	10% (Slope Ratings %)	20% (Slope Ratings %)	Flat ground Rotation time (hours)	System Flow + GPM	System Flow + l./sec.	Application Depth in.	Application Depth mm.	End Gun Flow # GPM	End Gun Flow # l./sec.
2	30	0	0	0	16.1	164	10,3	1.03	26	99	6,3
2,5	37.5	0	0	0	12.2	183	11,5	0.87	22	111	7,0
3	45	0	0	0	9.9	198	12,5	0.76	19	120	7,6
3,33	50	0	0	0	9	210	13,2	0.73	19	127	8,0

Spinner nozzles: 11/64" (4.37 mm)

Span: 6 5/8" x 199 ft. (168 mm x 60.63 m.) Tires: 11.2 x 24" Standard tire
Gearbox: Standard speed Overhang: 82 ft. (25 m.)

Pressure (bars)	Pressure (psi)	Application Variation Best (Slope Ratings %)	10% (Slope Ratings %)	20% (Slope Ratings %)	Flat ground Rotation time (hours)	System Flow + GPM	System Flow + l./sec.	Application Depth in.	Application Depth mm.	End Gun Flow # GPM	End Gun Flow # l./sec.
2	30	0	0	0	14.1	194	12,2	1.06	27	117	7,4
2,5	37.5	0	0	0	11	217	13,7	0.92	23	131	8,3
3	45	0	0	1	9	240	15,1	0.84	21	145	9,2
3,33	50	0	0	2	8.2	253	16,0	0.81	21	153	9,6

Spinner nozzles: 3/16" (4.76 mm)

Span: 6 5/8" x 199 ft. (168 mm x 60.63 m.) Tires: 11.2 x 24" Standard tire
Gearbox: Standard speed Overhang: 82 ft. (25 m.)

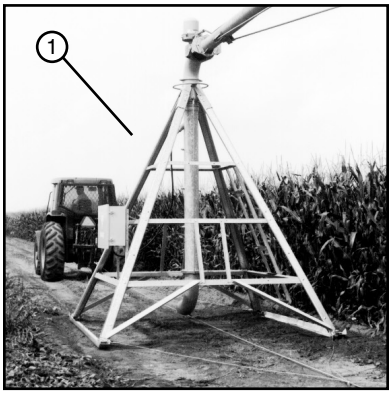
Pressure (bars)	Pressure (psi)	Application Variation Best (Slope Ratings %)	10% (Slope Ratings %)	20% (Slope Ratings %)	Flat ground Rotation time (hours)	System Flow + GPM	System Flow + l./sec.	Application Depth in.	Application Depth mm.	End Gun Flow # GPM	End Gun Flow # l./sec.
2	30	0	0	0	12.5	227	14,3	1.10	28	138	8,7
2,5	37.5	0	0	0	9.9	257	16,2	0.99	25	155	9,8
3	45	0	0	2	8.3	282	17,8	0.90	23	171	10,8
3,33	50	0	0	3	7.6	295	18,6	0.87	22	178	11,2

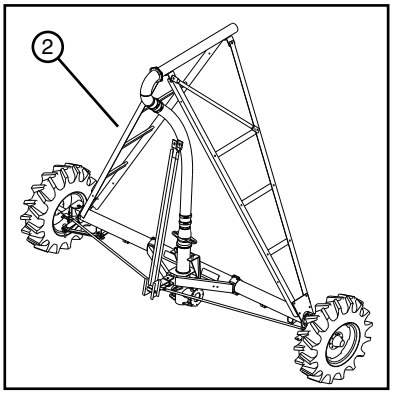
Towable Pivots

There are four towable pivot options for 8000 and 8120 series spans. The 7000 series spans are not towable. See figure 25-1.

- Skid Tow Pivot
- 2 Wheel EZ-Tow Pivot
- 4 Wheel EZ-Tow Pivot With Fixed Wheels Option
- 4 Wheel EZ-Tow Pivot With Swivel Wheel Option

See the TOWING section for drive unit preparation, towable pivot preparation and towing procedures.





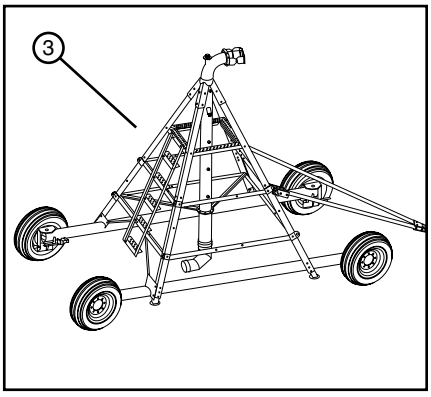


Figure 25-1 1. SKID TOW PIVOT 2. 2 WHEEL EZ-TOW PIVOT 3. 4 WHEEL EZ-TOW PIVOT

OPERATION

Towing Option
Towable Pivots

Towing Option
Preparing Drive Units for Towing

This topic provides instruction on the preparation of the drive units for towing.

REMEMBER: SAFETY FIRST – Operate according to the following procedures when towing and read all safety precautions in this manual.

1. Position the machine in the tow lane. See figure 27-1.

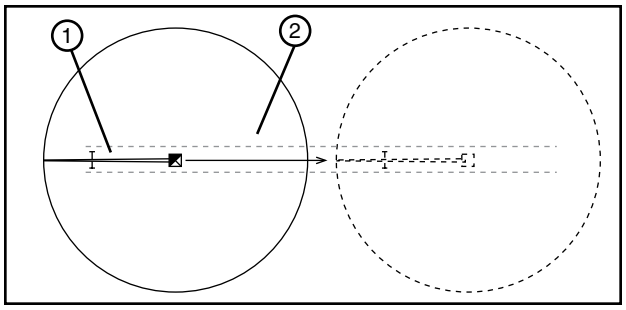


Figure 27-1 1. Machine
2. Tow Lane

NOTE

- **The tow lane should be flat and void of any crop rows.**
- **If towing on a side slope the machine may tend to shift down the hill due to gravitational pull.**
- **DO NOT tow across crop rows, ditches or rough terrain.**

⚠ WARNING

- **NEVER ATTEMPT TO LIFT THE ENTIRE DRIVE UNIT AT ONE TIME.**
- **IF THE JACK BEGINS TO SLIP OR MOVE OUT OF POSITION, STOP RAISING THE DRIVE UNIT IMMEDIATELY, LOWER THE DRIVE UNIT AND REPOSITION THE JACK.**

NOTE

- **Position the jack so it will not interfere with the rotation of the tire, wheel gear box, gear box mount or gear box mount hardware.**

2. The wheels on each drive unit must be turned into the tow position. Use a jack to lift one side of the drive unit until the tire is off of the ground. See figure 27-2.

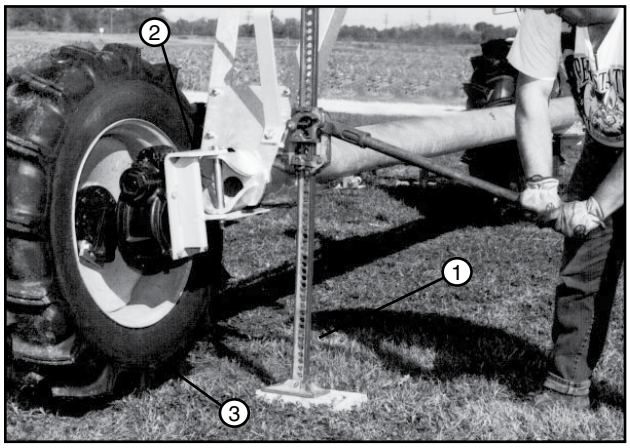


Figure 27-2 1. Jack
2. Drive Unit
3. Tire

Towing Option
Preparing Drive Units for Towing (Continued)

3. Loosen the clamps securing u-joint shields in position. Slide all four u-joint shields away from the gearboxes.
4. Remove lynch pin from retainer clip, then open retainer clip and pull the torque pin from axle torque arm behind gearbox hub and hub torque pin receiver. See figure 28-1.
5. Using a pry bar, push down on the gearbox mount steering arm to release it from the latch plate while pushing the tire toward the tow position until steering arm is out of latch plate. See figure 28-2.
6. Push the tire toward the tow position while supporting the drive shaft and using a small pry bar to separate the drive shaft u-joint half from the flex joint and wheel gearbox u-joint half.

   After separating the u-joint, place the loose end of drive shaft in the drive shaft keeper. See figure 28-3.

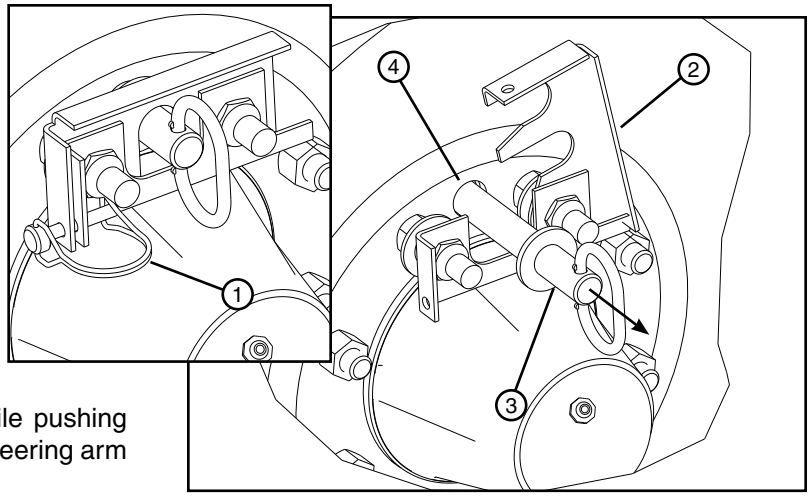


Figure 28-1 1. Lynch Pin 3. Torque Pin
2. Retainer Clip 4. Hub Torque Pin Receiver

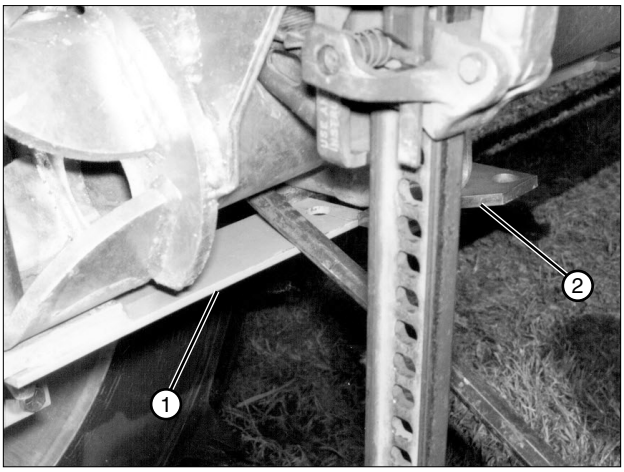


Figure 28-2 1. Steering Arm
2. Latch Plate

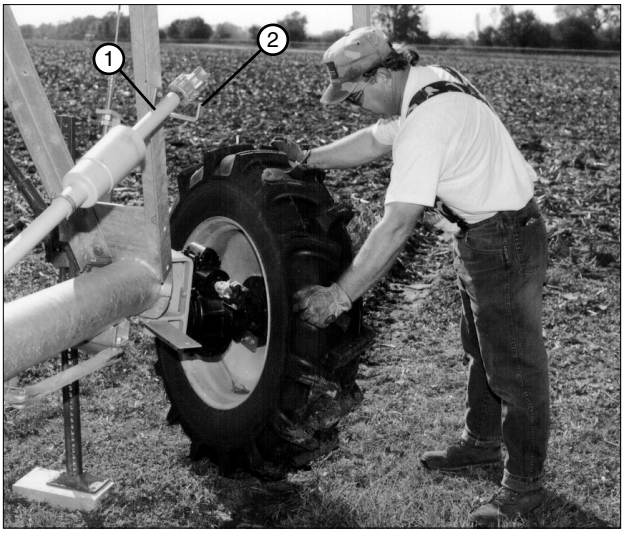


Figure 28-3 1. Drive Shaft
2. Drive Shaft Keeper

Preparing Drive Units for Towing (Continued)

8. Lift the carrier spring and release the tow link bar from the tow link carrier. See figure 29-1.
9. Position steering arm in tow link bar yoke, align holes, then attach steering arm to tow link bar with torque pin. Secure torque pin with lynch pin. See figure 29-2.
10. Lower the drive unit and remove the jack. The tire is now in the tow position. See figure 29-3.
11. Repeat steps 3-10 for all other drive unit tires.

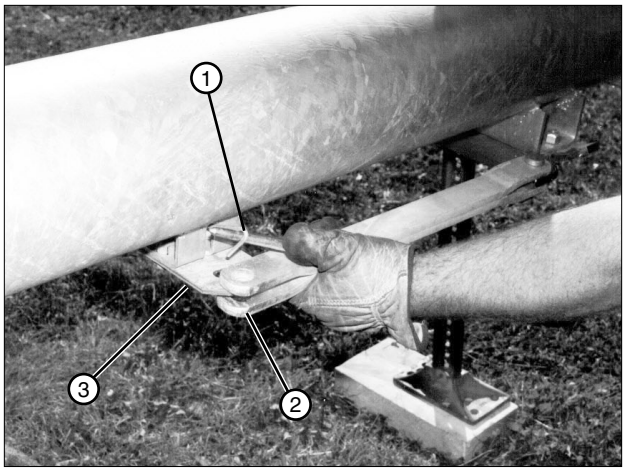


Figure 29-1 1. Carrier Spring 3. Tow Link Carrier
2. Tow Link Bar

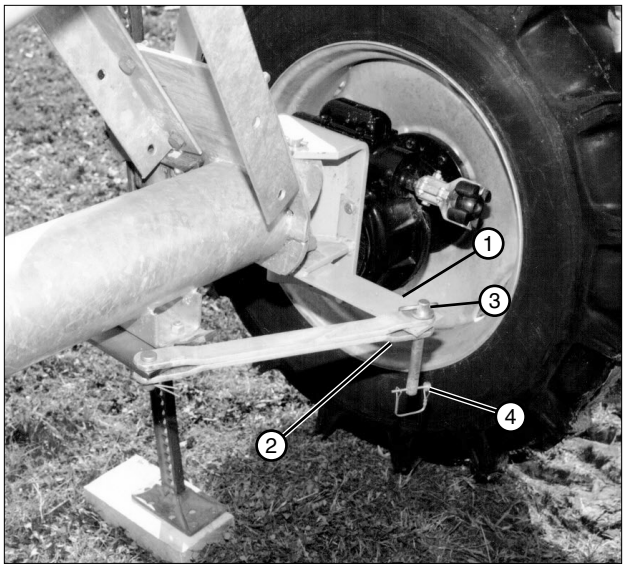


Figure 29-2 1. Steering Arm 3. Torque Pin
2. Tow Link Bar Yoke 4. Lynch Pin

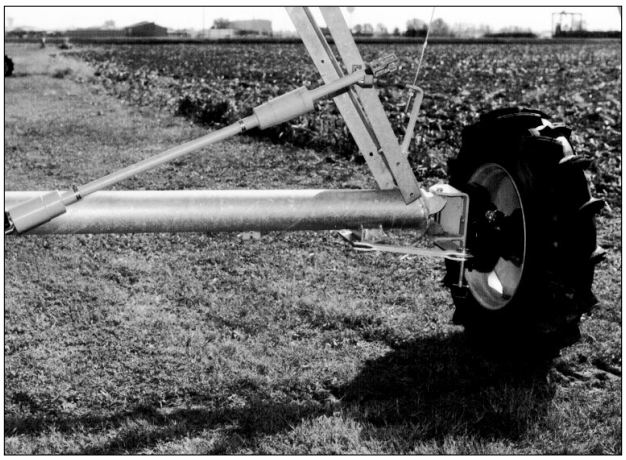


Figure 29-3 TOWING POSITION SHOWN

Towing Option
Preparing Drive Units for Operation

This topic provides instruction on the preparation of the drive units for operation after towing.

REMEMBER: SAFETY FIRST – Operate according to the following procedures when towing and read all safety precautions in this manual.

1. Position the machine in the tow lane. See figure 30-1.

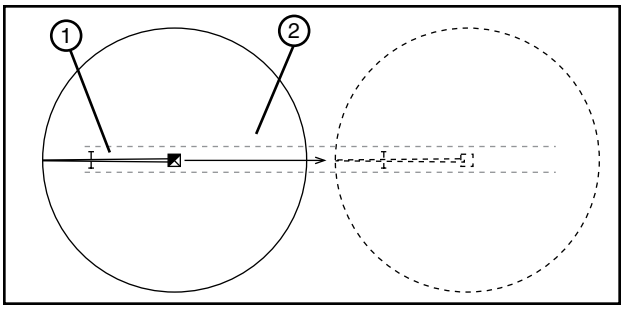


Figure 30-1 1. Machine
2. Tow Lane

NOTE

- **The tow lane should be flat and void of any crop rows.**
- **If towing on a side slope the machine may tend to shift down the hill due to gravitational pull.**
- **DO NOT tow across crop rows, ditches or rough terrain.**

⚠ WARNING

- **NEVER ATTEMPT TO LIFT THE ENTIRE DRIVE UNIT AT ONE TIME.**
- **IF THE JACK BEGINS TO SLIP OR MOVE OUT OF POSITION, STOP RAISING THE DRIVE UNIT IMMEDIATELY, LOWER THE DRIVE UNIT AND REPOSITION THE JACK.**

2. The wheels on each drive unit must be turned into the operating position. Use a jack to lift one side of the drive unit until the tire is off of the ground. See figure 30-2.
3. Remove lynch pin from torque pin, then remove torque pin and disconnect tow link bar from steering arm. See Figure 30-2.

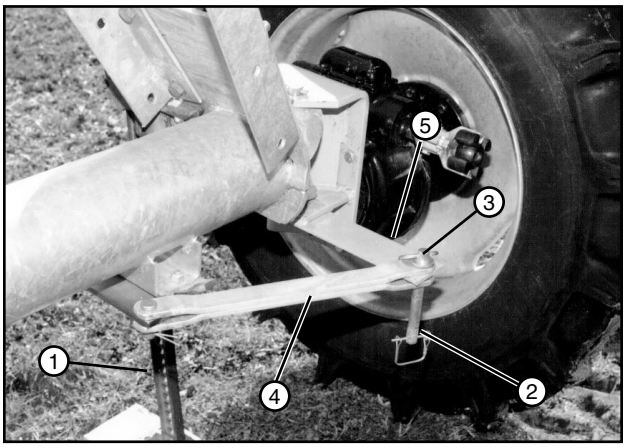


Figure 30-2 1. Jack
2. Lynch Pin
3. Torque Pin
4. Tow Link Bar
5. Steering Arm

NOTE

- **Position the jack so it will not interfere with the rotation of the tire, wheel gear box, gear box mount or gear box mount hardware.**

Preparing Machine for Operation (continued)

4. Rotate tow link bar into the tow link carrier until the carrier spring latches into the hole in tow link bar. See Figure 31-1.
5. Push the tire toward the operating position while aligning the drive shaft u-joint half and flex joint chamfered corners with the wheel gearbox u-joint half. See figure 31-2.

   Continue pushing the tire toward the operating position with enough force to push the gearbox u-joint half over the flex joint and latch the steering arm in the latch plate. See figure 31-2.
6. Make sure the steering arm is latched in the latch plate. See Figure 31-3.

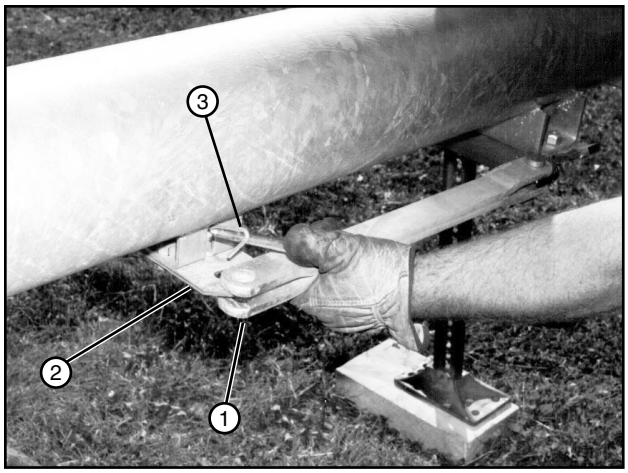


Figure 31-1 1. Tow Link Bar
2. Tow Link Carrier
3. Carrier Spring

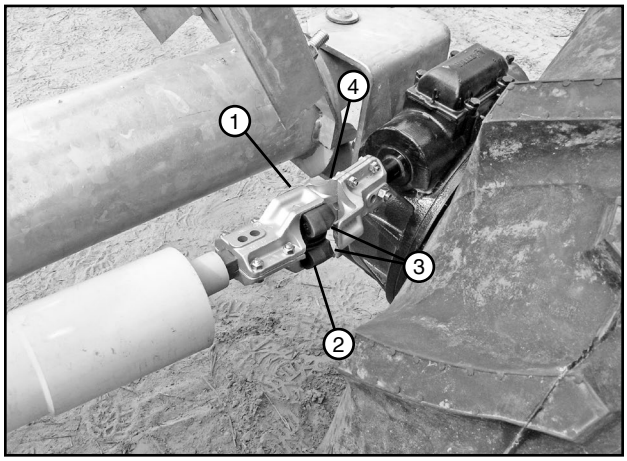


Figure 31-2 1. Drive Shaft U-Joint Half
2. Flex Joint
3. Chamfered Corner
4. Gear Box U-Joint Half

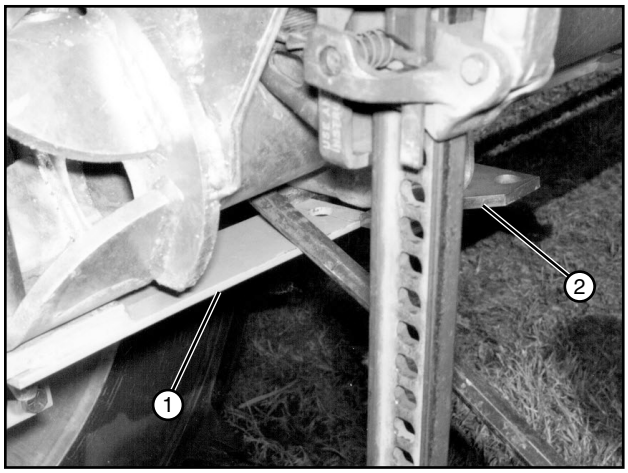


Figure 31-3 1. Steering Arm
2. Latch Plate

Towing Option
Preparing Machine for Operation (continued)

7. Slide the U-joint shield over the U-joint and position approximately 1/4 in (6.3 mm) away from touching the gearbox. Secure the U-joint shield to the drive shaft shield with a clamp. See figure 32-1.

   Repeat the procedure for all U-joint shields.

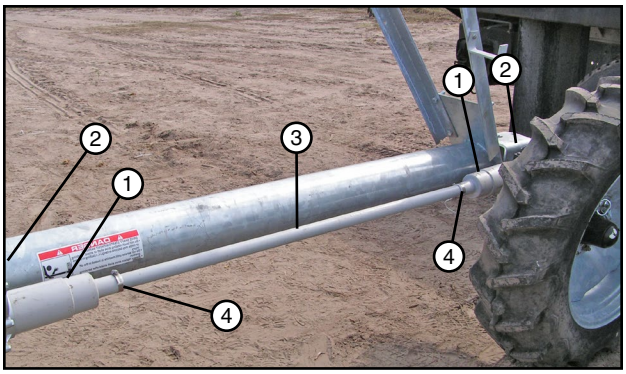


Figure 32-1 Operation Position
1. U-Joint Shield
2. Gearbox
3. Drive Shaft Shield
4. Clamp

NOTE

•If the drive unit towers are out of line after towing, move the drive unit towers into line with a tractor before installing torque pins in wheel hubs.

8. Rotate the tire until the hole in the hub torque pin receiver is aligned with the hole in the axle torque arm. Install the torque pin and close the retainer plate. Secure the retainer plate to the retainer clip with the lynch pin. See figure 32-2.
9. Lower the drive unit and remove the jack. The tire is now in the OPERATING position. See figure 32-3.
10. Repeat steps 4-10 for all other drive unit tires.

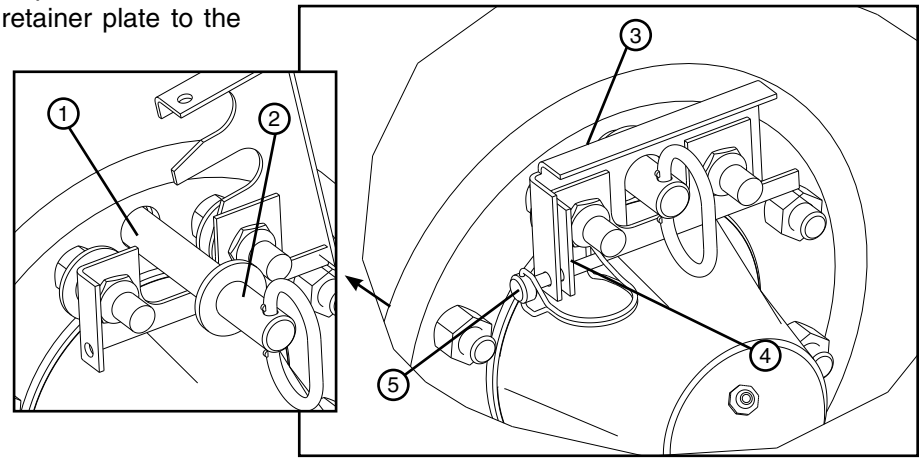


Figure 32-2 1. Hub Torque Pin Receiver 4. Retainer Clip
2. Torque Pin 5. Lynch Pin
3. Retainer Plate

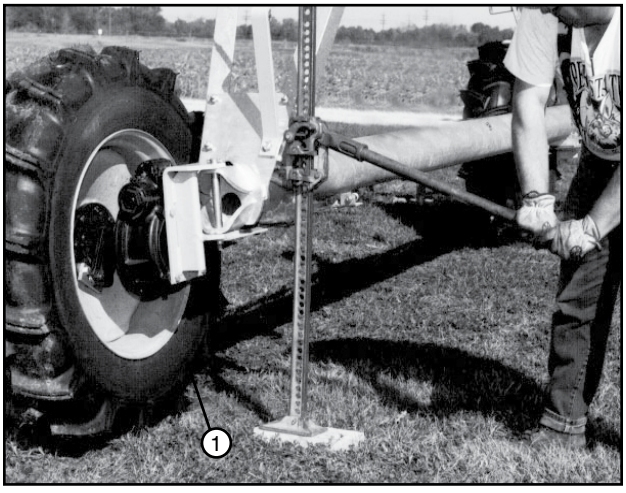


Figure 32-3 1. Tire Shown In Operating Position

Towing the Skid Tow Pivot

This topic provides instruction on the preparation and towing of the skid tow pivot.

REMEMBER: SAFETY FIRST - Operate according to the following procedures when towing and read all safety information in this manual.

1. Position the machine in the tow lane. See figure 33-1.
2. Disconnect the water supply line from lower riser. See figure 33-2.
3. Remove anchor chains securing skid pivot to pivot pad. See figure 33-2.

NOTE

- **It is recommended that the skid pivot be equipped with a pivot flex to reduce stress between the pivot and the span while towing.**

4. Make sure that the skid pivot is equipped with tow braces See figure 33-3.

⚠ WARNING

- **PIVOT TOW BRACES ARE CRITICAL TO PIVOT TOWING STRENGTH.**
- **TO REDUCE THE POSSIBILITY OF STRUCTURAL DAMAGE, TOW THE SKID PIVOT ONLY WHEN PIVOT IS EQUIPPED WITH TOW BRACES.**

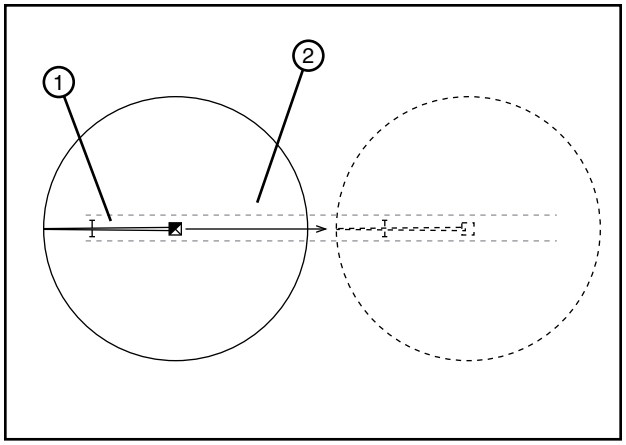


Figure 33-1 1. Machine
2. Tow Lane

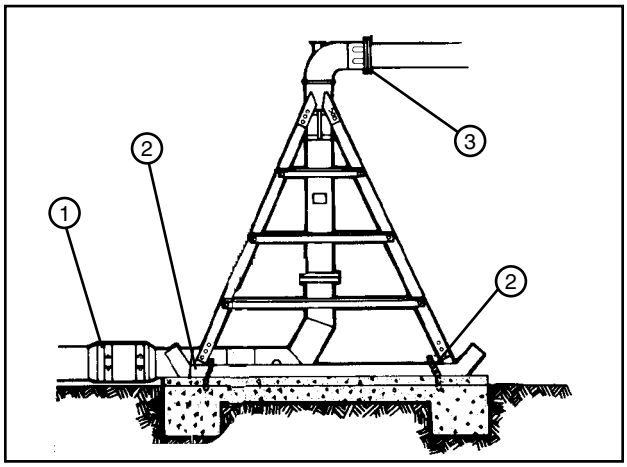


Figure 33-2 1. Water Supply Line 3. Pivot Flex
2. Anchor Chain

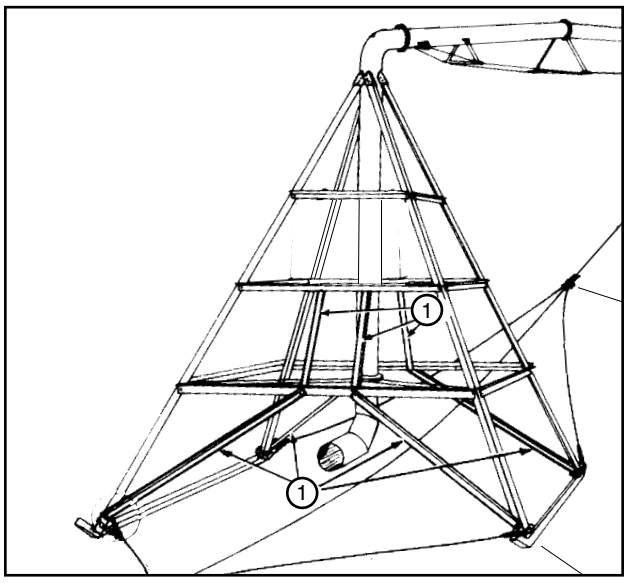


Figure 33-3 1. Tow Brace

OPERATION

Towing Option
Towing The Skid Tow Pivot (Continued)
Attaching Forward Tow Cable

5. Install the tow cable attachment bracket on the span pipe above the drive unit. See figure 34-1.
6. On one end of 1/2 in (12.7 mm) tow cable, extend 2 ft (610 mm) of cable through one of the eye bolts on turnbuckle, then clamp tow cable together with three 1/2 in (12.7 mm) cable clamps. See figure 34-1.
7. Bolt the other eye bolt on turnbuckle to the tow cable attachment bracket. See figure 34-1.
8. On the other end of 1/2 in (12.7 mm) tow cable, extend 2 ft (610 mm) of cable through a clevis and clamp with three 1/2 in (12.7 mm) cable clamps. See figure 34-1.
9. Wrap chains around the bottom of each pivot leg, then bolt a pivot trail cable to each chain. See figure 34-1
10. Attach trail cables to tow cable with 1/2 in (12.7 mm) cable clamps.
    - Adjust the leading trail cables on the tow cable, so that while towing, the leading ends of pivot skids raise approximately 4 in (102 mm) to prevent the skids from digging into the ground. See figure 34-1.
    - Adjust the trailing trail cables on the tow cable, so that while towing, the trail cables are taught. This will reduce the wallowing action of the skid pivot. See figure 34-1.

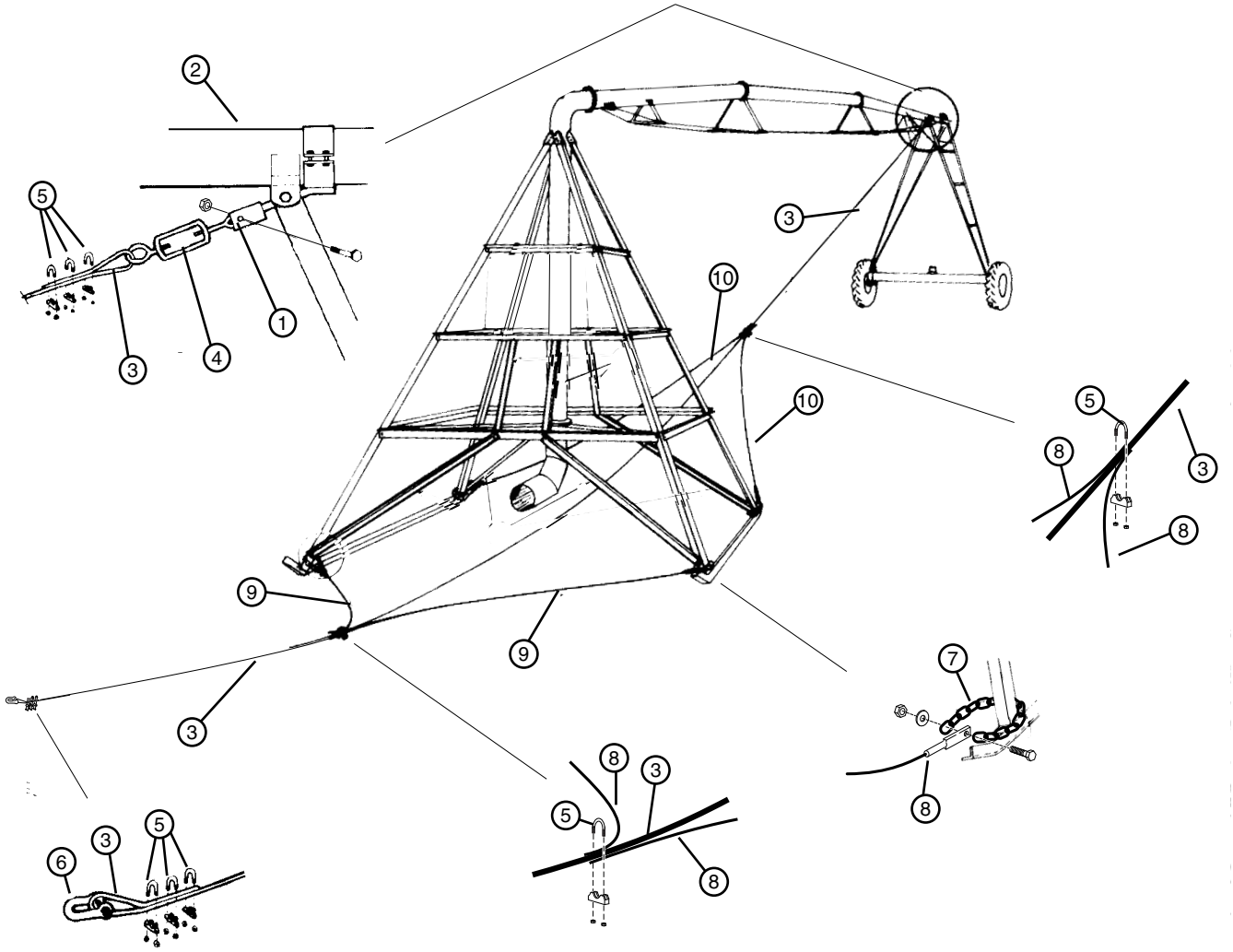


Figure 34-1
1. Tow Cable Attachment Bracket
2. Span Pipe
3. 1/2 in (12.7 mm) Tow Cable
4. Turnbuckle
5. 1/2 in Cable Clamp
6. Clevis
7. Chain
8. Trail Cable
9. Leading Trail Cable
10. Trailing Trail Cable

Towing The Skid Tow Pivot (Continued)

11. After the pivot and drive unit have been prepared for towing, connect the tow cable to the towing unit with the tow cable clevis. See figure 35-1.

⚠ CAUTION

- **TO REDUCE THE POSSIBILITY OF STRUCTURAL DAMAGE:**
- **IF TOWING ON A SIDE SLOPE THE MACHINE MAY TEND TO SHIFT DOWN THE HILL DUE TO GRAVITATIONAL PULL.**
- **DO NOT TOW ACROSS CROP ROWS, DITCHES OR ROUGH TERRAIN.**
- **DO NOT JERK THE MACHINE AT ANYTIME WHILE TOWING.**
- **DO NOT TOW THE MACHINE MORE THAN 2 MILES PER HOUR MAXIMUM.**
- **ALWAYS TOW THE MACHINE IN A STRAIGHT LINE.**
- **NEVER ATTEMPT TO TURN THE MACHINE WHEN TOWING.**
- **NEVER ATTEMPT REVERSING OR BACKING THE MACHINE INTO POSITION.**

12. Begin towing the machine in a slow, gradual manner.
13. Align the pivot legs with the anchor locations as the pivot approaches the pivot pad.

    NEVER attempt reversing or backing the machine into position.
14. Disconnect the tow cable, trailing cables and chains from the skid pivot and towing unit.
15. Secure skid pivot to pivot pad with anchor chains. See figure 35-2.
16. Connect the water supply line to the lower riser. See figure 35-2.
17. Prepare the drive unit for operation. See Preparing Drive Unit For Operating in the Towing Section.

Figure 35-1

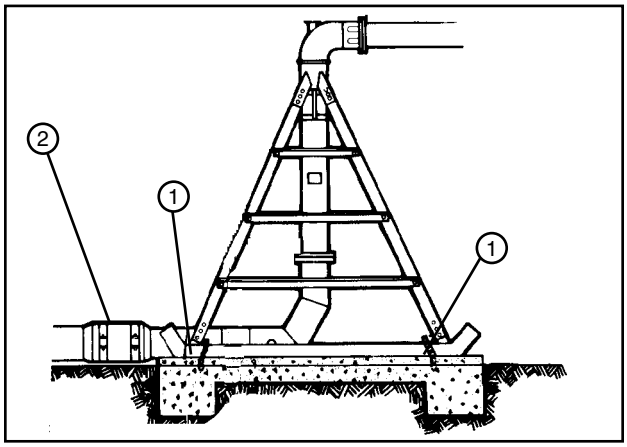


Figure 35-2 1. Anchor Chain
2. Water Supply Line

OPERATION

Towing Option

Towing the 2 Wheel EZ-Tow Pivot

This topic provides instruction on the preparation and towing of the 2 wheel EZ-Tow pivot.

REMEMBER: SAFETY FIRST - Operate according to the following procedures when towing and read all safety information in this manual.

1. Position the machine in the tow lane. See figure 37-1.
2. Disconnect the water supply line from riser pipe. See figure 37-2.
3. Release and lower the tongue.
4. Remove lynch pin from each torque pin, then remove each torque pin and disconnect the tow link bars from the gearbox mount steering arms. Install each torque pin back in the steering arm hole and secure with lynch pin. See figure 37-3.

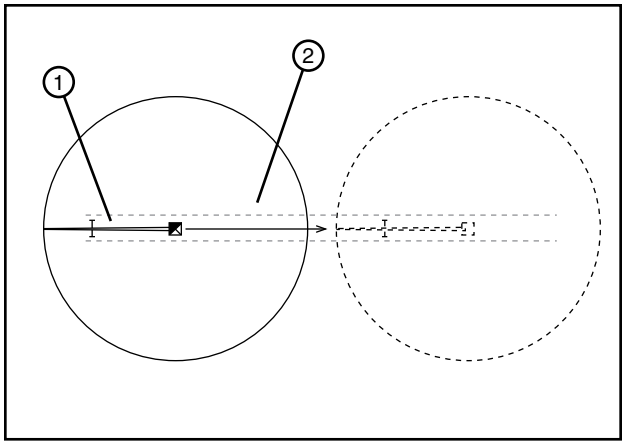


Figure 37-1 1. Machine
2. Tow Lane

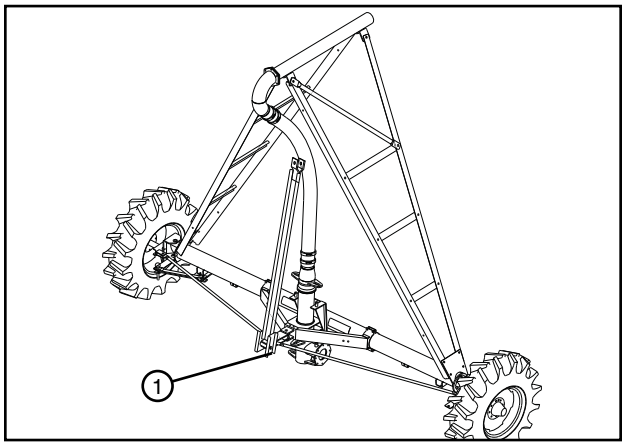


Figure 37-2 1. Riser Pipe

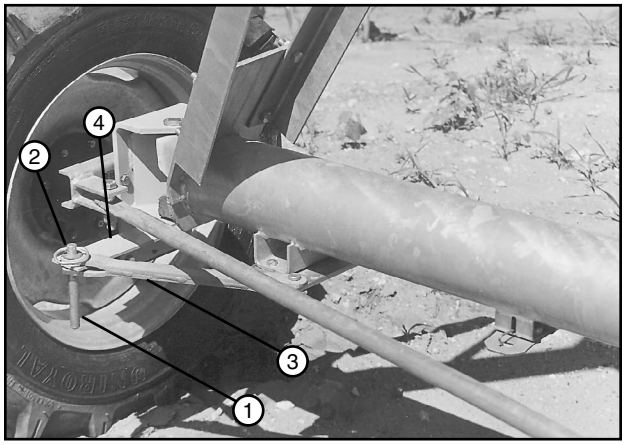


Figure 37-3 1. Lynch Pin
2. Torque Pin
3. Tow Link bar
4. Steering Arm

Towing Option
Towing the 2 Wheel EZ-Tow Pivot (Continued)

5. Rotate each tow link bar into the tow link carrier until the carrier spring latches into the hole in tow link bar. See figure 38-1.
6. Attach the tongue to the towing unit. See figure 38-2.
7. Use the winch to raise the riser pipe out of the anchor pipe. I may be necessary to pry the riser from the anchor pipe. See figure 38-3.

   When the riser clears the anchor pipe, raise the riser pipe to the tow position.
8. Prepare the drive units for towing. See Preparing Drive Unit For Towing in the Towing Section.
9. After the pivot and drive units have been prepared for towing, begin towing the machine in a slow, gradual manner.

   DO NOT jerk the center pivot at any point during towing.

   CAUTION: The wheel tracks of the tow path must not exceed 6 in depth.

⚠ CAUTION

- **TO REDUCE THE POSSIBILITY OF STRUCTURAL DAMAGE:**
- **IF TOWING ON A SIDE SLOPE THE MACHINE MAY TEND TO SHIFT DOWN THE HILL DUE TO GRAVITATIONAL PULL.**
- **DO NOT TOW ACROSS CROP ROWS, DITCHES OR ROUGH TERRAIN.**
- **DO NOT JERK THE MACHINE AT ANYTIME WHILE TOWING.**
- **DO NOT TOW THE MACHINE MORE THAN 2 MILES PER HOUR MAXIMUM.**
- **ALWAYS TOW THE MACHINE IN A STRAIGHT LINE.**
- **NEVER ATTEMPT TO TURN THE MACHINE WHEN TOWING.**
- **NEVER ATTEMPT REVERSING OR BACKING THE MACHINE INTO POSITION.**

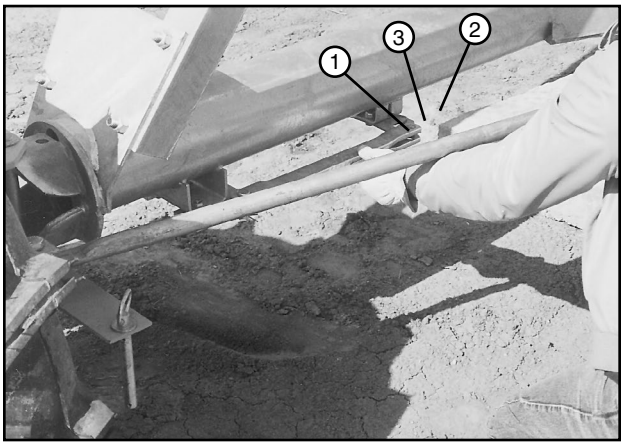


Figure 38-1 1. Tow Link Bar
2. Tow Link Carrier
3. Carrier Spring

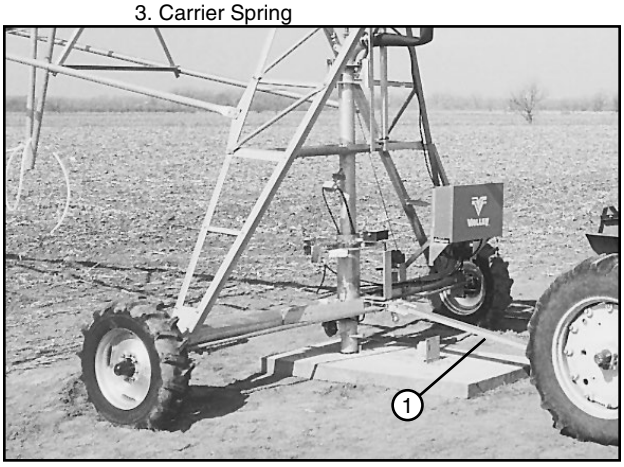


Figure 38-2 1. Tongue

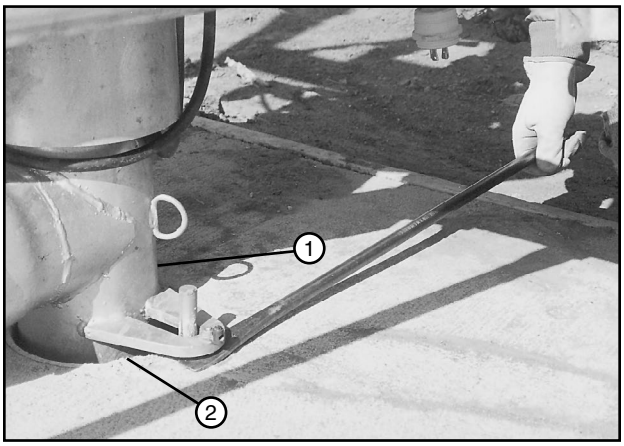


Figure 38-3 1. Riser Pipe
2. Anchor Pipe

Towing the 2 Wheel EZ-Tow Pivot (Continued)

10. Carefully align the riser pipe with the anchor pipe as the pivot approaches the pivot pad. Remember, you cannot back the center pivot up See figure 39-1.
11. Align and lower the riser pipe into the anchor pipe. Be sure the slotted ears on the riser pipe align with the studs in the pivot pad. In addition, the slotted ear on the Stop-In-Slot and End Gun Shutoff bracket must be positioned on the “T” bracket. See figure 39-2.
12. Disconnect the tongue from the towing unit.
13. Lift each carrier spring and release the tow link bar from the tow link carrier. Remove torque pin from each gearbox steering arm. See figure 39-3.

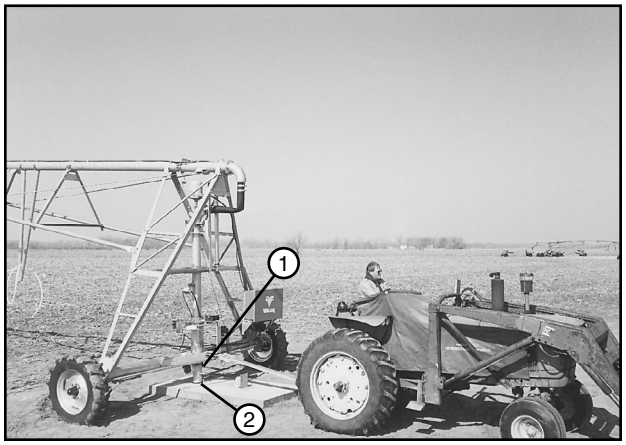


Figure 39-1 1. Riser Pipe
2. Anchor Pipe

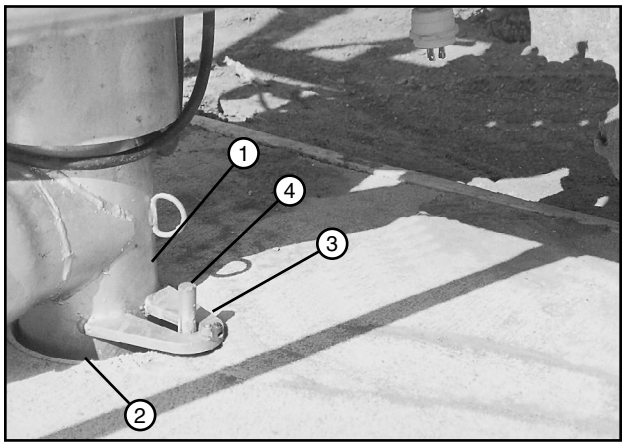


Figure 39-2 1. Riser Pipe
2. Anchor Pipe
3. Slotted Ear
4. Stud

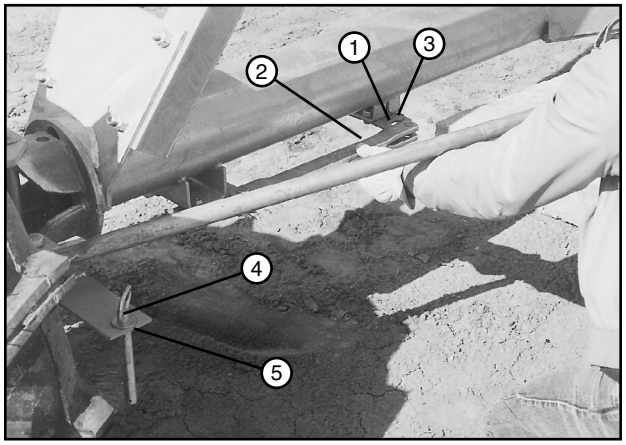


Figure 39-3 1. Carrier Spring
2. Tow Link
3. Tow Link Carrier
4. Torque Pin
5. Steering Arm

Towing Option
Towing the 2 Wheel EZ-Tow Pivot (Continued)

14. Position each steering arm in tow link bar yoke, align holes, then attach each steering arm to tow link bar with torque pin and secure with lynch pin. It may be necessary to move the tongue for proper alignment of the holes. See figure 40-1.
15. Secure tongue in the raised position.
16. Connect the water supply line to the lower riser. See figure 40-2.
17. Prepare the drive units for operation. See Preparing Drive Unit For Operation in the front of Towing Option section.

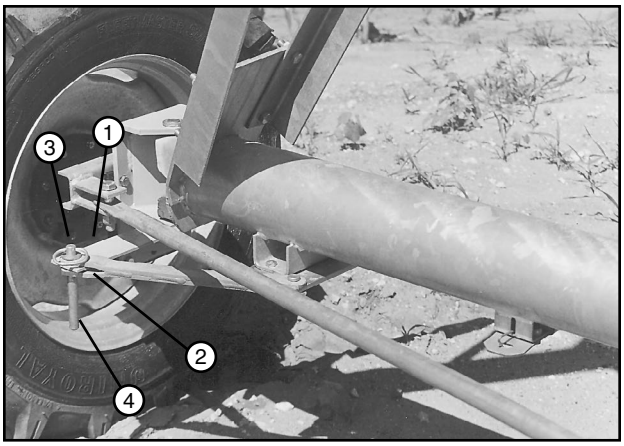


Figure 40-1 1. Steering Arm 3. Torque Pin
2. Tow Link Bar Yoke 4. Lynch Pin

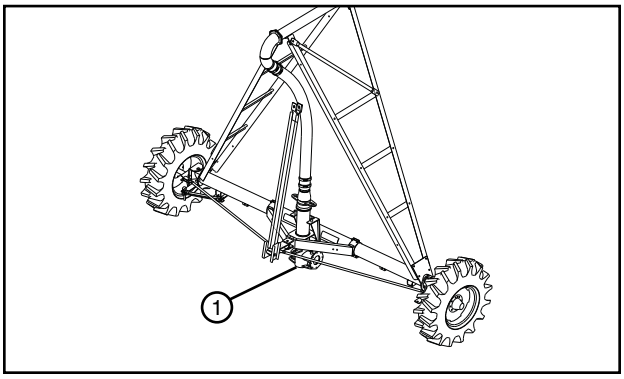


Figure 40-2 1. Riser Pipe

Towing the 4 Wheel EZ-Tow Pivot - Fixed Tire

This topic provides instruction on the preparation and towing of the 4 wheel EZ-Tow pivot with the standard fixed wheel option.

The standard fixed tire option allows the pivot to be towed in only two directions by moving the tongue 180 degrees from one side of the pivot to the other.

REMEMBER: SAFETY FIRST - Operate according to the following procedures when towing and read all safety information in this manual.

1. Position the machine in the tow lane. See figure 41-1.
2. Disconnect the water supply line from lower riser.
3. Prepare the drive units for towing. See Preparing Drive Unit For Towing in the front of Towing Option section.
4. Remove the load binders at each corner of the pivot. See figure 41-2.
5. If necessary, move the tongue to the side of pivot that faces the towing direction. See figure 41-3.

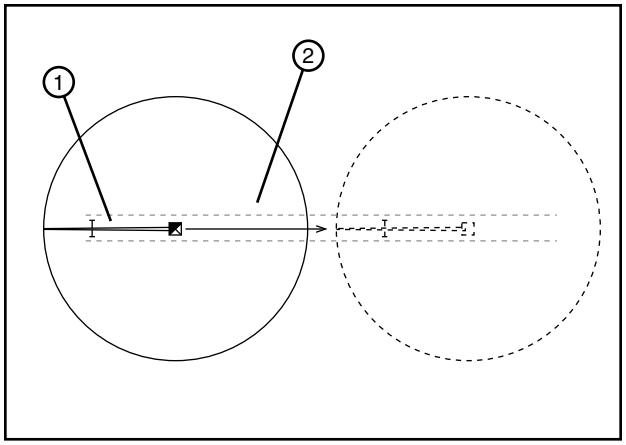


Figure 41-1 1. Machine
2. Tow Lane

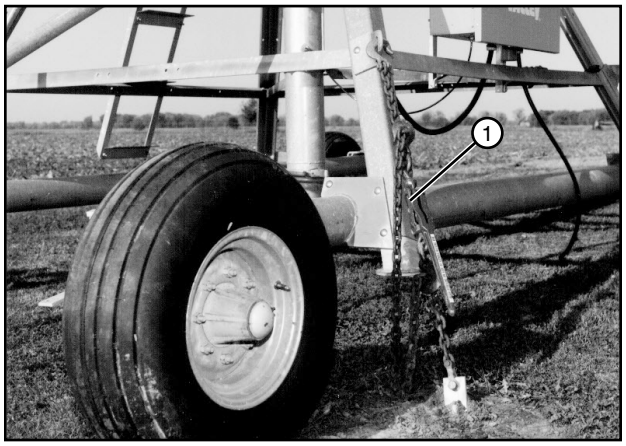


Figure 41-2 1. Load binder

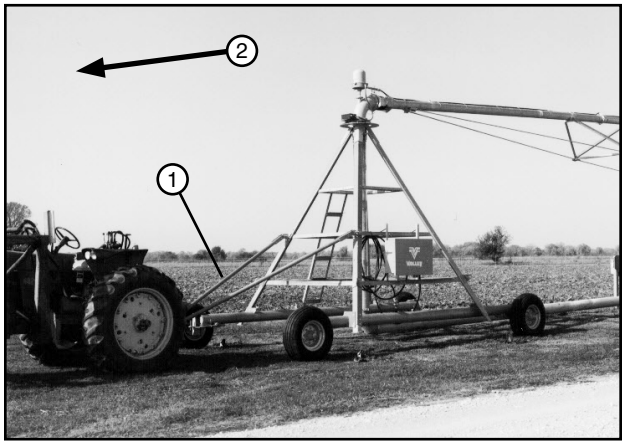


Figure 41-3 1. Tongue
2. Towing Direction

Towing Option
Towing the 4 Wheel EZ-Tow Pivot - Fixed Tire (Continued)

6. Hook tongue to the towing unit. See figure 42-1.
7. After the pivot and drive units have been prepared for towing, begin towing the machine in a slow, gradual manner.

   DO NOT jerk the center pivot at any point during towing.

   CAUTION: The wheel tracks of the tow path must not exceed 6 in depth.

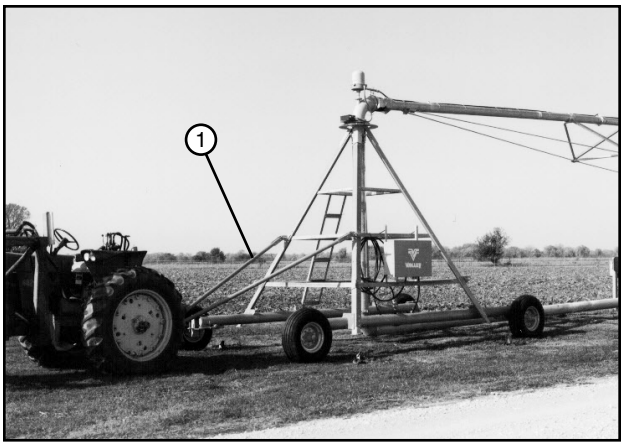


Figure 42-1 1. Tongue

⚠ CAUTION

TO REDUCE THE POSSIBILITY OF STRUCTURAL DAMAGE:

- **IF TOWING ON A SIDE SLOPE THE MACHINE MAY TEND TO SHIFT DOWN THE HILL DUE TO GRAVITATIONAL PULL.**
- **DO NOT TOW ACROSS CROP ROWS, DITCHES OR ROUGH TERRAIN.**
- **DO NOT JERK THE MACHINE AT ANYTIME WHILE TOWING.**
- **DO NOT TOW THE MACHINE MORE THAN 2 MILES PER HOUR MAXIMUM.**
- **ALWAYS TOW THE MACHINE IN A STRAIGHT LINE.**
- **NEVER ATTEMPT TO TURN THE MACHINE WHEN TOWING.**
- **NEVER ATTEMPT REVERSING OR BACKING THE MACHINE INTO POSITION.**

8. Align the pivot tires with the tire ruts and center point location as the pivot approaches the pivot pad.
9. Attach and tighten the load binders at each corner of the pivot. See figure 42-2.
10. Disconnect the tongue from towing unit.
11. Connect the water supply line to the lower riser.
12. Prepare the drive units for operation. See Preparing Drive Unit For Operation in the front of Towing Option section.

NOTE

- **The center point of the 4 wheel EZ-Tow pivot must be anchored in exactly the same position each time it is towed.**
- **To help position the pivot in exactly the same position each time it is towed, a small rut should be made for each of the tires to fall into. Installing cement ruts for the tires to fall into is recommended.**

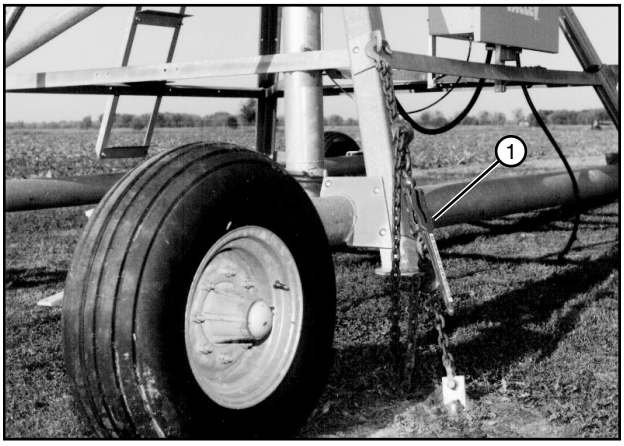


Figure 42-2 1. Load Binder

Towing the 4 Wheel EZ-Tow Pivot - Swivel Tire

This topic provides instruction on the preparation and towing of the 4 wheel EZ-Tow pivot with the swivel wheel option.

The swivel tire option allows the tires to be turned so the pivot can be rotated to any towing direction that is in line with the span.

REMEMBER: SAFETY FIRST - Operate according to the following procedures when towing and read all safety information in this manual.

1. Position the machine in the tow lane. See figure 43-1.
2. Disconnect the water supply line from lower riser.
3. Prepare the drive units for towing. See Preparing Drive Unit For Towing in the front of Towing Option section.
4. Remove the load binders at each corner of the pivot. See figure 43-2.
5. If the pivot wheels are in line with the span, move the tongue to the side of pivot that faces the towing direction. See figure 43-3. Then proceed to step 18 of these instructions.

   If the pivot wheels are not in line with the span continue with step 11 of these instructions.

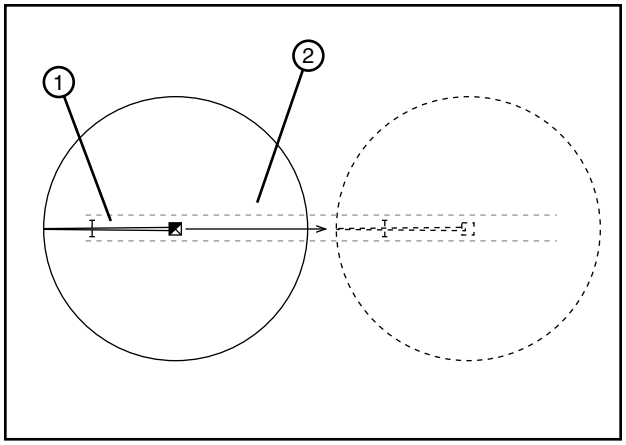


Figure 43-1 1. Machine
2. Tow Lane

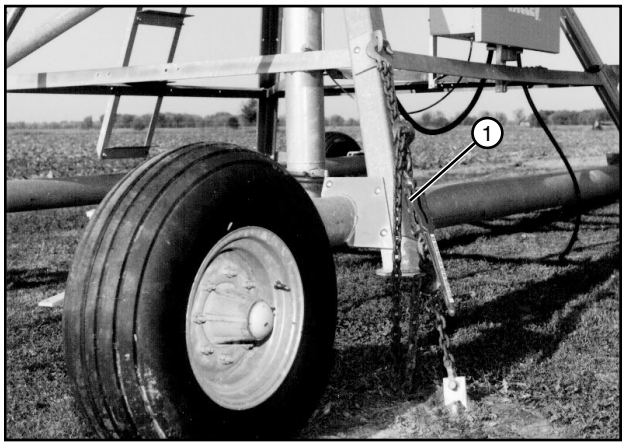


Figure 43-2 1. Load binder

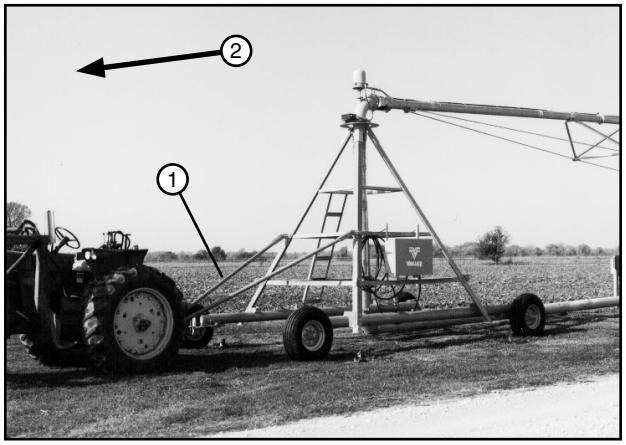


Figure 43-3 1. Tongue
2. Towing Direction

Towing Option
Towing the 4 Wheel EZ-Tow Pivot - Swivel Tire (Continued)

6. Remove hardware securing wheel in the tow position. See figure 44-1.
7. Insert a bar in the swivel tube and turn the wheel to the pivot swivel position. See figure 44-1.
8. Secure wheel in the swivel position with original hardware. See figure 44-2.
9. Repeat steps 11-13 to set all other pivot wheels in the swivel position.
10. Connect tongue to towing unit with a chain. See figure 44-3.
11. Slowly turn the pivot point to the desired tow location.
12. Reverse steps 11-13 to return the pivot wheels to the tow position.

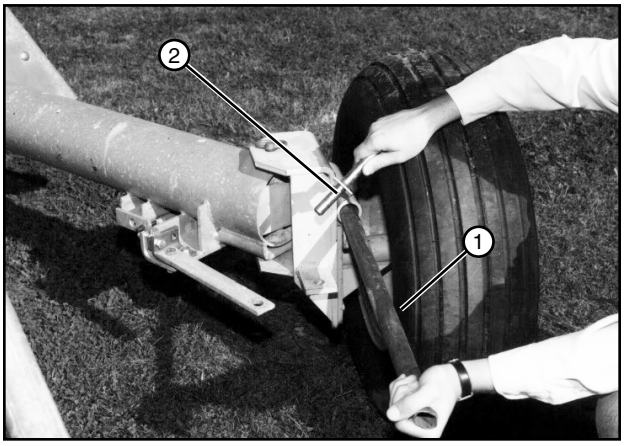


Figure 44-1 1. Bar
2. Swivel Tube

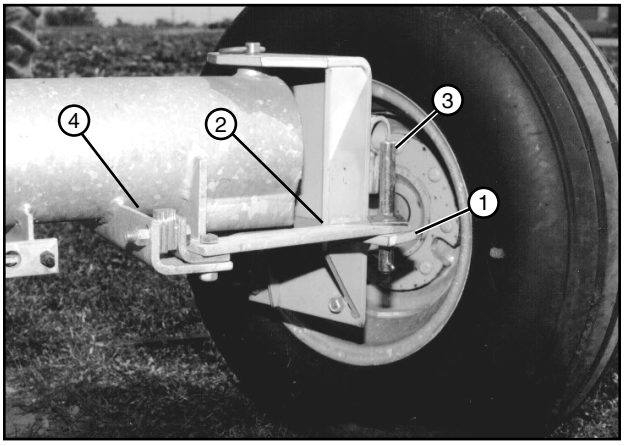


Figure 44-2 1. Steering Arm
2. Swivel Link
3. Pin
4. Swivel Link Spacers

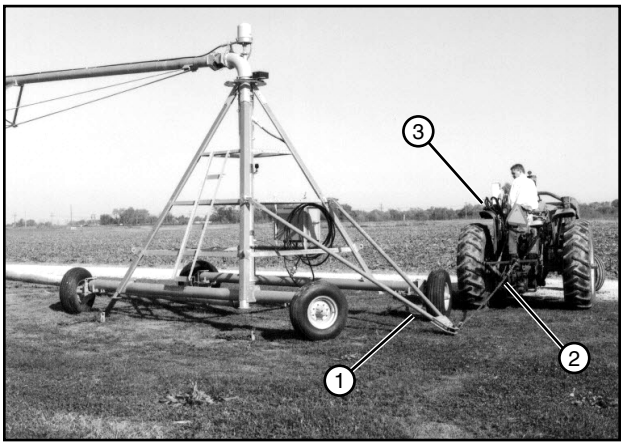


Figure 44-3 1. Tongue
2. Chain
3. Towing Unit

Towing the 4 Wheel EZ-Tow Pivot - Swivel Tire (Continued)

13. After the pivot and drive units have been prepared for towing, hook tongue to the towing unit. See figure 45-1.
14. Begin towing the machine in a slow, gradual manner.

    DO NOT jerk the center pivot at any point during towing.

    CAUTION: The wheel tracks of the tow path must not exceed 6 in depth.

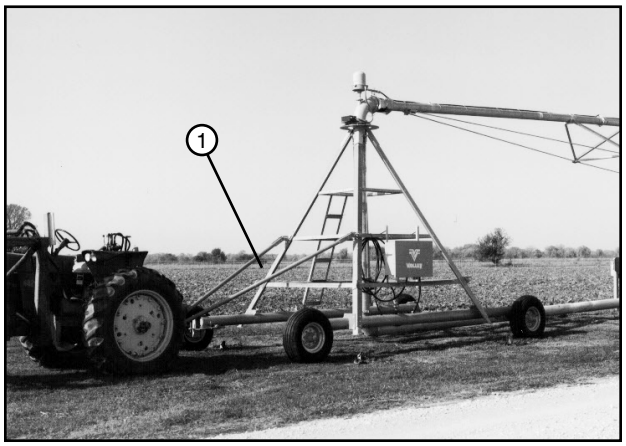


Figure 45-1 1. Tongue

⚠ CAUTION

- **TO REDUCE THE POSSIBILITY OF STRUCTURAL DAMAGE :**
- **IF TOWING ON A SIDE SLOPE THE MACHINE MAY TEND TO SHIFT DOWN THE HILL DUE TO GRAVITATIONAL PULL.**
- **DO NOT TOW ACROSS CROP ROWS, DITCHES OR ROUGH TERRAIN.**
- **DO NOT JERK THE MACHINE AT ANYTIME WHILE TOWING.**
- **DO NOT TOW THE MACHINE MORE THAN 2 MILES PER HOUR MAXIMUM.**
- **ALWAYS TOW THE MACHINE IN A STRAIGHT LINE.**
- **NEVER ATTEMPT TO TURN THE MACHINE WHEN TOWING.**
- **NEVER ATTEMPT REVERSING OR BACKING THE MACHINE INTO POSITION.**

15. Align the pivot tires with the tire ruts and center point location as the pivot approaches the pivot pad.
16. Attach and tighten the load binders at each corner of the pivot. See figure 45-2.
17. Disconnect the tongue from towing unit.
18. Connect the water supply line to the lower riser.
19. Prepare the drive units for operation. See Preparing Drive Unit For Operation in the front of Towing Option section.

NOTE

- **The center point of the 4 wheel EZ-Tow pivot must be anchored in exactly the same position each time it is towed.**
- **To help position the pivot in exactly the same position each time it is towed, a small rut should be made for each of the tires to fall into. Installing cement ruts for the tires to fall into is recommended.**

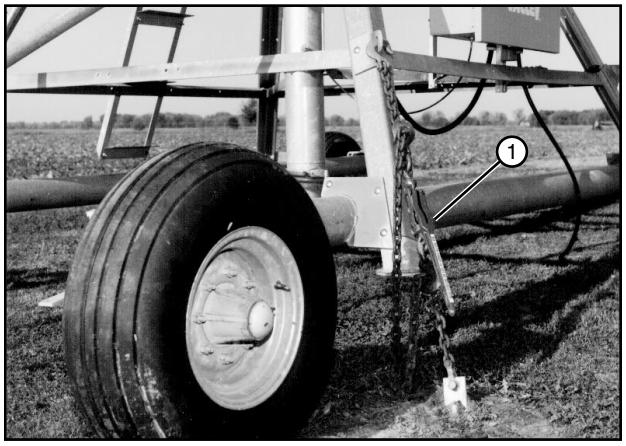


Figure 45-2 1. Load Binder

OPERATION

Towing Option

Wheel Gearbox 8000/8120 Series

NOTE

- **After the first operating season, change the oil in all of the wheel gearboxes.**
- **After the first oil change, change the wheel gearbox oil every third year or 3000 operating hours, whichever occurs first.**
- **At the end of each operating season, drain the wheel gearboxes of any condensation or contaminated oil that may have accumulated in the gearbox and refill to its normal level.**

1. Remove the drain plug from the bottom of the wheel gearbox and drain the oil into a container. See figure 47-1.
2. Install the drain plug after draining oil.
3. Clean all of the dirt away from the expansion chamber cap and remove the expansion chamber cap. Do not allow dirt to fall into the gearbox when removing the cap. See figure 47-2.
   - Make sure the vent holes on each side of the expansion chamber cap are open and unobstructed.

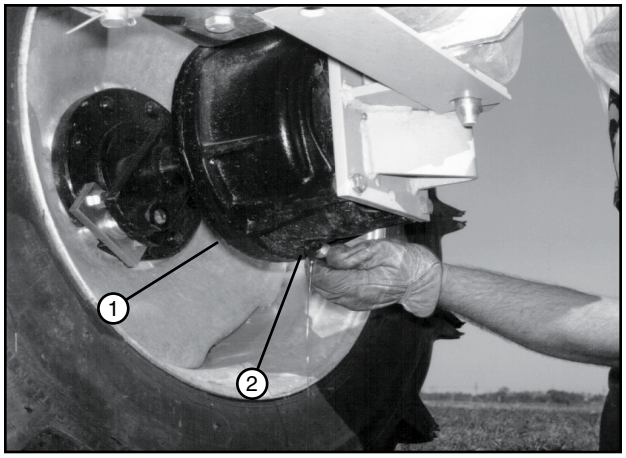


Figure 47-1 1. Wheel Gearbox
2. Drain Plug

NOTE

- **Use only Valley Gear Lube. Other brands of lubricants may contain corrosive extreme pressure additives, which may damage bronze worm gears.**

VALLEY GEAR LUBE	
Part No.	Description
0996557	55 Gallons
0996558	16 Gallons
0996559	5 Gallons
0996560	2 1/2 Gallons

- **The oil in worm gear cases may reach temperatures up to 200˚ F (94˚ C) without alarm.**

4. Fill the wheel gearbox with Valley Gear Lube. The capacity is approximately 3.9 quarts (3.7 liters).
   - Fill gearbox to the top of worm gear shaft or remove the check plug and fill until the oil begins to flow out of the check plug hole. See figure 47-3.
5. Install the expansion chamber cap after refilling the gearbox. Secure with original hardware and torque to 8 lb-ft (10.8 N·m).

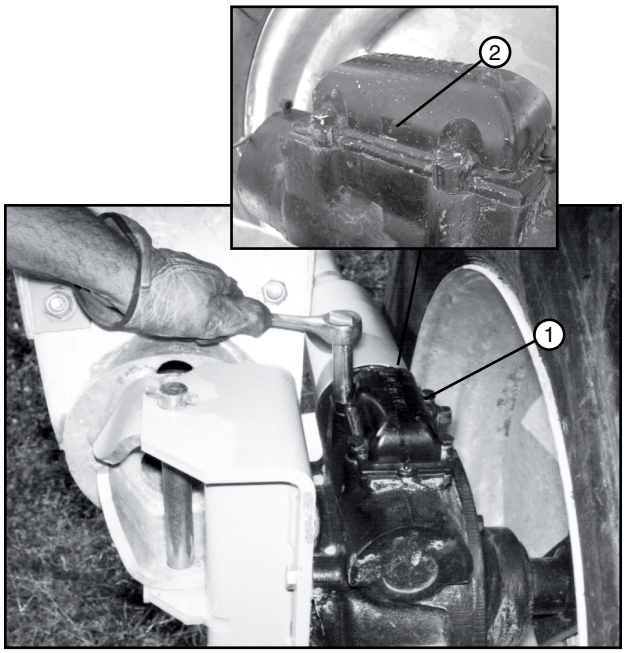


Figure 47-2 1. Expansion Chamber Cap
2. Vent Hole

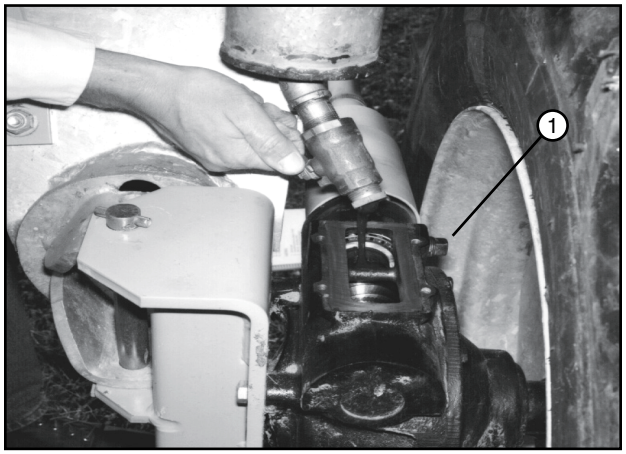


Figure 47-3 1. Check Plug

Center Drive Gearbox

NOTE

- **After the first operating season, change the oil in all of the wheel gearboxes.**
- **After the first oil change, change the wheel gearbox oil every third year or 3000 operating hours, whichever occurs first.**
- **At the end of each operating season, drain the wheel gearboxes of any condensation or contaminated oil that may have accumulated in the gearbox and refill to its normal level.**

1. Remove the drain plug with an allen wrench and completely drain the oil. See Figure 50-1.
2. Replace the drain plug and refill with Valley Gear Lube. See Figure 50-1.
3. Refill the gear case to within 1/2 inch (12.7 mm) of the bottom of the fill plug. See Figure 50-1.

NOTE

- **OIL LEVEL SHOULD BE 1-7/8 IN (48 MM) BELOW FILL PLUG WHEN FULL.**

⚠ WARNING

- **INPUT SEAL FAILURE CAN OCCUR IF OIL CAPACITY IS EXCEEDED.**

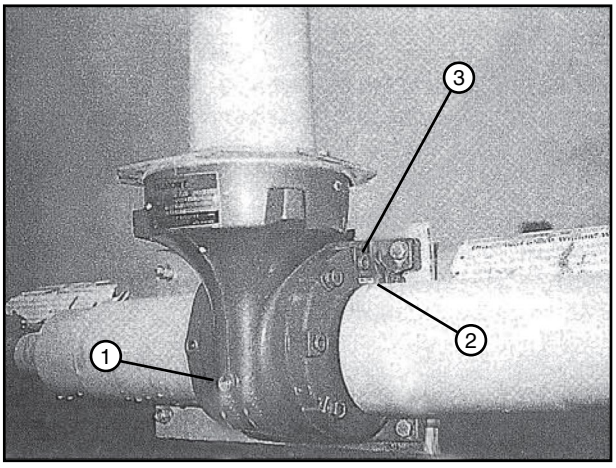


Figure 48-1 1. Drain Plug
2. Fill Level
3. Fill Plug/Point

Towable Hub Lubrication

The towable hubs should be greased at least once a year with water resistant lithium based grease.

This must be done whether the pivot has been towed or not during the season.

The grease fitting is located on the end of the hub. Refill the bearing cavity using a grease gun. See figure 49-1.

When the cavity is full, grease will cream around the seal area. Greasing the hub will also help push out any water which may have accumulated in the hub.

Wheel Lug Nut Torque

Wheel lug nuts should be torqued to 125 lb-ft (169.47 N·m). See figure 49-1.

Check the wheel lug nut torque annually, preseason; at spring start-up.

Tire Pressures

Proper tire pressure is important! Operating with low tire pressure will damage the tires and the drive train.

Check tire pressure several times a year:

- Pre-season: At spring start-up.
- During-season: Check tire pressure monthly.
- Post-season: When performing fall winterization.

For the correct tire pressure refer to the decal on the rim or the tire pressure chart. See figure 49-2.

⚠ WARNING

- **TIRES ARE SHIPPED AT A PRESSURE OF 30 TO 35 PSI (206 TO 241 KPA).**
- **BE SURE THE TIRES HAVE BEEN DEFLATED TO THE CORRECT PRESSURE (SHOWN ON DECAL) BEFORE THE TIRE IS USED.**

NOTE

- **When replacing tires be sure the ply rating of the new tire is equal to or greater than the ply rating of the old tire.**

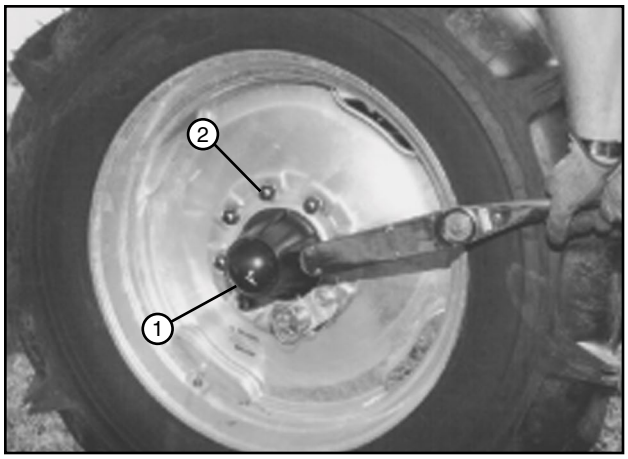


Figure 49-1 1. Grease Fitting
2. Wheel lug nut

TIRE PRESSURE CHART

Span Drive Units			
Tire Size	Pounds per Square Inch	Kilo pascal	Bar
(Inches)	(PSI)	(kPa)	(bar)
11 X 22.5 Tire	34	234	2.3
11.2 X 24 Tire	34	234	2.3
14.9 X 24 Float Tire	18	124	1.2
14.9 X 24 Turf Tire	18	124	1.2
18.4 X 26 Tire	16	110	1.1
11.2 X 38 Tire	23	158	1.5

Figure 49-2 *Tire pressure may be reduced to 16 psi (110 kPa) for increased flotation.

MAINTENANCE

Wheel Tracks

It is important to maintain wheel tracks. See figure 50-1.

- Wheel track depths must not exceed 4 in (100 mm).
- Wheel track depth can be controlled by using track fillers, tillers, discs, or flotation tires.

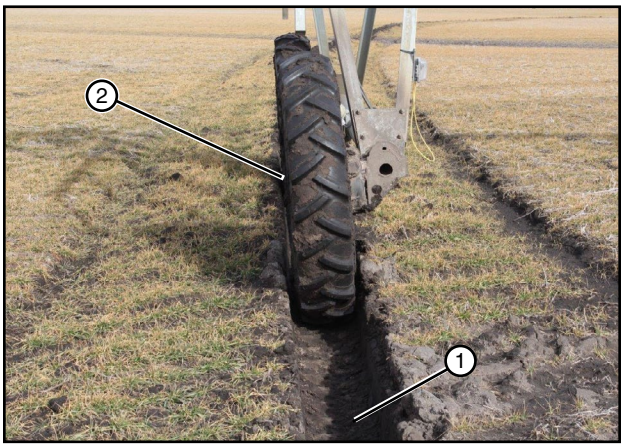


Figure 50-1 1. Wheel Track
2. Drive Unit

Engine/Generator

Refer to the Owner's Manual supplied with engine/generator for specific details on maintenance, operation, and winterizing of the engine/generator.

⚠ CAUTION

•A PARTIALLY FILLED FUEL TANK WILL PERMIT CONDENSATION WHICH WILL CONTAMINATE THE FUEL AND ACT TO DAMAGE THE INJECTION PUMP AND INJECTORS.

Pivot Swivel Lubrication

The pivot swivel should be greased every 5 to 7 revolutions with water resistant lithium based grease. See figure 50-2.

Greasing the pivot swivel regularly reduces the possibility of binding that can cause the pivot to move erratically. When a resolver is used for position sensing the erratic movement can cause incorrect position readings.

The grease fittings are located on the side of pivot near the pivot swivel. See figure 50-2.

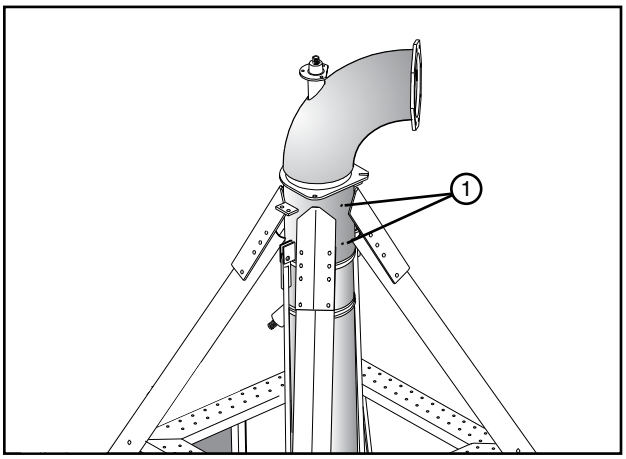


Figure 50-2 1. Grease Fitting

End Gun Arc Setting Example

An end gun is installed at the end of the machine and is used to increase the area irrigated beyond the end of the machine See Figure 51-1.

The end gun must be set to cover a specified area to ensure the best uniformity. This area is determined by two angles – the Forward and Backward end gun angles which are sometimes referred to as the end gun arc settings.

A line on the sprinkler chart specifies the correct end gun arc settings for the machine: See Figure 51-2.

END GUN ARC SETTING EXAMPLE:

FORWARD ANGLE = 45

BACKWARD ANGLE = 85

IMPORTANT: This is an example only. Refer to the sprinkler chart for each pivot to determine the correct end gun arc settings. These settings should initially be set by your Valley Dealer at time of installation and start up.

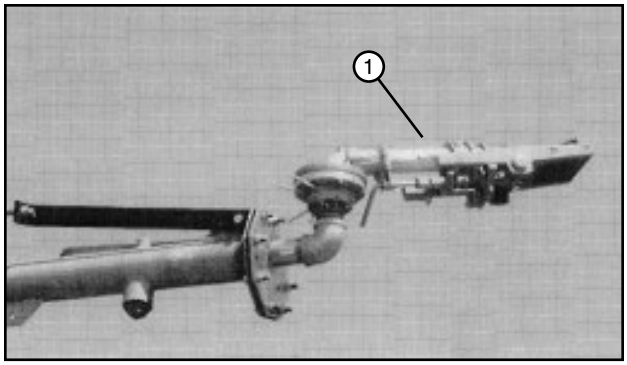


Figure 51-1 1. End Gun

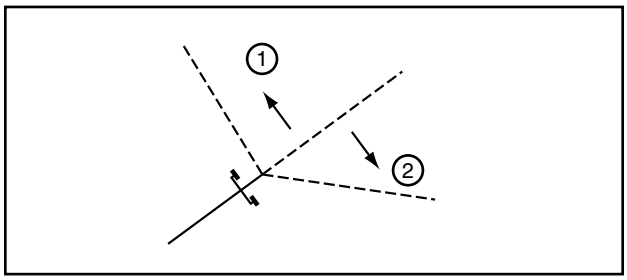


Figure 51-2 1. Backward Angle = 85°
2. Forward Angle = 45°

MAINTENANCE

Span Flushing Procedure

The purpose of flushing the machine is to remove sand and debris from the pipeline. Excessive accumulation of sand in the machine also adds weight and can cause structural damage to the machine.

The Flushing Process Should Be Performed:

- After system installation.
- After pump repair.
- After structural repair.
- Seasonally - prior to operating the system and after the operating season is over.
- As often as necessary according to debris or sand content in the water. Excessive sprinkler problems (clogging) could be an indication of high debris or sand content.

NOTE

•Excessive sprinkler problems (clogging) could be an indication of high debris or sand content.

⚠ DANGER

•DO NOT START THE FLUSHING PROCEDURE WHILE THE SYSTEM IS UNDER WATER PRESSURE. REMOVING SAND TRAP PLUGS WHILE THE SYSTEM IS UNDER PRESSURE MAY CAUSE PERSONAL INJURY OR DEATH.

1. Turn the pump off and make sure machine is completely drained.

⚠ DANGER

•BE AWARE OF HIGH WATER PRESSURE. TURN OFF THE PUMP AND ALLOW THE MACHINE TO DRAIN COMPLETELY BEFORE REPAIRING OR PERFORMING MAINTENANCE TO THE MACHINE.

2. Remove the pipe drains at each drive unit tower. Clean sand and foreign particles from these drains. Turn the rubber drain seal over when reinstalling. See figure 52-1.

NOTE

•The rubber drain seals should be turned over when being reinstalled. This practice helps to increase the seal life.

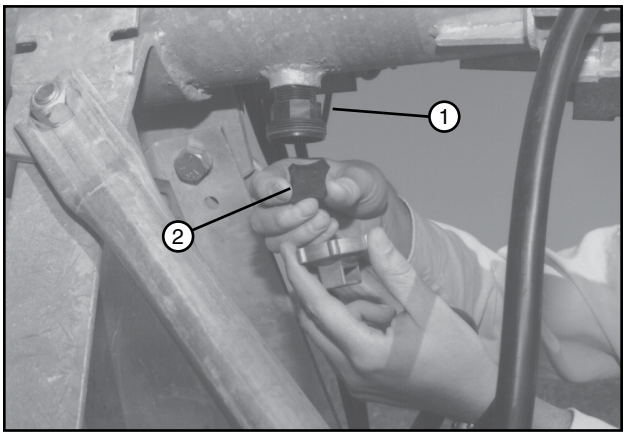


Figure 52-1 1. Pipe Drain
2. Rubber Seal

Span Flushing Procedure

3. Remove and clean the sand trap at the last regular drive unit. See figure 53-1.
4. Remove plugs from the overhang drains. Clean sand and foreign particles from these drains. Turn the rubber drain seal over when reinstalling.
5. Start the pump and allow the machine to flush thoroughly.

NOTE

- **After flushing for winterization, ensure the water has been allowed to drain completely before replacing the pipe drains and plugs to prevent freezing and splitting of the pipeline.**

6. Turn off the water supply and re-install the pipe drains, sand trap and overhang plugs.

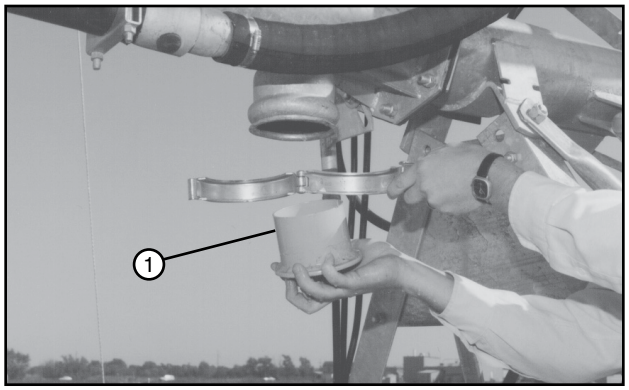


Figure 53-1 1. Sand Trap

MAINTENANCE

Winterization

In regions where the temperature during the winter months will drop below 40°F (4°C) and/or the growing season is 6 months or less, the irrigation machine must be winterized.

- Flush and drain the irrigation machine and all plumbing components as specified in the flushing procedure section. After flushing for winterization, ensure the water has been allowed to drain completely from all drains and plumbing components before replacing drains and plugs to prevent freezing and splitting of the pipeline.
- All underground pipe MUST be drained below the frost line. When drainage is complete, re-install all plugs to prevent rodent infestation.
- Perform all post-season maintenance as specified in the recommended maintenance section.
- Winterize auxiliary equipment such as pumps, power units, mainline pipes and hoses according to the auxiliary equipment manufacturers recommendations.

Parking the Machine

The metal in the irrigation machine will expand and contract with variances in temperature. When the machine is being operated, this poses no threat. However, if the machine is parked in the wheel tracks which were created during the year, shrinking due to the contraction of the metal could cause structural damage.

The possibility of structural damage due to metal contraction increases as the machine length increases. Machines which are 1500 ft (457 m) or longer are susceptible to these stresses, especially where extreme temperature variances occur (90°F (32°C) down to -0°F (-17°C)) and when wheel tracks are present.

To reduce the possibility of structural damage due to expansion and contraction of the metal, the operator should consider one of the following methods when parking the machine in the off season:

1. Park the machine in an area where the wheel tracks have been eliminated.
2. Place wooden 2 in x 12 in planks over the wheel tracks. Park the machine with the tires on the center of the planks.
3. Towable Drive Units – Place every third drive unit's wheels in the tow position.
4. Remove all wheel tracks and run the machine dry (without water) for approximately 100 yards (92 m) to 200 yards (183 m) monthly. Only run the pivot if the temperature is above 40°F (4°C).

Contact your Valley dealer for other winter storage/parking information and tips.

Off Season Storage of Hose

Never leave the hose laying in the field during the winter. The hose can be easily covered by snow, mud, or dust and can quickly become damaged by farm equipment. Driving over the top of the hose can cause damage. Since some hoses contain PVC or rubber, extended exposure to sunlight can lead to cracking or checking problems.

After the final irrigation pass of the season, purge the hose of any remaining water.

Store the hose in a protected area where it will be sheltered from the weather and safe from livestock and rodents. Store the hose away from gas or diesel fuels, contaminates, transformers, and welding areas that can produce ozone.

Regular Maintenance

Time, humidity, vibration, temperature, sand, and machine operation all contribute to wear on your Valley irrigation machine. To keep the machine operating properly with a minimum amount of down time, establish a regular preventative maintenance program using the recommended maintenance charts in this section. If replacement parts are needed, use only genuine Valley Real Parts.

Pivot

	Pre season	1st Pass	4th Pass	Mid season	Post season	Remarks
Check all nuts and bolts. Tighten as required.	X			X		
Check anchor bolts or chains.	X			X		If your pivot is towable, check the grounding conductor hook-ups prior to start up each time the pivot is towed.
Grease pivot swivel.	X		X	X		
Drain riser assembly.	X				X	
Check tire pressure.	X			X	X	Check at least one time during the operating season.

Span

	Pre season	1st Pass	4th Pass	Mid season	Post season	Remarks
Check all nuts and bolts. Tighten as required.	X			X		
Check flanges for leaks and tighten as required.	X			X		
Check pipe drains for proper drainage and invert the seal when applicable. Clean as required. See Winterization procedure.	X			X	X	
Check structural components for tightness.	X			X		

Sprinkler

	Pre season	1st Pass	4th Pass	Mid season	Post season	Remarks
Check the water pressure to make sure it matches the sprinkler package pressure.	X		X	X		Notify your local Valley dealer of any changes.
Check sprinklers and nozzles for tightness.	X			X		
Check sprinkler for free movement.	X			X		
Check sprinkler nozzles for wear.	X		X	X		
Check pressure gauge or pressure transducer for proper operation.	X			X		
Check for plugged or partially plugged nozzles.	X	X	X	X		Clean as required.
Flush entire machine.	X				X	See the Span Flushing Procedure and Winterization in the Maintenance section
Check end gun bearing and brake setting.	X				X	

MAINTENANCE

Regular Maintenance

Overhang/End Gun/Booster Pump

	Pre season	1st Pass	4th Pass	Mid season	Post season	Remarks
Check overhang cables for broken cable strands.	X			X		Replace if cables are damaged.
Clean and ensure operation of the end gun drain.	X			X	X	Clean as required.
Check and clean the sand trap.				X	X	As needed. See Winterization in the Maintenance section.
Check the end gun arc settings.	X			X		Refer to the sprinkler chart.
Check the end gun bearing and brake.	X			X		
Check the end gun nozzle for wear.	X					

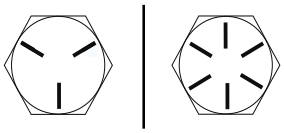
Drive Unit

	Pre season	1st Pass	4th Pass	Mid season	Post season	Remarks
Check the flex joint hose for leaks.	X			X		Tighten clamps or replace as required.
Check and change the center drive gearbox lubricant. Drain moisture.	X				X	See the Center Drive Gearbox in the Maintenance section.
Check the center drive gearbox seals and gaskets.	X					
Check the wheel gearbox lubricant level and drain moisture.	X				X	See the Wheel Gearboxes in the Maintenance section.
Change the wheel gearbox lubricant.	X					Change after the first season and then change every third season thereafter.
Check the wheel gearbox seals and gaskets.	X					
Check the drive shaft U-joints. Check the U-joint and drive shaft covers for damage.	X					Replace covers as required
Check the wheel lug nut torque. Tighten to 125 ft. lb (169 N·m) torque.	X				X	
Check the tire pressure.	X			X	X	See the Tire Pressure Chart in the Maintenance section.
Grease the towable hubs.	X			X	X	See Towable Hub Lubrication in the Maintenance section.

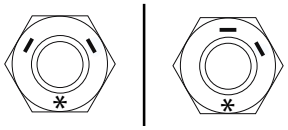
Regular Maintenance

Hardware Identification - SAE Grade - Inch Size

CAP SCREW
GRADE 5 GRADE 8

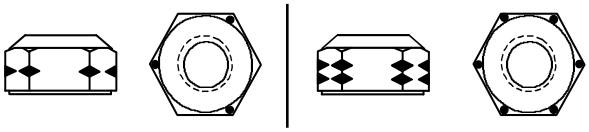


NUT
GRADE 5 GRADE 8



* Vendor's Mark

LOCKNUT
GRADE B GRADE C



Use With Grade 5 Screw

Use With Grade 8 Screw

Torque Chart - Hex Head Cap Screws

SIZE INCH	GRADE 5				GRADE 8			
		ACCEPTABLE RANGE		ACCEPTABLE RANGE		ACCEPTABLE RANGE		ACCEPTABLE RANGE
	lb-ft	lb-ft	N·m	N·m	lb-ft	lb-ft	N·m	N·m
1/4	9	8-9	12	11-12	12	11-13	16	15-17
5/16	18	16-19	24	22-25	25	22-27	34	30-36
3/8	31	28-33	42	38-44	43	39-47	58	53-64
7/16	49	44-53	66	60-71	69	63-75	94	85-101
1/2	75	68-81	102	92-109	106	96-115	144	130-156
9/16	108	98-117	146	133-158	152	139-166	206	188-225
5/8	149	135-162	202	183-219	210	191-229	285	259-310
3/4	264	240-297	358	325-402	372	338-406	504	458-550
7/8	426	387-464	577	525-629	601	546-655	815	740-888
1	637	579-695	863	785-942	900	818-982	1220	1109-1331

Critical Torque Applications

	GRADE 5		GRADE 8	
SPANS & DRIVE UNITS	lb-ft	N·m	lb-ft	N·m
Wheel lug nuts	125	169.4	N/A	N/A

MAINTENANCE

Regular Maintenance

Pivot Annual Maintenance Log

	YEAR	Date(s) Performed/Comments
Check all nuts and bolts. Tighten as required.		
Check anchor bolts or chains.		
Grease pivot swivel		
Drain riser assembly.		
Check placement of screens on generator, pump panel, and electric motors (used to prevent rodent damage).		
Check the air pressure in the tires.		

Span Annual Maintenance Log

	YEAR	Date(s) Performed/Comments
Check flanges for leaks and tighten as necessary.		
Check pipe drains for proper drainage and invert the seal when applicable (see Winterization).		
Check structural components for tightness.		

MAINTENANCE

Regular Maintenance

Sprinkler Annual Maintenance Log

	YEAR	Date(s) Performed/Comments
Check the pivot pressure to make sure it matches the sprinkler package pressure.		
Check sprinklers and nozzles for tightness.		
Check sprinkler for free movement.		
Check sprinkler nozzles for wear.		
Check pressure gauge or pressure transducer for proper operation.		
Check for plugged or partially plugged nozzles.		
Flush the entire machine.		
Check end gun bearing and brake setting.		

Alignment Annual Maintenance Log

	YEAR	Date(s) Performed/Comments
Check all nuts and bolts. Tighten as required.		

MAINTENANCE

Regular Maintenance

Overhang/End Gun/Booster Pump Annual Maintenance Log

	YEAR	Date(s) Performed/Comments
Check overhang cables for broken cable strands.		
Check and ensure operation of the end gun drain.		
Check and clean the sand trap.		
Check end gun arc settings.		
Check end gun bearing and brake.		
Check end gun nozzle for wear.		

Drive Unit Annual Maintenance Log

	YEAR	Date(s) Performed/Comments
Drain and replace center drive gearbox lubricant.		
Check/change wheel gearbox lubricant.		
Check center drive gearbox seals and gaskets.		
Check drive shaft U-joints and U-joint covers.		
Check wheel gearbox seals and gaskets.		
Check and tighten wheel lug bolts (125 lb-ft torque).		
Check tire pressure.		
Clean wheel gearbox ventilation hole expansion chamber (3 times/year).		
Grease towable hubs.		

MAINTENANCE