VFlex Corner
Owner's Manual

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www.valleyirrigation.com

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EC Declaration of Conformity

CE

We: **Valmont Industries, Inc.**
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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

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Place of Issue: Valley, NE 68064

Electrical Safety Statement

Installation Of The Valley Electric Irrigation Machine - European Union Only

Valmont Industries Inc. does not install a differential (ground fault) circuit breaker in the control panel of the Valley electric irrigation machine because the standards of protection vary according to country of destination. The distributor must provide and install a differential (ground fault) circuit breaker that meets the standards of the country where the Valley irrigation machine is installed.

In the European Union, differential circuit breaker protection is fixed at a maximum of 24 volts.

Good grounding of the Valley irrigation machine is required.

- If resistance to ground is lower than 80 ohms, a differential (ground fault) circuit breaker of 300 mA will meet requirements.
- If resistance to ground is between 80 and 800 ohms, a differential (ground fault) circuit breaker of 30 mA will meet requirements.

The power supply installation and inspection of equipment protection components or systems are the responsibility of the installer. Valmont Industries, Inc. is not responsible for the failure of equipment protection components or systems not of their manufacture.

Valley pivot irrigation machines receiving power from a generator must have a cable connected from the irrigation machine structure to a ground rod and another cable from the irrigation machine structure to the ground terminal on generator in order for the differential (ground fault) circuit breaker to work.

The linear irrigation machines equipped with a generator are not equipped with a ground rod but must have a cable connected from the linear irrigation machine structure to the ground terminal of the generator in order for the differential (ground fault) circuit breaker to work.

- The resistance between the irrigation machine and the generator must be substantially below 80 ohms.

About This Manual

Information contained in this manual applies to the Valley VFlex Corner.

All information, specifications, descriptions and illustrative material contained in this manual were based on information available at the time this publication was approved for printing.

Valmont Industries Inc. reserves the right to change specification or design at any time without notice and without incurring any obligation. Specifications are applicable to equipment sold within the United States and may vary outside of the United States.

Ancillary Equipment Warranty

The owner is responsible for warranty registration of all ancillary equipment such as engines, pumps and generators with its respective manufacturer.

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.

Safety

Maintain Safely

Use of Personal Protective Equipment

- People working in areas where there are potential electrical hazards must use, personal protective equipment that is appropriate for the specific parts of the body to be protected and for the work to be performed. Refer to U.S. Occupational Safety & Health Administration (OSHA) Regulations (Standards - 29 CFR) Safeguards for personnel protection. - 1910.335, or applicable national, state or local regulations, for additional information.
- Personal protective equipment must be maintained in a safe, reliable condition and periodically inspected or tested.
- Protective shields, protective barriers, or insulating materials must be used to protect each person from shock, burns, or other electrically related injuries while that person is working near exposed energized parts which might be accidentally contacted or where dangerous electric heating or arcing might occur. When normally enclosed live parts are exposed for maintenance or repair, they must be guarded to protect unqualified persons from contact with the live parts.
- Safety signs and tags. Safety signs, safety symbols, or accident prevention tags must be used where necessary to warn people about electrical hazards which may endanger them.

Conductive Materials and Equipment

Materials and equipment that may conduct electricity must be handled in a way that will prevent them from contacting energized power lines, exposed conductors or circuit parts.

- When handling long conductive objects (such as but not limited to truss rods, pipes, angles and ladders) in areas with energized power lines, exposed conductors or circuit parts, work practices (such as the use of insulation, guarding, and material handling techniques) must be used to minimize the hazard.
- Portable ladders must have non-conductive side rails.
- Do not wear conductive articles of jewelry and clothing (such as but not limited to watch bands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with conductive thread, or metal headgear) that could come in contact with energized power lines, exposed conductors or circuit parts.

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.

Maintain Safely
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.
30 in (76.2 cm) MINIMUM OR WIDTH OF ENCLOSURE, WHICH EVER IS GREATER	78 in (198.1 cm) MINIMUM OR HEIGHT OF ENCLOSURE, WHICH EVER IS GREATER	36 in (91.4 cm) MINIMUM	42 in (107 cm) MINIMUM	48 in (122 cm) 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.

Safety

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 (3.05 m) 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 (3.05 m) 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 (3.05 m) 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.

Maintain Safely

Minimal Lockout / Tagout Procedure

The following procedure establishes the minimum requirements for the lockout of energy isolating devices whenever maintenance or servicing is done on machines or equipment. It is used to ensure that the machine or equipment is stopped, isolated from all potentially hazardous energy sources and locked out before personnel perform any servicing or maintenance where the unexpectedly energized or start-up of the machine or equipment or release of stored energy could cause injury. All personnel, upon observing a machine or piece of equipment which is locked out to perform servicing or maintenance shall not attempt to start, energize, or use that machine or equipment.

When the energy isolating devices are not lockable, tagout should be used and affected personnel must wear full personal protection.

Refer to U.S. Occupational Safety & Health Administration (OSHA) Regulations (Standards - 29 CFR) Typical minimal lockout procedures - 1910.147 App A, or applicable national, state or local regulations, for additional information.

Sequence of Lockout

1. Notify all affected personnel that servicing or maintenance is required on a machine or equipment and that the machine or equipment must be shut down and locked out to perform the servicing or maintenance.
2. The authorized personnel shall identify the type and magnitude of the energy that the machine or equipment utilizes, shall understand the hazards of the energy, and shall know the methods to control the energy.
3. If the machine or equipment is operating, shut it down by the normal stopping procedure (depress the stop button, open switch, close valve, etc.).
4. Deactivate the energy isolating device(s) so that the machine or equipment is isolated from the energy source(s).
5. Lock out the energy isolating device(s) with assigned individual lock(s).
6. Stored or residual energy (such as that in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure, etc.) must be dissipated or restrained by methods such as grounding, repositioning, blocking, bleeding down, etc.
7. Ensure that the equipment is disconnected from the energy source(s) by first checking that no personnel are exposed, then verify the isolation of the equipment by operating the push button or other normal operating control(s) or by testing to make certain the equipment will not operate. CAUTION: Return operating control(s) to neutral or “off” position after verifying the isolation of the equipment.
8. The machine or equipment is now locked out.

⚠ DANGER

•WHEN PERSONNEL WILL BE EXPOSED TO CIRCUIT ELEMENTS AND ELECTRICAL PARTS, A QUALIFIED PERSON MUST USE TEST EQUIPMENT TO VERIFY THAT THE CIRCUIT ELEMENTS AND EQUIPMENT PARTS OF THE EQUIPMENT ARE DE-ENERGIZED

Restoring Equipment to Service

When the servicing or maintenance is completed and the machine or equipment is ready to return to normal operating condition, the following steps shall be taken.

1. Check the machine or equipment and the immediate area around the machine to ensure that nonessential items have been removed and that the machine or equipment components are operationally intact.
2. Check the work area to ensure that all personnel have been safely positioned or removed from the area.
3. Verify that the controls are in neutral.
4. Remove the lockout devices and reenergize the machine or equipment.
5. Notify affected personnel that the servicing or maintenance is completed and the machine or equipment is ready to be used.

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.

EMERGENCY STOPPING

The machine can be stopped at any time at any tower by turning the disconnect switch, located underneath the tower box, to the OFF position. See Figure 12-1.

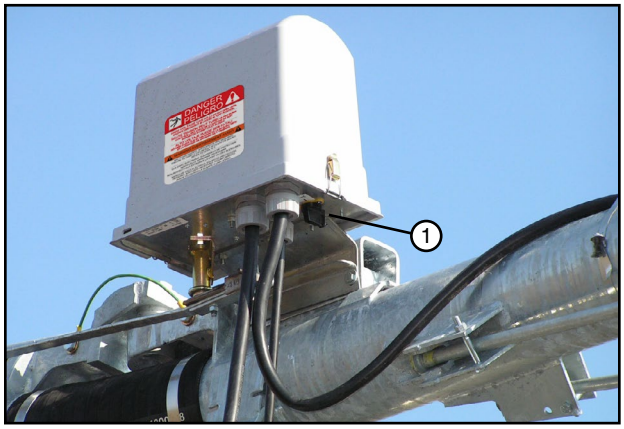


Figure 12-1 1. Disconnect Switch

⚠ WARNING

PROPER GROUNDING

DO NOT attempt to start the machine until the electrical service is properly installed and grounded by a qualified electrician as per the electrical standards.

If the power supplied to the machine is not grounded properly, severe injury or death can result should an electrical malfunction occur.

It is your responsibility to ensure that your power supplier and/or electrical contractor has grounded the irrigation machine as required by the National Electrical Code and by applicable local electrical codes. If a machine is properly grounded and fuse sizing is correct, there is extremely low probability of an individual being injured by electrical shock.

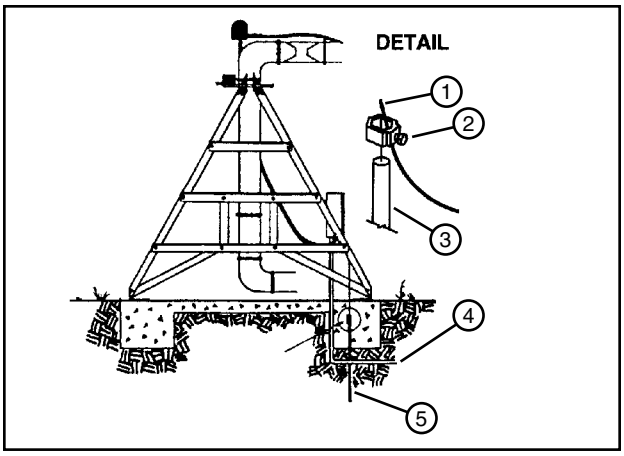


Figure 12-2 1. Copper Wire 2. Clamp 3. Copper Rod 4. 4 Wire Service Conductor 5. Ground Rod Installation

NOTE

- All 480 VAC, 60 Hz. (380 VAC, 50 Hz.) power supply services MUST be a 4 conductor service. Three 480 VAC (380 VAC) power lines and one ground conductor which is as large as the power carrying conductors for that service.

Operate Safely

⚠ DANGER

DISCONNECT POWER WHEN SERVICING
ALWAYS disconnect electrical power before servicing or performing maintenance to the machine.

If you are going to perform maintenance on the machine, YOU MUST shut off and lock the main power disconnect as shown below. See figure 13-1.

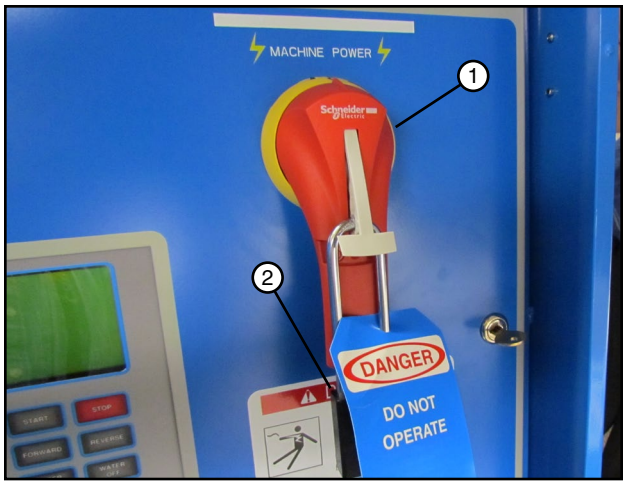


Figure 13-1 1. Main Power Disconnect
2. Lock

The blue (OSHA safety color code) tag shown below should also be filled out and attached to the disconnect after locking. See figure 13-2.

The tag should reveal the name of a person to contact before restoring power to the machine.

Figure 13-2

⚠ CAUTION

QUALIFIED SERVICE PERSONNEL
If you do not understand electricity or other parts of the machine, have qualified service personnel perform any hazardous repairs or maintenance.

⚠ CAUTION

GUARD ALL POWER TAKE-OFF DRIVES
This includes all belt and power line drives.

Replace any guards and shields removed for maintenance.

⚠ WARNING

MARK AND GUARD ALL POWER LINES
Do NOT deep rip or chisel near the buried power service wires.

Do NOT deep rip in a circle at the drive unit. The deep chisel track will cause severe stresses on the structure.

If you do deep rip your field, run the machine with the percent timer at 100% for the first revolution.

⚠ WARNING

SUSPECTED SHORT CIRCUITS
DO NOT touch the machine if you suspect a short-circuit situation. Call a qualified electrician or an authorized Valley dealer immediately.

Circumstances which may cause you to suspect hazardous voltage situations may include:

- Physical damage to the machine or span cable
- Recent electrical storms (lightning)
- Unusual operating characteristics of the machine

If you suspect a short circuit due to feeling a rippling tingle when touching the machine, DO NOT touch the machine again. Call a qualified electrician or an authorized Valley dealer immediately.

Operate Safely

⚠ 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 OVERSIZE FUSES

Fuses are sized for the protection of a specific machine.

Be certain you have the proper fuse sizes in place before initial start-up and when replacing fuses.

⚠ CAUTION

PLUG - IN CONNECTORS

Disconnect power before connecting or disconnecting any plug-in connectors.

⚠ 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.**

⚠ DANGER

DRIVE SHAFTS START WITHOUT WARNING

An electric motor on each tower of the center pivot powers two or more drive shafts connected to wheel gear drives. These drive shafts start and stop 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 main disconnect is locked in the OFF position.
- ALWAYS replace drive shaft shields after servicing.
- DRIVE SHAFT SHIELDS MUST ALWAYS BE IN PLACE WHEN OPERATING THE MACHINE.

Operate Safely

⚠ 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

CHECK MACHINE DIRECTION

DO NOT operate the machine if it moves in the direction opposite to that which was chosen.

Forward should be clockwise and reverse counter-clockwise.

⚠ 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 setting the on and off positions to avoid watering the roadways.

If an end gun is watering a roadway, immediately discontinue use and adjust the shutoff setting or call your Valley dealer to repair the end gun shut off mechanism.

⚠ CAUTION

AUTO REVERSE OPERATION SAFETY

If the machine reverses direction at a roadway or a physical object such as a building, tree line, power pole, etc., then you MUST provide a backup device to stop the machine if the reversing mechanism were to fail. See figure 15-1.

Contact your Valley dealer for more information concerning physical barricades for machines under these circumstances.

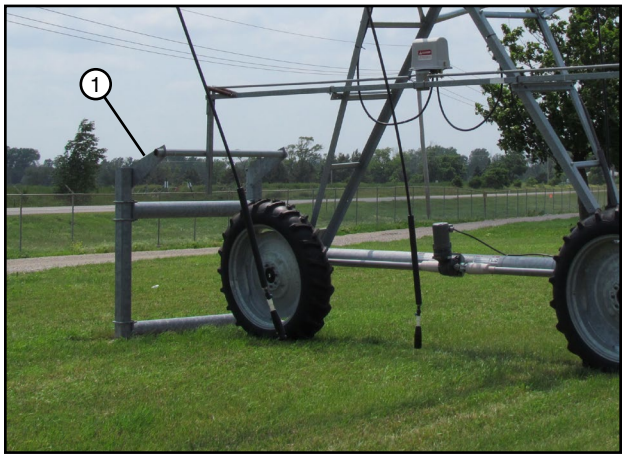


Figure 15-1 1. Physical Barricade

⚠ CAUTION

PROPER USE OF THE SAFETY OVERRIDE

Caution MUST be taken by the operator when using the safety override function as it will bypass or disable all of the machine's automatic safety shutdown circuits.

NEVER depress and hold the START/STOP SAFETY OVERRIDE switch in the START position for more than 3 to 5 seconds.

If the machine is not in full view by the operator, do not use the Safety Override function.

The operator MUST inspect the entire machine between each safety override start attempt.

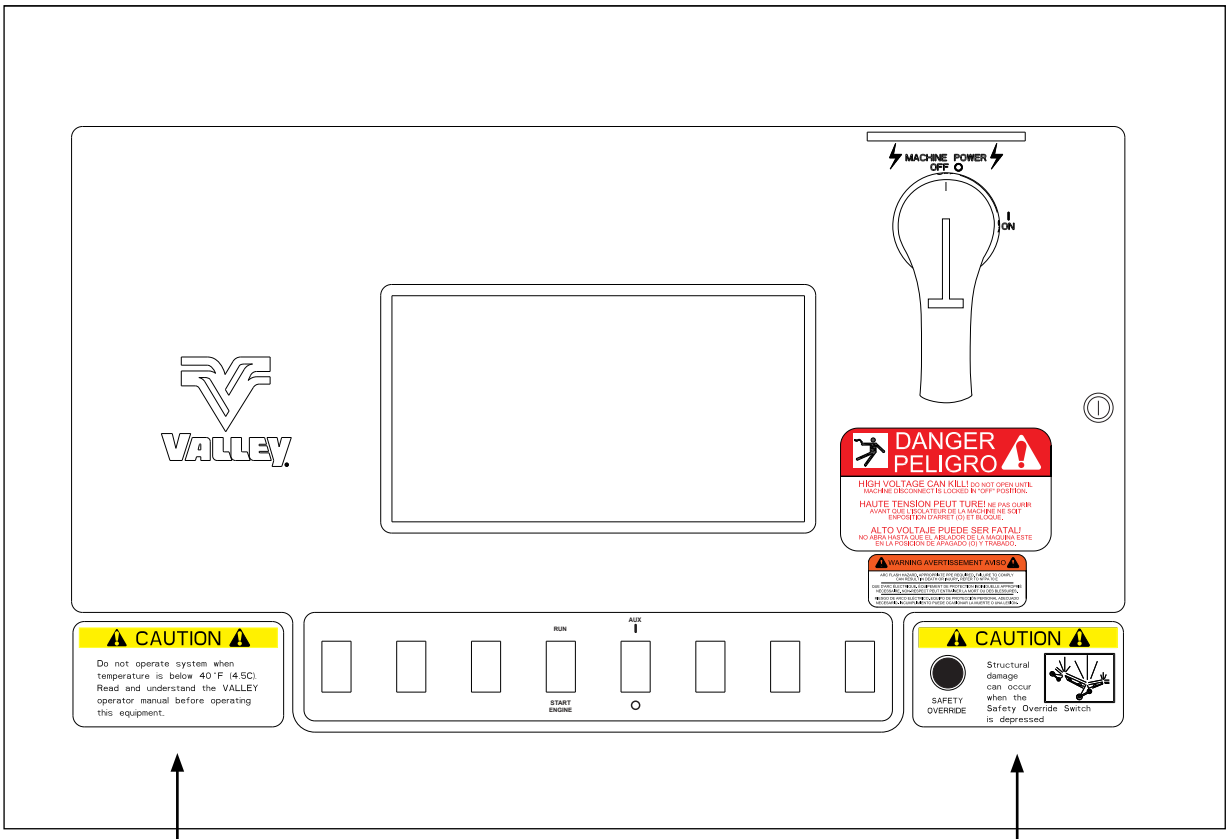
Repeated safety override start attempts can cause severe structural damage.

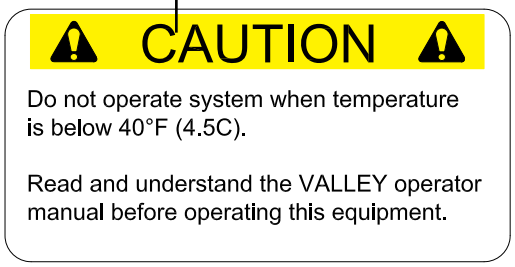
Call your Valley dealer if the machine fails to start.

Safety

Safety Decals

These Danger, Warning, and Caution decals appear in various locations on a Valley irrigation machine. You MUST familiarize yourself and other operator's with these safety decals. For replacement of any decal, contact your local Valley dealer.





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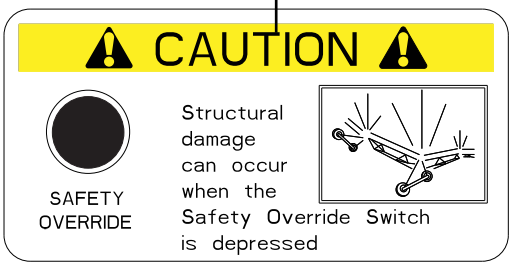

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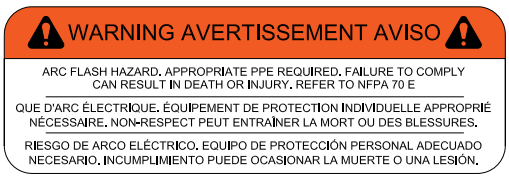

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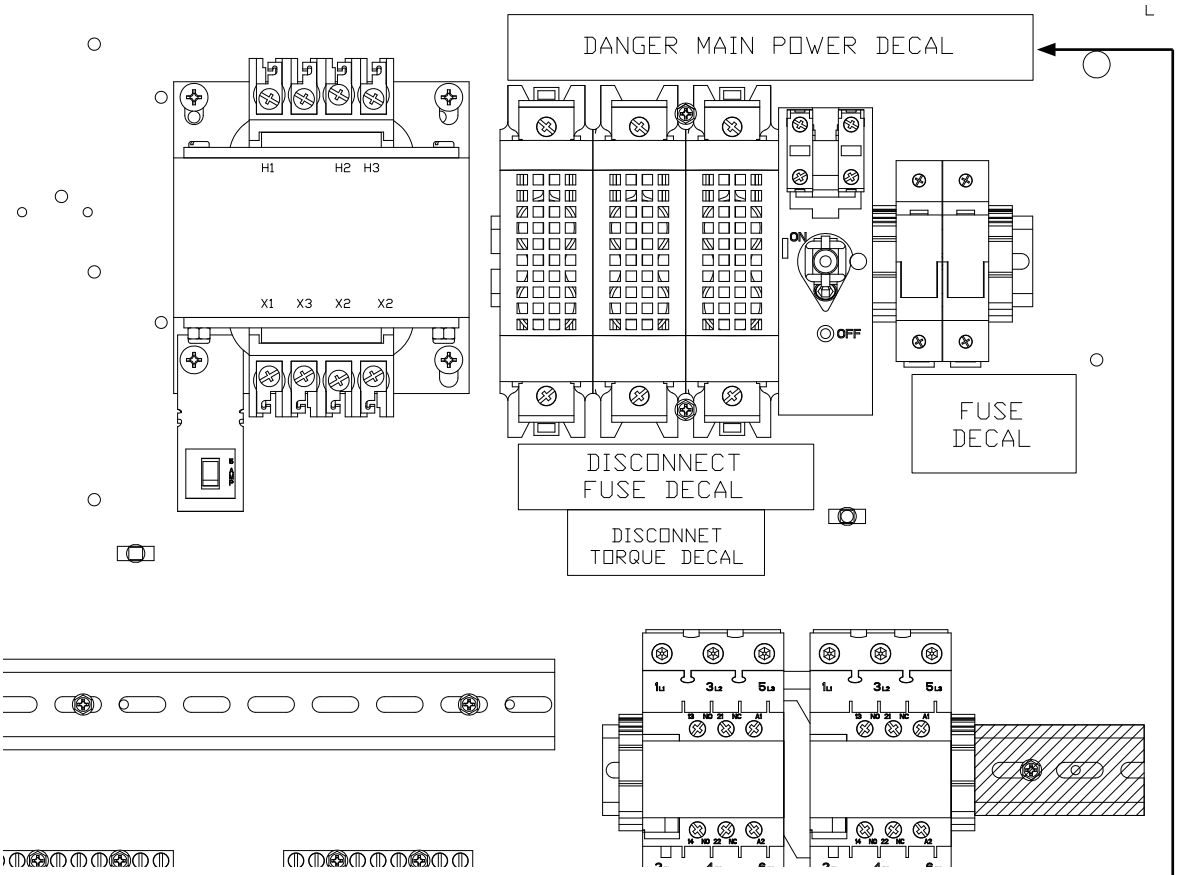
Safety Decals



DANGER PELIGRO

230V 1 PHASE MAIN POWER SUPPLY CONNECTION
USE 60°C MINIMUM INSULATION COPPER WIRE
L1 L2

BRANCHEMENT 230 VOLTS 1 PHASE DE L'ALIMENTATION ÉLECTRIQUE PRINCIPALE UTILISER DU FIL DE CUIVRE ISOLATION 60 °C MINIMUM

CONEXIÓN DE 230 VOLTIOS ÚNICA FASE DEL SUMINISTRO DE ENERGÍA ELÉCTRICA PRINCIPAL UTILICE CABLES DE COBRE CON AISLAMIENTO PARA 60 °C MÍNIMO

0999124

DANGER
PELIGRO

HIGH VOLTAGE CAN KILL! Do not open until machine disconnect is locked in "OFF" Position.

HAUTE TENSION REUT TUER! Ne pas ouvrir avant que L'isolateur de la machine ne soit en position d'arrêt (O) et bloqué.

ALTO VOLTAJE PUEDE SER FATAL!
No abra hasta que el aislador de la maquina este en la posicion de apagado (O) y trabado.

WARNING AVERTISSEMENT AVISO

ARC FLASH HAZARD. APPROPRIATE PPE REQUIED.
FAILURE TO COMPLY CAN RESULT IN DEATH OR INJURY.
REFER TO NFPA 70 E

RISQUE D'ARC ÉLECTRIQUE. ÉQUIPEMENT DE PROTECTION INDIVIDUELLE APPROPRIÉ NÉCESSAIRE.
NON-RESPECT PEUT ENTRAÎNER LA MORT OU DES BLESSURES.

RIESGO DE ARCO ELÉCTRICO. EQUIPO DE PROTECCIÓN PERSONAL ADECUADO NECESARIO. INCUMPLIMIENTO PUEDE OCASIONAR LA MUERTE O UNA LESIÓN.

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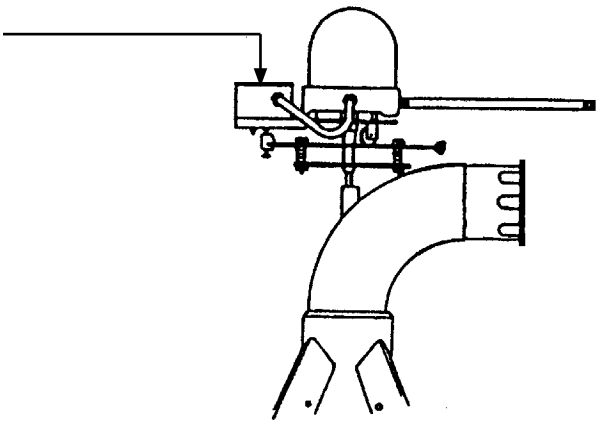
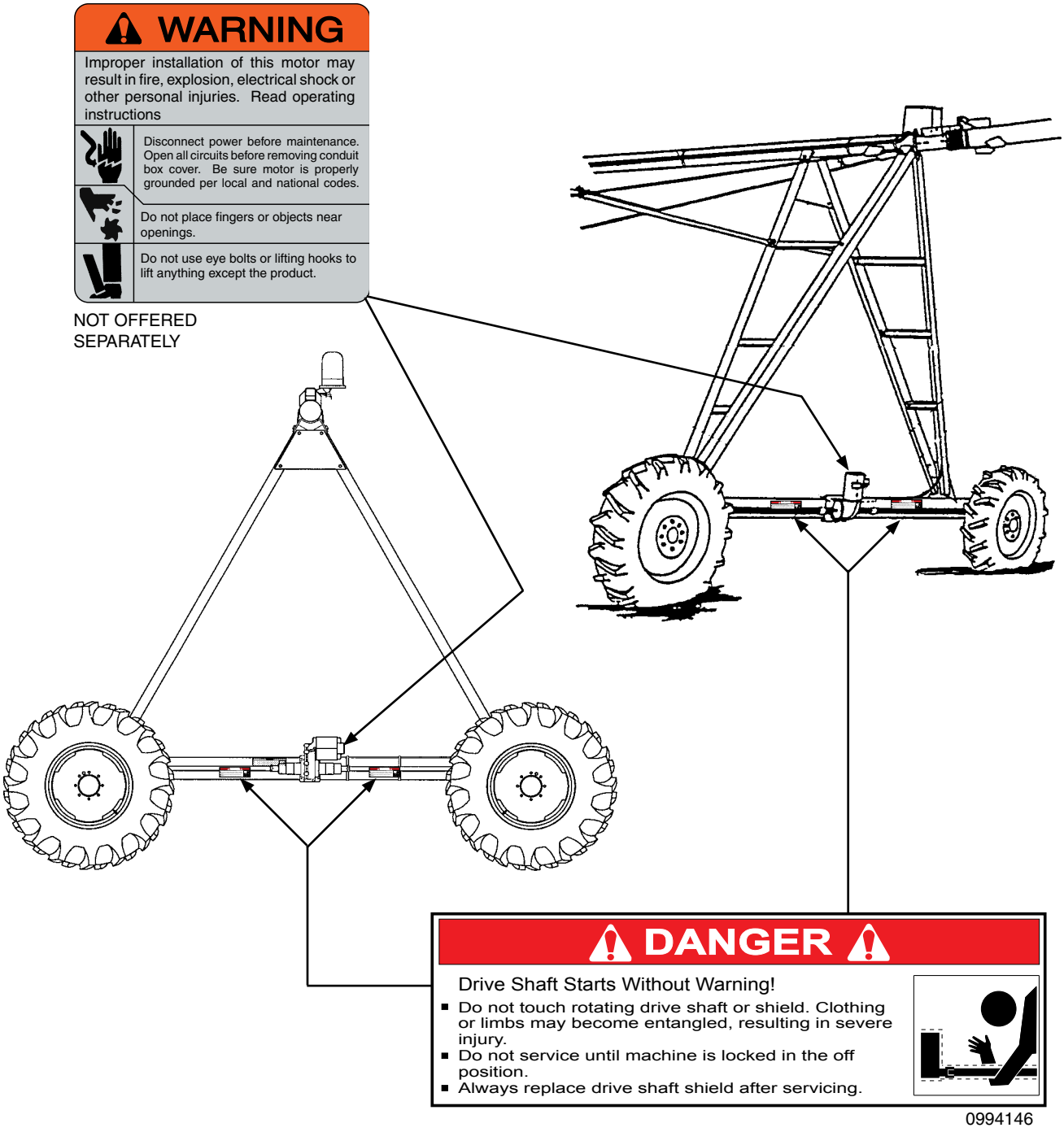
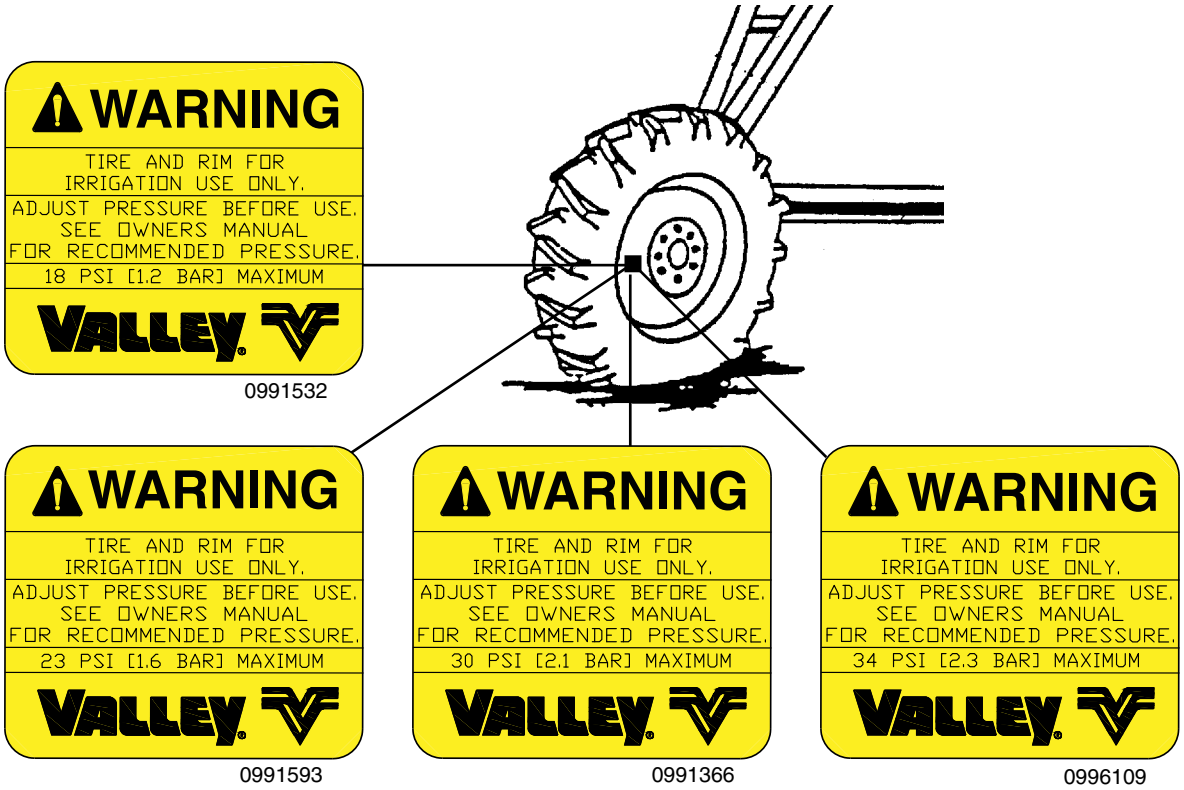


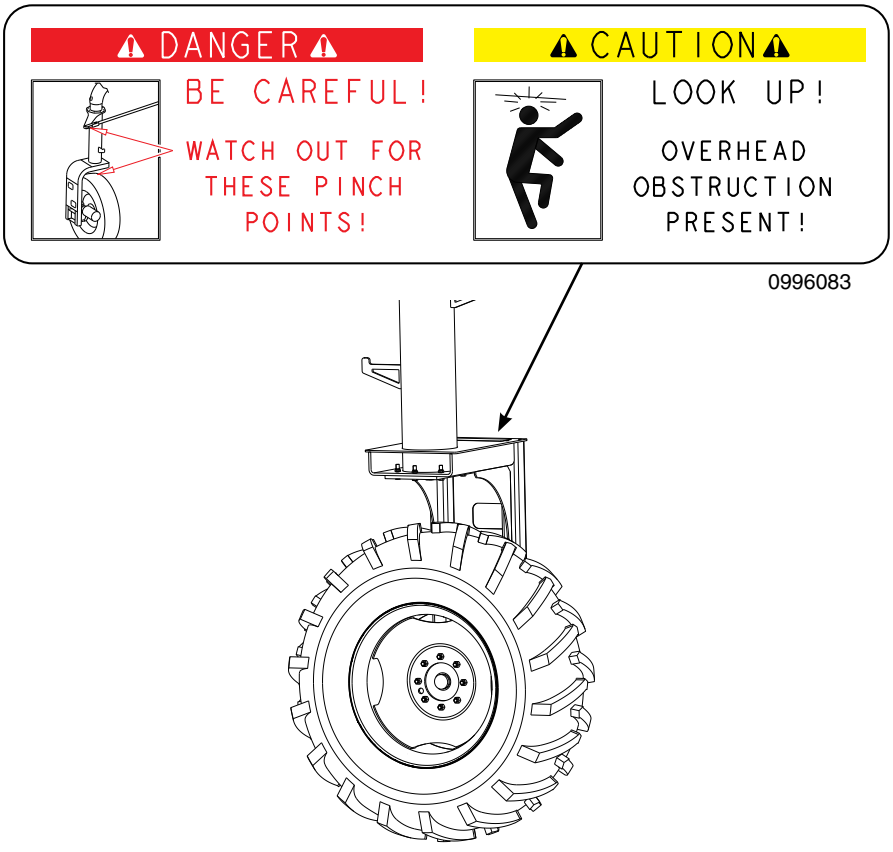
Safety

Safety Decals



Safety Decals



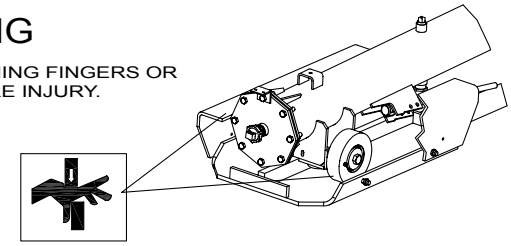


Safety Decals

CAUTION

PIPE MOVES WITHOUT WARNING

- DO NOT TOUCH MOVING CRADLE OR PIPE, CLOTHING FINGERS OR LIMBS MAY BECOME ENTANGLED, RESULTING IN SEVERE INJURY.
- KEEP AWAY FROM DRIVE UNIT DURING OPERATION.
- DO NOT SERVICE UNTIL MACHINE IS LOCKED IN THE OFF POSITION.
- KEEP TRAY CLEAR OF TOOLS, PARTS OR DEBRIS.
- GREASE LARGE & GUIDE ROLLERS REGULARLY.



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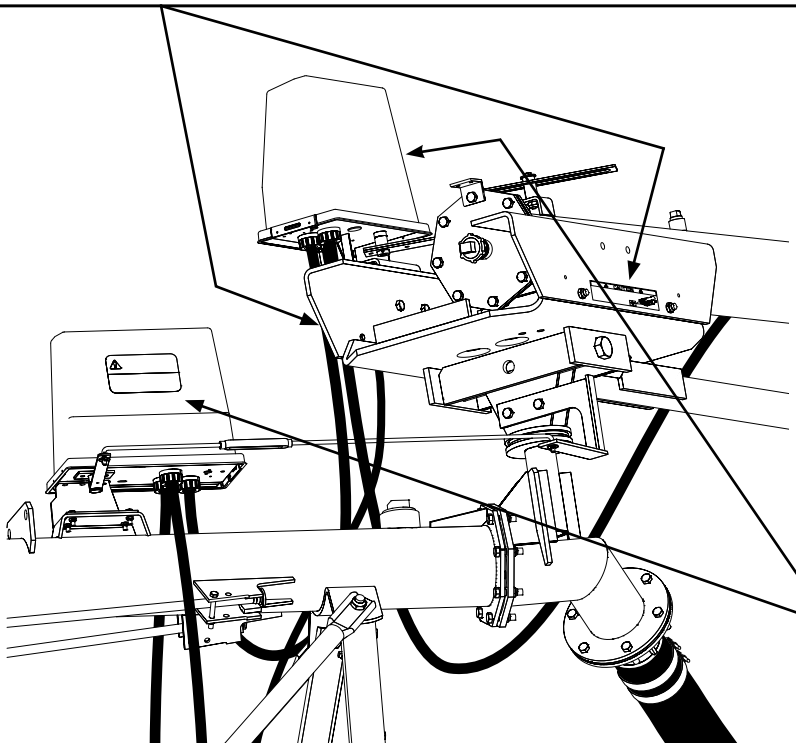

DANGER
PELIGRO

HIGH VOLTAGE CAN KILL! DO NOT OPEN UNTIL MACHINE DISCONNECT IS LOCKED IN "OFF" POSITION.

HAUTE TENSION PEUT TURE! NE PAS OURIR AVANT QUE L'ISOLATEUR DE LA MACHINE NE SOIT ENPOSITION D'ARRET (O) ET BLOQUE.

ALTO VOLTAJE PUEDE SER FATAL! NO ABRA HASTA QUE EL AISLADOR DE LA MAQUINA ESTE EN LA POSICION DE APAGADO (O) Y TRABADO.

WARNING AVERTISSEMENT AVISO

ARC FLASH HAZARD. APPROPRIATE PPE REQUIRED. FAILURE TO COMPLY CAN RESULT IN DEATH OR INJURY. REFER TO NFPA 70 E

QUE D'ARC ÉLECTRIQUE. ÉQUIPEMENT DE PROTECTION INDIVIDUELLE APPROPRIÉ NÉCESSAIRE. NON-RESPECT PEUT ENTRAÎNER LA MORT OU DES BLESSURES.

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DANGER

120 VOLTS

BE SURE DISCONNECT IN SWING TOWER CONTROL PANEL IS IN THE OFF POSITION BEFORE REMOVING COVER.

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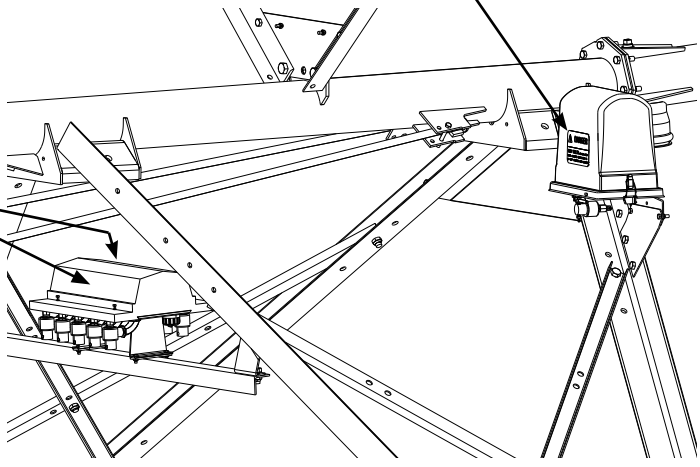


Components

Below is a description of the various components associated with a VFlex corner.

Last Regular Drive Unit

The Last Regular Drive Unit (LRDU) is where the corner span connects to the irrigation machine. The corner span is attached to the LRDU with a t-bar and outlet assembly. See Figure 21-1.

Extended Cradle

The extended cradle holds one end of the corner span and allows it to move forward and backward while the corner span extends and retracts. See Figure 21-1.

Sprinkler Sequencing Cam Box

The Sprinkler Sequencing Cam Box is mounted to the pipeline just above the LRDU and is connected via a linkage to the corner arm cradle. This linkage senses the angle of the corner relative to the regular machine, and turns a series of cams on a shaft inside the box. See Figure 21-1.

During corner arm extension, these cams deactivate microswitches which interrupt electrical signals to the solenoid valve box, causing the appropriate sprinkler control valves to open, allowing water to begin flowing to the sprinklers on the swing span and overhang.

During corner arm retraction, the cams activate the microswitches, sending an electrical signal to the solenoid valve box, causing the appropriate sprinklers to turn off.

Run/Cycle Box

The Run/Cycle Box is mounted to the side of cradle at the LRDU.

The arm extending from this box senses the position of the corner span relative to the LRDU and commands the SDU drive motors to move the corner arm in tandem with the regular machine.

This box also contains safety switches to stop the machine should the corner arm fall too far behind or travel too far ahead of the LRDU. See Figure 21-1.

Flexible Hose

The flexible hose provides water to the VFlex corner span. See Figure 21-1.

Span Cable

A cable with color coded wires enters and leaves each tower box. The cable runs the entire length of the machine and is referred to as span cable. See Figure 21-2.

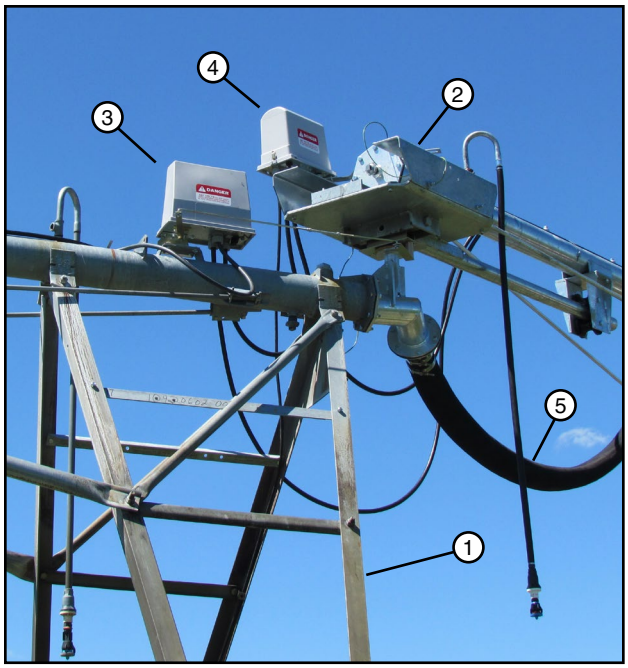


Figure 21-1
1. Last Regular Drive Unit
2. Extended Cradle
3. Sprinkler Sequencing Cam Box
4. Run/Cycle Box
5. Flexible Hose

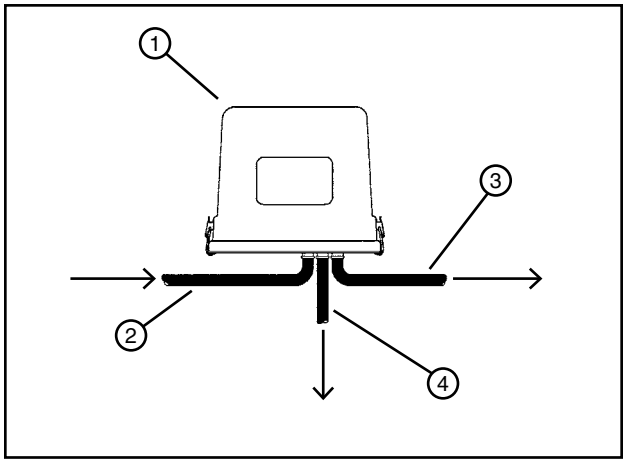


Figure 21-2
1. Tower Box
2. Span Cable Entering Tower Box
3. Span Cable Leaving Tower Box
4. Cable to Drive Motor

Overview

Components

Outlet Options

Fixed Outlet

The fixed outlet is used to transfer water from the LRDU to the corner. See figure 22-1.

Swivel Outlet Option

The swivel outlet allows the transfer hose to remain aligned with the VFlex corner arm. Standard on the inverted corner. See figure 22-1.

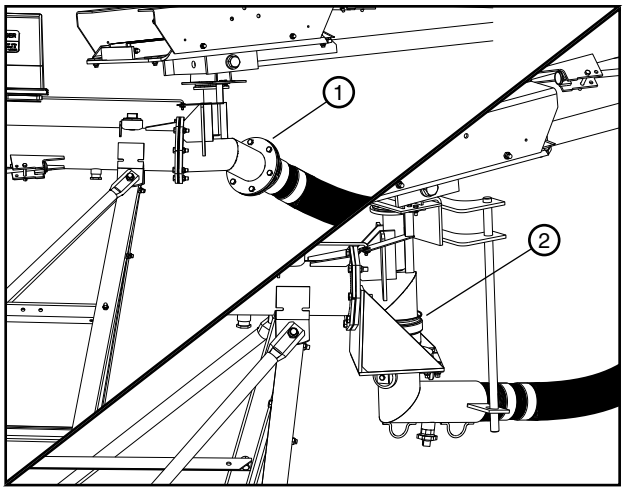


Figure 22-1 1. Fixed Outlet Option
2. Swivel Outlet Option

Solenoid Valve Box

The Solenoid Valve Box contains electrically operated solenoid valves which use signals from the sprinkler sequencing controller to activate and deactivate groups of sprinklers.

When a solenoid valve receives an electrical power signal, the valve opens, sending pressure through the tubing harness to the appropriate sprinkler control valves. The sprinkler control valves respond to the pressure signal by turning off the water flow to their sprinkler.

When power is removed from the solenoid valve, it closes, preventing the pressure signal from reaching the sprinkler control valves, causing them to open, and allowing water to flow out of the sprinkler. See Figure 22-2.

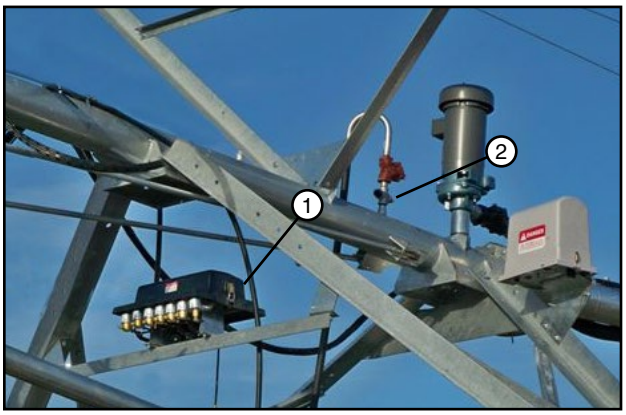


Figure 22-2 1. Solenoid Valve Box
2. Cross Filter

Cross Filter

The Cross Filter cleans the water that the solenoid valve box is sending to the sprinklers. See Figure 22-2.

Sprinklers

Evenly spaced along a span are a series of sprinklers.

At each sprinkler location is an sprinkler control valve, and in some cases, a pressure regulator. A tube harness connects each valve to the solenoid valve box. See Figure 22-3.

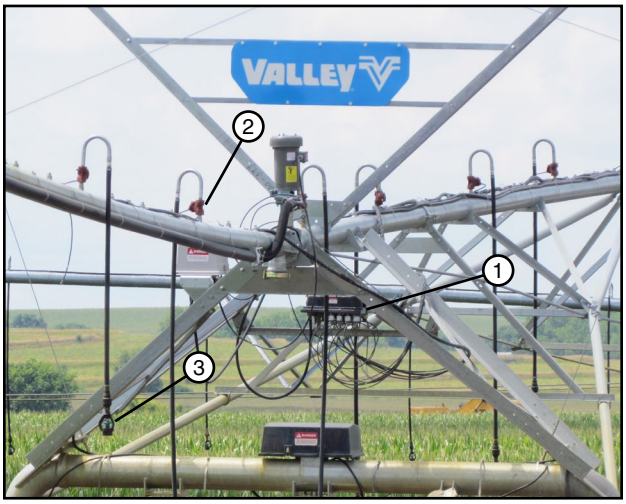


Figure 22-3 1. Solenoid Valve Box
2. Sprinkler Control Valve
3. Sprinklers

Components

Steerable Drive Unit

The Steerable Drive Unit (SDU) is located at the end of the corner span. The steering motor and steering gearbox are located on the basebeam. A single steering gearbox is standard. An optional dual steering gearbox is available. There are two offset legs, one on each end of the basebeam. At the bottom of each offset leg is a Corner Drive Wheel Gearbox. Dual steering gearboxes shown are optional. An optional Corner DualDrive tire configuration is available. See Figure 23-1.

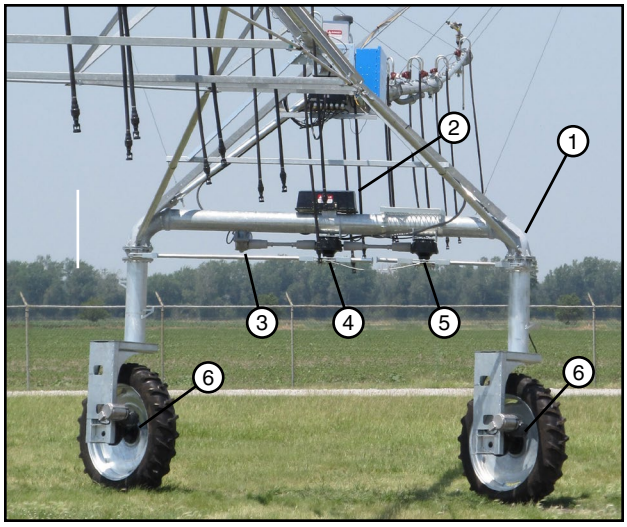


Figure 23-1
1. Steerable Drive Unit
2. Swing Tower Box
3. Steering Motor
4. Steering Gearbox
5. Optional Dual Steering Gearbox
6. Corner Drive Wheel Gearbox

Swing Tower Box

The swing tower box is mounted on top of the SDU basebeam. It contains the motor reversing contactor for directional control of the SDU, and drive contactor used to start and stop the SDU in response to signals from the run cycle box. See Figure 23-1.

There are two methods of guidance, either below ground guidance or GPS guidance.

Below Ground Guidance

When the below ground guidance is used, an oscillator box is mounted at the control panel and a guidance receiver is mounted in the swing tower box.

The oscillator box creates a signal that is transmitted through the buried wire. This signal is received by the antennas mounted below the SDU basebeam and delivered to the guidance receiver.

The guidance receiver determines the location of the wire in relationship to the SDU and commands the steering motor to turn the wheels of the SDU to follow the buried wire. See Figure 23-2.

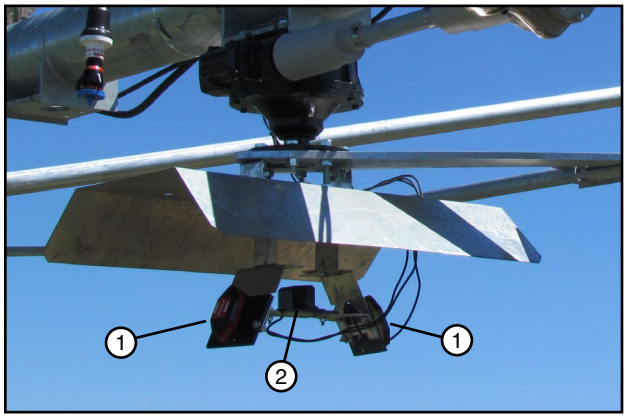


Figure 23-2
1. Steering Antenna
2. Reference Antenna

GPS Guidance Option

When the GPS guidance option is used, a GPS Receiver is mounted on the overhang sign support and a GPS control panel is mounted on the SDU.

The GPS guidance system works with satellites and an RTK Reference Station to determine the machine's position. It also commands the steering motor to turn the wheels of the SDU to follow the path installed on the GGS computer. See Figure 23-3.

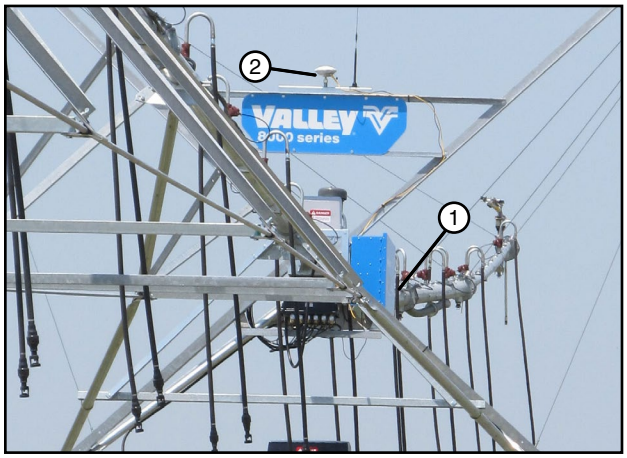


Figure 23-3
1. GGS Control Panel
2. GPS Receiver

Overview

Components

Booster Pump Option

The booster pump is located near the overhang above the SDU. It is responsible for supplying water to the end gun. The booster pump is activated by a setting in the control panel or the end gun shut off located at the pivot point. See Figure 24-1.

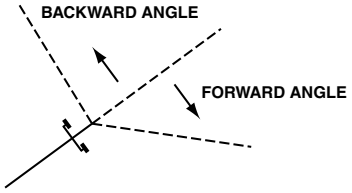
Overhang

The overhang is attached to the end of the corner span pipe. It is used for irrigation beyond the corner span and SDU. Support ears and cables hold up the overhang. See Figure 24-2.

End Gun Option

The end gun is located at the end of the overhang. It is used to irrigate a specified area beyond the end of the machine. See Figure 24-3.

The end gun is set to cover a specified area. This area is determined by the forward and backward angles, which are referred to as the end gun arc settings.



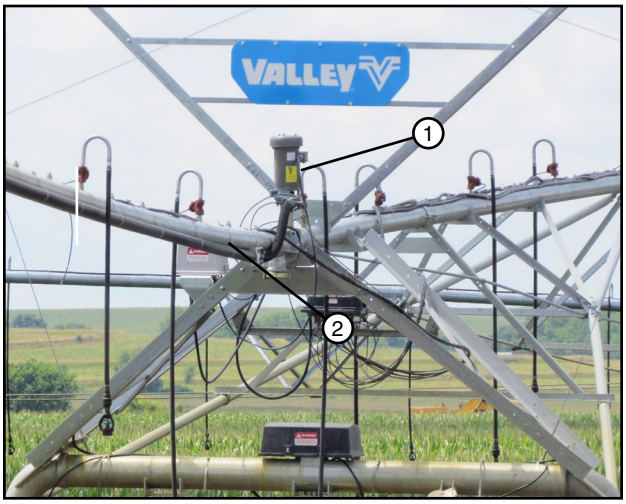


Figure 24-1 1. Booster Pump
2. Overhang

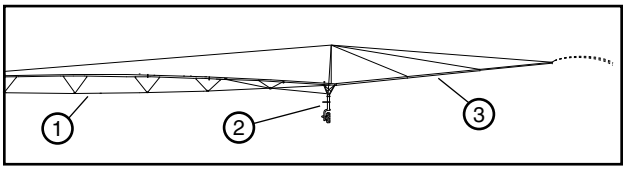


Figure 24-2 1. Corner Span
2. Steerable Drive Unit
3. Overhang

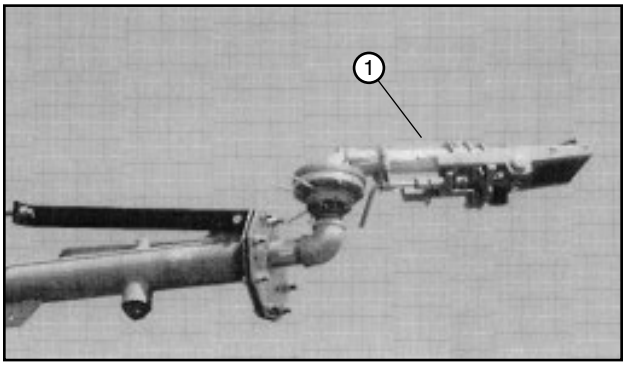


Figure 24-3 1. End Gun

Theory of Operation

The VFlex Corner runs only when the rest of the machine is running.

As the LRDU begins to move forward, it might appear that it is going to leave the corner span standing still, but when the roller assembly reaches a point three inches behind center of the extended cradle arm, it trips a switch in the run/cycle box mounted to the cradle. That switch signals the SDU to begin its travel cycle.

On a standard speed machine, the wheel drive motors on the SDU run at 56 RPM and the center drive motor on the LRDU runs at 34 RPM. This difference in speed permits the SDU to catch up and actually begin to overtake the LRDU until it reaches three inches beyond the center of the cradle. At that point, another switch signals the SDU to stop.

Since both units are moving simultaneously, the six inches of roller movement can take several feet of ground travel in order to complete one cycle of movement.

The SDU now waits again until it is three inches behind center before it re-enters the travel cycle. If the SDU or the LRDU movement causes the roller assembly to approach either end of the cradle, a safety switch in the Run/Cycle Box opens and shuts down the machine. The standard center pivot also has alignment safety switches at each tower of the machine to prevent structural damage.

There are two ways to guide the SDU. One way uses a GPS Receiver that is mounted on the overhang sign support, a GGS control panel mounted on the SDU, and an RTK Reference Station. Satellites transmit a signal to the GPS Receiver which uses the signals to determine its current position. The RTK Reference Station also recieves the satellite signals and transmits correction data to the small correction antenna mounted next to the GPS reciever. The station sends data for correcting the SDU's position to the GPS Receiver. This information plus the current SDU wheel position is transmitted to the GGS control panel. The GGS computer then calculates the anticipated travel direction. If that direction does not match the path pre loaded into the GGS computer the system activates a "steer," turning the wheels so that they follow the predetermined path.

The other way uses a buried guidance wire and three antennas mounted on the steering gearbox hub below the basebeam. The Pivot Control Panel has a device called an oscillator, which generates a low voltage AC signal into a buried wire loop. The loop of wire goes from the pivot to the edge of the field, around the field and back to the panel.

The SDU has a reference antenna that "listens" for the buried wire signal. When it "hears" the signal, it activates a device called the Guidance Control Unit, which translates the received signal. If that signal has enough strength, a relay that completes the safety circuit path is activated.

The other two antennas works together with the reference antenna to determine where the SDU is in relation to the buried wire. One antenna is for the forward mode (clockwise) and the other is for reverse mode (counterclockwise). The Guidance Control Unit compares the signals it is "hearing" to determine whether a steering action is necessary.

Because steering can only take place when the machine is moving, you must select a percentage timer setting that is greater than zero. For example, selecting 50% means that the Last Regular Drive Unit (LRDU) moves for 30 seconds and then stops for 30 seconds.

During any given travel cycle, if the GPS Receiver determines the SDU is not on the correct path or the steering antenna detects a location signal other than "over the wire", it causes the SDU's control box to initiate a steering command that will return the SDU to its proper position. The steering action is a combination of electrical and mechanical links that keeps the two SDU wheel assemblies parallel throughout the steer cycle.

Because the steering of the wheels takes place while the machine is moving, they should never become perpendicular to the basic pivot. There are steering limit switches that prevent such an oversteer. If the SDU ever gets far enough off its intended path or track, the following actions occur depending on the guidance system used:

- GPS - Based on the settings in the GGS control panel, the machine will shut down after traveling 6.6 ft (2 m) off the path.
- Buried Wire - The signal received by the reference antenna weakens until it can not "hear" it. When this happens, the safety relay "drops out", which opens the safety circuit and shuts down the machine.
- A second over steer safety typically 10 ft to 15 ft off the wire is in the steering hardware and works in conjunction with the steer limit switches mentioned earlier. If the electrical circuitry fails to stop the steering action, a backup switch mechanically opens the safety circuit.

Theory of Operation

The second significant area of operation is water distribution with the sprinklers and end gun.

Two control boxes are involved with the sequencing of sprinklers.

One is the Sprinkler Sequencing Cam Box. It has a series of cams and microswitches that are operated by a sprocket/chain linkage connected to the cradle by a turnbuckle control rod. As the corner span extends or retracts, the cams receive location information based on how the control rod pushes or pulls on the sprocket linkage.

The other control box is the Solenoid Valve Box. When the control rod “tells” the Sprinkler Sequencing Cam Box that the corner span has begun to extend, a signal is sent to the Solenoid Valve Box. 120 VAC is removed from one or more of the normally closed solenoid valves, allowing the water to move through the tubing harnesses to the hydraulic valves on each sprinkler. Without control line pressure on the top of a hydraulic valve diaphragm, main line water pressure raises the diaphragm and allows water to flow through the valve and out the sprinkler, thus turning the sprinkler on.

When the control rod “tells” the Sprinkler Sequencing Cam Box that the corner span has begun to retract, another signal is sent to the Solenoid Valve Box. During retraction, 120 VAC is applied to one or more of the solenoid valves, blocking off the exhaust port and sending control line pressure to the top of the hydraulic valve diaphragm. When the control pressure water seals the diaphragm into the “down” position, the main line water is blocked from the sprinkler, thus turning the sprinkler off.

If the machine has a pressure regulator installed at each sprinkler, the regulator will maintain pressure and flow whether the corner span is extended or retracted, even though more area is being irrigated and the pump is producing more flow. However, if pressure regulators are not used, a potential problem exists. Since there are between 17 and 35 extra sprinklers turned on in the course of irrigating a corner, the amount of water (and pressure) available to the rest of the sprinklers on the machine is much less. The result would be a very unfavorable water distribution pattern.

Overcoming this problem requires the corner span to slow down. As the corner span begins to extend, a specific relay in the Sprinkler Sequencing Cam Box engages the second percentage timer in the Run Cycle Box. This timer slows down the movement of the entire machine during the cornering phase. That relay disengages the second percentage timer after the corner span retracts, causing the corner span to return to its usual speed.

This second percentage timer, once set for the pressure differential between extension and retraction, need not be changed thereafter since it operates on a ratio that is directly proportional to the percent setting selected at the Pivot Control Panel.

The end gun can also be used to distribute water in a corner. If there is insufficient water pressure to operate an end gun, the Booster Pump supplies enough pressure for the water to go through a flexible hose to the end gun.

When the control rod “tells” the Sprinkler Sequencing Cam Box that the corner span has begun to extend, a signal is sent to the Solenoid Valve Box. Unlike the other solenoids valves, this valve is normally open. When 120 VAC is applied, water moves through the tubing harness to the angle valve. Meanwhile, the Booster Pump gets a signal from the Run/Cycle Box to start the motor. Since the angle valve is normally open, main line water pressure raises the diaphragm and allows water to flow through the valve, into the flexible hose, and out the end gun, thus turning it on.

The end gun covers a specified area to ensure the best uniformity. This area is determined by two angles (Forward and Backward), which are also referred to as the end gun arc settings.

When the control rod “tells” the Sprinkler Sequencing Cam Box that the corner span has begun to retract, another signal is sent to the Solenoid Valve Box. During retraction, 120 VAC is removed from the solenoid valve, opening the exhaust port and sending control line pressure to the top of the angle valve diaphragm. Meanwhile, the Booster Pump gets a signal from the Run/Cycle Box to stop the motor. With insufficient water pressure in the hose and the control pressure water sealing the diaphragm into the “down” position, the water is blocked from the end gun, thus turning it off.

Starting and Stopping the Machine

Starting the Machine

Refer to your pivot owner's manual for information about starting the machine. The VFlex corner runs only when the rest of the machine is running.

Emergency Stopping

To stop the machine in an emergency situation, shut off any one of the following:

- Main Service Disconnect Switch from public power to the control panel. See figure 27-1.
- Control Panel Main Disconnect Switch. See figure 27-1.
- Any Tower Box Disconnect Switch. See figure 27-1.

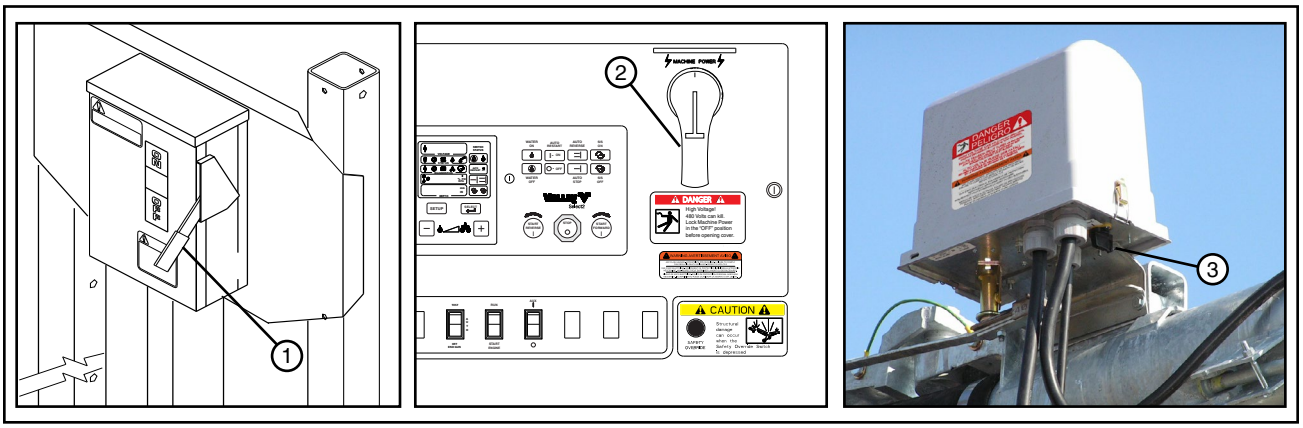


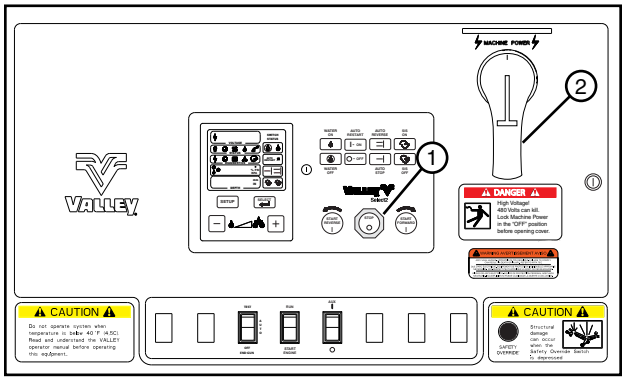
Figure 27-1 1. Main Service Disconnect Switch
2. Control Panel Main Disconnect Switch
3. Tower Box Disconnect Switch

Stopping Under Normal Conditions

1. Press the STOP key. See figure 27-2.
2. Turn the main disconnect switch to the OFF position. See figure 27-2.
3. Turn the pumping unit OFF (if not automatic).
4. If an engine generator set is utilized, place the Engine Run/Start switch to the Start position for the next start-up sequence.

⚠ WARNING

• DO NOT SHUT THE MACHINE OFF BY SLOWLY IDLING DOWN THE ENGINE GENERATOR SET. THIS PRACTICE CAUSES LOW VOLTAGE AND WILL DAMAGE MACHINE COMPONENTS. ALWAYS STOP THE IRRIGATION MACHINE PRIOR TO SHUTTING DOWN THE ENGINE-GENERATOR SET.



(Select2 control panel shown)

Figure 27-2 1. Stop Key
2. Main Disconnect Switch OFF

Operation

Safety

⚠ DANGER

- **THE CONTROL PANEL CONTAINS HIGH VOLTAGE! 480 VOLTS CAN KILL.**
- **ALWAYS DISCONNECT ELECTRICAL POWER BEFORE SERVICING OR PERFORMING MAINTENANCE TO THE MACHINE.**
- **TESTING AND TROUBLESHOOTING SHOULD BE PERFORMED ONLY BY AN AUTHORIZED VALLEY DEALER.**
- **ALWAYS REPLACE ANY GUARDS OR SHIELDS THAT ARE REMOVED FOR PERFORMING MAINTENANCE.**

Disconnect All Power

Before performing service or maintenance on any part of the machine, follow the MINIMAL LOCKOUT/TAGOUT PROCEDURE located in the SAFETY section of this manual and do the following:

1. SHUT OFF and LOCK the public power service disconnect to the irrigation machine. See Figure 29-1.

   FILL OUT the blue (OSHA safety color code) tag and attach to the disconnect after locking. See Figure 29-1.

2. SHUT OFF and lock the control panel main power disconnect. See Figure 29-2.

   FILL OUT the blue (OSHA safety color code) tag and attach to the disconnect after locking. See Figure 29-2.

⚠ 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.**

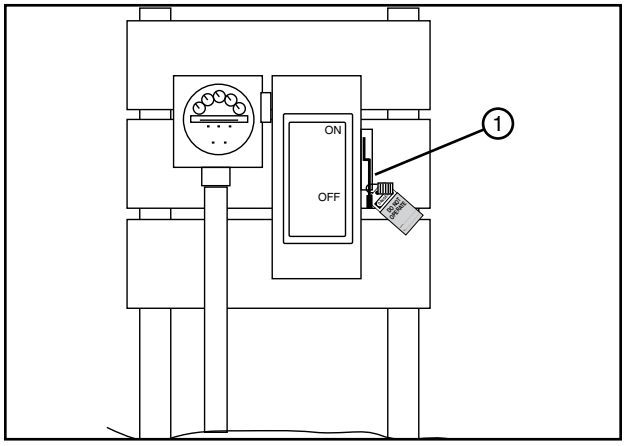


Figure 29-1 1. Public Power Service Disconnect

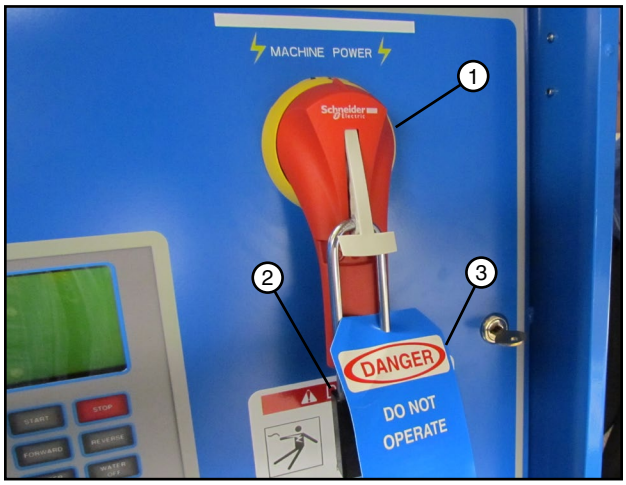


Figure 29-2 1. Main Disconnect
2. Lock
3. Blue Tag

Maintenance

Wheel Gearbox

NOTE

- **After the first operating season, change the oil in all wheel gearboxes, bell housings and gear motors.**
- **After the first oil change, change the wheel gearbox, bell housing and gear motor 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. Clean all dirt away from the expansion chamber cap and remove the expansion chamber cap from the wheel gearbox. Do not allow dirt to fall into the gearbox when removing the cap. See Figure 30-3.
   - Make sure the vent holes on each side of the expansion chamber cap are open and unobstructed.
2. Remove the drain plug from wheel gearbox, bell housing and gear motor. Drain oil into a container. See Figure 30-1 and 30-2.
3. Install the drain plugs after draining oil.
4. Remove fill plug and oil level plug from gear motor. See Figure 30-2.
5. Remove fill plug from bell housing. See Figure 30-2.
6. Fill the gear motor with Valley Red gear lube through fill plug hole until oil runs out of oil level hole. Install oil level and fill plug in gear motor.

NOTE

- **Use only Valley Red Gear Lube. Other Lubricants may contain corrosive extreme pressure additives, which may damage components and void your warranty.**

VALLEY GEAR LUBE	
Part No.	Description
0996587	55 Gallons
0996586	2 1/2 Gallons

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

7. Fill gearbox with Valley gear lube to the top of fill line on the inside of the gearbox or top of worm gear shaft. The capacity is approximately 6.5 quarts (6.2 liters). Allow time while refilling the gearbox for the oil to equalize between the bell housing and wheel gearbox. DO NOT over fill.
8. Fill bell housing with Valley gear lube to top of coupling as seen through the fill plug hole.
9. Install bell housing fill plug and wheel gearbox check plug. Then install the expansion chamber cap on wheel gearbox. Secure with original hardware and torque to 8 lb-ft (10.8 N·m).

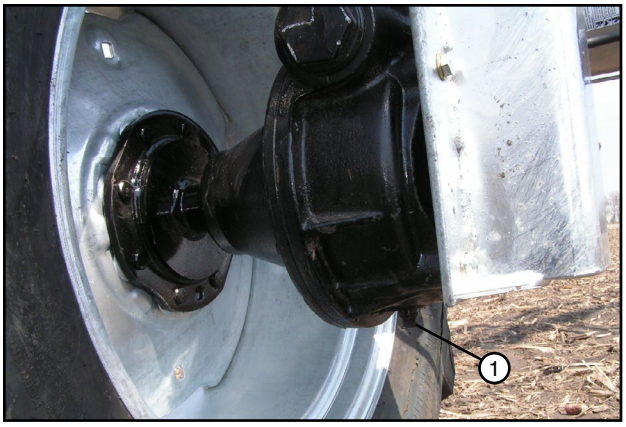


Figure 30-1 1. Drain Plug Wheel Gearbox

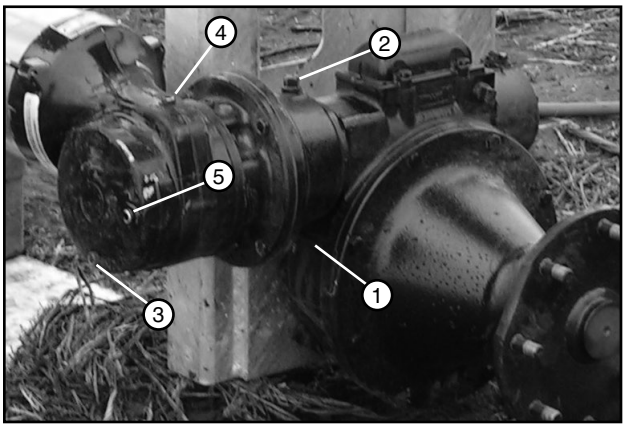


Figure 30-2 1. Drain Plug Bell Housing 4. Fill Plug Gear Motor
2. Fill Plug Bell Housing 5. Oil Level Plug Gear Motor
3. Drain Plug Gear Motor

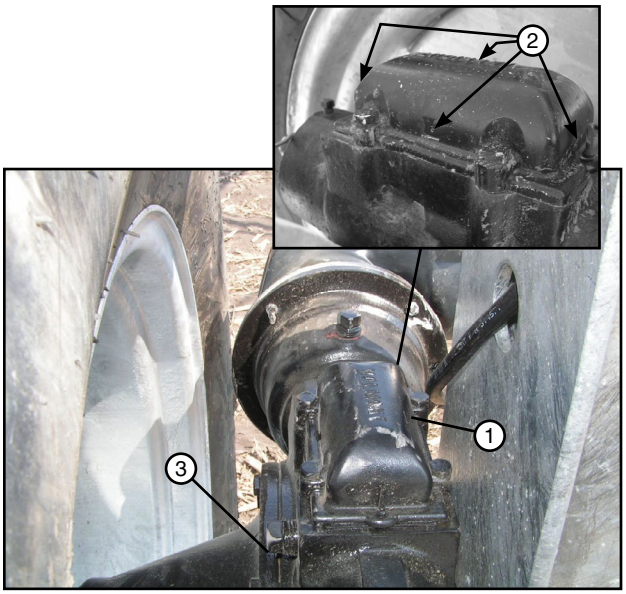


Figure 30-3 1. Expansion Chamber Cap
2. Vent Holes
3. Check Plug

Optional DualDrive Gearbox

NOTE

- **Elevation of one side tire using a block may-be required. This would allow better access to the fill plug.**

1. Loosen all lug nuts allowing one tire to tilt enough for the removal drain/fill plugs.
2. Remove the drain plug from center drive gearbox. Drain oil into a container. See Figure 31-1 and 31-2.
3. Install the drain plugs after draining oil.
4. Remove fill plug from gearbox. See Figure 31-2.
5. Fill gearbox with Valley Red Gear Lube to the fill line shown in Figure 31-2. Allow time while refilling the gearbox for the oil to equalize in the gearbox. DO NOT over fill.

NOTE

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

VALLEY GEAR LUBE	
Part No.	Description
0996587	55 Gallons
0996586	2 1/2 Gallons

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

6. Secure with original hardware and torque to 20 lb-ft (27 N·m) minimum.
7. Tighten lug nuts to 125 lb-ft (169.47 N-m).

Steering Gear Motor

NOTE

- **After every operating season, change the oil in the steering motor gearbox.**

1. Remove both the fill plug and drain plug from the steering motor gearbox, then drain the oil into a container. See Figure 31-1.
2. Install the drain plug after draining oil.
3. Fill the steering motor gearbox to 0.5 in (12.7 mm) below fill plug hole with Valley Blue Gear Lube.
4. Install fill plug after refilling the gearbox.

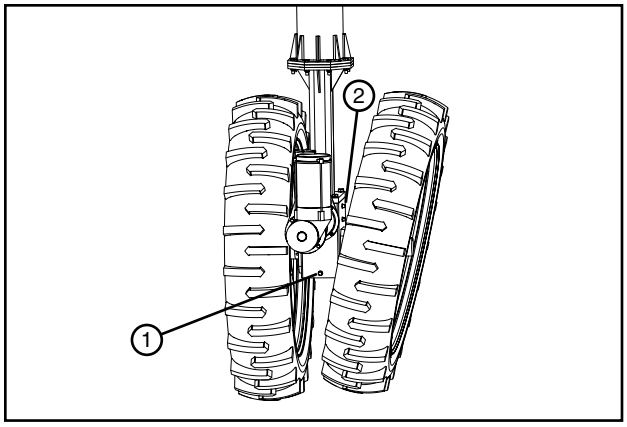


Figure 31-1 1. Drain Plug
2. Fill Plug

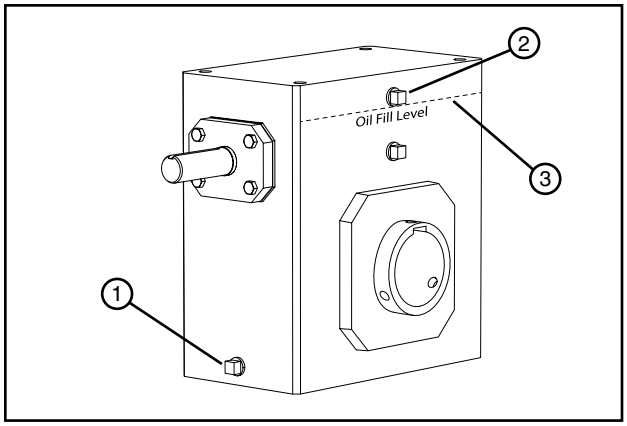


Figure 31-2 1. Drain Plug
2. Fill Plug
3. Oil Level

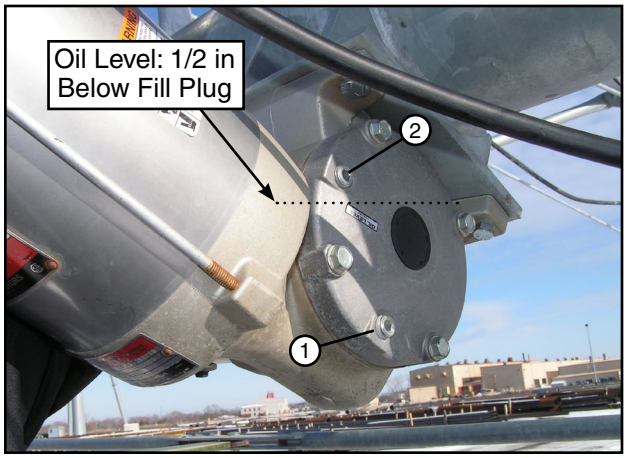


Figure 31-3 1. Drain Plug
2. Fill Plug

Steering Gearbox

NOTE

- **After every operating season, change the oil in the steering gearbox.**

Steering Gearbox will need to be removed to change gear lube.

NOTE

- **Use only Valley Blue Gear Lube. Other Lubricants may contain corrosive extreme pressure additives, which may damage components and void your warranty.**

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.**

Wheel Lug Nut Torque

Check the wheel lug nut torque annually to make sure it is at 125 lb-ft (169.47 N·m). See Figure 32-2.

Tire Pressure

Proper tire pressure is important! Operating with low tire pressure damages the tires and the drive train. Operating with high tire pressure increases wheel tracks and shortens the life of the tire.

Check the tire pressure at these times during the year:

- At the start of the irrigation season
- Every month of the irrigation season
- When performing winterization or at the end of the irrigation season

For the correct tire pressure refer to the decal on the rim or the tire pressure chart. See Figure 32-3.

⚠ WARNING

- **TIRES ARE SHIPPED AT A PRESSURE OF 30 TO 50 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.**

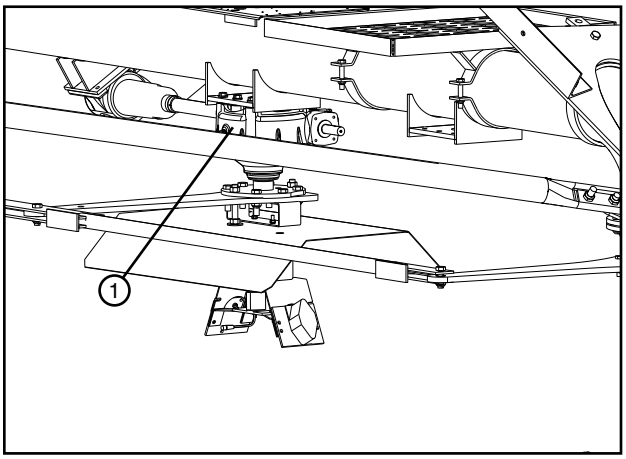


Figure 32-1 1. Steering Gearbox

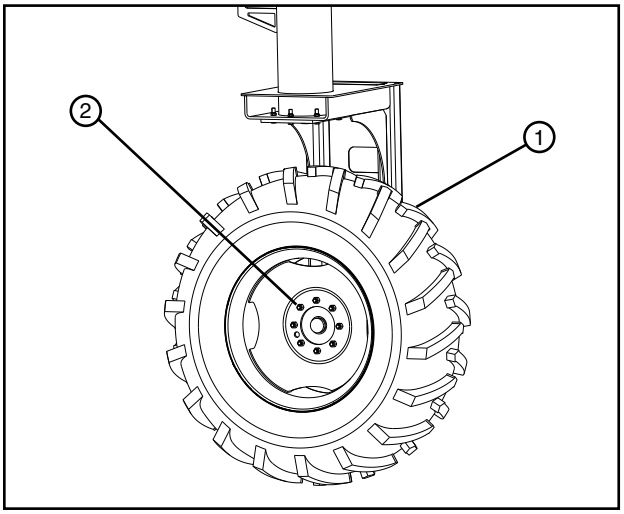


Figure 32-2 1. Tire and Wheel
2. Lug Nut

TIRE PRESSURE CHART

Span Drive Units			
Tire Size (Inches)	Pounds per Square Inch (PSI)	Kilopascals (kPa)	Bar (bar)
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
16.9 X 24 Turf Tire	18*	124	1.2
18.4 X 26 Tire	10	69	.69
11.2 X 38 Tire	23	158	1.5

Figure 32-3 * Tire pressure may be reduced to 16 psi (110 kPa) for increased floatation.

Barricade

Maintain the barricade structure and area.

Inspect the barricade structure for failure and tighten any loose hardware completely.

Ensure that the actuator arm contacts the tripping structure. Under certain conditions, soil may build up in the wheel track resulting in a ramp effect. This may allow the actuator arm to go over the top of the structure which trips the actuator arm. See Figure 33-1.

Should this happen, the machine will not stop but continue to move and can result in damage to the machine. Remove any build up of soil in the barricade area.

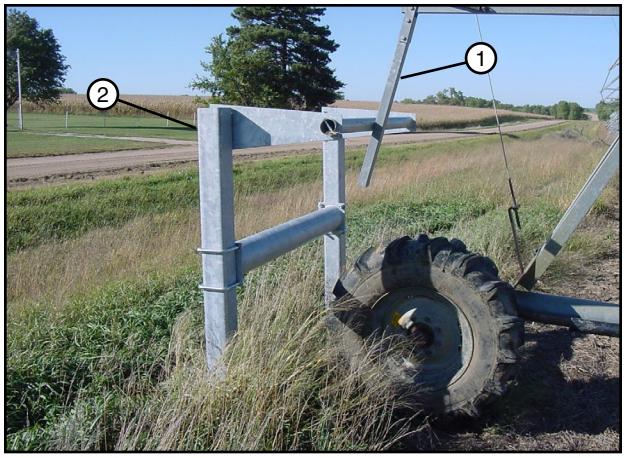


Figure 33-1 1. Actuator arm
2. Barricade

Wheel Tracks

It is important to maintain wheel tracks. If left in a state of disrepair, wheel tracks can cause structural damage to the irrigation machine. See Figure 33-2.

- Wheel tracks should be maintained and controlled. A maximum allowable wheel track for machines is 8-10 in (20-25 cm) deep.
- Establish a wheel track with the first several revolutions of the machine at maximum speed and minimum water application depth.
- Deep ripping or chiseling in the wheel track area should be avoided.
- Wheel tracks can be controlled by various methods which include larger tires, dry wheel track sprinkler packages, boombacks, wide-flat berms, drag socks, etc. Wheel track depth can be controlled by using track fillers, tillers, discs, or flotation tires.
- If berms are built for wheel tracks it is recommended to have a width of 3 ft (1 m) to prevent slippage off the sides and compacted to prevent deep wheel tracks. Proper drainage may be required to prevent water buildup. Berms are not recommended for the steerable drive unit wheel tracks due to the potential variability of the wheel track from season to season.
- Wheel tracks may be wider with dual steering gearboxes.

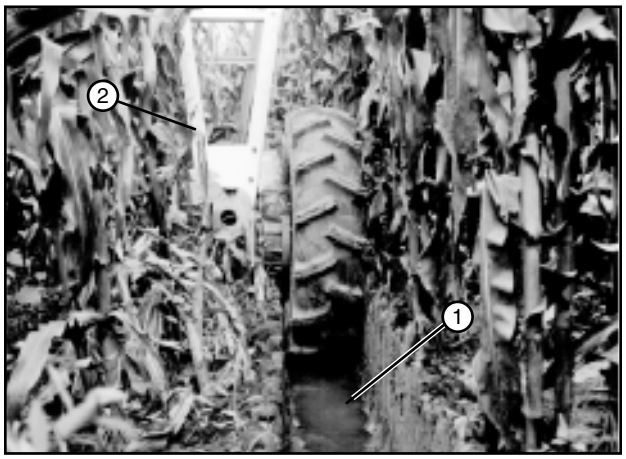


Figure 33-2 1. Wheel Track
2. Drive Unit

⚠ CAUTION

- **OPERATOR INTERFACE PANEL IS LOCATED ON THE CORNER STEERABLE DRIVE UNIT (SDU). IT IS ACCESSED BY CLIMBING STEPS ON THE FORWARD SDU LEG TO OPERATOR PLATFORM. WET OR MUDDY CONDITIONS CAN RESULT IN SLIPPERY SURFACES.**
- **WATCH OUT FOR THE LOCATION OF THE STEERING ARM AND TIE ROD TO INSURE YOU DO NOT HIT YOUR HEAD OR SHOULDERS AS YOU MOVE UP SDU LEG AND NEVER ATTEMPT TO UTILIZE STEPS WHILE CORNER IS MOVING.**

Maintenance

Miscellaneous

Hose Replacement

If the 4-1/2 in (11.4 cm) hose is sufficiently weather-cracked, checked, or leaking, you need to replace the hose. Follow the steps below to replace the 4-1/2 in (11.4 cm) hose. See Figure 34-1.

1. Loosen the hose clamps. See Figure 34-1.
2. Remove the old hose.
3. Slide the hose clamps over the new hose.

⚠ WARNING

- **ENSURE "STRIPE" DOWN THE HOSE REMAINS STRAIGHT. TWISTED HOSES CAN KINK, PREVENTING THE PROPER AMOUNT OF WATER REACHING THE SPRINKLERS.**

NOTE

- **To aid installation of the hose, a vegetable based soap or tire bead lubricant may be used to lubricate the barbed pipe. DO NOT use oil, grease, or other petroleum-based products.**

4. Slide the new hose onto each stub pipe until the hose contacts the hose stops.
5. Tighten the hose clamps. See Figure 34-1.

Contact your local Valley Dealer if you have any questions about replacing the 4-1/2 in (11.4 cm) hose.

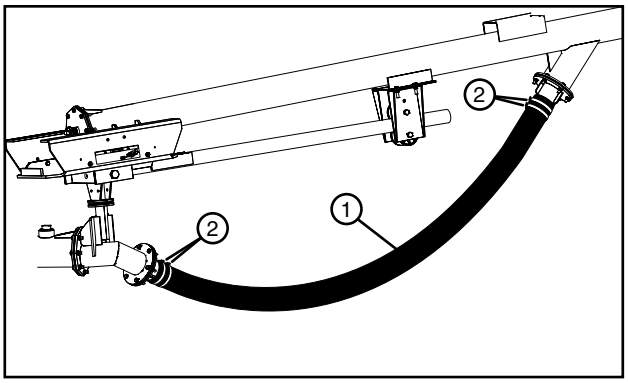


Figure 34-1 1. 4-1/2 in Hose
2. 4-1/2 in Hose Clamps

Electrical and Grounding Conductors

Check the condition of all electrical and grounding conductors regularly. See Figure 34-2.

Have your local Valley dealer repair or replace any broken conduit or electrical wire that has worn or cracked insulation.

Always make sure the ground wires are attached securely. See Figures 34-2 and 34-3.

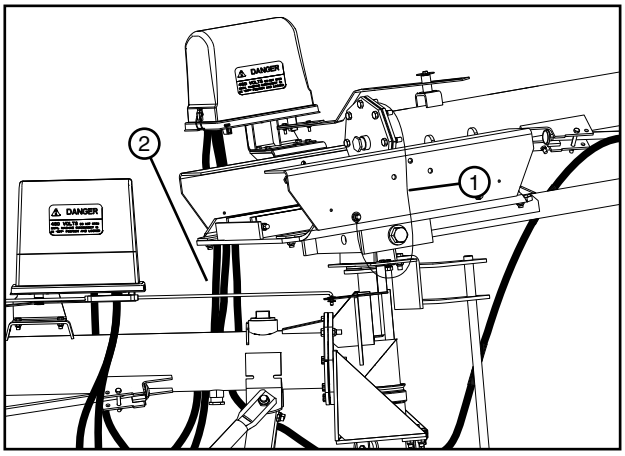


Figure 34-2 1. Ground Wire
2. Electrical Conductor

T-Bar Lubrication

Lubricate the T-bar/corner outlet bushing at the start of each season and every 1,000 hours of operation with a water-resistant lithium-based grease. See Figure 34-3.

Lubricating the T-bar/corner outlet bushing regularly reduces the possibility of binding.

The grease fittings are located on the side of the corner outlet bushing. See Figure 34-3.

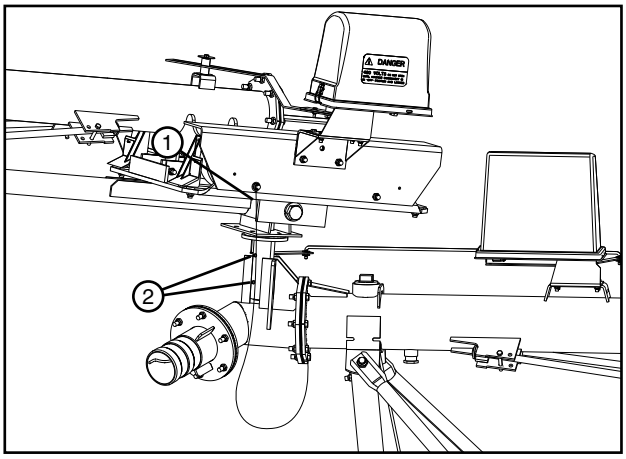


Figure 34-3 1. Ground Wire
2. Grease Fitting

Miscellaneous

Guide and Track Roller Bearing Lubrication

Lubricate the guide and track rollers at the start of each irrigating season and every 1,000 hours of operation with a water-resistant lithium-based grease.

1. From on top the extended cradle, use a grease gun to lubricate the grease fitting on each guide roller. See Figure 35-1.
2. Lubricate the grease fitting on each track roller. See Figure 35-2.
3. During lubrication visually inspect rollers for excessive wear.

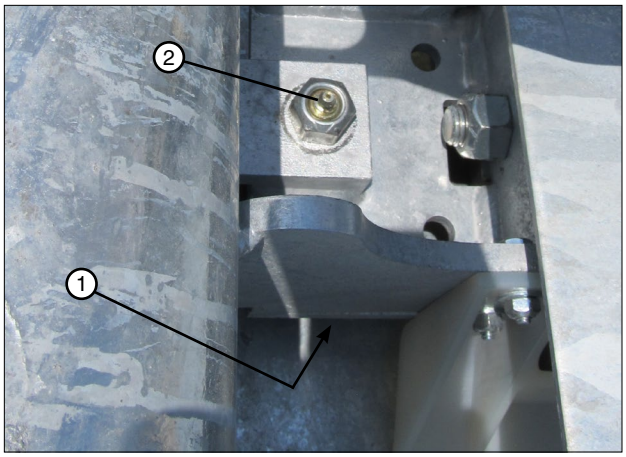


Figure 35-1 1. Guide Roller
2. Grease Fitting

Wear Plate Inspection

The extended cradle is equipped with changeable wear plates to prevent excessive wear.

1. Check the condition of track rollers, guide rollers and wear plates regularly to prevent extended cradle damage. See Figure 35-3.

NOTE

- **Wear plates should be replaced when they have worn down 1/16 inch of their original thickness.**

2. Have your local Valley dealer replace worn guide rollers, track rollers and/or wear plates.

NOTE

- **Main rollers must be replaced when gap in Figure 35-3 becomes less than 1/16 inch.**

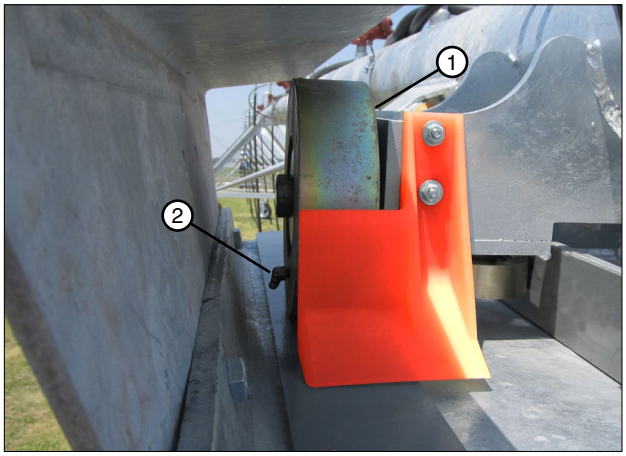


Figure 35-2 1. Track Roller
2. Grease Fitting

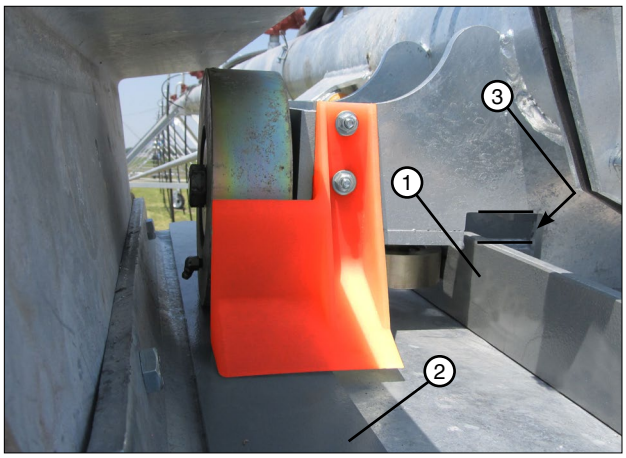


Figure 35-3 1. Track Roller Wear Plates
2. Guide Roller Wear Plates
3. Wear Gap

Miscellaneous
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 36-1.

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 for this machine specifies the correct end gun arc settings for the machine. See Figure 36-2.

END GUN ARC SETTING EXAMPLE:

FORWARD ANGLE = 45˚

BACKWARD ANGLE = 85˚

IMPORTANT: This is an example only. Refer to the sprinkler chart for this machine 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.

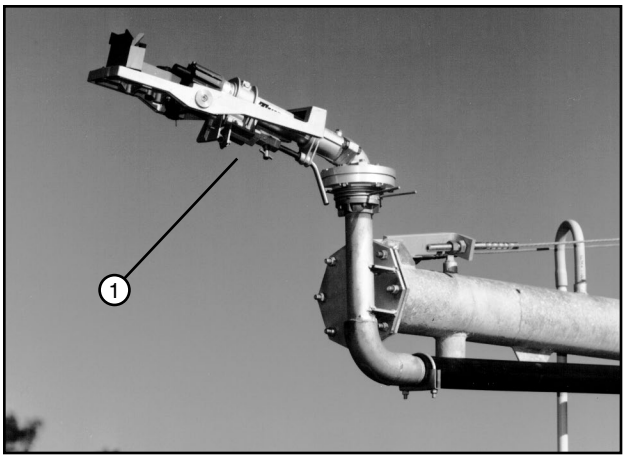


Figure 36-1 1. End Gun

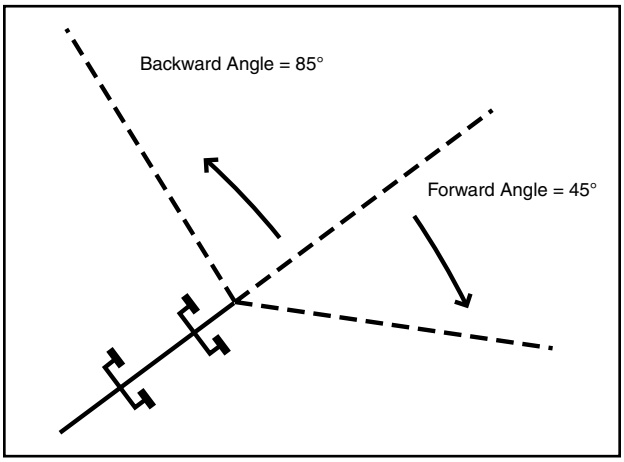


Figure 36-2

Annual 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 PARTS.

Corner

	1st Pass	4th Pass	Pre-season	Remarks
Check all nuts and bolts. Tighten as required.	X		X	
Check equipment grounding conductors. Tighten or clean as required.			X	
Lubricate T-bar/corner outlet bushing			X	See T-Bar Lubrication in Maintenance section
Lubricate the guide and track rollers			X	See Guide and Track Roller Bearing Lubrication in Maintenance section.
Check guide and track roller wear plates.			X	See Wear Plate Inspection in Maintance Section.
Check air pressure in tires.	X		X	Also check at least once during the operating season.
Check condition of electrical conductor.			X	Replace if frayed, worn, or weather checked.

Steerable Drive Unit

	1st Pass	4th Pass	Pre-season	Remarks
Check the motor lead cable for damage.			X	Contact your Valley dealer if the outer insulating sheath is cracked.
Check for proper ground connection on motor and motor lead.			X	
Check each motor drain hole for proper drainage.			X	
Drain and replace the steering gear motor lubricant.			X	See the Steering Gear Motor in the Maintenance section.
Check the gearmotor seals and gaskets.			X	
Check the steering drive shaft U-joints and U-joint covers.			X	
Check the gearbox seals and gaskets.			X	
Check and tighten the wheel lug bolts. (125 ft. lbs. torque).	X		X	When ever a lug nut is tightened, re-check lug nuts after the first revolution.
Check the steering tie rod bushings for excessive wear or play.			X	Contact your valley dealer if excessive wear or play is found.
Check the tie cable on the dual steering option for wear.			X	Replace if strands are broken or eyelet bushings show excessive wear.
Clean gearbox ventilation hole in expansion chamber (3 times a year).			X	Ventilation holes must be kept open to extend the gearbox seal life.
Check/change the wheel gearbox lubricant. (Applys to option dual drive option)			X	See the Wheel Gearbox in the Maintenance section.
Drain and replace the wheel gear motor lubricant. (Applys to option dual drive option)			X	See the Wheel Gearbox in the Maintenance section.
Grease SDU U-Joints if dual drive option is present			X	

Maintenance

Annual Maintenance

Span

	1st Pass	4th Pass	Pre-season	Remarks
Check flanges for leaks and tighten as required.			X	
Check pipe drains for proper drainage and invert the seal when applicable. (See Winterization procedure.)			X	These must be checked at end-of-season shutdown.
Check structural components for tightness.			X	
Check power cable for damage and proper banding to ensure proper attachment.			X	
Check/clean cross filter.			X	

Sprinkler

	1st Pass	4th Pass	Pre-season	Remarks
Check solenoid valves and sprinkler valves for proper operation.			X	See Sprinkler Test Procedure in Maintenance section
Check the pivot pressure to make sure it matches the sprinkler package pressure.		X	X	Notify your Valley dealer of any changes.
Check sprinklers and nozzles for tightness.			X	
Check sprinkler for free movement.			X	
Check sprinkler nozzles for wear.		X	X	Increasing the engine RPM or drop in pressure indicates wear.
Check pressure gauge.			X	
Check for plugged or partially plugged nozzles.	X	X	X	
Flush entire machine.			X	See Flushing Procedure.
Check end gun bearing and brake setting.			X	
Check tubing harness for damage.			X	

Overhang/Booster Pump

	1st Pass	4th Pass	Pre-season	Remarks
Check overhang cables for broken cable strands.			X	Replace if cables are damaged.
Clean and ensure operation of the end gun drain.			X	Always check at end-of-season shutdown.
Check and clean the sand trap.			X	As needed. See Winterization Procedure.
Check the end gun arc settings.			X	Refer to the sprinkler chart.
Check the end gun bearing and brake.			X	
Check the end gun nozzle for wear.			X	
Drain the booster pump and ensure that the booster pump is drained completely.			X	See Winterization Procedure.
Ensure the booster pump hose is drained.			X	This should be done at end of season

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 water.

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 main disconnect switch off. Only water is required for this procedure - the machine does not need to run.
2. Remove the pipe drains at each tower and clean sand and foreign particles from these drains. Turn the rubber drain seal over when reinstalling. See Figure 39-1.

NOTE

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

3. Remove and clean the sand trap at the last regular drive unit. See Figure 39-2.

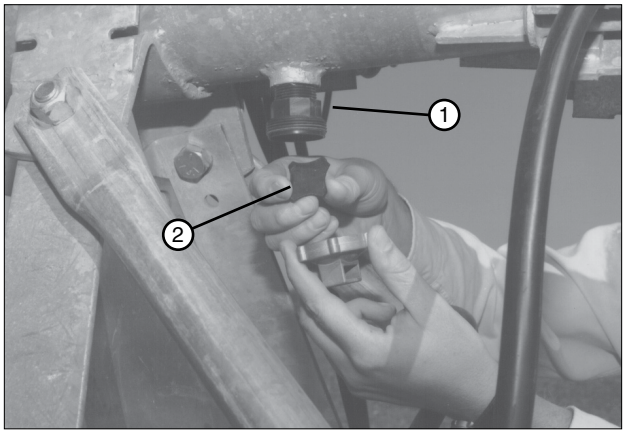


Figure 39-1 1. Pipe Drain
2. Rubber Seal

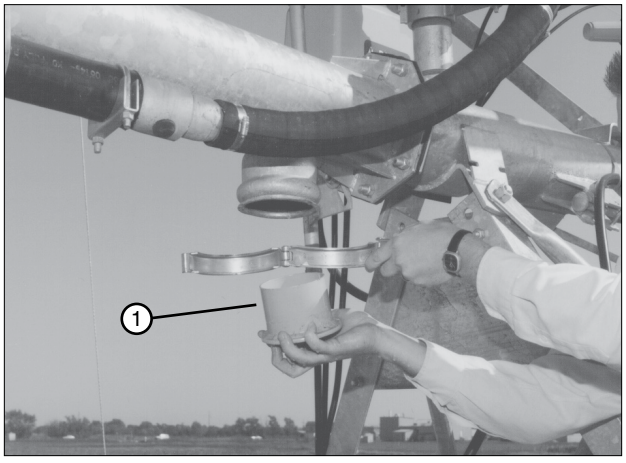


Figure 39-2 1. Sand Trap

Span Flushing Procedure

4. Remove plugs from the overhang drain. See Figure 40-1.
5. Start the pump and allow the machine to flush thoroughly.
6. Turn off the water supply and install the pipe drains, sand trap, and overhang plugs.
7. If the machine is equipped with an end gun:
   - Make sure the booster pump hose drain is not plugged with sand. See Figure 40-2.
   - Clean the end gun shut off solenoid valve cross filter or optional dirty water filter. See Figures 40-3 and 40-4. Refer to caution and note below.

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.

⚠ CAUTION

•OVER TIGHTENING OF THE 3/4 PIPE PLUG CAN CAUSE SCREEN FILTER DAMAGE NOT ALLOWING WATER TO REACH SOLENOIDS. SEE FIGURE 40-3.

NOTE

•Tighten 3/4 pipe plug hand tight, then 1/4 turn using pliers. See Figure 40-3.

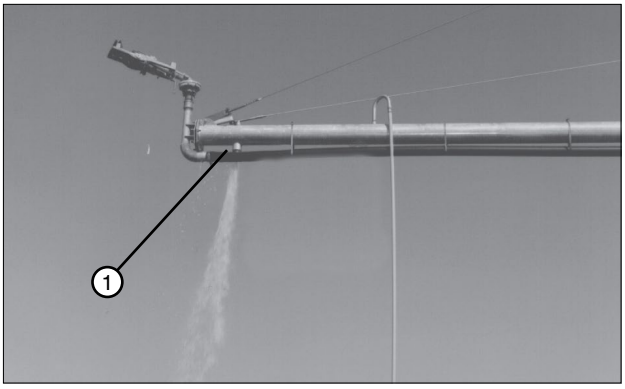


Figure 40-1 1. Overhang Drain

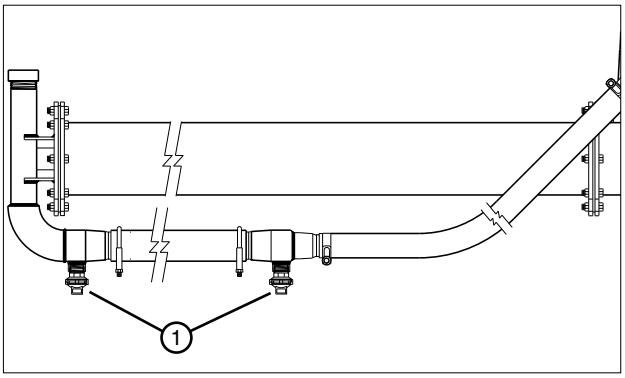


Figure 40-2 1. Booster Pump Hose Drain

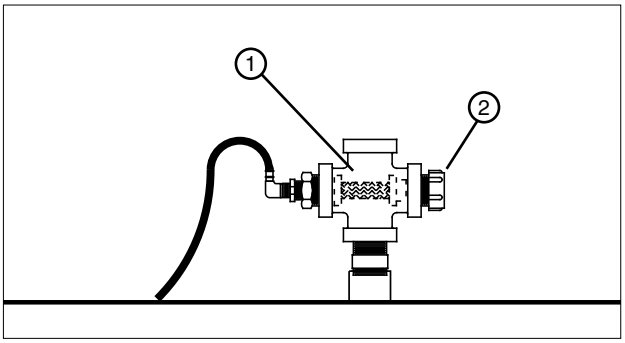


Figure 40-3 1. Cross Filter
2. 3/4 Pipe Plug

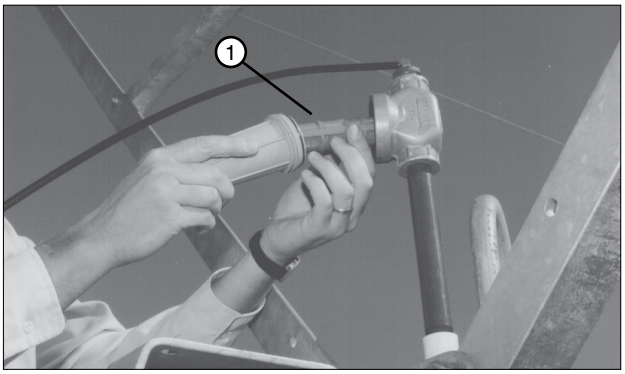


Figure 40-4 1. Optional Dirty Water Filter

Sprinkler Test Procedure

Located on the last regular drive uint (LRDU) is the sprinkler sequencing box. The sequencing box must be tested prior to seasonal operation. Test when machine is running wet (spraying water). See Figure 41-1.

1. Remove 1/8 in x 1 in cotter pin with flat washer. See Figure 41-2.
2. Lift sprinkler rod from sequencing box arm.
3. With the machine running wet move sequencing box arm to fully extended position, confirming that all sprinklers are operating. See Figure 41-2.

NOTE

- **If the sequencing arm is moved to far, the safety microswitch in the sequencing cam box will open, thus shutting down the machine.**

5. Move the sequencing box arm back until all sprinklers are off except those that are not equip with sprinkler valves.
6. Reinstall sprinkler rod in reverse order when complete.

NOTE

- **DO NOT change the length of the linkage arm during this procedure.**

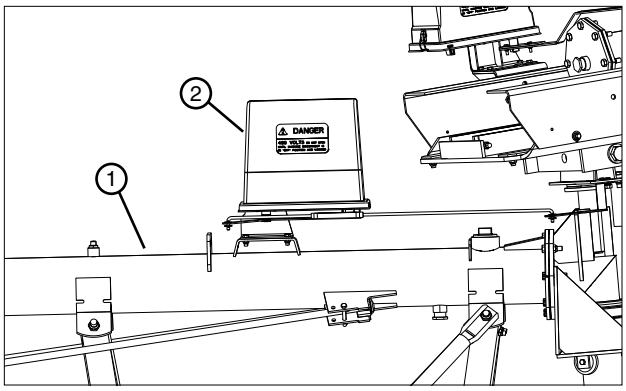


Figure 41-1 1. Last Regular Drive Unit
2. Sprinkler Sequencing Box

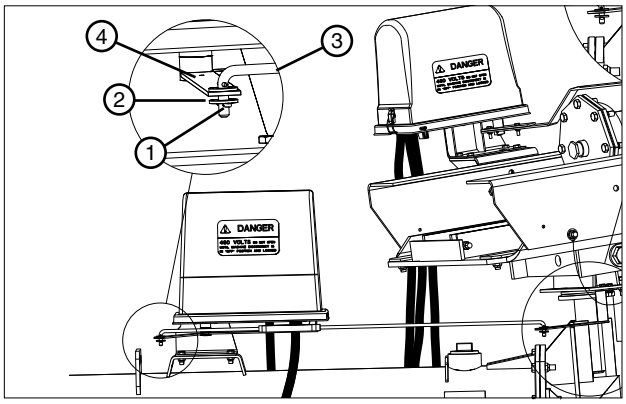


Figure 41-2 1. 1/8 x 1 Cotter Pin
2. 1/8 Flat Washer
3. Sprinkler Rod
4. Sprinkler Sequencing Box Control Arm

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 manufacturer recommendations.
- Ensure the main pipeline is completely drained and replace all of the drains. Any low spot in the mainline which is buried above the frost line between the pump and the pivot should have a riser installed at the low point to provide access for pumping water from the line.

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. Long machines are more 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 (5.1 cm) x 12 in (30.5 cm) planks over the wheel tracks. Park the machine with the tires on the center of the planks.
3. 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.

Troubleshooting List

The table below lists various problems that could occur along with their possible causes and corrective actions.

PROBLEM	POSSIBLE CAUSE OR CORRECTIVE ACTION
Machine has shut down or will not start.	The pivot is out of alignment - See the Pivot Owners Manual.
	A drive unit is stuck. Fill the wheel track with dry soil to allow movement.
	A flat tire at the drive unit
	A failed drive unit U-joint.
	Check the SDU for signs of motor or gearbox problems (failure, burn out, or breakage).
	Faulty LRDU drive systems
	Check the LRDU for signs of failure in the mechanical assemblies or the Run Cycle Box control arm linkage.
	Call your Valley Dealer.
SDU is out of its wheel track.	Check the wheel track to see if the SDU is having difficulty climbing over a steep soil ridge.
	Check the mechanical steering motor or gearbox.
	Faulty wheel gearbox motors
	Call your Valley dealer.
Sprinklers fail to come on or shut off.	The plastic tubing is plugged or broken.
	Plugged water filters
	A faulty solenoid coil - call your Valley dealer.
	Plugged or damaged cross filter

Troubleshooting