



**Bender160™
Owner's Manual
Supplement**

0998322_C

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General Information

About This Manual

Information contained in this manual applies to the Valley Bender160 option.

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

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.

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.

Irrigation Equipment near Airports and Crop Dusting Aircraft

- If any part of the irrigation machine comes within 3200 ft (975 m) of an airport runway, especially the approach (ends) of the runway, additional warning markers may be required. In the United States, CFR Title 14, Chapter I, Subchapter E, Part 77 – Safe, Efficient Use, and Preservation of the Navigable Airspace describes when marking is needed.

This document is available at: www.ecfr.gov

- Marking requirements vary depending on the location of the irrigation equipment relative to the runway, the type of airport (Civil, Military, or Heliport) and other factors. Contact the local airport authority for guidance and specific recommendations. In the United States, guidelines for marking structures near airports are published by the Federal Aviation Administration in Advisory Circular AC 70/7460-1L – Obstruction Marking and Lighting.

Available here: www.faa.gov/regulations_policies/advisory_circulars

- For irrigation machines near private or unregulated airfields, including farm-based airstrips, Valley strongly recommends complying with the same standards and requirements as Civil airports as shown in Part 77.
- Regulations vary by country, contact your local aviation authority for guidance.

Overhang cables, including overhang back cables are a particular danger. In locations where low-flying aircraft are likely, such as within 1,500 ft (457 m) of an end of an airport runway, or where crop dusting aircraft are common, Valley recommends adding obstruction markers to overhang cables to improve their visibility.

For large overhangs (36 ft / 10.97 m Heavy Duty and longer), five 12 in (300 mm) or 20 in (500 mm), aviation orange marker balls are sufficient. One near the rabbit ears, two in the middle of the back cables and two in the middle of the highest overhang cables. Refer to Section 3.5 in AC70/7460-1 for additional details. Aviation marker balls are available online and from a variety of aviation and airport safety equipment providers.

Safety

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 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.

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. De-activate 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 non-essential items are removed and that the machine or equipment components are operationally intact.
2. Check the work area to ensure that all personnel are safely positioned or removed from the area.
3. Verify that the controls are in neutral.
4. Remove the lockout devices and re-energize 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.

Safety

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. Refer to Figure 10-1.



Figure 10-1 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. Refer to Figure 10-2.

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.

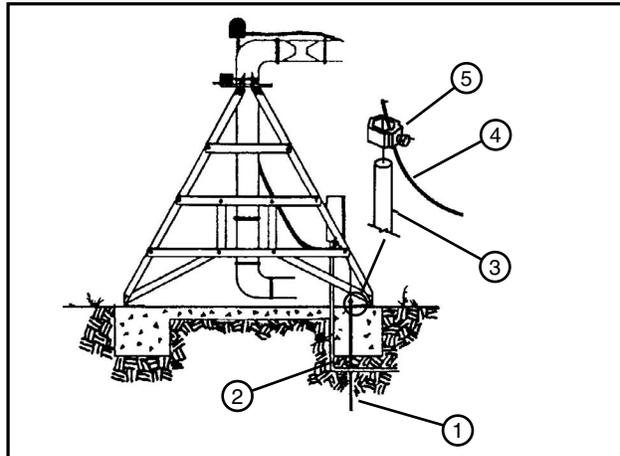


Figure 10-2 1. Ground Rod Installation 2. Service Conductor 3. Copper Ground Rod 4. Copper Ground Wire 5. Clamp

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.
- Each time a towable machine is moved, the ground wire MUST be reattached to the ground rod and checked for electrical integrity before restarting the machine.

Operate Safely (Continued)

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. Refer to Figure 11-1.

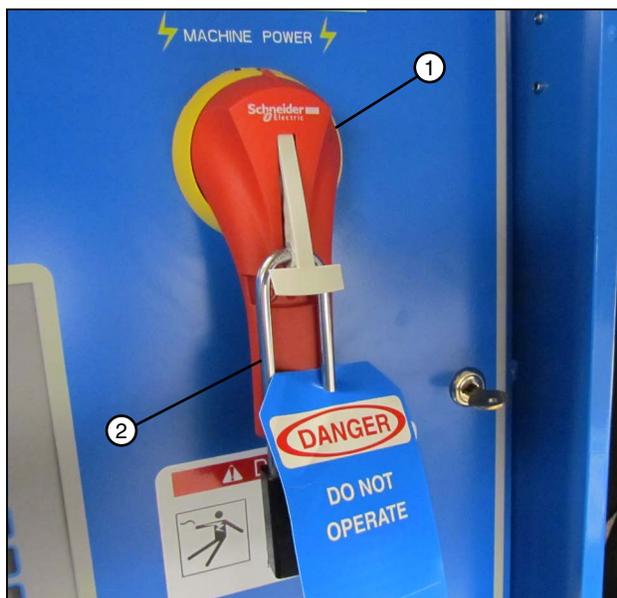


Figure 11-1 1. Main Power Disconnect
2. Lock

The blue (OSHA safety color code) tag shown below should also be filled out and attached to the disconnect after locking. Refer to Figure 11-2.

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



Figure 11-2

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.

Safety

Operate Safely (Continued)

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 SHAFT 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 (Continued)

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

Pivots 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 should be 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

PART CIRCLE 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. Refer to Figure 13-1.

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



Figure 13-1 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.

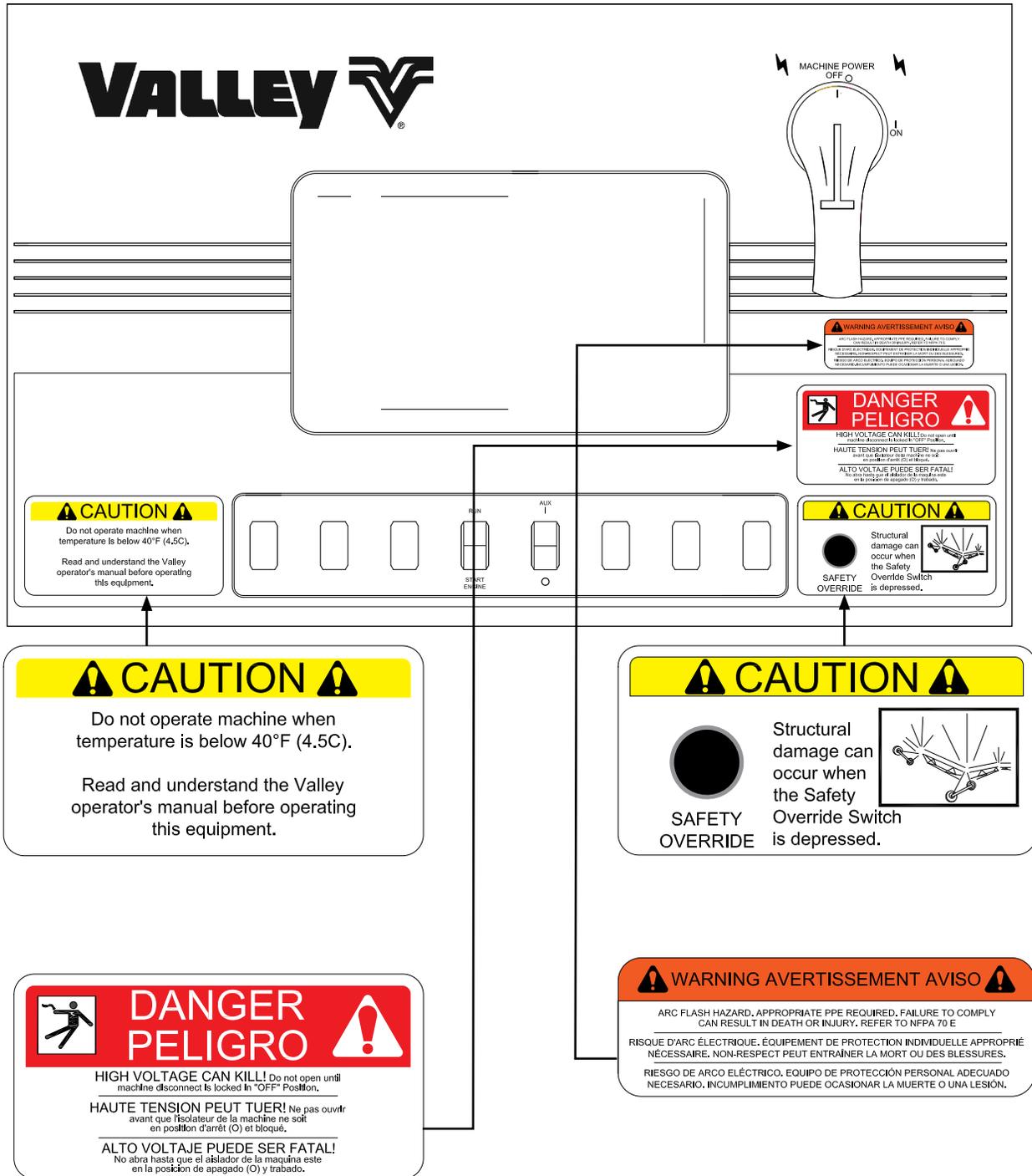
Repeated safety override start attempts can cause severe structural damage.

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 operators with these safety decals. For replacement of any decal, contact your local Valley dealer.



Safety Decals (Continued)



DANGER PELIGRO

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

HAUTE TENSION PEUT TUER! NE PAS OUVRIR AVANT QUE L'ISOLATEUR DE LA MACHINE NE SOIT EN POSITION D'ARRÊT (O) ET BLOQUÉ.

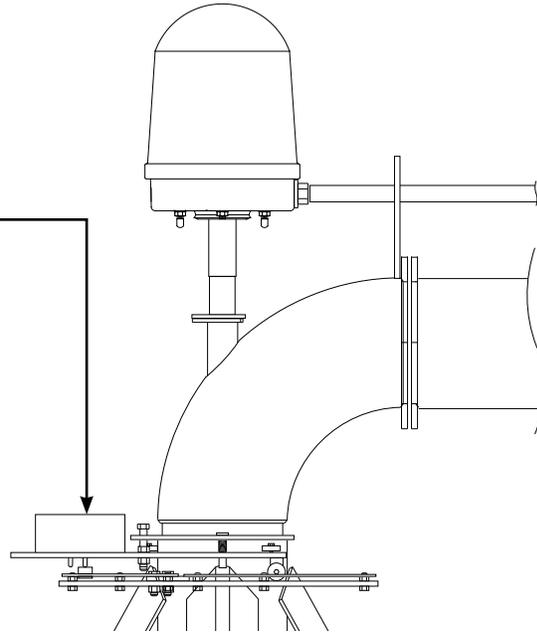
ALTO VOLTAJE PUEDE SER FATAL! NO ABRA HASTA QUE EL AISLADOR DE LA MAQUINA ESTE EN LA POSICION DE APAGADO (O) Y TRABADO.

WARNING AVERTISSEMENT AVISO

ARC FLASH HAZARD. APPROPRIATE PPE REQUIRED. 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.



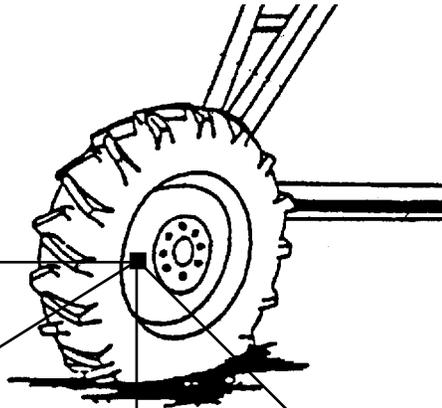

WARNING

TIRE AND RIM FOR IRRIGATION USE ONLY.

ADJUST PRESSURE BEFORE USE. SEE OWNERS MANUAL FOR RECOMMENDED PRESSURE.

18 PSI [1.2 BAR] MAXIMUM

VALLEY




WARNING

TIRE AND RIM FOR IRRIGATION USE ONLY.

ADJUST PRESSURE BEFORE USE. SEE OWNERS MANUAL FOR RECOMMENDED PRESSURE.

23 PSI [1.6 BAR] MAXIMUM

VALLEY



WARNING

TIRE AND RIM FOR IRRIGATION USE ONLY.

ADJUST PRESSURE BEFORE USE. SEE OWNERS MANUAL FOR RECOMMENDED PRESSURE.

30 PSI [2.1 BAR] MAXIMUM

VALLEY



WARNING

TIRE AND RIM FOR IRRIGATION USE ONLY.

ADJUST PRESSURE BEFORE USE. SEE OWNERS MANUAL FOR RECOMMENDED PRESSURE.

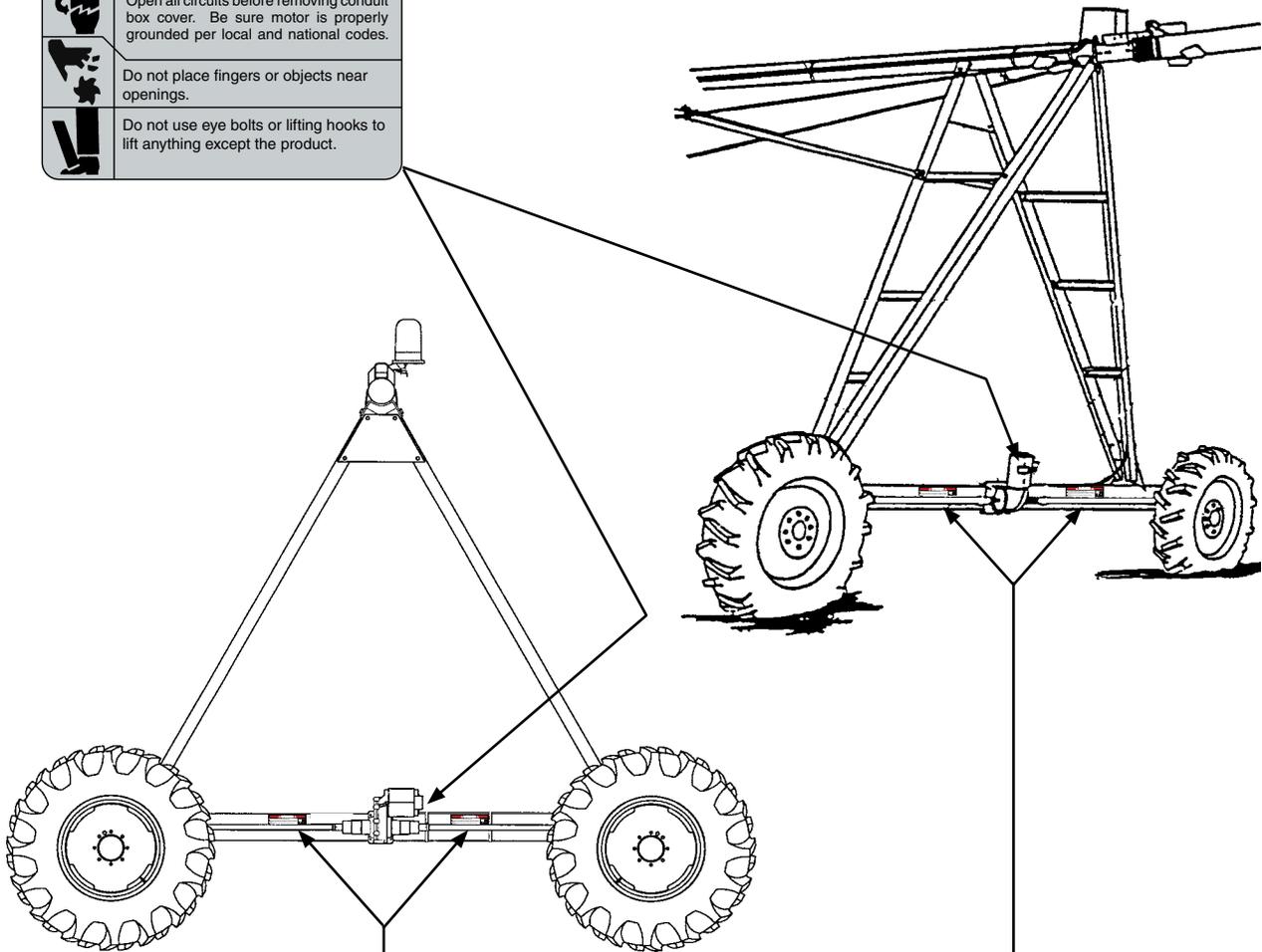
34 PSI [2.3 BAR] MAXIMUM

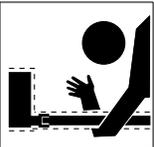
VALLEY

Safety

Safety Decals (Continued)

 WARNING	
Improper installation of this motor may result in fire, explosion, electrical shock or other personal injuries. Read operating instructions	
	Disconnect power before maintenance. Open all circuits before removing conduit box cover. Be sure motor is properly grounded per local and national codes.
	Do not place fingers or objects near openings.
	Do not use eye bolts or lifting hooks to lift anything except the product.



 DANGER 	
Drive Shaft Starts Without Warning!	
<ul style="list-style-type: none">Do not touch rotating drive shaft or shield. Clothing or limbs may become entangled, resulting in severe injury.Do not service until machine is locked in the off position.Always replace drive shaft shield after servicing.	

Safety Decals (Continued)

 **DANGER** 
PELIGRO

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

HAUTE TENSION PEUT TUER! NE PAS OUVRIR AVANT QUE L'ISOLATEUR DE LA MACHINE NE SOIT EN POSITION D'ARRÊT (O) ET BLOQUÉ.

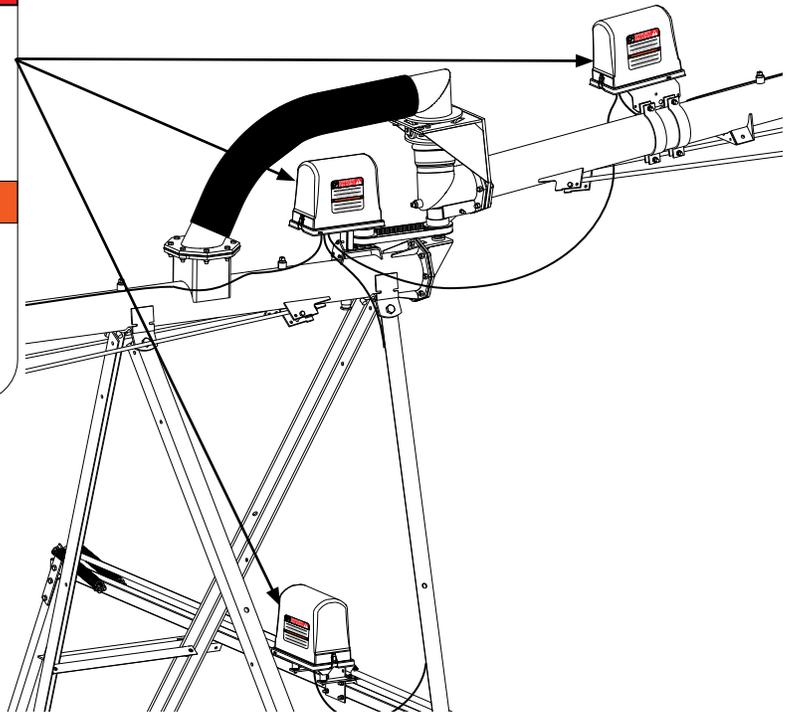
ALTO VOLTAJE PUEDE SER FATAL! NO ABRA HASTA QUE EL AISLADOR DE LA MAQUINA ESTE EN LA POSICIÓN DE APAGADO (O) Y TRABADO.

 **WARNING** **AVERTISSEMENT** **AVISO** 

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

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.



Safety

Bender160 Components

Below is a description of the various components associated with a Bender160.

Bender160 Swivel

The Bender160 swivel is located at the bending point. The swivel is attached to the fixed pipe span with a ball and hitch configuration. See Figure 19-1.

Bender160 Box

The Bender160 Box is mounted towards the end of Bender160 fixed pipe.

The Bender160 box controls regular span alignment while running in normal straight mode.

This box can also control end guns (if equipped) during bending mode.

A safety switch in the Bender160 box will stop the machine in the event that the machine does not stop at the end of field stop. This switch has to be field adjusted and set.

Junction Tower Box

The junction tower box is used to allow extra span cable during bend mode. See Figure 19-1.

Fixed Pipe

This pipe has a fixed outlet that is used to transfer water to the swivel. The hitch mounting ball is attached to the end of the fixed pipe.

Swivel Pipe

This pipe is a regular last pipe that is used as a first pipe on the bending spans to allow for the swivel hardware to be connected. See Figure 19-1.

Flexible Hose

The flexible hose provides water to the bending portion of machine with use of the swivel and fixed pipe. See Figure 19-1.

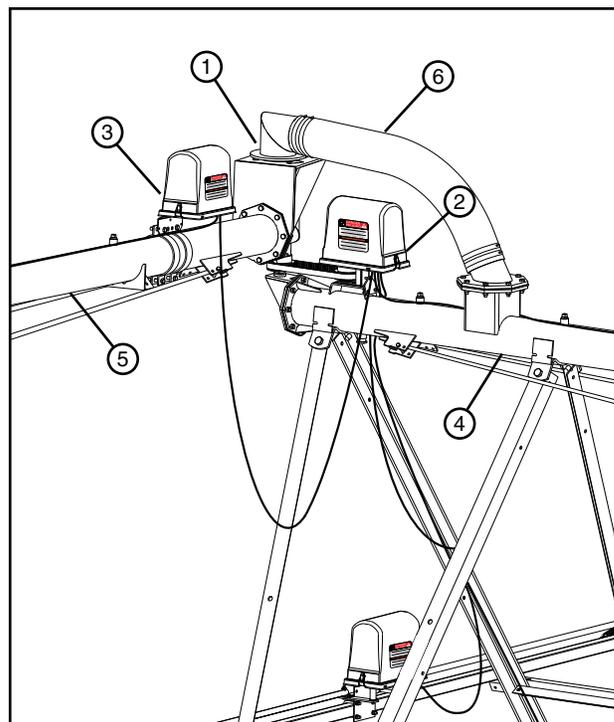


Figure 19-1 1. Bender160 Swivel 4. Fixed Pipe
2. Bender160 Box 5. Swivel Pipe
3. Junction Tower Box 6. Flexible Hose

Overview

Bender160 Components

Bender End of Field Bender Stop

WARNING

- **BENDER BARRICADE MUST BE INSTALLED PRIOR TO ENTERING INTO BEND MODE. FAILURE TO INSTALL THE BARRICADE PRIOR TO BENDING THE SYSTEM CAN RESULT IN DAMAGE TO BOTH THE SYSTEM AND ANY FIELD OBSTRUCTIONS IT MAY BE BENDING AROUND.**

The Bender end of field stop is located on the bending tower. The bender end of field stop uses a different plate than the standard end of field stop. This allows the tire to be positioned closer to the EOFS in case the bending spans pull hard enough to slide the drive unit. See Figure 20-1.

When the bender end of field stop arm contacts the bending barricade, the bending tower stops, and the machine enters the bending mode. The remaining spans continue to move until the end of the field stop arm contacts the end of field barricade.

If the auto reverse option is installed, the operator can choose to either have the system stop or automatically reverse its direction of travel and continue to run once the final end of field stop is reached.

CAUTION

- **NEVER USE THE SAFETY OVERRIDE BUTTON TO WALK THE MACHINE OFF OF THE BARRICADE. STRUCTURAL DAMAGE MAY RESULT.**
- **SOIL MAY BUILD UP IN THE WHEEL TRACK RESULTING IN A RAMP EFFECT ALLOWING THE ACTUATOR ARM TO GO OVER THE BARRICADES. REGULARLY MAINTAIN THE WHEEL TRACK TO INSURE THE ACTUATOR ARM ALWAYS CONTACTS THE BARRICADE.**

Bender Stop Box

The Bender stop box overrides straight mode normal safety allowing the machine to enter the bending mode.

Also, water is shutoff to the sprinklers on the stopped spans if the optional water shutoff valve is installed in the Bender stop box, and sprinkler shutoff valves are installed on each sprinkler on the stopped spans.

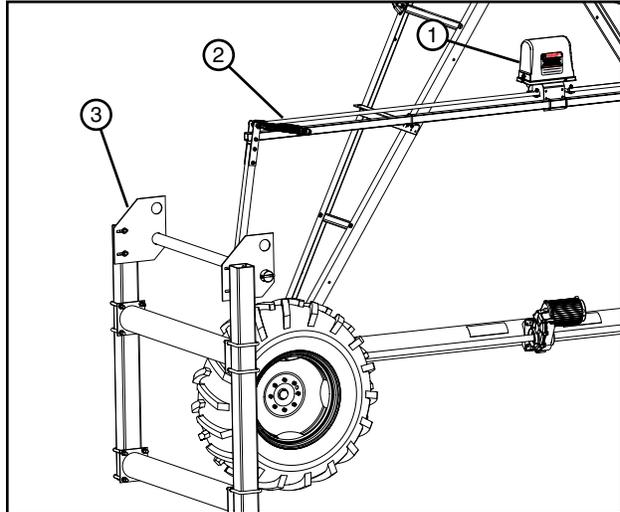


Figure 20-1 1. Bender Stop Box
2. End of Field Stop
3. Bender End of Field Stop Barricade

Bender160 Components Bender Drive Unit Anchor

⚠ WARNING

- **BENDER BARRICADE MUST BE INSTALLED PRIOR TO ENTERING INTO BEND MODE. FAILURE TO INSTALL THE BARRICADE PRIOR TO BENDING THE SYSTEM CAN RESULT IN DAMAGE TO BOTH THE SYSTEM AND ANY FIELD OBSTRUCTIONS IT MAY BE BENDING AROUND.**
- **OPERATOR MUST BE PRESENT DURING THE FIRST BEND WITH THE BENDER DRIVE UNIT ANCHORS.**

The Bender drive unit anchor is located at the bending tower in conjunction with two concrete pads. The bender drive unit anchor consists of a rear tire hold down. See Figure 21-1.

When the bender end of field stop arm contacts the bending barricade, the bending tower stops, and the machine enters the bending mode. The bender drive unit anchor holds down the rear tire during the bending procedure to prevent the rear tire from lifting off of the ground, allowing for stability and consistent bending procedure.

⚠ CAUTION

- **NEVER USE THE SAFETY OVERRIDE BUTTON TO WALK THE MACHINE OFF OF THE BARRICADE. STRUCTURAL DAMAGE MAY RESULT.**
- **SOIL MAY BUILD UP IN THE WHEEL TRACK RESULTING IN A RAMP EFFECT ALLOWING THE ACTUATOR ARM TO GO OVER THE BARRICADES. REGULARLY MAINTAIN THE WHEEL TRACK TO INSURE THE ACTUATOR ARM ALWAYS CONTACTS THE BARRICADE.**

Optional Hold Down Components

The optional hold down components are used in situations where more hold down strength is required. This may be necessary for long bender machines, or on steep terrain, which could result in pulling forces great enough to severely compress the trailing tire against the hold down frame, or the leading tire against the concrete. See Figure 21-2.

When being used properly the rear hold down hook is to allow additional anchor strength to the rear tire hold down. Additionally the front tire support is used to transfer the load off the tire to the concrete pad.

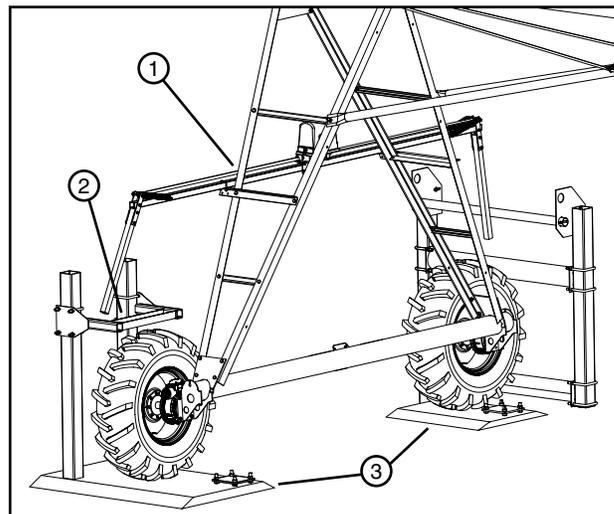


Figure 21-1 Bender Drive Unit Anchor
1. Bender Drive Unit
2. Rear Tire Hold Down
3. Concrete Pad

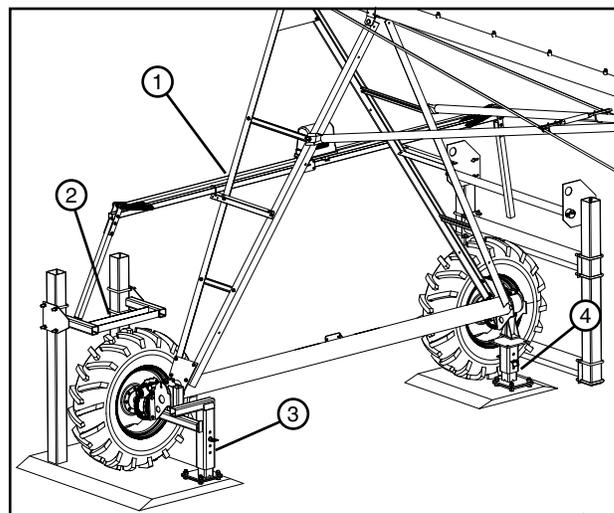


Figure 21-2 Optional Hold Down Components
1. Bender Drive Unit
2. Rear Tire Hold Down
3. Rear Hold Down Hook
4. Front Tire Support

Overview

Starting and Stopping the Machine

Starting the Machine

Refer to your pivot owner's manual for information about starting the machine. The Bender160 runs only when the machine is running and the Bender stop box is engaged. During operation the machine pauses when going into bend mode. This is normal and may last as long as a few minutes before the machine starts bending.

⚠ WARNING

- **BENDER BARRICADE MUST BE INSTALLED PRIOR TO ENTERING INTO BEND MODE. FAILURE TO INSTALL THE BARRICADE PRIOR TO BENDING THE SYSTEM CAN RESULT IN DAMAGE TO BOTH THE SYSTEM AND ANY FIELD OBSTRUCTIONS IT MAY BE BENDING AROUND.**

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 23-1.
- Control Panel Main Disconnect Switch. See Figure 23-1.
- Any Tower Box Disconnect Switch. See Figure 23-1.

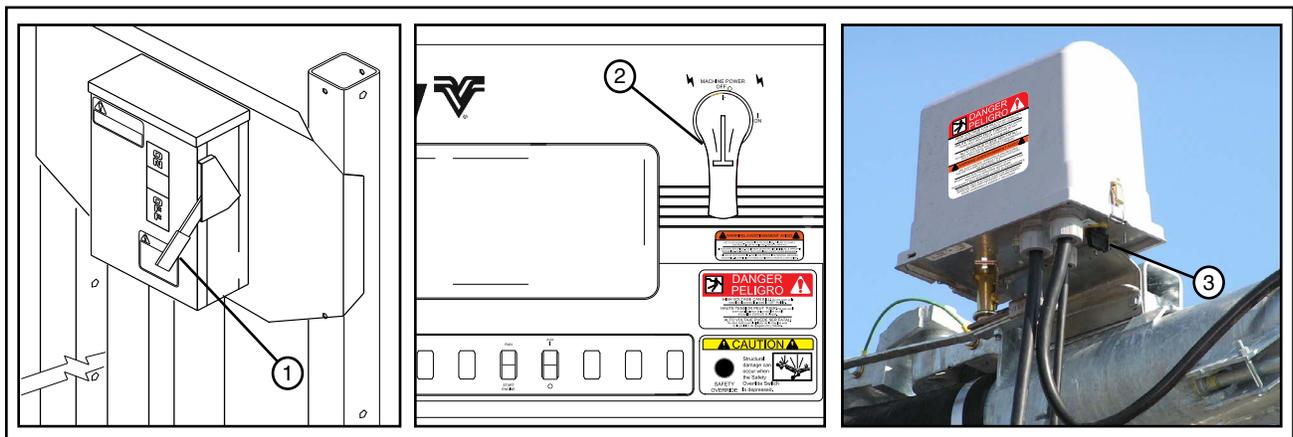


Figure 23-1 1. Main Service Disconnect Switch
2. Control Panel Main Disconnect Switch
3. Tower Box Disconnect Switch

Stopping Under Normal Conditions

1. Press the STOP key. See Figure 23-2.
2. Turn the main disconnect switch to the OFF position. See Figure 23-2.
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.**

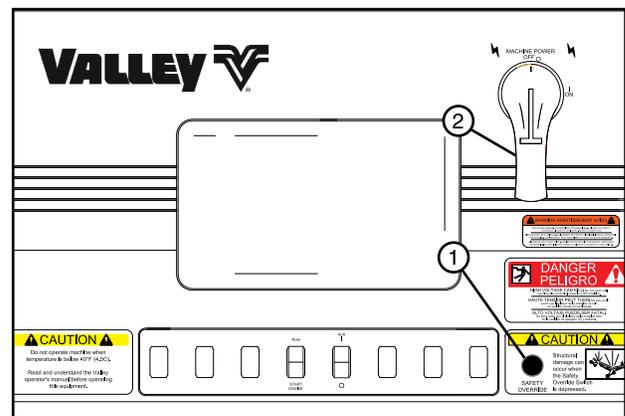


Figure 23-2 1. Stop Key
2. Main Disconnect Switch OFF

Operation

Tilt Sensor

The tilt sensor is mounted near the Bender Stop box. The tilt sensor will shutdown the machine if the drive unit begins to tip and the angle becomes greater than 15 degrees.

Restrictions

Tires

Only the following tire sizes may be used with the Bender160.

- 11R X 22.5
- 11 X 24.5
- 11.2 X 24
- 11.2 X 38
- Valley Revolution
- 14.9 X 24
- 16.9 X 24
- 18.4 X 26
- Military surplus tires are not allowed on any machine that has a Bender option.

WARNING

- THE USE OF LARGER OR MORE AGGRESSIVE TIRES MAY INCREASE SYSTEM PULLOUT AT BENDER DRIVE UNIT.
- USE OF TIRES WIDER THAN 18.4 X 26 AFTER THE BEND POINT CAN CAUSE STRUCTURAL DAMAGE DUE TO EXCESS PULL OUT LOADS.
- EXCESSIVE PULLOUT AT BENDER DRIVE UNIT MAY RESULT IN A SYSTEM SAFETY SHUTDOWN.

Drive Units

NOTE

- Heavy Duty (3 wheel) base beam is required on the bender drive unit for machines exceeding 1500 ft or 10 spans beyond the bender drive unit.

3 wheel base beams are allowed on all drive units.

The following options are not allowed at or beyond the bender drive unit:

- 4 wheel base beams
- Track drive and articulating base beams
- Rapaft Tracks and Agri-Trac

WARNING

- 4 WHEEL BASE BEAMS, TRACK DRIVE OR ARTICULATING BASE BEAMS ARE NOT ALLOWED AFTER THE BENDING POINT.
- USE OF 4 WHEEL BASE BEAMS, TRACK DRIVE OR ARTICULATING DRIVE UNITS AFTER THE BEND POINT CAN CAUSE STRUCTURAL DAMAGE DUE TO EXCESS PULL OUT LOADS.
- EXCESSIVE PULLOUT AT BENDER DRIVE UNIT MAY RESULT IN A SYSTEM SAFETY SHUTDOWN.

Bender Anchors

- Required on all machines exceeding 1000 feet beyond the bender drive unit.
- Bender anchors can only anchor the machine bending in one direction with the optional hold down components installed.
- Field conditions, tire selection, slopes, etc. may cause variations from the above recommendations.

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 25-1.

FILL OUT the blue (OSHA safety color code) tag and attach to the disconnect after locking. See Figure 25-1.

2. SHUT OFF and lock the control panel main power disconnect. See Figure 25-2.

FILL OUT the blue (OSHA safety color code) tag and attach to the disconnect after locking. See Figure 25-2.

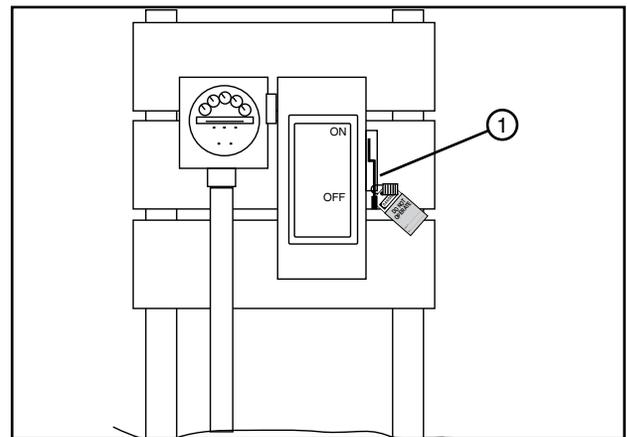


Figure 25-1 1. Public Power Service Disconnect

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.**

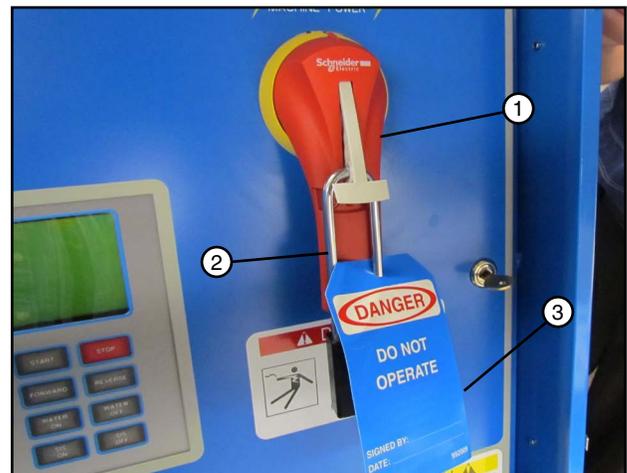


Figure 25-2 1. Main Disconnect
2. Lock
3. Blue Tag

Maintenance

Belt Replacement

Replacement of the alignment belt requires a belt and splice kit for the Bender160. If the belt shows signs of damage or wear, contact your Valley dealer. See Figure 26-1.

Hose Replacement

If the 6 in hose is sufficiently weather-cracked, checked, or leaking, replace the hose. Follow the steps below to replace the 6 in hose. See Figure 26-2.

1. Loosen the hose clamps. See Figure 26-2.
2. Remove the old hose.
3. Slide the hose clamps over the new hose.

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 26-2.

Contact your local Valley dealer if you have any questions about replacing the 6 in hose.

Female Swivel Gasket Replacement

Follow the steps below to replace the pierce gasket. See Figure 26-3.

1. Remove the two 1/2 in bolts on the upper elbow tabs connecting the upper elbow to the rotating collar.
2. Lift the upper elbow assembly out of the rotating collar and set aside.
3. Remove the old gasket and replace with a new one ensuring the lip seal is pointing downward.
4. Gently push the inlet elbow back into the rotating collar and align the bolt holes in the tabs.
5. Using the two 1/2 in bolts from before, bolt the upper elbow to the rotating collar and torque the nuts to 75 ft-lbs.

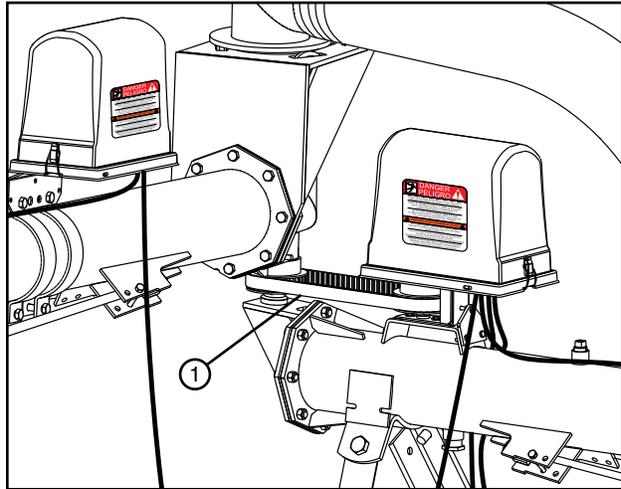


Figure 26-1 1. Alignment Belt

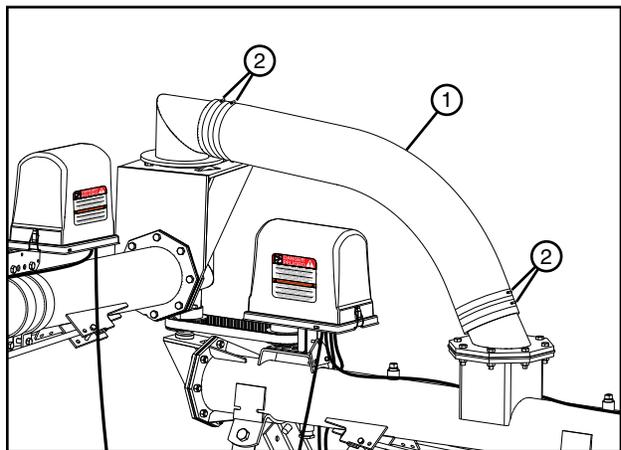


Figure 26-2 1. 6 in Hose
2. Adjustable Hose Clamps

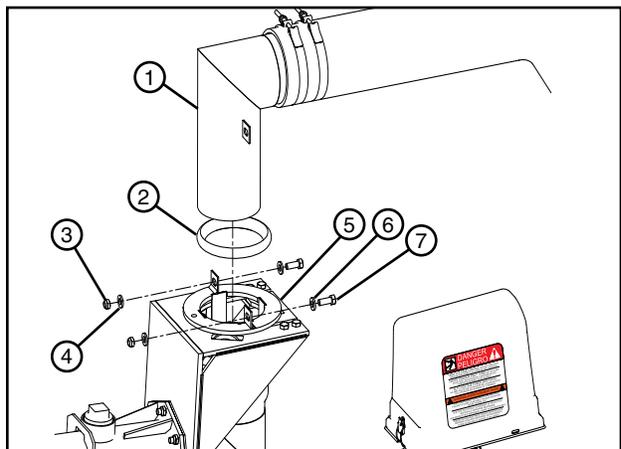


Figure 26-3 1. Upper Elbow
2. Pierce Gasket
3. 1/2 In Hex Nut
4. 1/2 In Lock Washer
5. Rotating Collar
6. 1/2 Flat Washer
7. 1/2 In x 1/4 In Bolt

Drain Seal Replacement

If the drain seal is damaged or leaking, replace the parts using the following steps. See Figure 27-1.

1. Remove the lower drain body and remove the old drain seal.
2. Install new drain seal.
3. Install lower drain body.

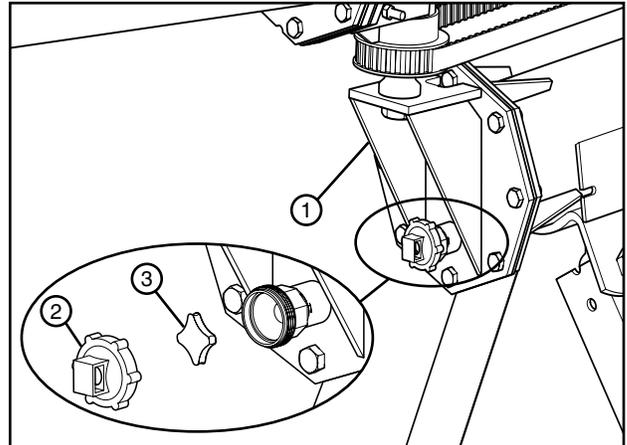


Figure 27-1 1. Ball Mount
2. Lower Drain Body
3. Drain Seal

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.

Bender160				
	1st Pass	2nd Pass	Pre-season	Remarks
Check all nuts and bolts. Tighten as required.			X	
Check flanges for leaks and tighten as required.			X	
Check condition of hose.			X	See Hose Replacement in Maintenance section.
Check condition of belt.			X	Call your Valley dealer.
Check roller mount for excessive wear.			X	Call your Valley dealer.
Check Bender Drive Unit Anchor Hardware.	X		X	
Check Anchor Pads and Barricade.	X		X	

Figure 27-2

Troubleshooting

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.
	Corrosion has caused the tower box alignment to bind up.
	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.
	Bender160 alignment belt has broke.
	End of field stop has not been engaged.
	Call your Valley dealer.
Machine is running out of alignment.	A bow in the machine while running in straight mode is normal.
	Call your Valley dealer.
End gun fails to come on or shut off.	The plastic tubing is plugged or broken.
	Plugged water filters.
	Call your Valley dealer.
Machine pauses at start of bend mode.	During operation the machine pauses when going into bend mode. This is normal and may last as long as a few minutes before the machine starts bending.