Valley AutoPilot Control Panel Owner's Manual

For
Software Version 2.00

0998901_B

www.valleyirrigation.com

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Quick Reference Guide

TO RUN THE MACHINE:

(Refer to the Overview section for a detailed explanation)

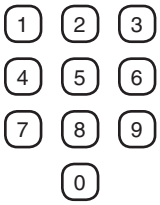
1. ALWAYS make sure that vehicles, other equipment, livestock, and persons are clear of the machine before operating.
2. Turn the control panel main disconnect switch to the ON position. If the power is supplied by an engine driven generator, adjust the RPM of the generator until the voltmeter reads 460 – 505 volts. DO NOT EXCEED 505 VOLTS.

Run The Machine Wet (With Water)

3. Press  .
4. Select direction of travel: Press  or  .
5. Set the water application:
   - Use  to set water application by inches (mm) of water.
   - Use  to set water application by percent timer setting.

   (a) Press the  or  .

   (b) Use the NUMERIC keys to enter depth of water in inches (mm) or percent timer setting.



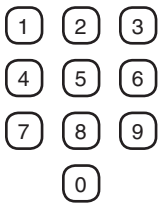
6. Press  to start the machine. Press  to stop the machine.

Run The Machine Dry (Without Water)

3. Press  .
4. Select direction of travel: Press  or  .
5. Set the water application:
   - Use  to set water application by percent timer setting.

   (a) Press  .

   (b) Use the NUMERIC keys to enter percent timer setting.



6. Press  to start the machine. Press  to stop the machine.

SYSTEM FAULTS & DESCRIPTIONS

FAULT	DESCRIPTION
SYSTEM POWER FAULT	Voltage has fallen below the low voltage limit for more than 15 seconds or power was lost, while the machine was running.
SYSTEM SAFETY FAULT	Caused by a break in the safety return circuit that lasted longer than 3 seconds.
PRESSURE FAULT	The pressure fell below the low pressure limit or the Pressure Delay is not a sufficient amount of time to build pressure in the machine after it is started.
COMMAND FAULT	The machine was commanded to stop by one of the following: 1) The stop key was pressed. 2) An autostop condition occurred at the end-of-field stop. 3) A programmed stop command was executed.
DAILY OPS FAULT	The daily operations program shut the machine down because it is not allowed to run between a certain time period, DAILY OPS is only displayed on the system faults screen when Daily Ops is turned ON.
GPS COM FAULT	When GPS is selected as a protocol and the System shutdown due to no communication with GPS for user specified time when shutdown of GPS signal loss is ON, while system was running or waiting.
GPS LOCK FAULT	When GPS is selected as a protocol and the System shutdown due to GPS signal loss for user specified time when shutdown of GPS signal loss is ON, while system is running or waiting.

ERROR CODES & DESCRIPTIONS

ERROR	DESCRIPTION
E01	BBRAM - BATTERY BACKED RAM CHECKSUM FAILED AT POWER UP.
E02	EEPROM - CHECKSUM FAILED AT POWER UP.
E03	UNIT RESETS - THIS IS LOGGED WHEN THE SOFTWARE RESETS.
E04	POWER DROP - POWER DROPPED BELOW LOW VOLTAGE LIMIT.
E05	SYSTEM SAFETY - POSSIBLE TOWER MISALIGNMENT, DRIVE UNIT MAY BE STUCK.
E06	PUMP SAFETY - PRESSURE TOO LOW AFTER PRESSURE DELAY.
E07	PRESSURE SENSOR - OUT OF RANGE HIGH, CHECK CONNECTION.
E08	PRESSURE SENSOR - OUT OF RANGE LOW, CHECK CONNECTION.
E09	PRESSURE SENSOR - PRESSURE HIGH WITH PUMP OFF, CHECK CONNECTION.

ERROR	DESCRIPTION
E10	PRESSURE SENSOR - MECHANICAL SWITCH COULD BE STUCK.
E11	RESOLVER - ANGLE JUMPING AROUND, LUBE J PIPE.
E12	RESOLVER - POSSIBLY DISCONNECTED.
E13	KEYPAD - POSSIBLE KEY STUCK CHECK KEYPAD CONNECTION.
E14	FWD/REV SENSE - POSSIBLE SHORT, CHECK WIRING.
E15	NO COMMUNICATION WITH SOIL PROBE.
E16	SOIL PROBE DATA ALL ZEROS.
E17	NOT ASSIGNED. DISPLAY WILL BE SHOWN AS "NOT AVAILABLE".
E18	GPS COMMUNICATION ERROR.
E19	GPS SIGNAL LOSS.
E20	DGPS SIGNAL LOSS.

QUICK REFERENCE GUIDE

Valley AutoPilot Control Panel

Quick Reference Guide

Minimum Control Panel Setup - Auto Universal Linear

To setup the control panel for use with the Auto Universal Linear, follow one of the procedures below:

RunTime Position without GPS

1. Set the System Type to Universal Linear, press **SYSTEM, 1, 8, 8, 8, 5, 1** and **SYSTEM**.
2. Set the Language and Unit of Measure, press **SYSTEM** and **7**.
   (a) Select the desired Language.
   (b) Select the desired Unit of Measure. Press **SYSTEM** to return to the machine status screen.
3. Set the Linear and Pivot Minimum Application, press **SYSTEM, 1, 8** and **1**.
   (a) Enter the Linear Minimum Application rate from the sprinkler chart. Press **ENTER**.
   (b) Enter the Pivot Minimum Application rate from the sprinkler chart. Press **ENTER**, and **SYSTEM**.
4. Set the Time Per Revolution, press **SYSTEM, 1, 8,** and **2**.
   (a) Enter the Time Per Revolution from the sprinkler chart. Press **ENTER**, and **SYSTEM**.
5. Calibrate the pressure transducer to the current water pressure reading of zero.
   (a) With pump OFF and machine dry, press **SYSTEM, 1, 8, 8, 8, 1, 1** and **SYSTEM**.
6. Set the Linear position and speed and Pivot position, press **SYSTEM, 1** and **5**.
   (a) Press **1**, Enter the Linear Start position, usually zero (0). Press **ENTER**.
   (b) Press **2**, Enter the Linear End position. Press **ENTER**.
   (c) Press **3**, Enter the estimated Linear Position. Press **ENTER**.
   (d) Press **4**, Enter the Linear Intermediate and End Tower Speeds.
      (1) Enter the Intermediate Drive Unit speed. Press **ENTER**.
      (2) Enter the End Tower Drive Unit speed. Press **ENTER**.
   (e) Press **5**, Pivot Position.
      (1) Enter Pivot Position in degrees. Press **ENTER**, and **SYSTEM**.
7. Set the Linear Stop-In-Slot position in Zone A, press **SYSTEM, 1, 3, 2, 2,** and **1**.
   (a) Enter the Linear Stop-In-Slot position. Press **ENTER**.
   (b) Select the Direction for Linear Stop-In-Slot to work, **0** = Both, **1** = Forward, **2** = Reverse. Press **ENTER**, and **SYSTEM**.
   (c) Load the Auto Transition Program, press **PROGRAM** and **4**.
   (d) Select the desired Auto Transition Program number from Auto-Prog Transitions Table in the program section.

NOTE

Refer to the Owner's Manual for minimum control panel setup for all other machine types.

BUTTON TABLE

= ***ENTER***

= ***SYSTEM***

= ***PROGRAM***

Obtain speed information from the VChart report for this machine or use the Estimated Drive Unit Speed chart.

- If machine is in Linear A, the Pivot Position is 0°.
- If machine is in Linear B, the Pivot Position is 180°.

GPS Position with Backup RunTime

1. Set the System Type to Universal Linear, press **SYSTEM, 1, 8, 8, 8, 5, 1** and **SYSTEM**.
2. Set the Language and Unit of Measure, press **SYSTEM** and **7**.
   (a) Select the desired Language.
   (b) Select the desired Unit of Measure. Press **SYSTEM** to return to the machine status screen.
3. Activate the GPS and set the Baud Rate, press **SYSTEM, 1, 8, 8, 7, 2, 1, 6, 2, 4** and **SYSTEM**.
4. Set the Linear and Pivot Minimum Application, press **SYSTEM, 1, 8,** and **1**.
   (a) Enter the Linear Minimum Application rate from the sprinkler chart. Press **ENTER**.
   (b) Enter the Pivot Minimum Application rate from the sprinkler chart. Press **ENTER**, and **SYSTEM**.
5. Set the Time Per Revolution, press **SYSTEM, 1, 8,** and **2**.
   (a) Enter the Time Per Revolution from the sprinkler chart. Press **ENTER**, and **SYSTEM**.
6. Calibrate the pressure transducer to the current water pressure reading of zero.
   (a) With pump OFF and machine dry, press **SYSTEM, 1, 8, 8, 8, 1, 1** and **SYSTEM**.
7. Set the Linear Start position. Follow step a or b below.
   (a) Set Latitude and Longitude values automatically to the current position of machine.
      (1) Run the machine to the Linear Start position.
      (2) Press **SYSTEM, 1, 5, 1, 1, 1, 1** and **SYSTEM**.

   OR
   (b) Set Latitude and Longitude values manually.
      (1) Press **SYSTEM, 1, 5, 1, 1** and **2**.
      (2) Enter the latitude. Press **ENTER**.
      (3) Enter the longitude. Press **ENTER**, and **SYSTEM**.
8. Set the Linear End position. Follow step a or b below.
   (a) Set Latitude and Longitude values automatically to the current position of machine.
      (1) Run the machine to the Linear End position.
      (2) Press **SYSTEM, 1, 5, 1, 2, 1, 1** and **SYSTEM**.

   OR
   (b) Set Latitude and Longitude values manually.
      (1) Press **SYSTEM, 1, 5, 1, 2** and **2**.
      (2) Enter the latitude. Press **ENTER**.
      (3) Enter the longitude. Press **ENTER**, and **SYSTEM**.
9. Set the Linear Speed and Pivot Position.
   (a) Press **SYSTEM, 1, 5** and **4**.
      (1) Enter the Intermediate Drive Unit speed. Press **ENTER**.
      (2) Enter the End Tower Drive Unit speed. Press **ENTER** to retain the value.
   (b) Press **5**, Pivot Position.
      (1) Enter Pivot Position in degrees. Press **ENTER**, and **SYSTEM**.
10. Set the Linear Stop-In-Slot position in Zone A, Press **SYSTEM, 1, 3, 2, 2** and **1**.
    (a) Enter the Linear Stop-In-Slot position. Press **ENTER**.
    (b) Select the Direction for Linear Stop-In-Slot to work, **0** = Both, **1** = Forward, **2** = Reverse. Press **ENTER**.
    (c) Press **SYSTEM** to return to the machine status screen.
11. Load the Auto Transition Program, press **PROGRAM** and **4**.
    (a) Select the desired Auto Transition Program number from Auto-Prog Transitions Table in the program section.

NOTE

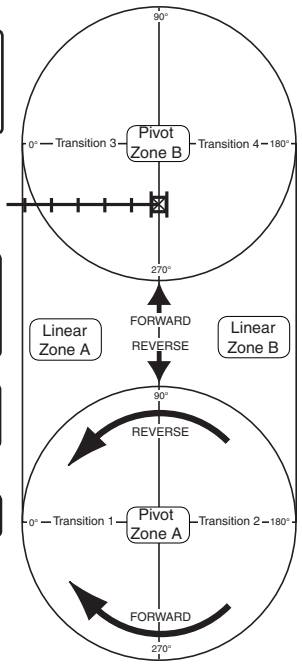
- **GPS is used for Linear Position Only. A resolver is used for Pivot Position.**
- **If the Latitude or Longitude position is shown as West or South the position MUST be entered as a Negative Degree.**
- **In North America:**
  - **Latitude is always Positive.**
  - **Longitude is always Negative.**

Use a handheld GPS receiver to obtain the GPS coordinates for the position. Use the GPS Angular Conversion chart to convert the values into decimals of degree.

Use a handheld GPS receiver to obtain the GPS coordinates for the position. Use the GPS Angular Conversion chart to convert the values into decimals of degree.

Obtain speed information from the VChart report for this machine or use the Estimated Drive Unit Speed chart.

- If machine is in Linear A, the Pivot Position is 0°.
- If machine is in Linear B, the Pivot Position is 180°.



Universal Linear Basic Field Configuration Example

QUICK REFERENCE GUIDE

Declaration Of Conformity

CE

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

Serial Number:

Purchase Order:

declare under our sole responsibility that the product,

Crop Irrigation System

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

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

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

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

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

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

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

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

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

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

Ron Pollak
Senior Electrical Engineer
Valmont Industries, Inc.

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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 machines are the responsibility of the installer. Valmont Industries Inc. is not responsible for the failure of equipment protection components or machines 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 resistance between the irrigation machine and the generator must be substantially below 80 ohms.

About This Manual

Information contained in this manual applies to all Valley AutoPilot Control Panels with software version 2.00.

Specifications, descriptions, and illustrative material contained herein were as accurate as known at the time this publication was approved for printing. Valmont Industries Inc. reserves the right to change specification or design without incurring obligation. Specifications are applicable to machines sold in the United States and may vary outside the United States.

Additional information is contained within the Valley AutoPilot Control Panel Advanced Features Manual, Part Number 0998907 (English).

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 can be powered by high voltage, which can be extremely dangerous if used improperly. For maximum safety and optimum performance of the machine, all owner/operators 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 describes immediate hazards that can result in severe personal injury or death.

⚠ WARNING

The HAZARD SYMBOL used with the word WARNING describes unsafe actions or situations that can result in severe injury, death and/or major equipment or property damage.

⚠ CAUTION

The HAZARD SYMBOL used with the word CAUTION describes unsafe actions or situations that can result in 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.

Valley AutoPilot Control Panel

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 can 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.
30in.(760mm) MINIMUM OR WIDTH OF ENCLOSURE, WHICH EVER IS GREATER	78in.(1980mm) MINIMUM OR HEIGHT OF ENCLOSURE, WHICH EVER IS GREATER	36in.(915mm) MINIMUM	42in.(1065mm) MINIMUM	48in.(1220mm) 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

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, lightning, 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 inch (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 inch (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.

Valley AutoPilot Control Panel

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 14-1.

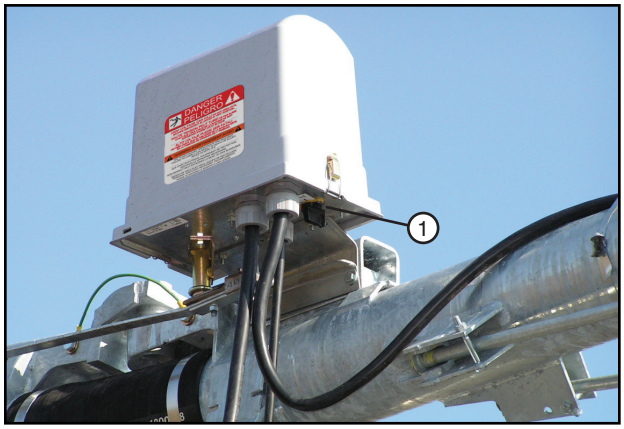


Figure 14-1 1. Disconnect Switch

⚠ 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.

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 (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 15-1.

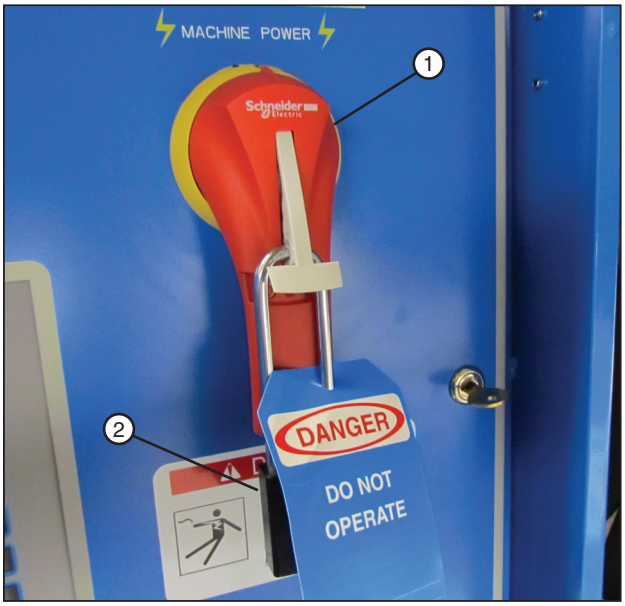


Figure 15-1 1. Main Power Disconnect
2. Lock

The blue (OSHA safety color code) tag shown below should also be filled out and attached to the disconnect after locking. Refer to Figure 15-2.

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

Figure 15-2

⚠ 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 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 (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

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. Refer to Figure 17-1.

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

Figure 17-1 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.

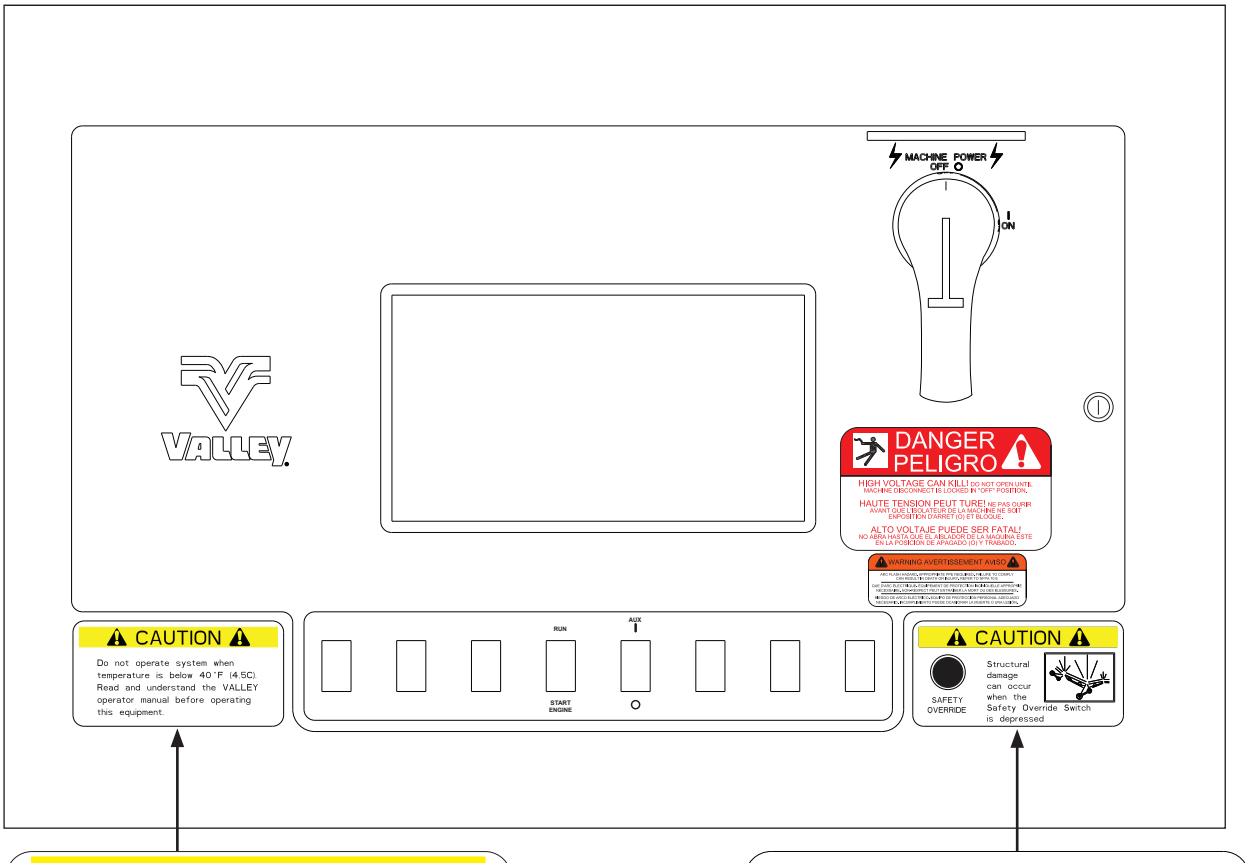
Call your Valley dealer if the machine fails to start.

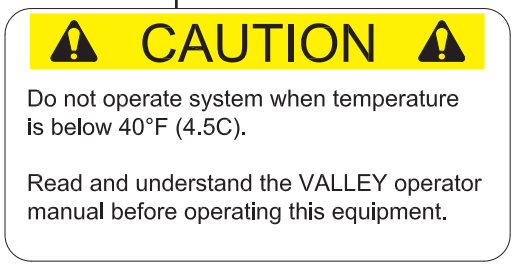
Valley AutoPilot Control Panel

Safety

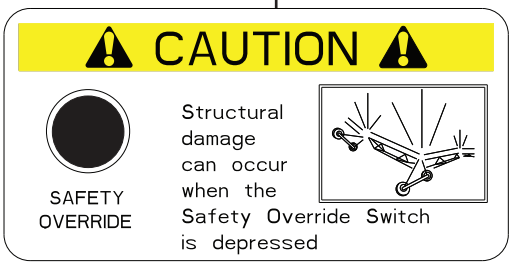
Safety Decals

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.

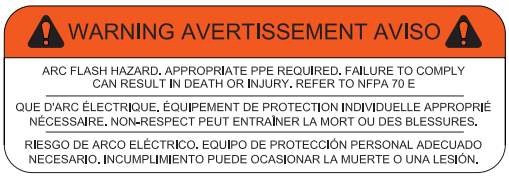




0997300

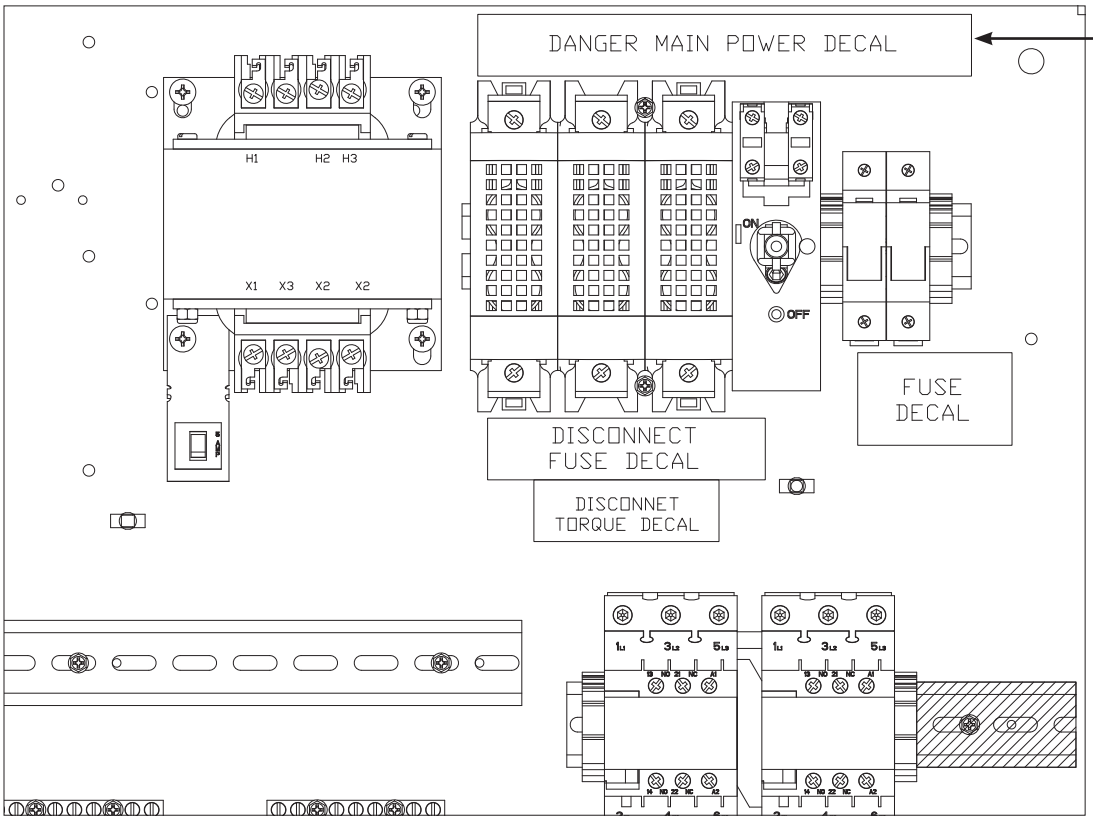


Not Available



0999135

Safety Decals (Continued)



DANGER PELIGRO

MAIN POWER SUPPLY CONNECTION
USE 60°C MINIMUM INSULATION COPPER WIRE
L1 L2 L3

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

CONEXIÓN DEL SUMINISTRO DE ENERGÍA ELÉCTRICA
PRINCIPAL UTILICE CABLES DE COBRE CON AISLAMIENTO
PARA 60 °C MÍNIMO 0999119

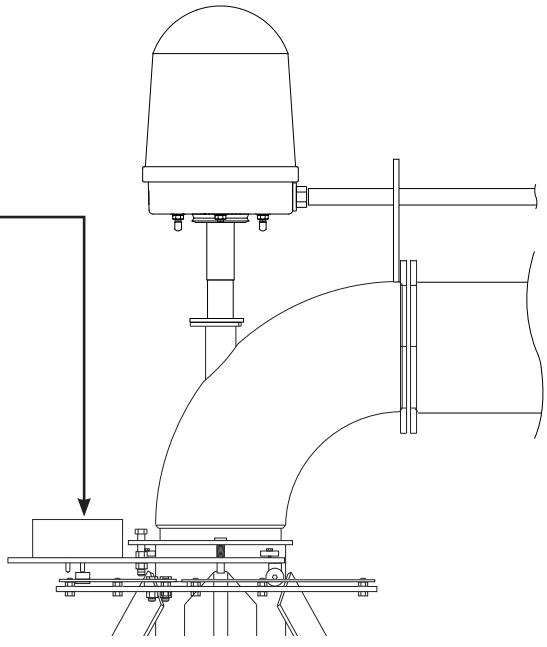
0999119

DANGER

HIGH VOLTAGE

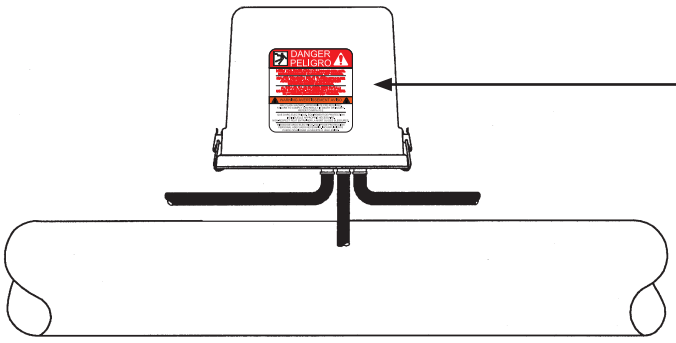
DO NOT OPEN UNLESS PIVOT DISCONNECT SWITCH IS IN THE "OFF" POSITION

0991148



Safety

Safety Decals (Continued)



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.

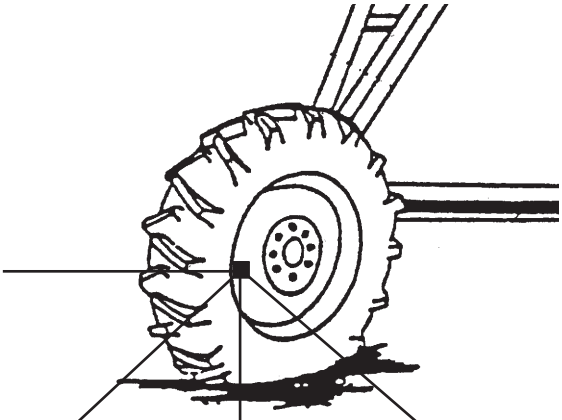
WARNING AVERTISSEMENT AVISO

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.

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

0999122



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

0991532

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

0991593

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

0991366

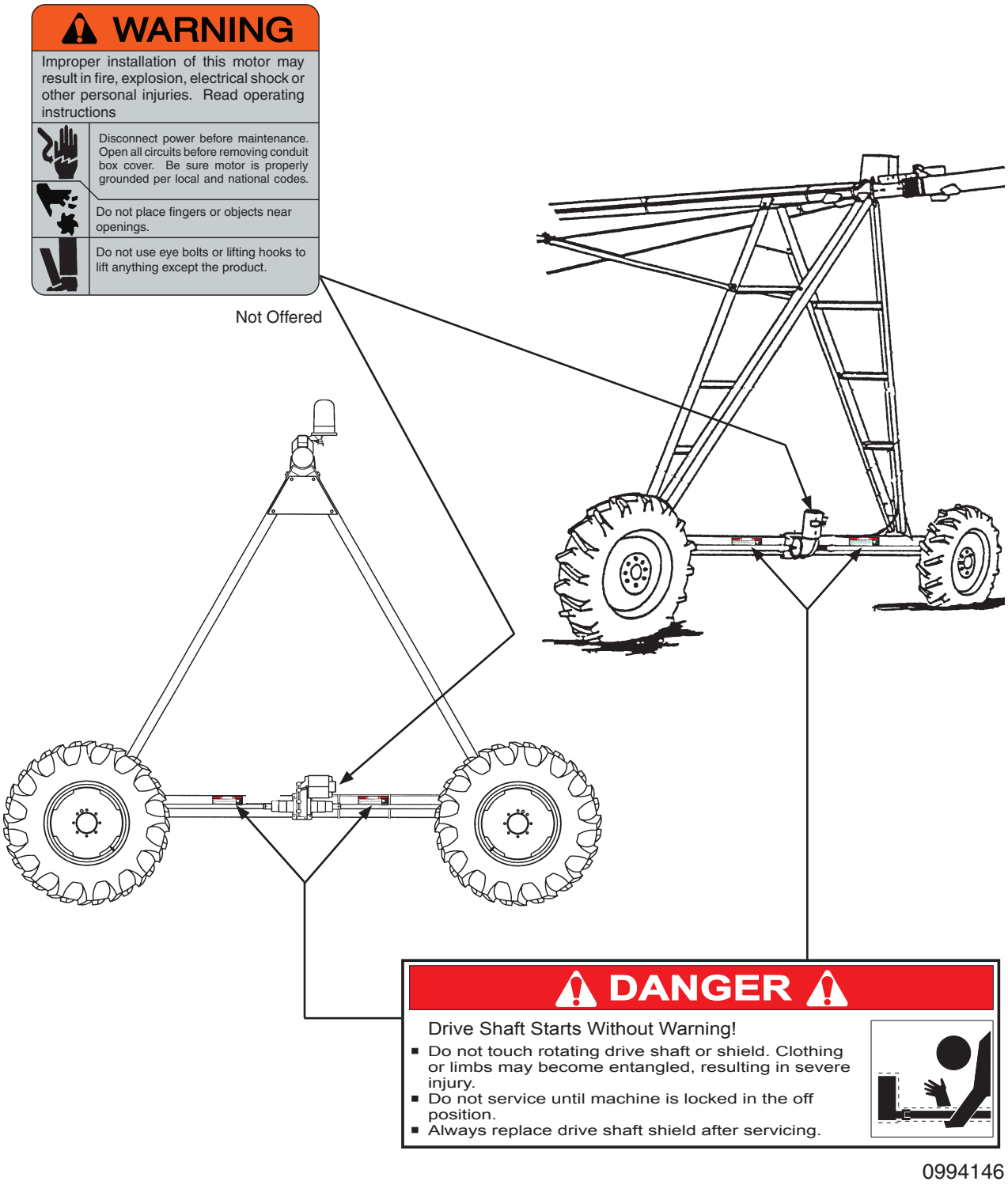
WARNING

TIRE AND RIM FOR IRRIGATION USE ONLY.
ADJUST PRESSURE BEFORE USE. SEE OWNERS MANUAL FOR RECOMMENDED PRESSURE.
34 PSI [2.3 BAR] MAXIMUM

VALLEY

0996109

Safety Decals (Continued)



0994146

Safety

OverView

The pages in this section provide a brief description of the Valley AutoPilot control panel applications, components, and controls.

Applications

Universal Linear

The Universal Linear can operate as a pivot or a linear. See figure 23-1.

In pivot mode, the cart has a swivel so the span can pivot around the cart and the resolver is functional for radial position.

In linear mode, the cart uses proximity switches to keep the cart perpendicular with the first span. The cart steers by making one side of the cart go forward and the other reverse.

Figure 23-1 Universal Linear

The system type in the AutoPilot control panel is set to AUL/VSAL and the zone is set depending on machine location in the field, to either linear A, linear B or pivot A, B, C, or D.

Auto Mode

The Auto mode can be used with the universal linear.

When the auto mode is used, transition commands can be programmed to automatically control the transition from linear mode to pivot mode and pivot mode to linear mode based on position in the field.

The Basic Field configuration example consists of four transitions: two linear zones and two pivot zones. See figure 23-2.

The advanced field configuration example consists of eight transitions: two linear zones and four pivot zones. See figure 23-3.

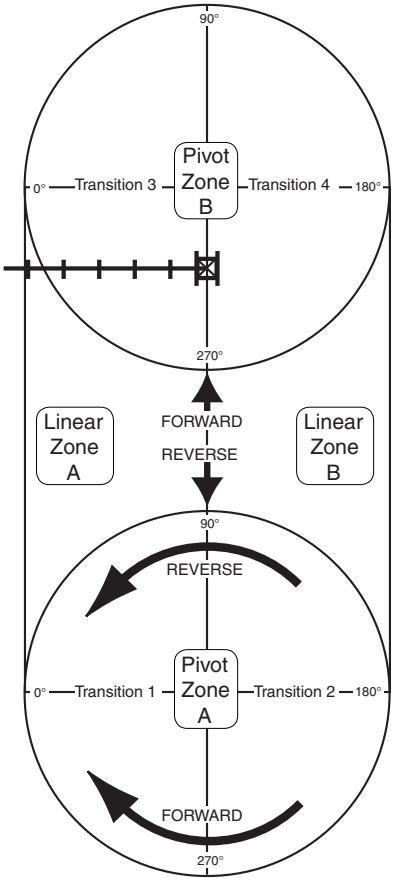


Figure 23-2 Universal Linear Basic Field Configuration Example

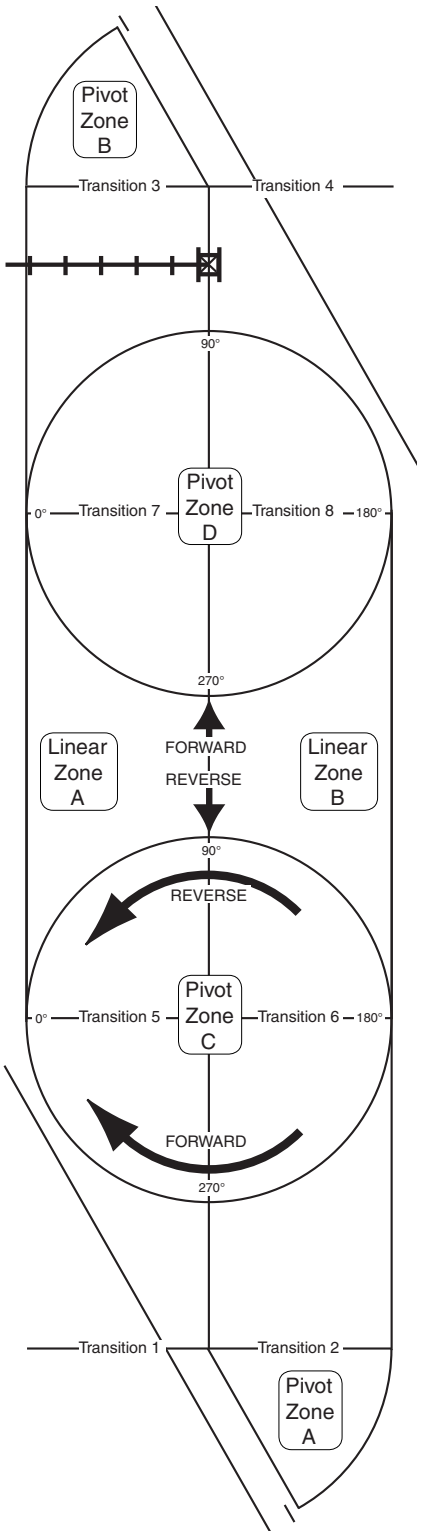


Figure 23-3 Universal Linear Advanced Field Configuration Example

Applications (continued)

Swing Around Rainger Linear

The Swing Around Rainger Linear can function as a linear and a pivot. See figure 24-1.

The swing around Rainger linear cart has a swivel so the span can pivot around the cart and the resolver is functional for radial position.

Figure 24-1 Swing Around Rainger Linear

The swing around function must have user intervention during pivot mode. The user must manually lock and unlock the latches for the linear swing around machine. Proximity switches on the latches will determine if the machine is in linear A, linear B, or pivot mode.

The system type in the AutoPilot control panel is set to universal linear and the zone is set depending on the machine location in the field, to either linear A, linear B, or pivot. The auto mode must not be used with the linear swing around.

A field configuration example consists of two linear zones and a pivot zone at each end of the field. See figure 24-2.

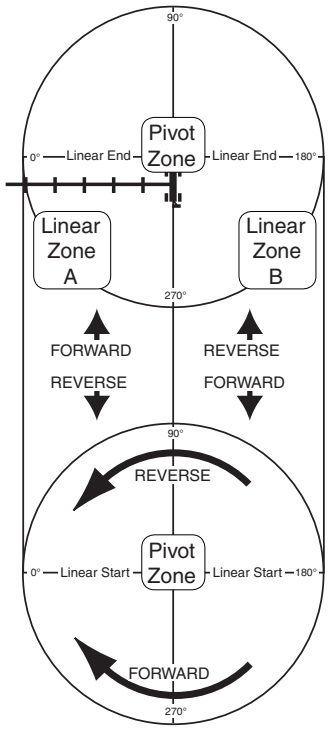


Figure 24-2 Linear Swing Around Field Configuration Example

Swing Around Two or Four Wheel Linear

The Swing Around Two or Four Wheel Linear can function as a linear and a pivot. See figure 24-3.

The Swing Around Two or Four Wheel Linear does not have a swivel. The cart is mounted solid to the first span. Therefore a resolver is not functional.

The swing around function must have user intervention during pivot mode. The user must either turn the wheels of the Two Wheel Linear into the pivot position or lower the swing around wheels of the Four Wheel Linear, to raise the drive wheels off of the ground. This allows the entire cart to rotate during pivot operation.

Figure 24-3 Swing Around Four Wheel Linear

The system type in the AutoPilot control panel is set to swing around linear and the zone is set depending on machine location in the field, to either linear A, linear B, or pivot. The auto mode cannot be used with the linear swing around.

A field configuration example consists of two linear zones and a pivot zone at each end of the field. See figure 24-2.

Applications (continued)

Standard Rainger or Two Wheel Linear

The Standard Rainger or Two Wheel Linear can only operate as a linear because it does not have a swivel and the cart is mounted solid to the first span. See figure 25-1.

The system type in the AutoPilot control panel is set to standard linear and the zone is set to either linear A or linear B. The auto mode cannot be used with a standard linear.

Figure 25-1 Standard Rainger Linear

Standard Two Wheel Linear

A field configuration example consists of two linear zones on one field. See figure 25-2.

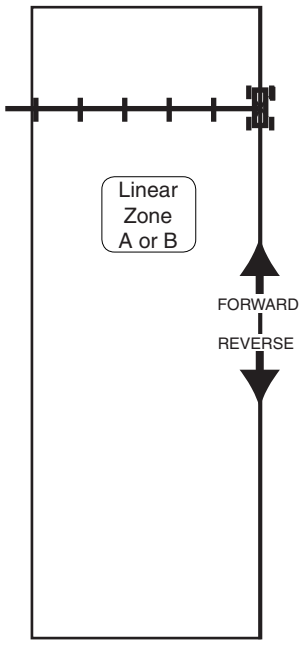


Figure 25-2 Standard Linear Field Configuration Example

Applications (continued)

Towable Pivot

The skid tow, four wheel towable, and two wheel towable are all towable pivots. See figure 26-1.

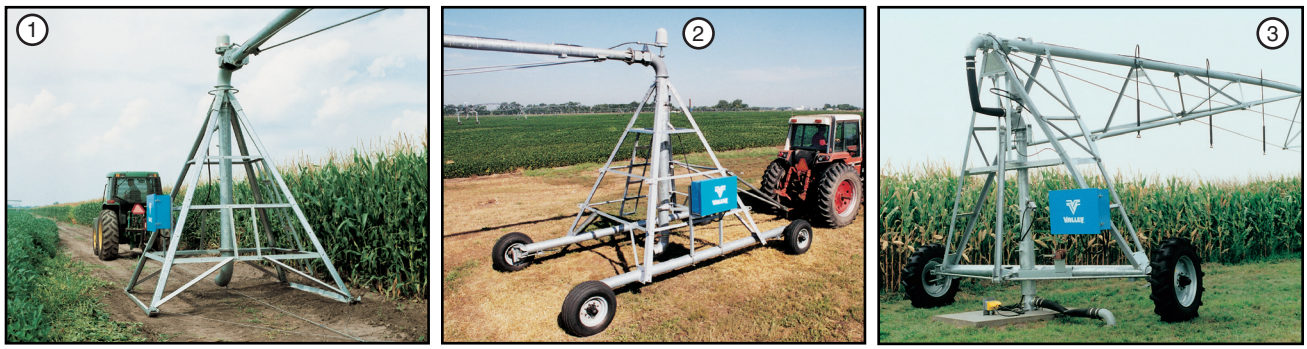


Figure 26-1 1. Skid Tow Pivot 2. Four Wheel Towable Pivot 3. Two Wheel Towable Pivot

A towable pivot can only function as a pivot. There is a swivel so a resolver is used to indicate radial position. End-gun, stop-in-slot settings, and programs can be set for each pivot zone.

The auto mode cannot be used with a towable pivot.

The towable pivot can be towed to multiple field locations. A field configuration example consists of four pivot zones: A, B, C, or D. See figure 26-2.

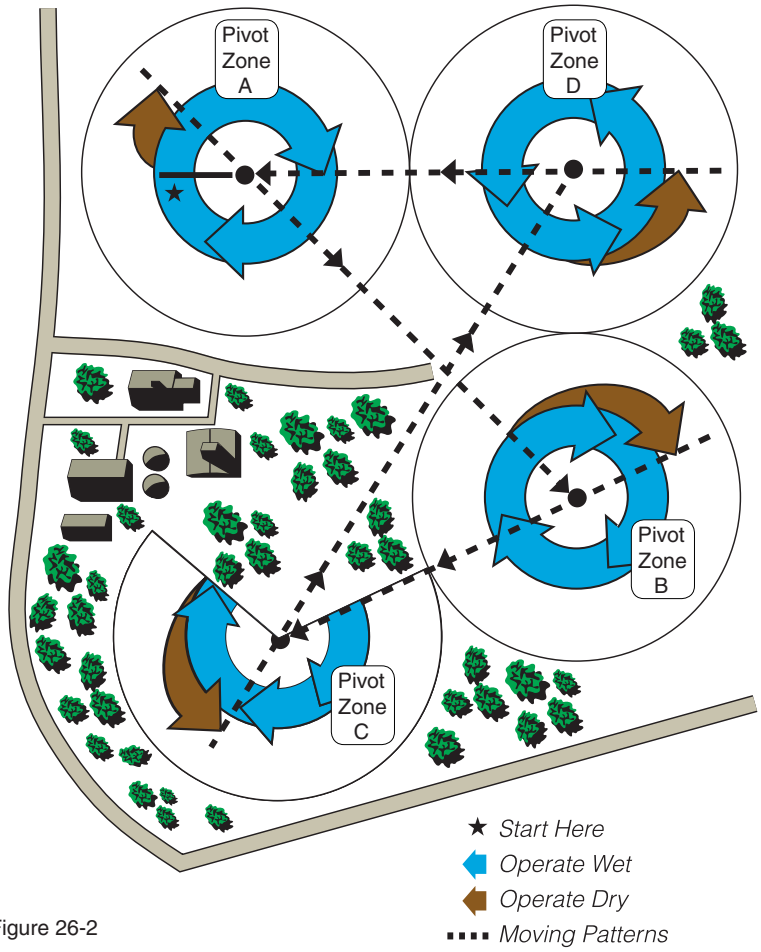


Figure 26-2

Control Panel

The Valley AutoPilot control panel uses a key pad for execution of operator commands. The key pad works in conjunction with the display screen on the control panel module. See figure 27-1.

Main Disconnect

This switch disconnects all power to the machine except at the incoming (upper) terminals on the Main Disconnect Switch inside the control panel. The function of the disconnect is to turn the power ON or OFF. See figure 27-1.

Safety Override Switch

The machine's safety circuit can be overridden by depressing this switch in conjunction with the start key. See figure 27-1.

⚠ WARNING

•NEVER DEPRESS THE SAFETY OVER RIDE SWITCH FOR LONGER THAN THREE SECONDS AT ANY TIME. USING THE SAFETY OVERRIDE CAN CAUSE SERIOUS STRUCTURAL DAMAGE. CALL YOUR LOCAL VALLEY DEALER, SHOULD YOUR MACHINE FAIL TO START.

3 Second Delay Timer

A three-second delay timer is standard equipment built into the circuitry of the control panel.

In the event of a momentary power loss or voltage drop, the machine will remain running if power is returned within three seconds.

Pump Restart Delay

When the control panel also controls an irrigation pump that is set to automatically start, the irrigation pump must be protected from damage with a pump restart delay. The pump restart delay must be in the pump circuit between the irrigation machine control panel and the pump.

⚠ CAUTION

•TO REDUCE THE POSSIBILITY OF DAMAGE TO AN AUTOMATICALLY CONTROLLED ELECTRIC PUMP DUE TO A MOMENTARY POWER LOSS OF 3 SECONDS OR LESS, A PUMP RESTART DELAY IS REQUIRED IN THE PUMP CIRCUIT BETWEEN THE IRRIGATION MACHINE CONTROL PANEL AND THE PUMP.

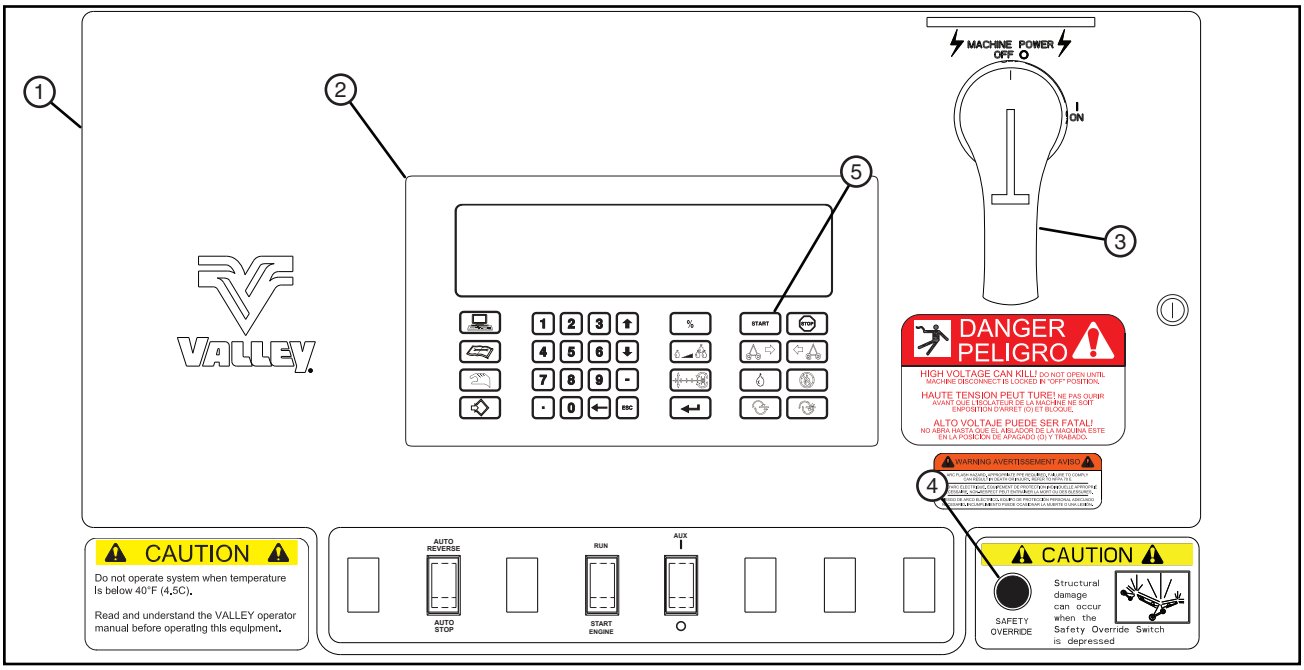


Figure 27-1
1. Control Panel
2. Control Panel Module
3. Main Disconnect Switch
4. Safety Override Switch
5. Start Key

Valley AutoPilot Control Panel

Control Panel Display - Item 1

The control panel display is used to show current machine status and information for programming and selecting functions. When the control panel main disconnect is turned on and at all other times when the operator is not programming the control panel, the control panel display shows the current machine status on the status screen. See figure 28-1. A short explanation of the Status Screen - Item 2 elements is given below and on the following pages.

NOTE **•This Status Screen example illustrates the operating conditions of a typical irrigation machine. The Status screen of your machine will show different conditions.**

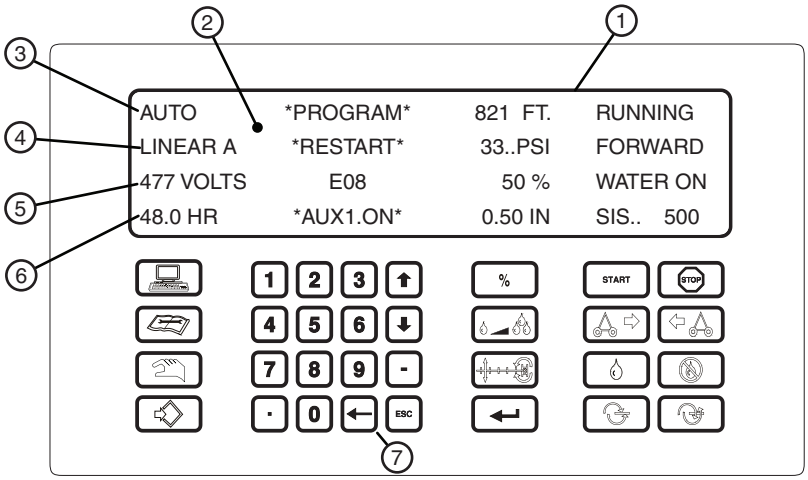


Figure 28-1
1. Control Panel Display
2. Default Status Screen
3. Transition Mode
4. Machine Mode/Zone
5. Voltage
6. Hours/Rev
7. Back Arrow

Transition Mode - Item 3

Indicates the current transition mode. The transition mode can be either auto or manual and is only displayed when the Constants System Type is set to Universal Linear. The time of day is displayed in place of the transition mode for all other System Types. See figure 28-1.

Machine Mode/Zone - Item 4

Indicates the current machine mode and zone of operation. Machine mode/zone can be either Pivot A, B, C, D or Linear A or B based on System Type. See figure 28-1.

Voltage - Item 5

Indicates the current operating voltage. The machine will shut down if the voltage drops below the Low Voltage Limit. See figure 28-1.

Hours/Rev - Item 6

In a pivot mode/zone: Indicates the number of hours to complete one revolution based on the percent timer setting. See figure 28-1.

In a linear mode/zone: Indicates the number of hours to complete one pass based on the percent timer and linear speed setting. See figure 28-1.

Time And Date

The display of the time of day and date varies depending on the System Type setting.

To view either the time of day or the date, press the BACK ARROW key - Item 7 while the status screen is displayed. The current time of day and/or date are displayed. See figure 28-2.

Press the back arrow key again to toggle back to the status screen or after 60 seconds without pressing a key the screen reverts back to the status screen.

- If the current time is 1:45:00 P.M., it is displayed on screen in a 24 hour format as 13:45:00. See figure 28-2.
- If the current date is August 18, 2007, it is displayed on screen as 08/18/07 or 18/08/07, depending on the selected unit of measure. See figure 28-2.

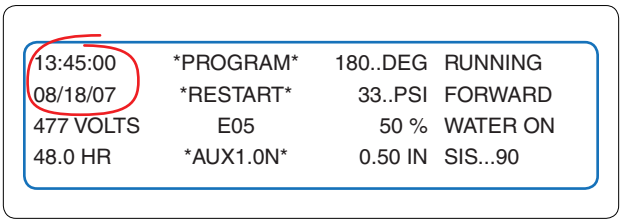


Figure 28-2

Control Panel Display (Continued)

Program Notice - Item 1

Indicates a program has been loaded and is waiting to be executed. See figure 29-1.

- If no programs are loaded or waiting, then the ***PROGRAM*** message will not appear.

Restart Notice - Item 2

Indicates AUTORESTART, DAILY OPS, and/or CYCLE are ON. See figure 29-1.

- If AUTORESTART, DAILY OPS, and CYCLE are off, the ***RESTART*** message will not appear.

Error Code Notice - Item 3

Displays an error code indicating that an input status change has been detected. See figure 29-1.

- If no input status changes are detected, the error code notice will not appear.

Auxiliary #1 Notice - Item 4

Indicates the AUXILIARY #1 output is ON. See figure 29-1.

- If Auxiliary #1 output is off, the ***AUX1.ON*** message will not appear.
- The Auxiliary #2 status is not displayed.

Field Position - Item 5

Indicates the machine location in the field. See figure 29-1.

- When the machine is in the pivot zone, the location of the machine is expressed in degrees.
- When the machine is in the linear zone, the location of the machine is expressed in feet or meters away from the linear starting point.

Water Pressure - Item 6

Indicates the current water pressure at the pressure transducer, in pounds per square inch (psi) or kilopascal (kPa) depending on the selected unit of measure. See figure 29-1.

Percent Timer Setting - Item 7

Indicates the current pivot or linear percent timer setting. See figure 29-1.

Depth Setting - Item 8

Indicates the current pivot or linear depth setting in inches or millimeters depending on the selected unit of measure. See figure 29-1.

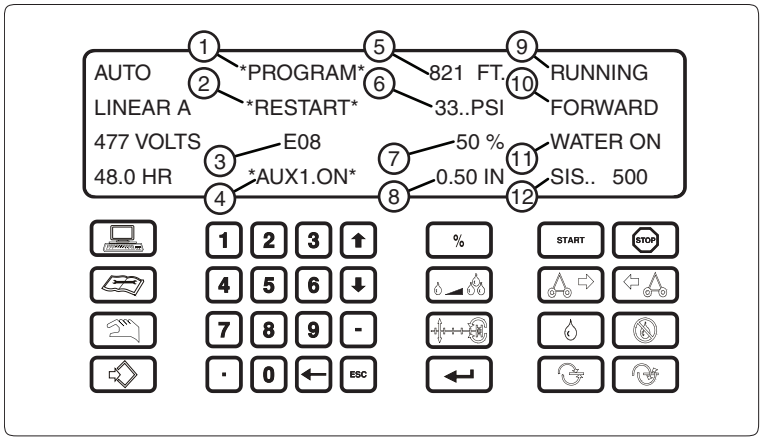


Figure 29-1

1. Program Notice
2. Restart Notice
3. Error Code Notice
4. Auxiliary 1 Notice
5. Field Position
6. Water Pressure
7. Percent Timer Setting
8. Depth Setting
9. Machine Status
10. Direction Status
11. Water Status
12. Stop-In-Slot Notice

Machine Status - Item 9

Indicates the current status of the irrigation machine either RUNNING, STOPPED, or WAITING for water pressure. See figure 29-1.

Direction Status - Item 10

Indicates the direction, FORWARD or REVERSE, that the machine is set to move in or is moving in the forward or clockwise direction. See figure 29-1.

Water Status - Item 11

Indicates the current setting for applying water, either WATER ON or WATER OFF. See figure 29-1.

Stop-In-Slot Notice - Item 12

Indicates the current Stop-In-Slot setting. See figure 29-1.

- If the Stop-In-Slot is ON and in the same zone as the machine, SIS plus the Stop-In-Slot position will be displayed. See figure 29-1.

  Example: Pivot Zone = SIS..90 (degrees)

  Linear Zone = SIS.. 500 (feet or meters)

- If the Stop-In-Slot is ON but NOT in the same zone as the machine, only SIS...ON is displayed.
- If the Stop-In-Slot is OFF, SIS...OFF will be displayed.

Valley AutoPilot Control Panel

Function Keys

The function keys are located on the far left side of the keypad. See figure 30-1.

The function keys are used to program the panel, view data, and select options not frequently used. Following are explanations of each function key:

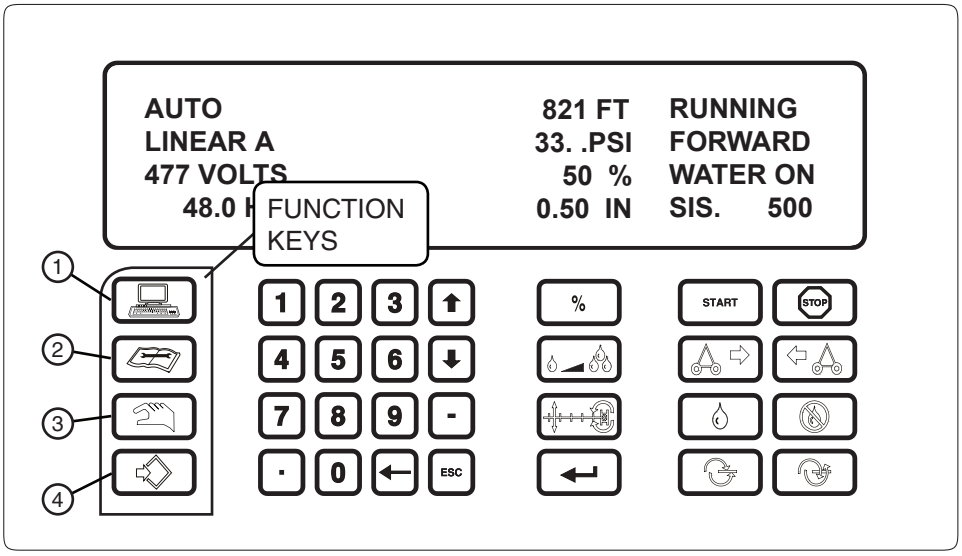


Figure 30-1

1. Program Key
2. Diagnostics Key
3. Options Key
4. System Key

Program Key

Use to either write or run programs that execute commands in the future based upon conditions such as date/time and position in the field. See figure 30-1.

Diagnostics Key

Used to assist the operator in determining the cause of an unplanned machine shutdown or potential problem situation. See figure 30-1.

Options Key

Use to control options not frequently used by the operator. See figure 30-1.

System Key

Used to input the constant values of the irrigation machine, reset other values, and view machine operating data. See figure 30-1.

Numeric Entry Keys

The numeric entry keypad is used to input values such as percentage timer setting, water application depth, SIS setting, etc. and is also used for programming the panel. See figure 31-1. The functions of these keys are explained below:

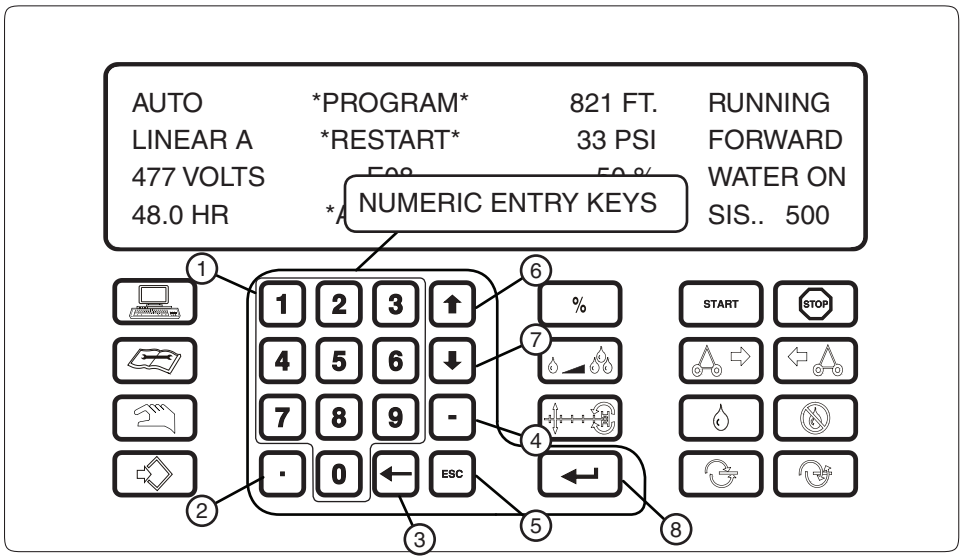
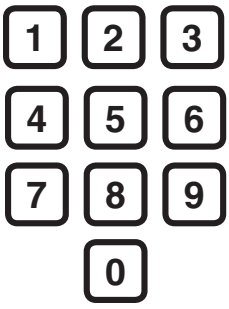


Figure 31-1

1. Number Keys
2. Decimal Point Key
3. Back Arrow Key
4. Minus Sign Key
5. Escape Key
6. Contrast Darker Key
7. Contrast Lighter Key
8. Enter Key



Number Keys

Use to input numerical values and select programming options. See figure 31-1.

Decimal Point Key

Use to input numerical values in decimal form. See figure 31-1.

Example: 270.1°

Back Arrow Key

Use to back space and delete the previous number or symbol. See figure 31-1.

Minus Sign Key

Use to input negative values (generally not used). See figure 31-1.

Escape Key

Use to step backward from the current screen to a previous screen without performing any changes. See figure 31-1.

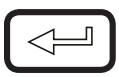
Repeatedly pressing the escape key will step backward from the current screen, through previous screens until the Status screen is displayed.

Contrast Darker Key

Use to increase the contrast between the text and background on the control panel display. See figure 31-1.

Contrast Lighter Key

Use to decrease the contrast between the text and background on the control panel display. See figure 31-1.



Enter Key

Use at the end of a numerical value entry or programming sequence. See figure 31-1.

Valley AutoPilot Control Panel

Command Selection Keys

The command selection keys are used for general operation of the irrigation machine. See figure 32-1. A short explanation of each command selection key is given below:

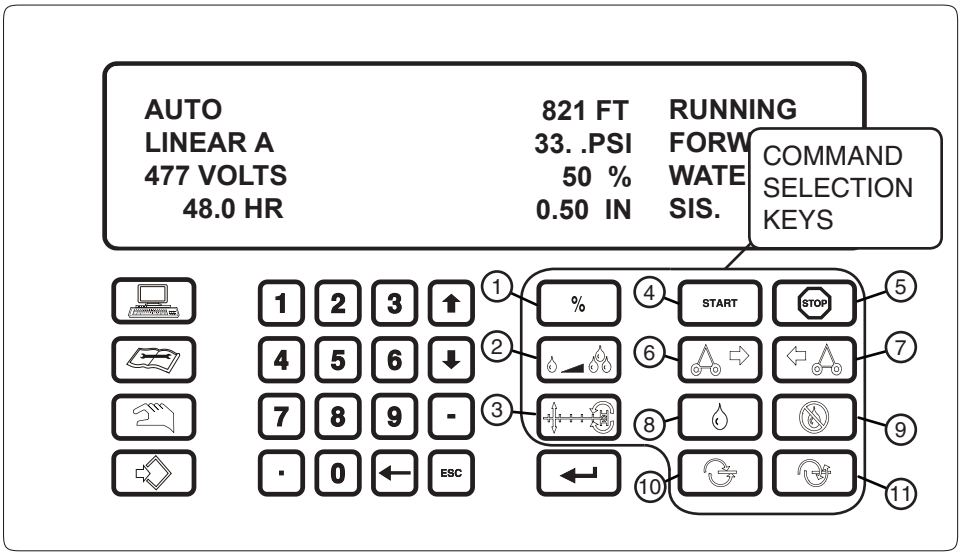


Figure 32-1
1. Percent Key
2. Depth Key
3. Pivot/Linear Key
4. Start Key
5. Stop Key
6. Forward Key
7. Reverse Key
8. Water ON Key
9. Water OFF Key
10. Stop-In-Slot ON Key
11. Stop-In-Slot OFF Key

Percent Key

Press to set the separate linear and pivot percent timers. See figure 32-1.

Depth Key

Press to set the separate linear and pivot water application depths in inches or millimeters depending on the selected unit of measure. See figure 32-1.

Pivot/Linear Key

Press to change the pivot or linear transition mode and/or zone. See figure 32-1.

Start Key

Press to start the machine assuming safety circuits are operating correctly. The machine has a time delay that will not allow it to be restarted by pressing the Start key, within five seconds after being stopped. See figure 32-1.

Stop Key

Press to halt the machine movement, shut the pump off, and close the water valve. See figure 32-1.

Forward Key

Press to command machine movement in the forward direction. See figure 32-1.

Reverse Key

Press to command machine movement in the reverse direction. See figure 32-1.

Water ON Key

Press to command pump to turn on, valve to open, or both when machine is started. A pre-programmed pressure switch delay is automatically recalled to allow sufficient time for pressure to build up in the machine. See figure 32-1.

Water OFF Key

Press to turn off the pump and/or close water valve. See figure 32-1.

Stop-In-Slot ON Key

Press to engage the stop-in-slot feature, which will stop the machine at a preset location in the field selected by the operator. See figure 32-1.

Stop-In-Slot OFF Key

Press to disengage the stop-in-slot feature. See figure 32-1.

Symbols and Conventions

This manual uses a few symbols and conventions which are explained below.

Command Prompt

Any command which requires the operator to input data will show a command prompt on the bottom line of the screen.

Next to the command prompt, the screen will display the current value (in parentheses). The value in parentheses is the default value. See figure 33-1.

If the default value in parentheses is what the operator wants to enter, press ⏎ and this value will be entered. Otherwise, input the desired value.
The command prompt is always identified by > in the bottom line of the screen. See figure 33-1.

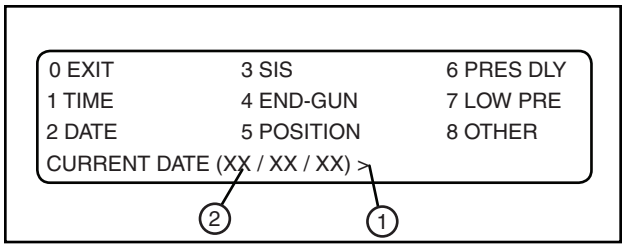


Figure 33-1 1. Command Prompt
2. Default Value

Exiting Screens

Press 0 or ESC one time to step backward from the current screen to the previous screen.

Press 0 or ESC repeatedly to step backward from the current screen, through previous screens until the Status screen is displayed.

Screen Delays

Any screen which is left for more than 60 seconds without pressing a key, will revert back to the previous screen which was displayed. The status screen will eventually be displayed.

Illustrations

The descriptions of procedures throughout this manual consist of instructions and illustration of the key or series of keys to press along with the decision screen that is displayed. This convention will be used throughout the manual. See Figure 33-2.

1. Press ◇, 1, and 2 for the Date screen. See figure 33-2.
2. The date is entered in a month/day/year format when the unit of measure is set to inch or day/month/year format when unit of measure is set to metric.

   If the date is 08/31/07 and the unit of measure is set to inch.

   Press 0, 8, 3, 1, 0, 7 for 08/31/07. See figure 33-2.
3. Press ⏎ to retain 08/31/07 as the date.

NOTE

- **The value shown in parenthesis indicates the current value being used by the control module.**

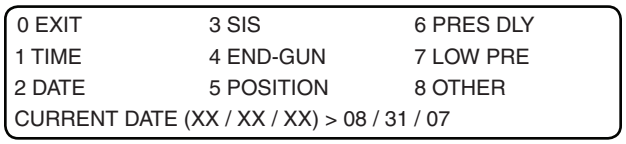


Figure 33-2

NOTE

- **The value shown in parenthesis indicates the current time of day being used by the control module.**

Minimum Control Panel Setup

This section is a guide to minimum Control Panel Setup for each available system type based on product type. See the Valley AutoPilot Control Panel Advanced Features Manual, part number 0998907 (English), for detailed information on other features not shown in this section.

There are four System Types available:

- AUL/VSAL

  AUL = Auto Universal Linear

  VSAL = Valley Swing Around Linear
- Swing Around Linear
- Linear (No Swing), Standard Linear
- Towable Pivot

Contents

Control Panel Setup

Auto Universal Linear

To setup the control panel for use on an Auto Universal Linear machine with Run Time positioning or GPS positioning, see figure 37-1, do the following:

Figure 37-1 Universal Linear

1. Set the System Type to AUL/VSAL. See figure 37-1.
   (a) Press ⇨, 1, 8, 8, 8, 5, and 1.
2. Set the Language and Unit of Measure.
   (a) Press ⇨ and 7.
   (b) Select the desired Language: 1 = English, 2 = Spanish, 3 = French, 4 = Italian, 5 = Portuguese
   (c) Select the desired Unit of Measure: 0 = Inches or 1 = Metric
3. Set the Current Time, Press ⇨, 1, and 1.
   (a) Enter the time in the 24 hour format. Press ↵ to retain the value.
4. Set the Current Date, press ⇨, 1, and 2.
   (a) Enter the current date.
   - When the Unit of Measure is set to Inches, enter the date in a mm/dd/yy format.
   - When unit of measure is set to Metric, enter the date in a dd/mm/yy format.

   (b) Press ↵ to retain the value.
5. Set the Linear and Pivot Minimum Application, press ⇨, 1, 8, and 1.
   (a) Enter the Linear Minimum Application rate from the VChart. Press ↵ to retain the value.
   (b) Enter the Pivot Minimum Application rate from the VChart. Press ↵ to retain the value.
6. Set the Time Per Revolution, press ⇨, 1, 8, and 2.
   (a) Enter the Time Per Revolution from the sprinkler chart. Press ↵ to retain the value.
7. Set the Current Voltage, press ⇨, 1, 8, and 3.
   (a) Enter the current voltage. See Voltage in the back of this section
   (b) Press ↵ to retain the value.
8. Set the Low Voltage Limit if lower than 440 volts, press ⇨, 1, 8, 8 and 4.
   (a) Enter the low voltage limit. See Low Voltage in the back of this section.
   (b) Press ↵ to retain the value.
9. Calibrate the pressure transducer to the current water pressure reading of zero.
   (a) With pump OFF and machine dry, press ⇨, 1, 8, 8, 8, 1, and 1.

Control Panel Setup

Auto Universal Linear

10. Load the Auto Transition Program, press [Computer] and [4].
    (a) Select the desired Auto Transition Program number from Auto-Prog Transition Table in this section.
11. Program the position related control panel settings based on how the machine is equipped:
    - If the machine is NOT equipped with GPS Position, continue with STEP 12 on this page.
    - If the machine is equipped with GPS Position, use the SETUP GPS POSITION procedure on the next page.

Setup Run Time Position

12. Set the Linear position, speed and Pivot position, press [Diamond], [1], and [5].
    (a) Press [1], Enter the Linear Start position, usually zero (0). Press [Enter] to retain the value.
    (b) Press [2], Enter the Linear End position. Press [Enter] to retain the value.
    (c) Press [3], Enter the estimated Linear Position. Press [Enter] to retain the value.
    (d) Press [4], Enter the Linear Speed (Intermediate and End Tower Drive Unit) from the VChart or Estimated Drive Unit Speed chart in this section. Press [Enter] to retain the value.
    (e) Press [5], Enter Pivot Position in degrees. If the machine is in Linear A then Pivot Position is 0°. If the machine is in Linear B, then the Pivot Position is 180°. Press [Enter] to retain the value.
13. Set the Linear Stop-In-Slot position in Zone A, press [Diamond], [1], [3], [2], [2], and [1].
    (a) Enter the Linear Stop-In-Slot position. Press [Enter] to retain the value.
    (b) Select the Direction for Linear Stop-In-Slot to work, [0] = Both, [1] = Forward, [2] = Reverse. Press [Enter] to retain the value.

    Minimum control panel setup of an Auto Universal Linear machine that is NOT equipped with GPS Position is complete.

Auto Universal Linear
Setup GPS Position

To setup the GPS position type use the SET CURRENT method and do the following.

- In order for the GPS receiver to calculate an initial position fix, make sure the GPS receiver is on for 5 minutes or more before beginning the setup procedure.
- Obtain intermediate and last tower speed information from the VChart report for this machine or use the Estimated Drive Unit Speed chart in this section.
- Be prepared to run the machine to the Linear Start and Linear End positions in order to set the GPS coordinates.

NOTE

•GPS is used for Linear Position Only. A resolver is used for Pivot Position.

1. Set the 25-Pin Com Port protocol to GPS,
   (a) Press [⇨], [1], [8], [8], [7], [2], [1], and [6].
2. Set the Baud Rate value to 4800 baud,
   (a) Press [ESC], [2], and [4].
3. Set the Linear Start position using the SET CURRENT method.
   (a) Run the machine to the Linear Start position.
   (b) Press [⇨], [1], [5], [1] and [1].
   (c) Press [1], to set the Linear Start position to the current position.
   (d) Press [1] to save or [2] to cancel.
   (e) Press [⇨] to go back to the status screen
4. Set the Linear End position using the SET CURRENT method.
   (a) Run the machine to the Linear End position.
   (b) Press [⇨], [1], [5], [1] and [2].
   (c) Press [1], to set the Linear End position to the current position.
   (d) Press [1] to save or [2] to cancel.
   (e) Press [ESC] two times to go back to the position screen.
5. Set the Linear Speed.
   (a) Press [4]
   (b) Enter the Intermediate Drive Unit speed. Press [↵] to retain the value.
   (c) Enter the End Tower Drive Unit speed. Press [↵] to retain the value.
   (d) Press [⇨] to go back to the status screen
6. Set the Linear Stop-In-Slot position in Zone A, press [⇨], [1], [3], [2], [2], and [1].
   (a) Enter the Linear Stop-In-Slot position. Press [↵] to retain the value.
   (b) Select the Direction for Linear Stop-In-Slot to work, [0] = Both, [1] = Forward, [2] = Reverse. Press [↵] to retain the value.

   Minimum control panel setup of an Auto Universal Linear machine equipped with GPS Position is complete. Customizing the Position Loss constants is OPTIONAL. If desired see SETUP POSITION LOSS (OPTIONAL) in this section.

Control Panel Setup

Swing Around Rainger Linear

To setup the control panel for use on an Swing Around Rainger Linear machine with Run Time positioning or GPS positioning, see figure 41-1, do the following:

Figure 41-2 Swing Around Rainger Linear

NOTE

•Do not set this System Type as a Swing Around, the system type must be set up as a AUL/VSAL to operate properly.

1. Set the System Type to AUL/VSAL. See figure 41-1.
   (a) Press ⇨, 1, 8, 8, 8, 5, and 1.
2. Set the Language and Unit of Measure, press ⇨ and 7.
   (a) Select the desired Language: 1 = English, 2 = Spanish, 3 = French, 4 = Italian, 5 = Portuguese
   (b) Select the desired Unit of Measure: 0 = Inches or 1 = Metric
3. Set the Current Time, Press ⇨, 1, and 1.
   (a) Enter the time in the 24 hour format. Press ↵ to retain the value.
4. Set the Current Date, press ⇨, 1, and 2.
   (a) Enter the current date.
   • When the Unit of Measure is set to Inches, enter the date in a mm/dd/yy format.
   • When unit of measure is set to Metric, enter the date in a dd/mm/yy format.
   (b) Press ↵ to retain the value.
5. Set the Linear and Pivot Minimum Application, press ⇨, 1, 8, and 1.
   (a) Enter the Linear Minimum Application rate from the VChart. Press ↵ to retain the value.
   (b) Enter the Pivot Minimum Application rate from the VChart. Press ↵ to retain the value.
6. Set the Time Per Revolution, press ⇨, 1, 8, and 2.
   (a) Enter the Time Per Revolution from the sprinkler chart. Press ↵ to retain the value.
7. Set the Current Voltage, press ⇨, 1, 8, and 3.
   (a) Enter the current voltage. See Voltage in the back of this section
   (b) Press ↵ to retain the value.
8. Set the Low Voltage Limit if lower than 440 volts, press ⇨, 1, 8, 8 and 4.
   (a) Enter the low voltage limit. See Low Voltage in the back of this section.
   (b) Press ↵ to retain the value.
9. Calibrate the pressure transducer to the current water pressure reading of zero.
   (a) With pump OFF and machine dry, press ⇨, 1, 8, 8, 8, 1, and 1.

Control Panel Setup

Swing Around Rainger Linear

10. Set up the Transition Programs depending on the application
    - If the hose inlet is on each end of the machine, use the End Inlet Transition Setup below.
    - If the hose inlet is on the side of the machine, use the Side Inlet Transition Setup below.

End Inlet Transition Setup

Setup all of the Transition Programs (T1 - T8) to stop at each transition when reached in a pivot or linear running mode.

(a) Press [PC], [3], and [1].
(b) Set T1, press [1], [5], [5], [5], [5]
(c) Set T2, press [2], [5], [5], [5], [5]
(d) Set T3, press [3], [5], [5], [5], [5]
(e) Set T4, press [4], [5], [5], [5], [5]
(f) Set T5, press [5], [5], [5], [5], [5]
(g) Set T6, press [6], [5], [5], [5], [5]
(h) Set T7, press [7], [5], [5], [5], [5]
(i) Set T8, press [8], [5], [5], [5], [5]

Side Inlet Transition Setup

Setup the Transition Programs (T1 - T4) to stop at each transition when reached in a pivot running mode and change direction at each transition when reached in a linear running mode.

(a) Press [PC], [3], and [1].
(b) Set T1, press [1], [5], [5], [4], [3]
(c) Set T2, press [2], [5], [5], [4], [3]
(d) Set T3, press [3], [5], [5], [4], [3]
(e) Set T4, press [4], [5], [5], [4], [3]

Setup the Transition Programs (T5 - T8) to stop at each transition when reached in a pivot or linear running mode.

(f) Set T5, press [5], [5], [5], [5], [5]
(g) Set T6, press [6], [5], [5], [5], [5]
(h) Set T7, press [7], [5], [5], [5], [5]
(i) Set T8, press [8], [5], [5], [5], [5]

11. Program the position related control panel settings based on how the machine is equipped:
    - If the machine is NOT equipped with GPS Position, continue with STEP 12 on this page.
    - If the machine is equipped with GPS Position, use the SETUP GPS POSITION procedure on the next page.

Setup Run Time Position

12. Set the Linear position, speed and Pivot position, press [◇], [1], and [5].
    (a) Press [1], Enter the Linear Start position, usually zero (0). Press [↵] to retain the value.
    (b) Press [2], Enter the Linear End position. Press [↵] to retain the value.
    (c) Press [3], Enter the estimated Linear Position. Press [↵] to retain the value.
    (d) Press [4], Enter the Linear Speed (Intermediate and End Tower Drive Unit) from the VChart or Estimated Drive Unit Speed chart at the end of this section. Press [↵] to retain the value.
    (e) Press [5], Enter Pivot Position in degrees. If the machine is in Linear A then Pivot Position is 0°. If the machine is in Linear B, then the Pivot Position is 180°. Press [↵] to retain the value.
13. Set the Linear Stop-In-Slot position in Zone A, press [◇], [1], [3], [2], [2], and [1].
    (a) Enter the Linear Stop-In-Slot position. Press [↵] to retain the value.
    (b) Select the Direction for Linear Stop-In-Slot to work, [0] = Both, [1] = Forward, [2] = Reverse. Press [↵] to retain the value.

    Minimum control panel setup of a Swing Around Rainger Linear machine that is NOT equipped with GPS Position is complete.

Swing Around Rainger Linear
Setup GPS Position

To setup the GPS position type use the SET CURRENT method and do the following.

- In order for the GPS receiver to calculate an initial position fix, make sure the GPS receiver is on for 5 minutes or more before beginning the setup procedure.
- Obtain intermediate and last tower speed information from the VChart report for this machine or use the Estimated Drive Unit Speed chart in this section.
- Be prepared to run the machine to the Linear Start and Linear End positions in order to set the GPS coordinates.

1. Set the 25-Pin Com Port protocol to GPS,
   (a) Press [⇨], [1], [8], [8], [7], [2], [1], and [6].
2. Set the Baud Rate value to 4800 baud,
   (a) Press [ESC], [2], and [4].
3. Set the Linear Start position using the SET CURRENT method.
   (a) Run the machine to the Linear Start position.
   (b) Press [⇨], [1], [5], [1] and [1].
   (c) Press [1], to set the Linear Start position to the current position.
   (d) Press [1] to save or [2] to cancel.
   (e) Press [⇨] to go back to the status screen
4. Set the Linear End position using the SET CURRENT method.
   (a) Run the machine to the Linear End position.
   (b) Press [⇨], [1], [5], [1] and [2].
   (c) Press [1], to set the Linear End position to the current position.
   (d) Press [1] to save or [2] to cancel.
   (e) Press [ESC] two times to go back to the position screen.
5. Set the Linear Speed.
   (a) Press [4]
   (b) Enter the Intermediate Drive Unit speed. Press [↵] to retain the value.
   (c) Enter the End Tower Drive Unit speed. Press [↵] to retain the value.
   (d) Press [⇨] to go back to the status screen
6. Set the Linear Stop-In-Slot position in Zone A, press [⇨], [1], [3], [2], [2], and [1].
   (a) Enter the Linear Stop-In-Slot position. Press [↵] to retain the value.
   (b) Select the Direction for Linear Stop-In-Slot to work, [0] = Both, [1] = Forward, [2] = Reverse. Press [↵] to retain the value.

   Minimum control panel setup of a Swing Around Rainger Linear machine equipped with GPS Position is complete. Customizing the Position Loss constants is OPTIONAL. If desired see SETUP POSITION LOSS (OPTIONAL) in this section.

NOTE

•GPS is used for Linear Position Only. A resolver is used for Pivot Position.

Control Panel Setup

Swing Around Two or Four Wheel Linear

To setup the control panel for use with Swing Around Two or Four Wheel Linear machine with Run Time positioning or GPS positioning, see figure 45-1, do the following:

1. Set the System Type to Swing Around Linear. See figure 45-1.
   (a) Press [⇨], [1], [8], [8], [8], [5], and [2].
2. Set the Language and Unit of Measure.
   (a) Press [⇨] and [7].
   (b) Select the desired Language: [1] = English, [2] = Spanish, [3] = French, [4] = Italian, [5] = Portuguese
   (c) Select the desired Unit of Measure: [0] = Inches or [1] = Metric
3. Set the Current Time, Press [⇨], [1], and [1].
   (a) Enter the time in the 24 hour format. Press [↵] to retain the value.
4. Set the Current Date, press [⇨], [1], and [2].
   (a) Enter the current date.
   - When the Unit of Measure is set to Inches, enter the date in a mm/dd/yy format.
   - When unit of measure is set to Metric, enter the date in a dd/mm/yy format.

   (b) Press [↵] to retain the value.
5. Set the Linear and Pivot Minimum Application, press [⇨], [1], [8], and [1].
   (a) Enter the Linear Minimum Application rate from the VChart. Press [↵] to retain the value.
   (b) Enter the Pivot Minimum Application rate from the VChart. Press [↵] to retain the value.
6. Set the Time Per Revolution, press [⇨], [1], [8], and [2].
   (a) Enter the Time Per Revolution from the sprinkler chart. Press [↵] to retain the value.
7. Set the Current Voltage, press [⇨], [1], [8], and [3].
   (a) Enter the current voltage. See Voltage in the back of this section
   (b) Press [↵] to retain the value.
8. Set the Low Voltage Limit if lower than 440 volts, press [⇨], [1], [8], [8] and [4].
   (a) Enter the low voltage limit. See Low Voltage in the back of this section.
   (b) Press [↵] to retain the value.
9. Calibrate the pressure transducer to the current water pressure reading of zero.
   (a) With pump OFF and machine dry, press [⇨], [1], [8], [8], [8], [1], and [1].

Figure 45-1 Four Wheel Linear Swing Around

Control Panel Setup

Swing Around Two or Four Wheel Linear

10. Program the position related control panel settings based on how the machine is equipped:
    - If the machine is NOT equipped with GPS Position, continue with STEP 11 on this page.
    - If the machine is equipped with GPS Position, use the SETUP GPS POSITION procedure on the next page.

Setup Run Time Position

11. Set the Linear position, speed and Pivot position, press [◇], [1], and [5].
    (a) Press [1], Enter the Linear Start position, usually zero (0). Press [↵] to retain the value.
    (b) Press [2], Enter the Linear End position. Press [↵] to retain the value.
    (c) Press [3], Enter the estimated Linear Position. Press [↵] to retain the value.
    (d) Press [4], Enter the Linear Speed (Intermediate and End Tower Drive Unit) from the VChart or Estimated Drive Unit Speed chart at the end of this section. Press [↵] to retain the value.
    (e) Press [5], Enter Pivot Position in degrees. If the machine is in Linear A then Pivot Position is 0°. If the machine is in Linear B, then the Pivot Position is 180°. Press [↵] to retain the value.
12. Set the Linear Stop-In-Slot position in Zone A, press [◇], [1], [3], [2], [2], and [1].
    (a) Enter the Linear Stop-In-Slot position. Press [↵] to retain the value.
    (b) Select the Direction for Linear Stop-In-Slot to work, [0] = Both, [1] = Forward, [2] = Reverse. Press [↵] to retain the value.

    Minimum control panel setup of a Swing Around Two or Four Wheel Linear machine that is NOT equipped with GPS Position is complete.

Swing Around Two or Four Wheel Linear Setup GPS Position

To setup the GPS position type use the SET CURRENT method and do the following.

- In order for the GPS receiver to calculate an initial position fix, make sure the GPS receiver is on for 5 minutes or more before beginning the setup procedure.
- Obtain intermediate and last tower speed information from the VChart report for this machine or use the Estimated Drive Unit Speed chart in this section.
- Be prepared to run the machine to the Linear Start and Linear End positions in order to set the GPS coordinates.

1. Set the 25-Pin Com Port protocol to GPS,
   (a) Press ⇨, 1, 8, 8, 7, 2, 1, and 6.
2. Set the Baud Rate value to 4800 baud,
   (a) Press ESC, 2, and 4.
3. Set the Linear Start position using the SET CURRENT method.
   (a) Run the machine to the Linear Start position.
   (b) Press ⇨, 1, 5, 1 and 1.
   (c) Press 1, to set the Linear Start position to the current position.
   (d) Press 1 to save or 2 to cancel.
   (e) Press ⇨ to go back to the status screen
4. Set the Linear End position using the SET CURRENT method.
   (a) Run the machine to the Linear End position.
   (b) Press ⇨, 1, 5, 1 and 2.
   (c) Press 1, to set the Linear End position to the current position.
   (d) Press 1 to save or 2 to cancel.
   (e) Press ESC two times to go back to the position screen.
5. Set the Linear Speed.
   (a) Press 4.
   (b) Enter the Intermediate Drive Unit speed. Press ↵ to retain the value.
   (c) Enter the End Tower Drive Unit speed. Press ↵ to retain the value.
   (d) Press ⇨ to go back to the status screen
6. Set the Linear Stop-In-Slot position in Zone A, press ⇨, 1, 3, 2, 2, and 1.
   (a) Enter the Linear Stop-In-Slot position. Press ↵ to retain the value.
   (b) Select the Direction for Linear Stop-In-Slot to work, 0 = Both, 1 = Forward, 2 = Reverse. Press ↵ to retain the value.

   Minimum control panel setup of a Two or four Wheel Linear Swing Around machine equipped with GPS Position is complete. Customizing the Position Loss constants is OPTIONAL. If desired see SETUP POSITION LOSS (OPTIONAL) in this section.

NOTE

•GPS is used for Linear Position Only.

Control Panel Setup

Standard Rainger or Two Wheel Linear

To setup the control panel for use with a Standard Rainger or Two wheel Linear machine with Run Time positioning or GPS positioning, see figure 49-1, do the following:

Figure 49-1 Rainger Linear Lateral

1. Set the System Type to Linear (No Swing). See figure 49-1.
   (a) Press [⇨], [1], [8], [8], [8], [5], and [3].
2. Set the Language and Unit of Measure.
   (a) Press [⇨] and [7].
   (b) Select the desired Language: [1] = English, [2] = Spanish, [3] = French, [4] = Italian, [5] = Portuguese
   (c) Select the desired Unit of Measure: [0] = Inches or [1] = Metric
3. Set the Current Time, Press [⇨], [1], and [1].
   (a) Enter the time in the 24 hour format. Press [↵] to retain the value.
4. Set the Current Date, press [⇨], [1], and [2].
   (a) Enter the current date.
   - When the Unit of Measure is set to Inches, enter the date in a mm/dd/yy format.
   - When unit of measure is set to Metric, enter the date in a dd/mm/yy format.

   (b) Press [↵] to retain the value.
5. Set the Linear Minimum Application, press [⇨], [1], [8], and [1].
   (a) Enter the Linear Minimum Application rate from the VChart. Press [↵] to retain the value.
6. Set the Current Voltage, press [⇨], [1], [8], and [3].
   (a) Enter the current voltage. See Voltage in the back of this section
   (b) Press [↵] to retain the value.
7. Set the Low Voltage Limit if lower than 440 volts, press [⇨], [1], [8], [8] and [4].
   (a) Enter the low voltage limit. See Low Voltage in the back of this section.
8. Calibrate the pressure transducer to the current water pressure reading of zero.
   (a) With pump OFF and machine dry, press [⇨], [1], [8], [8], [8], [1], and [1].

Control Panel Setup

Standard Rainger or Two Wheel Linear

9. Program the position related control panel settings based on how the machine is equipped:
   - If the machine is NOT equipped with GPS Position, continue with STEP 11 on this page.
   - If the machine is equipped with GPS Position, use the SETUP GPS POSITION procedure on the next page.

Setup Run Time Position

10. Set the Linear position, speed and Pivot position, press [◇], [1], and [5].
    (a) Press [1], Enter the Linear Start position, usually zero (0). Press [↵] to retain the value.
    (b) Press [2], Enter the Linear End position. Press [↵] to retain the value.
    (c) Press [3], Enter the estimated Linear Position. Press [↵] to retain the value.
    (d) Press [4], Enter the Linear Speed (Intermediate and End Tower Drive Unit) from the VChart or Estimated Drive Unit Speed chart at the end of this section. Press [↵] to retain the value.
11. Set the Linear Stop-In-Slot position in Zone A, press [◇], [1], [3], [2], [2], and [1].
    (a) Enter the Linear Stop-In-Slot position. Press [↵] to retain the value.
    (b) Select the Direction for Linear Stop-In-Slot to work, [0] = Both, [1] = Forward, [2] = Reverse. Press [↵] to retain the value.

    Minimum control panel setup of a Standard Rainger or Two Wheel Linear machine that is NOT equipped with GPS Position is complete.

Standard Rainger or Two Wheel Linear Setup GPS Position

To setup the GPS position type use the SET CURRENT method and do the following.

- In order for the GPS receiver to calculate an initial position fix, make sure the GPS receiver is on for 5 minutes or more before beginning the setup procedure.
- Obtain intermediate and last tower speed information from the VChart report for this machine or use the Estimated Drive Unit Speed chart in this section.
- Be prepared to run the machine to the Linear Start and Linear End positions in order to set the GPS coordinates.

1. Set the 25-Pin Com Port protocol to GPS,
   (a) Press [⇨], [1], [8], [8], [7], [2], [1], and [6].
2. Set the Baud Rate value to 4800 baud,
   (a) Press [ESC], [2], and [4].
3. Set the Linear Start position using the SET CURRENT method.
   (a) Run the machine to the Linear Start position.
   (b) Press [⇨], [1], [5], [1] and [1].
   (c) Press [1], to set the Linear Start position to the current position.
   (d) Press [1] to save or [2] to cancel.
   (e) Press [⇨] to go back to the status screen
4. Set the Linear End position using the SET CURRENT method.
   (a) Run the machine to the Linear End position.
   (b) Press [⇨], [1], [5], [1] and [2].
   (c) Press [1], to set the Linear End position to the current position.
   (d) Press [1] to save or [2] to cancel.
   (e) Press [ESC] two times to go back to the position screen.
5. Set the Linear Speed.
   (a) Press [4]
   (b) Enter the Intermediate Drive Unit speed. Press [↵] to retain the value.
   (c) Enter the End Tower Drive Unit speed. Press [↵] to retain the value.
   (d) Press [⇨] to go back to the status screen
6. Set the Linear Stop-In-Slot position in Zone A, press [⇨], [1], [3], [2], [2], and [1].
   (a) Enter the Linear Stop-In-Slot position. Press [↵] to retain the value.
   (b) Select the Direction for Linear Stop-In-Slot to work, [0] = Both, [1] = Forward, [2] = Reverse. Press [↵] to retain the value.

   Minimum control panel setup of a Standard Rainger or Two Wheel Linear machine equipped with GPS Position is complete. Customizing the Position Loss constants is OPTIONAL. If desired see SETUP POSITION LOSS (OPTIONAL) in this section.

NOTE

•GPS is used for Linear Position Only.

Control Panel Setup

Towable Pivot

To setup the control panel for use with the Towable Pivot with Run Time positioning or GPS positioning, see figure 53-1, do the following:

Figure 53-1 Four Wheel Towable Pivot

1. Set the System Type to Towable Pivot. See figure 53-1.
   (a) Press ⇨, 1, 8, 8, 8, 5, and 4.
2. Set the Language and Unit of Measure.
   (a) Press ⇨ and 7.
   (b) Select the desired Language: 1 = English, 2 = Spanish, 3 = French, 4 = Italian, 5 = Portuguese
   (c) Select the desired Unit of Measure: 0 = Inches or 1 = Metric
3. Set the Current Time, Press ⇨, 1, and 1.
   (a) Enter the time in the 24 hour format. Press ↵ to retain the value.
4. Set the Current Date, press ⇨, 1, and 2.
   (a) Enter the current date.
   - When the Unit of Measure is set to Inches, enter the date in a mm/dd/yy format.
   - When unit of measure is set to Metric, enter the date in a dd/mm/yy format.

   (b) Press ↵ to retain the value.
5. Set the Pivot Minimum Application, press ⇨, 1, 8, and 1.
   (a) Enter the Pivot Minimum Application rate from the VChart. Press ↵ to retain the value.
6. Set the Time Per Revolution, press ⇨, 1, 8, and 2.
   (a) Enter the Time Per Revolution from the sprinkler chart. Press ↵ to retain the value.
7. Set the Current Voltage, press ⇨, 1, 8, and 3.
   (a) Enter the current voltage. See Voltage in the back of this section
   (b) Press ↵ to retain the value.
8. Set the Low Voltage Limit if lower than 440 volts, press ⇨, 1, 8, 8 and 4.
   (a) Enter the low voltage limit. See Low Voltage in the back of this section.
   (b) Press ↵ to retain the value.
9. Calibrate the pressure transducer to the current water pressure reading of zero.
   (a) With pump OFF and machine dry, press ⇨, 1, 8, 8, 8, 1, and 1.

Valley AutoPilot Control Panel

Control Panel Setup

Towable Pivot

10. Program the position related control panel settings based on how the machine is equipped:
    - If the machine is NOT equipped with GPS Position, continue with STEP 11 on this page.
    - If the machine is equipped with GPS Position, use the SETUP GPS POSITION procedure on the next page.

Setup Pivot Positions

11. Set the Pivot Position, press ⇨, 1, 5 and 5.
    (a) Enter pivot span position in degrees. Press ↵ to retain the value.
12. Set the Pivot Stop-In-Slot position of each zone, press ⇨, 1, 3, and 2.
    (a) Select the Zone, 1 = A, 2 = B, 3 = C, 4 = D.
    (b) Enter the Pivot Stop-In-Slot position.
    (c) Press ↵ to retain the value.
    (d) Select the Direction for Stop-In-Slot to work, 0 = Both, 1 = Forward, 2 = Reverse.
    (e) Press ↵ to retain the value.
    (f) Repeat steps a), b), c), d) and e) for each Pivot Zone.

    Minimum control panel setup of a Towable Pivot that is NOT equipped with GPS Position is complete.

Towable Pivot
Setup GPS Position

To setup the GPS position type use the EDIT method and do the following.

- Use a handheld GPS receiver to obtain the GPS coordinates for the Pivot Point position. If necessary, use the GPS Angular Conversion chart in this section to convert the GPS coordinate values into decimals of degree.
- In order to set the position of pivot span the GPS receiver must be locked on a satellite. Make sure the GPS receiver is on for 5 minutes or more before beginning the setup procedure.
- Obtain the last tower speed and pivot length information from the VChart report for this machine or measure the span length from pivot to last regular drive unit not including the overhang and use the Estimated Drive Unit Speed chart in this section.

1. Set the 25-Pin Com Port protocol to GPS,
   (a) Press ⇨, 1, 8, 8, 7, 2, 1, and 6.
2. Set the Baud Rate value to 4800 baud.
   (a) Press ESC, 2, and 4.
3. Set the Pivot Point position using EDIT.
   (a) Press ⇨, 1, 5, and 1.
   (b) Select the Zone, 1 = A, 2 = B, 3 = C, 4 = D.
   (c) Press 2 to EDIT latitude and longitude.
   (d) Enter the latitude. Press ↵ to retain value
   (e) Enter the longitude. Press ↵ to retain value
4. Set the Fallback Position Run Time.
   (a) Press ⇨, 1, 5, 2, 3, 1 and 1.
   (b) Enter pivot speed. Press ↵ to retain value.
   (c) Enter pivot length. Press ↵ to retain value.
5. Set the Position of pivot span.
   (a) Press ⇨, 1, 5 and 3.
   (b) Enter pivot span position in degrees.
   (c) Press ↵ to retain the value.
6. Set the Pivot Stop-In-Slot position of each zone.
   (a) Press ⇨, 1, 3, and 2.
   (b) Select the Zone, 1 = A, 2 = B, 3 = C, 4 = D.
   (c) Enter the Pivot Stop-In-Slot position. Press ↵ to retain the value.
   (d) Select the Direction for Linear Stop-In-Slot to work, 0 = Both, 1 = Forward, 2 = Reverse.
   (e) Press ↵ to retain the value.
   (f) Repeat steps a), b), c), d) and e) for each Pivot Zone.

   Minimum control panel setup of a Towable Pivot equipped with GPS Position is complete. Customizing the Position Loss constants is OPTIONAL. If desired see SETUP POSITION LOSS (OPTIONAL) in this section.

NOTE

•GPS is used for Pivot Point Position and pivot span position.

NOTE

•Latitude and Longitude positions displayed on a handheld GPS receiver are usually displayed as North, South, East or West.

•The direction displayed affects how the position is entered into the control panel.

•If the position is shown as West or South the position MUST be entered as a Negative Degree.

•In North America:

• - Latitude positions are always Positive.

• - Longitude positions are always Negative.

•After setup, if the pivot point position is shown incorrectly as 90° or 270°, make sure that the positive or negative value was entered correctly.

Control Panel Setup

Setup Position Loss (Optional)

In the event of GPS Position Loss, 3 different position loss functions can be used independently or with each other to control the machine operation. Listed below are the functions and their default settings.

- Shutdown System: When ON, shuts the system down if GPS position is lost for a specified period of time. Default setting is ON with10 minute delay.
- Disable Endguns: When ON, disables the endguns if GPS position is lost for a specified period of time. Default setting is OFF with 10 minute delay.
- Fallback Position: When ON, if GPS position is lost the position is calculated using Backup Runtime until GPS position is re-acquired. Default setting is ON.

Shutdown System

To setup Shutdown System, do the following.

1. Display the Shutdown System screen,
   - Press ⇨, 1, 5, 2 and 1.
2. Set to ON or OFF. See figure 56-1.
   - Press 1 ON or 0 OFF
3. Enter delay time, 1 to 255 minutes. See figure 56-2.
   - Press ↵ to retain value.

Disable End Guns

To setup Disable Endguns, do the following.

1. Display the Disable Endgun screen,
   - Press ⇨, 1, 5, 2 and 2.
2. Set to ON or OFF.
   - Press 1 ON or 0 OFF
3. Enter delay time, 1 to 255 minutes. See figure 56-4.
   - Press ↵ to retain value.

Fallback Position

To setup Fallback Position, do the following.

1. Display the Fallback Position screen,
   - Press ⇨, 1, 5, 2 and 3.
2. Set to ON or OFF.
   - Press 1 ON or 0 OFF

```
IN EVENT OF GPS SIGNAL LOSS          *=ON
1 SHUTDOWN SYSTEM   3*FALLBACK POSITION
2 DISABLE ENDGUNS
SYSTEM SHUTDOWN 1..ON  0..OFF >
```

Figure 56-1

```
IN EVENT OF GPS SIGNAL LOSS          *=ON
1*SHUTDOWN SYSTEM   3*FALLBACK POSITION
2 DISABLE ENDGUNS
SYSTEM SHUTDOWN DELAY MIN (10) >
```

Figure 56-2

```
IN EVENT OF GPS SIGNAL LOSS          *=ON
1*SHUTDOWN SYSTEM   3*FALLBACK POSITION
2 DISABLE ENDGUNS
DISABLE ENDGUNS 1..ON  0..OFF >
```

Figure 56-3

```
IN EVENT OF GPS SIGNAL LOSS          *=ON
1*SHUTDOWN SYSTEM   3*FALLBACK POSITION
2*DISABLE ENDGUNS
DISABLE ENDGUNS DELAY MIN ( 10) >
```

Figure 56-4

```
IN EVENT OF GPS SIGNAL LOSS          *=ON
1*SYSTEM SHUTDOWN   3*FALLBACK POSITION
2 DISABLE ENDGUNS
USE RUNTIME 1..ON  0..OFF >
```

Figure 56-5

Auto-Prog Transition Table

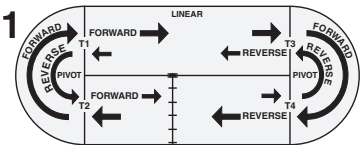
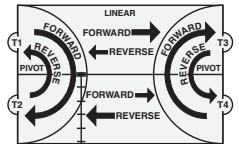
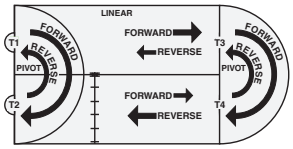
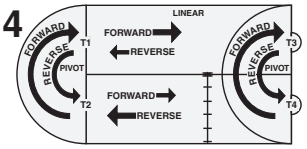
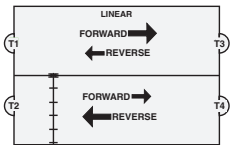
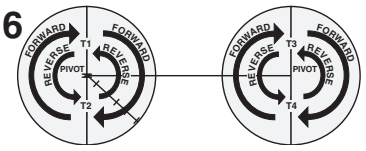
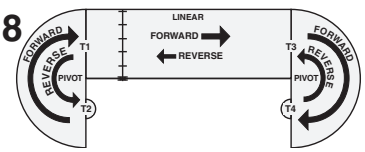
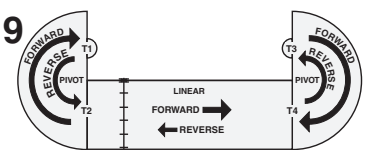
AUTO-PROG NUMBER	TRANSITION LOCATIONS, MODES AND DIRECTIONS	RUNNING MODE	TRANSITION NUMBER / TRANSITION MODE			
			T1	T2	T3	T4
1		Pivot/Forward	Linear/Forward to T3	Pivot/Forward ∗	Pivot/Forward ∗	Linear/Reverse to T2
		Pivot/Reverse	Pivot/Reverse ∗	Linear/Forward to T4	Linear/Reverse to T1	Pivot/Reverse ∗
		Linear/Forward	Linear/Forward ∗	Linear/Forward ∗	Pivot/Forward to T4	Pivot/Reverse to T3
		Linear/Reverse	Pivot/Reverse to T2	Pivot/Forward to T1	Linear/Reverse ∗	Linear/Reverse ∗
2		Pivot/Forward	Linear/Forward ∗	Linear/Forward to T4	Linear/Reverse to T1	Linear/Reverse ∗
		Pivot/Reverse	Linear/Forward to T3	Linear/Forward ∗	Linear/Reverse ∗	Linear/Reverse to T2
		Linear/Forward	Linear/Forward ∗	Linear/Forward ∗	Pivot/Reverse to T4	Pivot/Forward to T3
		Linear/Reverse	Pivot/Forward to T2	Pivot/Reverse to T1	Linear/Reverse ∗	Linear/Reverse ∗
3		Pivot/Forward	Linear/Forward to T3	Pivot/Forward ∗	Linear/Reverse to T1	Pivot/Forward ∗
		Pivot/Reverse	Pivot/Reverse ∗	Linear/Forward to T4	Pivot/Reverse ∗	Linear/Reverse to T2
		Linear/Forward	Linear/Forward ∗	Linear/Forward ∗	Pivot/Reverse to T4	Pivot/Forward to T3
		Linear/Reverse	Pivot/Reverse to T2	Pivot/Forward to T1	Linear/Reverse ∗	Linear/Reverse ∗
4		Pivot/Forward	Pivot/Forward ∗	Linear/Forward to T4	Pivot/Forward ∗	Linear/Reverse to T2
		Pivot/Reverse	Linear/Forward to T3	Pivot/Reverse ∗	Linear/Reverse to T1	Pivot/Reverse ∗
		Linear/Forward	Linear/Forward ∗	Linear/Forward ∗	Pivot/Forward to T4	Pivot/Reverse to T3
		Linear/Reverse	Pivot/Forward to T2	Pivot/Reverse to T1	Linear/Reverse ∗	Linear/Reverse ∗
5		Pivot/Forward	Pivot/Forward ∗	Pivot/Forward ∗	Pivot/Forward ∗	Pivot/Forward ∗
		Pivot/Reverse	Pivot/Reverse ∗	Pivot/Reverse	Pivot/Reverse ∗	Pivot/Reverse ∗
		Linear/Forward	Linear/Forward ∗	Linear/Forward ∗	Linear/Reverse to T1	Linear/Reverse to T2
		Linear/Reverse	Linear/Forward to T3	Linear/Forward to T4	Linear/Reverse ∗	Linear/Reverse ∗
6		Pivot/Forward	Pivot/Forward to T2	Pivot/Forward to T1	Pivot/Forward to T4	Pivot/Forward to T3
		Pivot/Reverse	Pivot/Reverse to T2	Pivot/Reverse to T1	Pivot/Reverse to T4	Pivot/Reverse to T3
		Linear/Forward	Pivot/Forward ∗	Pivot/Reverse ∗	Pivot/Forward ∗	Pivot/Reverse ∗
		Linear/Reverse	Pivot/Reverse ∗	Pivot/Forward ∗	Pivot/Reverse ∗	Pivot/Forward ∗
7		Pivot/Forward	Pivot/Reverse to T2	Pivot/Forward ∗	Pivot/Forward ∗	Pivot/Reverse to T3
		Pivot/Reverse	Pivot/Reverse ∗	Pivot/Forward to T1	Pivot/Forward to T4	Pivot/Reverse ∗
		Linear/Forward	Pivot/Reverse ∗	Pivot/Forward ∗	Pivot/Forward ∗	Pivot/Reverse ∗
		Linear/Reverse	Pivot/Reverse ∗	Pivot/Forward ∗	Pivot/Forward ∗	Pivot/Reverse ∗
8		Pivot/Forward	Pivot/Reverse to T2	Pivot/Forward ∗	Pivot/Forward ∗	Linear/Reverse to T2
		Pivot/Reverse	Pivot/Reverse ∗	Linear/Forward to T4	Pivot/Forward to T4	Pivot/Reverse ∗
		Linear/Forward	Pivot/Reverse ∗	Linear/Forward ∗	Pivot/Forward ∗	Pivot/Reverse to T3
		Linear/Reverse	Pivot/Reverse ∗	Pivot/Forward to T1	Pivot/Forward ∗	Linear/Reverse ∗
9		Pivot/Forward	Linear/Forward to T3	Pivot/Forward ∗	Pivot/Forward ∗	Pivot/Reverse to T3
		Pivot/Reverse	Pivot/Reverse ∗	Pivot/Forward to T1	Linear/Reverse to T1	Pivot/Reverse ∗
		Linear/Forward	Linear/Forward ∗	Pivot/Forward ∗	Pivot/Forward to T4	Pivot/Reverse ∗
		Linear/Reverse	Pivot/Reverse to T2	Pivot/Forward ∗	Linear/Reverse ∗	Pivot/Reverse ∗

Figure 57-1

∗ Although part of the Auto Program, this transition mode will never occur because the machine cannot physically reach the transition in the related running mode.

Control Panel Setup

Voltage

The Voltage constant calibrates the volt meter with the actual voltage coming into the control panel so that the voltage fluctuations can be monitored correctly.

The incoming voltage to the control panel must be measured with a meter by a qualified electrician or service person. This value is entered as the voltage constant.

The supply voltage should never exceed the limits shown in the Maximum Supply Voltage chart. Refer to Figure 58-1.

Nominal Supply Voltage	Maximum Supply Voltage
480 VAC @ 60Hz	505 VAC
415 VAC @ 50Hz	420 VAC
400 VAC @ 50Hz	420 VAC
380 VAC @ 50Hz	420 VAC
230 VAC @ 60Hz	253 VAC
220 VAC @ 50Hz	243 VAC
120 VAC @ 60Hz	132 VAC
110 VAC @ 50Hz	121 VAC

Figure 58-1 Maximum Supply Voltage

Low Voltage

The Low Voltage constant is used to set the low voltage limit. The low voltage limit factory default setting is 440 volts for use with a supply voltage of 480 VAC @ 60Hz. Recommended low voltage limits for other supply voltages are shown in the Recommended Low Voltage chart. Refer to Figure 58-2.

If the control panel voltmeter senses voltage below the low voltage limit, a built-in timer keeps the machine running for up to 15 seconds to prevent nuisance shutdowns due to voltage fluctuations.

If the low voltage condition still exists after 15 seconds, the machine will be shut down and the diagnostics screen will display a fault for machine power.

Nominal Supply Voltage	Recommended Low Voltage Setting
480 VAC @ 60Hz	440 VAC
415 VAC @ 50Hz	375 VAC
400 VAC @ 50Hz	365 VAC
380 VAC @ 50Hz	355 VAC
230 VAC @ 60Hz	220 VAC
220 VAC @ 50Hz	210 VAC
120 VAC @ 60Hz	105 VAC
110 VAC @ 50Hz	95 VAC

Figure 58-2 Recommended Low Voltage

⚠ CAUTION

- **DO NOT SET LOW VOLTAGE LOWER THAN THE RECOMMENDED LOW VOLTAGE LIMIT.**
- **LOW VOLTAGE WILL DAMAGE THE DRIVE MOTORS AND OTHER ELECTRICAL COMPONENTS. CORRECT THE PROBLEM BEFORE RESUMING OPERATION**

Estimated Drive Unit Speed Table

Use this table to estimate the Intermediate Drive Unit and End Drive Unit speed based on the drive unit motor output RPM, tire size, and machine voltage. Refer to Figure 58-3.

Estimated Drive Unit Speed																
Drive Unit Motor Output RPM	Tire Sizes / Machine Voltage and Hertz															
	11.2 x 24				14.9 x 24				16.9 x 24				11.2 x 38			
	480 Volt 60Hz		380 Volt 50Hz		480 Volt 60Hz		380 Volt 50Hz		480 Volt 60Hz		380 Volt 50Hz		480 Volt 60Hz		380 Volt 50Hz	
	ft./min.	M/min.	ft./min.	M/min.	ft./min.	M/min.	ft./min.	M/min.	ft./min.	M/min.	ft./min.	M/min.	ft./min.	M/min.	ft./min.	M/min.
29	5.90	1.80	4.91	1.50	6.54	1.99	5.45	1.66	6.98	2.13	5.81	1.77	8.06	2.45	6.71	2.04
30	6.10	1.86	5.08	1.55	6.77	2.06	5.64	1.72	7.22	2.20	6.01	1.83	8.34	2.54	6.95	2.12
34	6.95	2.12	5.79	1.76	7.40	2.25	6.16	1.88	8.16	2.48	6.80	2.07	9.45	2.88	7.87	2.40
35	7.12	2.17	5.93	1.81	7.89	2.40	6.57	2.00	8.42	2.56	7.01	2.14	9.73	2.96	8.11	2.47
37	7.53	2.29	6.27	1.91	8.53	2.60	7.11	2.16	8.90	2.71	7.41	2.26	10.28	3.13	8.56	2.61
43	8.75	2.66	7.29	2.22	9.91	3.02	8.26	2.51	10.34	3.15	8.61	2.62	11.94	3.64	9.95	3.03
56	11.39	3.47	9.49	2.89	12.63	3.85	10.52	3.20	13.48	4.10	11.23	3.42	15.56	4.74	12.96	3.95
58	11.80	3.59	9.83	2.99	13.08	3.98	10.90	3.32	13.96	4.25	11.63	3.54	16.12	4.91	13.43	4.09
68	13.84	4.21	11.53	3.51	15.34	4.67	12.78	3.89	16.36	4.98	13.63	4.15	18.90	5.76	15.74	4.79
69	14.03	4.27	11.69	3.56	15.57	4.74	12.97	3.95	16.60	5.05	13.83	4.21	19.18	5.84	15.98	4.86

Figure 58-3 Estimated Drive Unit Speed Table

GPS Angular Conversion Table

Use the GPS Angular Conversion table to convert the GPS angular degrees from minutes and seconds to decimal degrees when manually setting up the GPS coordinates in the Pro2 control panel. Refer to Figure 59-1.

Minutes and Seconds into Decimals of a Degree

(Based on 1 second = 0.00027778 degrees)

Minutes into Decimals of a Degree						Seconds into Decimals of a Degree					
Min.	Deg.	Min.	Deg.	Min.	Deg.	Sec.	Deg.	Sec.	Deg.	Sec.	Deg.
1	0.0167	21	0.3500	41	0.6833	1	0.0003	21	0.0058	41	0.0114
2	0.0333	22	0.3667	42	0.7000	2	0.0006	22	0.0061	42	0.0117
3	0.0500	23	0.3833	43	0.7167	3	0.0008	23	0.0064	43	0.0119
4	0.0667	24	0.4000	44	0.7333	4	0.0011	24	0.0067	44	0.0122
5	0.0833	25	0.4167	45	0.7500	5	0.0014	25	0.0069	45	0.0125
6	0.1000	26	0.4333	46	0.7667	6	0.0017	26	0.0072	46	0.0128
7	0.1167	27	0.4500	47	0.7833	7	0.0019	27	0.0075	47	0.0131
8	0.1333	28	0.4667	48	0.8000	8	0.0022	28	0.0078	48	0.0133
9	0.1500	29	0.4833	49	0.8167	9	0.0025	29	0.0081	49	0.0136
10	0.1667	30	0.5000	50	0.8333	10	0.0028	30	0.0083	50	0.0139
11	0.1833	31	0.5167	51	0.8500	11	0.0031	31	0.0086	51	0.0142
12	0.2000	32	0.5333	52	0.8667	12	0.0033	32	0.0089	52	0.0144
13	0.2167	33	0.5500	53	0.8833	13	0.0036	33	0.0092	53	0.0147
14	0.2333	34	0.5667	54	0.9000	14	0.0039	34	0.0094	54	0.0150
15	0.2500	35	0.5833	55	0.9167	15	0.0042	35	0.0097	55	0.0153
16	0.2667	36	0.6000	56	0.9333	16	0.0044	36	0.0100	56	0.0156
17	0.2833	37	0.6167	57	0.9500	17	0.0047	37	0.0103	57	0.0158
18	0.3000	38	0.6333	58	0.9667	18	0.0050	38	0.0106	58	0.0161
19	0.3167	39	0.6500	59	0.9833	19	0.0053	39	0.0108	59	0.0164
20	0.3333	40	0.6667	60	1.0000	20	0.0056	40	0.0111	60	0.0167

Figure 59-1 GPS Angular Conversion Table

Angular Degree Examples

An angular degree in degrees, minutes, seconds will look like the following examples:

- **10° 11´ 37˝, reads as 10 degrees, 11 minutes, 37 seconds.**
  - (a) Convert minutes and seconds to a decimal degree value using the table in Figure 59-1.

    11 minutes = 0.1833 degrees

    37 seconds = 0.0103 degrees.

  - (b) Add all decimal degree values together.

    10 degrees = 10.0000 degrees

    11 minutes = 0.1833 degrees

    37 seconds = 0.0103 degrees

    10˚ 11' 37" = 10.1936 degrees

- **12° 5.245´, read as 12 degrees, 5.245 minutes**.
  - (a) Convert decimals of a minute to decimal degrees using the table in 59-1 and multiply the decimal of a minute by 0.0167.

    5 minutes = 0.0833 degrees

    0.245 minutes =

    $0.245 \times 0.0167 = 0.0041$ degrees

  - (b) Add all decimal degree values together.

    12 degrees = 12.0000 degrees

    5 minutes = 0.0833 degrees

    0.245 minutes = 0.0041 degrees

    12˚ 5.245' = 12.0874 degrees

Valley AutoPilot Control Panel

Control Panel Setup

System Constants Record

Enter system constants as needed. If desired fill in the form below with the applicable constants for this machine.

SIS	MODE/ZONE	
	STOP POSITION	
	DIRECTION	

POSITION - ANGLE AND GPS COORDINATES		
LINEAR POSITION	LINEAR START LATITUDE	
	LINEAR START LONGITUDE	
	LINEAR END LATITUDE	
	LINEAR END LONGITUDE	
	LINEAR SPEED	
PIVOT POSITION	PIVOT ZONE	
	PIVOT ANGLE	
	PIVOT POINT LONGITUDE	
	PIVOT POINT LATITUDE	

PRES DLY	PRESSURE DELAY	
LOW PRES	LOW PRESSURE LIMIT	
MIN APP	LINEAR MINIMUM APP	
	PIVOT MINIMUM APP	
HRS/REV	TIME PER REVOLUTION	
VOLTAGE	MEASURED VOLTAGE	
FLOWMETER	FLOWMETER PULSE RATE	
RTU ID	THREE DIGIT ID NUMBER	

DAILY OPS		
DAILY ON/OFF	ON or OFF	
DAILY START/STOP	START TIME	
	STOP TIME	
	ACTIVE DAYS	
CYCLE ON/OFF	ON or OFF	
CYCLE INTERVAL	INTERVAL	
CYCLE START TIME	START TIME	

WIND	WIND HIGH LIMIT	
	ON or OFF	
AR /AS	ON or OFF	
PERCENT TIMER	CYCLE IN SECONDS	
LOW VOLTAGE	LOW VOLTAGE LIMIT	
DIR OFFSET	DIRECTION OFFSET	
ENGINE/PUMP	ENGINE OR PUMP	
	NORMAL OR ALT	

COM PORT		
	9-PIN	25-PIN
BAUD RATE		
	9-PIN	25-PIN
PROTOCOL		
KEY WAIT	WAIT TIME IN SECONDS	

BASE ID		
MODEM TYPE		
CALLOUT TRIES		
RADIO HOP	ON or OFF	
	INTERMEDIATE UNIT ID	
PHONE NUMBER		
HARDWARE FLOW CONTROL		

PRES TYPE	PRESSURE SENSOR TYPE	

BACK LIGHT	BACK LIGHT DELAY	

MOISTURE		
SOIL PROBE		
SOIL PROBE CONSTANTS	A	
	B	
	C	

SYSTEM TYPE	

Option / Notice / Events

		ENABLED
SHUTDOWN EVENTS	SAFETY	
	PRESSURE	
	VOLTAGE	
	WIND	
	RELAY COM	
WARNING 1 EVENTS	SAFETY	
	PRESSURE	
	VOLTAGE	
	CPU RESET	
	NEW CONSTANT	
WARNING 2 EVENTS	AUX1 IN STATUS	
	AUX2 IN STATUS	
STATUS CHANGE 1 EVENTS	RUN / STOP	
	DEPTH %	
	FOR / REV	
	DAILY ON / OFF	
	PGM STEP	
STATUS CHANGE 2 EVENTS	END GUN	
	SIS ON / OFF	
	DEG CHANGE (10)	
	DEGREE (0.0)	
	REGION	

Figure 60-1

System Constants Record (continued)

End Gun Settings

		Lower Distance	Upper Distance
Linear A Sequence	1	_____	_____
	2	_____	_____
	3	_____	_____
	4	_____	_____
	5	_____	_____
	6	_____	_____

		Lower Distance	Upper Distance
Linear B Sequence	1	_____	_____
	2	_____	_____
	3	_____	_____
	4	_____	_____
	5	_____	_____
	6	_____	_____

		Left Angle	Right Angle
Pivot A Sequence	1	_____	_____
	2	_____	_____
	3	_____	_____
	4	_____	_____
	5	_____	_____
	6	_____	_____
	7	_____	_____
	8	_____	_____
	9	_____	_____

		Left Angle	Right Angle
Pivot B Sequence	1	_____	_____
	2	_____	_____
	3	_____	_____
	4	_____	_____
	5	_____	_____
	6	_____	_____
	7	_____	_____
	8	_____	_____
	9	_____	_____

		Left Angle	Right Angle
Pivot C Sequence	1	_____	_____
	2	_____	_____
	3	_____	_____
	4	_____	_____
	5	_____	_____
	6	_____	_____
	7	_____	_____
	8	_____	_____
	9	_____	_____

		Left Angle	Right Angle
Pivot D Sequence	1	_____	_____
	2	_____	_____
	3	_____	_____
	4	_____	_____
	5	_____	_____
	6	_____	_____
	7	_____	_____
	8	_____	_____
	9	_____	_____

Wide Boundary Settings

		Lower Distance	Upper Distance
Linear A Sequence	1	_____	_____
	2	_____	_____
	3	_____	_____
	4	_____	_____
	5	_____	_____
	6	_____	_____

		Lower Distance	Upper Distance
Linear B Sequence	1	_____	_____
	2	_____	_____
	3	_____	_____
	4	_____	_____
	5	_____	_____
	6	_____	_____

		Left Angle	Right Angle
Pivot A Sequence	1	_____	_____
	2	_____	_____
	3	_____	_____
	4	_____	_____
	5	_____	_____
	6	_____	_____
	7	_____	_____
	8	_____	_____
	9	_____	_____

		Left Angle	Right Angle
Pivot B Sequence	1	_____	_____
	2	_____	_____
	3	_____	_____
	4	_____	_____
	5	_____	_____
	6	_____	_____
	7	_____	_____
	8	_____	_____
	9	_____	_____

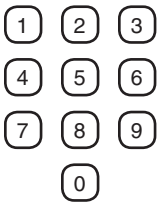
		Left Angle	Right Angle
Pivot C Sequence	1	_____	_____
	2	_____	_____
	3	_____	_____
	4	_____	_____
	5	_____	_____
	6	_____	_____
	7	_____	_____
	8	_____	_____
	9	_____	_____

		Left Angle	Right Angle
Pivot D Sequence	1	_____	_____
	2	_____	_____
	3	_____	_____
	4	_____	_____
	5	_____	_____
	6	_____	_____
	7	_____	_____
	8	_____	_____
	9	_____	_____

Control Panel Setup

Run The Machine Wet (With Water)

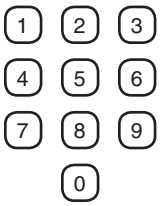
1. ALWAYS make sure that vehicles, other equipment, livestock, and persons are clear of the machine before operating.
2. Turn the control panel main disconnect switch to the ON position. If the power is supplied by an engine driven generator, adjust the RPM of the generator until the voltmeter reads 460 – 505 volts. DO NOT EXCEED 505 VOLTS.
3. Press  prior to setting the percent.
4. Set the water application.
   (a) Press  to set water application by inches of water or  to set water application by percent timer setting.
   (b) Use the NUMERIC keys to enter Depth of water in inches or Percent timer setting.



5. Select direction of travel.
   Press  or  .
6. Press  to start the machine. Press  to stop the machine.

Run The Machine Dry (Without Water)

1. ALWAYS make sure that vehicles, other equipment, livestock, and persons are clear of the machine before operating.
2. Turn the control panel main disconnect switch to the ON position.
   If the power is supplied by an engine driven generator, adjust the RPM of the generator until the voltmeter reads 460 – 505 volts. DO NOT EXCEED 505 VOLTS.
3. Press  to shut the water off.
4. Set the water application.
   (a) Press  to set water application by percent timer setting.
   (b) Use the NUMERIC keys to enter percent timer setting.



5. Select direction of travel.
   Press  or  .
6. Press  to start the machine. Press  to stop the machine.

Operation
Stopping The Machine
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 64-1.
- Control Panel Main Disconnect Switch. See figure 64-1.
- Any Tower Box Disconnect Switch. See figure 64-1.

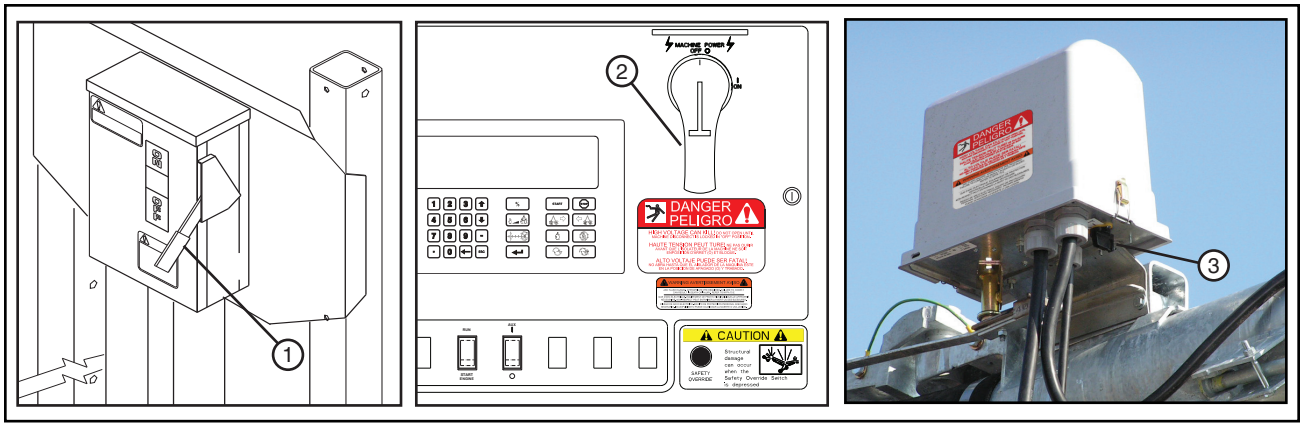


Figure 64-1 1. Main Service Disconnect Switch
2. Control Panel Main Disconnect Switch
3. Tower Box Disconnect Switch

Stopping Under Normal Conditions

1. Press the STOP key. See figure 64-2.
2. Turn the main disconnect switch to the OFF position. See figure 64-2.
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.**

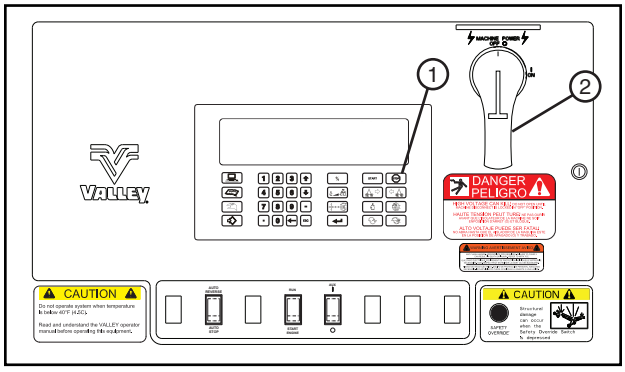


Figure 64-2 1. Stop Key
2. Main Disconnect Switch OFF

Diagnostics Screen

The diagnostics section provides an overview of using the diagnostic features incorporated into the control panel. Diagnostics aid in identifying machine failures, troubleshooting, and correcting problems.

- Press to view the diagnostics screen. See figure 65-1.

Figure 65-1

System Faults

System Faults are failures that shut the machine down. Any item showing FAULT on the system faults screen will have caused the machine to shut down.

The faults that can be indicated on the System Fault Screen are shown below in figure 65-2, along with a brief description. See Troubleshooting section for possible causes and corrective action.

SYSTEM POWER FAULT	Voltage may be low or it may have temporarily fallen below the low voltage limit for more than 15 seconds, while the machine was running.
SYSTEM SAFETY FAULT	Caused by a break in the safety return circuit.
PRESSURE FAULT	The pressure fell below the low pressure limit for more than thirty seconds or the Pressure Delay is not a sufficient amount of time to build pressure in the machine after it is started.
COMMAND FAULT	The machine was commanded to stop by one of the following: 1) The stop key was pressed. 2) An autostop condition occurred at the end-of-field stop. 3) A programmed stop command was executed.
STOP-IN-SLOT (SIS) FAULT	The machine was shut down by the Stop-In-Slot.
BBRAM FAULT	An attempt was made to start the machine when error E01 was displayed on the status screen.
FOR/REV FAULT	Both the forward and reverse sense relays were on for more than 15 seconds while the system was running or waiting.
WIND FAULT	The machine shut down because the wind speed reached the high wind limit. The wind speed indicator is an option. WIND is only displayed on the system faults screen when wind is turned ON.
DAILY OPS FAULT	The daily operations program shut the machine down because it is not allowed to run between a certain time period. DAILY OPS is only displayed on the system faults screen when Daily Ops is turned ON.
RELAY COM FAULT	There is a hardware or software communication problem between the module and the electrical relay board within the control panel.
GPS COM FAULT	When GPS is selected as a protocol and the System shutdown due to no communication with GPS for user specified time when shutdown of GPS signal loss is ON, while system was running or waiting.
GPS LOCK FAULT	When GPS is selected as a protocol and the System shutdown due to GPS signal loss for user specified time when shutdown of GPS signal loss is ON, while system is running or waiting.
TRANSITION FAULT	While the system was running in manual mode: 1. In Linear mode, when the machine transitions between zones. 2. In Pivot mode, when the machine reaches the transition position. While the system was running in auto mode: 3. A transition programmed stop occurs. 4. While in linear mode, a wrong transition was detected. 5. While in pivot mode, the pivot cart alignment proximity switch was actuated after the 2° buffer expired.

Figure 65-2

Diagnostics

Viewing System Faults

To view the System Faults screen do the following:

1. Press  and 1 to display the System Faults screen. See figure 66-1.

   When a recognized fault causes the machine to shut down, FAULT is displayed next to the item responsible for the shut down.

   FAULT is automatically cleared the next time the machine is ran successfully.

SYSTEM POWER	OK	SIS	OK
SYSTEM SAFETY	OK	WIND	OK
PRESSURE	OK	DAILY OPS	OK
COMMAND	FAULT	RELAY COM	OK

Figure 66-1

03:00:00	(1)	180..DEG	RUNNING
08/08/07		33..PSI	FORWARD
477 VOLTS	E08	50 %	WATER ON
48.0 HR		0.50 IN	SIS...90

Figure 66-2 1. Error Code

Status Screen Diagnostics

If a failure occurs, an error code appears on the status screen. If more than one error has occurred, the errors that have occurred, will sequence between each other every second. See figure 66-2.

NOTE

- **Viewing the error log screen clears the error codes from the status screen.**

Clearing An Error Code

To clear an error code from the status screen, do the following:

1. Press  and 2 to display the Error Log screen and clear error codes from the status screen. See figure 66-3.

```
0 EXIT
1 SEARCH BACKWARD
2 SEARCH FORWARD
PRESS NUMBER >
```

Figure 66-3

Error Codes

A list of possible error codes is shown below in figure 67-1. See Troubleshooting section for possible causes and corrective action.

E01 BATTERY BACKED RAM	Module self test of battery backed memory detected a data error.
E02 EEPROM	Module self test of nonvolatile memory detected a data error.
E03 UNIT RESETS	This error code records power cycles and/or software resets.
E04 POWER DROP	The machine voltage momentarily dropped below the low voltage setting.
E05 SYSTEM SAFETY	The machine safety circuit was momentarily open.
E06 PUMP SAFETY	The water pressure dropped below the low pressure limit for longer than the built in 30 second pressure drop timer.
E07 PRESSURE SENSOR	The water pressure sensor value too high. Above 160 psi (1103.1 kPa).
E08 PRESSURE SENSOR	The water pressure sensor value too low. Below 6 psi (41.3 kPa).
E09 PRESSURE SENSOR	The water pressure stayed above 7 psi (48.2 kPa) after pump had been OFF for five minutes.
E10 PRESSURE SENSOR	The water pressure was above the low pressure setting after five minutes with pump OFF.
E11 RESOLVER	The pivot swivel jumped or moved 5° or more in one second.
E12 RESOLVER	The resolver return voltage value is too high.
E13 KEYPAD	The keypad has failed or key is stuck.
E14 FWD/REV SENSE	Both forward and reverse run lines were powered for more than 15 seconds.
E15 CPROBE COMMUNICATIONS	The control module cannot communicate with the soil probe.
E16 CPROBE DATA INVALID	The control module is communicating with the soil probe but all data is zero.
E17 UNASSIGNED	Will display "NOT AVAILABLE".
E18 GPS COMMUNICATIONS ERROR	GPS is selected as the protocol. No communication for 10 seconds.
E19 GPS SIGNAL LOSS	The GPS signal transitions from Lock to Unlock.
E20 DGPS SIGNAL LOSS	The DGPS signal transitions from DGPS to Standard.

Figure 67-1

Error Logs

For each error code there is an error log.

When an error occurs information about the error including the first time and date that the error occurred, last time and date that the error occurred and total count of all times that the error occurred is recorded in the error log. See figure 67-2.

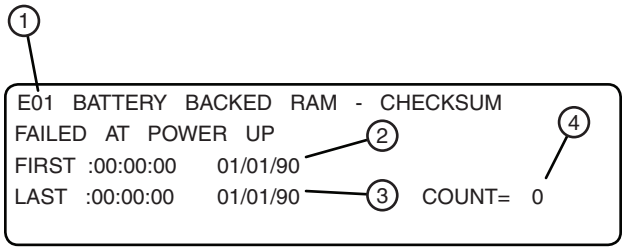


Figure 67-2
1. Error Code
2. First Occurrence Time and Date
3. Last Occurrence Time and Date
4. Total Occurrences

Diagnostics

Viewing An Error Log

To view an Error Log, do the following:

1. Press  , 2, and 1 to display the E01 Error Log screen. See figure 68-1.

NOTE

•Viewing the error log screen clears the error codes from the status screen.

2. Locate the desired error log:
   - Press 1 to search backward through the Error Logs.
   - Press 2 to search forward through the Error Logs.

Resetting An Error Log To Zero

To reset an Error Log to zero, do the following:

1. Press  , 2, and 1 to display the E01 Error Log screen. See figure 68-2.
2. Locate the desired error log. See figure 68-3.
   - Press 1 to search backward through the Error Logs.
   - Press 2 to search forward through the Error Logs.
3. Press  two times.

   The count is reset to zero and the first and last occurrences are set to the current time and date. See figure 68-4.

```
E01 BATTERY BACKED RAM - CHECKSUM
FAILED AT POWER UP
FIRST :00:00:00    01/01/90
LAST  :00:00:00    01/01/90          COUNT=  0
```

Figure 68-1

```
E01 BATTERY BACKED RAM - CHECKSUM
FAILED AT POWER UP
FIRST :00:00:00    01/01/90
LAST  :00:00:00    01/01/90          COUNT=  0
```

Figure 68-2

```
E04 POWER DROP - POWER DROPPED BELOW
LOW VOLTAGE LIMIT
FIRST :07:23:23    07/08/07
LAST  :08:37:18    07/09/07          COUNT=  4
```

Figure 68-3 Selected Error Log

```
E04 POWER DROP - POWER DROPPED BELOW
LOW VOLTAGE LIMIT
FIRST :12:26:35    07/10/07
LAST  :12:26:35    07/10/07          COUNT=  0
```

Figure 68-4

Troubleshooting

Use this Troubleshooting section with the machine owner's manual to diagnose and troubleshoot problems with the machine and/or control panel.

Always perform service or maintenance safely, use personal protection equipment when required, maintain a minimum working clearance around the control panel and other equipment, use fall protection when required, always use at least the minimal lockout/tagout procedure when maintaining or servicing the machine. For more information see Performing Maintenance Safely in the Safety section.

⚠ WARNING

- **TO REDUCE THE POSSIBILITY OF SEVERE INJURY OR DEATH:**
- **TROUBLESHOOTING OR REPAIRING ELECTRICAL PROBLEMS SHOULD ONLY BE PERFORMED BY A QUALIFIED VALLEY DEALER.**
- **ALWAYS CONTACT YOUR LOCAL VALLEY DEALER TO TROUBLESHOOT OR CORRECT ANY ELECTRICAL PROBLEMS ON OR ASSOCIATED WITH THE CONTROL PANEL OR MACHINE. NEVER ATTEMPT TO TROUBLESHOOT OR CORRECT ELECTRICAL PROBLEMS ON YOUR OWN.**
- **USE PERSONAL PROTECTION EQUIPMENT WHEN REQUIRED.**
- **MAINTAIN A MINIMUM WORKING DISTANCE AROUND THE CONTROL PANEL AND OTHER EQUIPMENT.**
- **USE FALL PROTECTION WHEN REQUIRED.**
- **BEFORE SERVICING OR PERFORMING MAINTENANCE ON THE MACHINE, ALWAYS SHUT OFF ALL ELECTRICAL POWER TO THE CONTROL PANEL AND MACHINE, THEN USE THE MINIMAL LOCKOUT/TAGOUT PROCEDURE ON THE SERVICE DISCONNECT AND CONTROL PANEL.**

Troubleshooting
System Faults

Listed below are the possible system faults with the description, possible causes, whether the machine will shutdown if the error occurs, and corrective action to take. See figures 70-1 and 71-1.

SYSTEM FAULT	DESCRIPTION WITH POSSIBLE CAUSES	SHUT DOWN	CORRECTIVE ACTION
SYSTEM POWER FAULT	Voltage may be low or it may have temporarily fallen below the low voltage limit for more than 15 seconds while the machine was running.	YES	Check Low Voltage Limit for correct value. Contact your Valley dealer.
SYSTEM SAFETY FAULT	Caused by a break in the safety return circuit for more than 3 seconds.	YES, if more than 3 seconds.	Make sure end tower is NOT stuck. Check for flat tire on end tower. Check for wheel gearbox failure. Check End of Field Stop for proper operation. Contact your Valley dealer.
PRESSURE FAULT	The pressure fell below the low pressure limit for more than thirty seconds or the Pressure Delay is not a sufficient amount of time to build pressure in the machine after it is started.	YES, if more than 30 seconds.	Make sure pump is ON. Set Low Pressure Limit higher. Set Pressure Delay for longer period of time. Contact your Valley dealer.
COMMAND FAULT	The machine was commanded to stop by one of the following: 1. The stop key was pressed. 2. An autostop condition occurred at the end-of-field stop. 3. A programmed stop command was executed.	YES	1. Normal Operation. 2. Normal Operation. 3. Normal Operation.
STOP-IN-SLOT (SIS) FAULT	The machine was shut down by the Stop-In-Slot.	YES	Normal Operation - No corrective action needed. If desired program a different Stop-in-Slot location.
BBRAM FAULT	Indicates that an attempt was made to start the machine when Error E01 was displayed on the status screen.	YES	Contact your Valley dealer. Clear by viewing by viewing Diagnostics/System Fault when BBRAM is present.
FOR/REV FAULT	Both the forward and reverse sense relays were on for more then 15 seconds while the system was running or waiting.	YES	Contact your Valley dealer. Fault cleared when the system attempts to run.
WIND FAULT	The machine shut down because the wind speed reached the high wind limit. The wind speed indicator is an option. WIND is only displayed on the system faults screen when wind is turned ON.	YES	Normal Operation - No corrective action needed.
DAILY OPS FAULT	The daily operations program shut the machine down because it is not allowed to run between a certain time period, DAILY OPS is only displayed on the system faults screen when Daily Ops is turned ON.	YES	Normal Operation - No corrective action needed. If desired reprogram Daily OPS To run at a different time or turn Daily OPS OFF.

Figure 70-1

System Faults (continued)

SYSTEM FAULT	DESCRIPTION WITH POSSIBLE CAUSES	SHUT DOWN	CORRECTIVE ACTION
RELAY COM FAULT	There is a hardware or software communication problem between the module and the electrical relay board within the control panel.	YES	Contact your Valley dealer.
GPS COM FAULT	While the system was running or waiting, all of the following must have occurred: 1. GPS is selected as a protocol. 2. A GPS signal loss is set to shut down the machine. 3. The machine shutdown due to no communication with the GPS for a user specified time.	YES	Check the GPS connection and the power supply. Contact your Valley dealer.
GPS LOCK FAULT	While the system was running or waiting, all of the following must have occurred: 1. GPS is selected as a protocol. 2. A GPS signal loss is set to shut down the machine. 3. The machine shut down due to GPS signal loss for a user specified time.	YES	Check for a clear path above the antenna. Contact your Valley dealer.
TRANSITION FAULT	While the system was running in manual mode: 1. In Linear mode, when the machine transitions between zones. 2. In Pivot mode, when the machine reaches the transition position. While the system was running in auto mode: 1. A transition programmed stop occurs. 2. While in linear mode, a wrong transition was detected. 3. While in pivot mode, the pivot cart alignment proximity switch was actuated after the 2° buffer expired.	YES	1. Normal Operation. 2. Normal Operation. 1. Normal Operation. 2. Contact your Valley dealer. 3. Contact your Valley dealer.

Figure 71-1

Troubleshooting

Error Codes

Listed below are the possible error codes with the description, threshold for the error to occur, whether the machine will shutdown if the error occurs and possible causes or corrective action to take to clear error codes from the status screen by viewing the error code, error log. See figures 72-1 and 73-1.

ERROR	DESCRIPTION	THRESHOLD	SYSTEM FAULT SHUT DOWN	POSSIBLE CAUSES or CORRECTIVE ACTION	SHOWN ON SCREEN
E01	E01 BBRAM - BATTERY BACKED RAM CHECKSUM FAILED AT POWER UP.	Batteries should be changed every 7 years.	NO	Weak battery backed ram batteries.	YES
				Contact your Valley dealer.	
E02	E02 EEPROM - CHECKSUM FAILED AT POWER UP.	One of the blocks failed.	YES	Power is lost while entering constants.	YES
				Try to hard reset module.	
				Contact your Valley dealer.	
E03	E03 UNIT RESETS - THIS IS LOGGED WHEN THE SOFTWARE RESETS.	Every time the software is power cycled.	NO	Records every time the module is power cycled. Normal operation no corrective action.	NO
E04	E04 POWER DROP - POWER DROPPED BELOW LOW VOLTAGE LIMIT.	If Running/Waiting and voltage drops below low voltage.	YES, after 15 seconds.	See Low Voltage in the Constants section for correct setting.	YES
				Contact your Valley dealer.	
E05	E05 SYSTEM SAFETY - POSSIBLE TOWER MISALIGNMENT, DRIVE UNIT MAY BE STUCK.	Safety lost while running.	YES, after 3 seconds.	Safety circuit open.	YES
				Misaligned tower.	
				Overwatering timer timed out.	
				Contact your Valley dealer.	
E06	E06 PUMP SAFETY - PRESSURE TOO LOW AFTER PRESSURE DELAY.	Pressure with pump off.	YES, until started.	Low pressure.	YES
				Low pressure set point too close to operating pressure.	
				Pump, pressure transducer, or pressure switch may have failed.	
				Contact your Valley dealer.	
E07	E07 PRESSURE SENSOR - OUT OF RANGE HIGH, CHECK CONNECTION.	> 4.5 volts.	NO	Pressure transducer has failed.	YES
				Contact your Valley dealer.	
E08	E08 PRESSURE SENSOR - OUT OF RANGE LOW, CHECK CONNECTION.	< 0.5 volts.	NO	Pressure transducer has failed.	YES
				Contact your Valley dealer.	
E09	E09 PRESSURE SENSOR - PRESSURE HIGH WITH PUMP OFF, CHECK CONNECTION.	Pump off for 5 min. and more then 7 PSI.	NO	Water still in riser pipe.	YES
				Machine drain may be plugged.	
				Recalibrate pressure transducer.	
				Pressure transducer has failed.	
				Contact your Valley dealer.	
E10	E10 PRESSURE SENSOR - MECHANICAL SWITCH COULD BE STUCK.	Pump off for 5 min. and switch still on.	NO	Pressure transducer is stuck.	YES
				Pressure transducer has failed.	
				Contact your Valley dealer.	
E11	E11 RESOLVER -ANGLE JUMPING AROUND, LUBE J PIPE.	5° jump in 1 second (twice).	NO	Pivot point binding.	YES
				J-Tube overtightened or seized.	
				Pipe not secured to H-bracket.	
				Collector ring loose.	
				Contact your Valley dealer.	

Figure 72-1

Error Codes (continued)

ERROR	DESCRIPTION	THRESHOLD	SYSTEM FAULT SHUT DOWN	POSSIBLE CAUSES or CORRECTIVE ACTION	SHOWN ON SCREEN
E12	E12 RESOLVER - POSSIBLY DISCONNECTED.	X AND Y = 2.5 volts.	NO	Resolver wires are loose or shorted.	YES
				Contact your Valley dealer.	
E13	E13 KEYPAD - POSSIBLE KEY STUCK CHECK KEYPAD CONNECTION.	10 seconds.	NO	Keypad failure or key stuck.	YES
				Contact your Valley dealer.	
E14	E14 FWD/REV SENSE - POSSIBLE SHORT, CHECK WIRING.	2 seconds.	YES, after 15 seconds.	Forward and reverse lines are powered.	YES
				The machine status will show running when AR/AS is OFF even though the motor contactor is disabled.	
				The machine will stop if AR/AS is ON and Auto Stop is selected.	
				If AR/AS is ON and Auto Reverse is selected, the machine will alternate between forward and reverse direction control. Since motor power is disabled until the direction has locked in the machine will not move.	
				Contact your Valley dealer.	
E15	E15 NO COMMUNICATION WITH SOIL PROBE.		NO	Soil probe sensor, wiring, or R485 convertor failure.	YES
				Contact your Valley dealer.	
E16	E16 SOIL PROBE DATA ALL ZEROS.		NO	Soil probe sensor may be bad.	YES
				Contact your Valley dealer.	
E17	E17 - NOT ASSIGNED. DISPLAY WILL BE SHOWN AS "NOT AVAILABLE".				NO
E18	E18 - GPS COMMUNICATION ERROR.	10 seconds.	YES, if selected.	No communication for 10 seconds.	NO, position will flash.
				Check GPS connection.	
				Loss of power.	
E19	E19 - GPS SIGNAL LOSS.	10 seconds.	YES, if selected.	Signal from GPS transitions from GPS Lock to GPS Unlock.	NO, position will flash.
				Check for clear path above the antenna.	
E20	E20 - DGPS SIGNAL LOSS.	10 seconds.	NO	Signal from DGPS transitions from DGPS to Standard.	NO
				Check for clear path above the antenna.	

Figure 73-1

Troubleshooting

Troubleshooting List

Listed below and on the next page are various problems with the description, possible causes or corrective action to take. See figure 74-1 and 75-1.

PROBLEM	POSSIBLE CAUSE OR CORRECTIVE ACTION
RESOLVER POSITION IS NOT ACCURATE.	PIVOT POINT BINDING.
	J-TUBE PACKING OVERTIGHTENED OR SEIZED.
	PIPE NOT SECURED TO H-BRACKET.
	COLLECTOR RING LOOSE.
	DIRECTION OFFSET INCORRECT.
	CONTACT YOUR VALLEY DEALER.
PIVOT AUTO REVERSES RANDOMLY.	CONTACT YOUR VALLEY DEALER.
PIVOT AUTO STOPS RANDOMLY.	CONTACT YOUR VALLEY DEALER.
PIVOT BREAKS SAFETY AT BARRICADE.	BARRICADE TOO HIGH ON ACTUATOR ARM.
	AUTO REVERSE/AUTO STOP DISABLED.
	AUTO REVERSE/AUTO STOP BOX NOT CENTERED.
	CONTACT YOUR VALLEY DEALER.
PRESSURE TRANSDUCER READING INCORRECT.	CALIBRATE WITHOUT WATER.
	CHECK VALVE HOLDING WATER IN RISER.
	TRANSDUCER HAS ICE AGAINST SENSOR.
	TRANSDUCER PLUGGED.
	PRESSURE TUBE PLUGGED OR DAMAGED.
	CONTACT YOUR VALLEY DEALER.
NO DISPLAY.	CONTRAST ADJUSTED TOO LIGHT OR DARK.
	DISCONNECT SWITCH OFF.
	NO POWER TO PIVOT.
	CONTACT YOUR VALLEY DEALER.
END GUN DOES NOT SHUT OFF.	INCORRECT END GUN ENTRY.
	FILTER PLUGGED.
	DEFECTIVE END GUN HARDWARE.
	DIRECTION OFFSET INCORRECT; ARC TOO SMALL.
	CONTACT YOUR VALLEY DEALER.
END GUN DOES NOT TURN ON.	END GUN CONSTANTS NOT PROGRAMMED.
	DEFECTIVE END GUN HARDWARE.
	END GUN IS DISABLED UNDER OPTIONS.
	CONTACT YOUR VALLEY DEALER.
SCREEN CYCLES ON AND OFF.	ERRATIC INCOMING POWER.
	LOW VOLTAGE.
	CONTACT YOUR VALLEY DEALER.

Figure 74-1

Troubleshooting List (continued)

PROBLEM	POSSIBLE CAUSE OR CORRECTIVE ACTION
DOES NOT STOP AT SIS.	SIS NOT TURNED ON.
	SIS POSITION HAS BEEN CHANGED.
	MACHINE MUST MOVE AT LEAST 2° AWAY FROM THE SIS POSITION BEFORE IT CAN BE STOPPED AGAIN.
	CONTACT YOUR VALLEY DEALER.
BACKLIGHT DOES NOT TURN ON.	CONTACT YOUR VALLEY DEALER.
BACKLIGHTING DOES NOT TURN OFF.	INCORRECT CONSTANT ENTERED.
	CONTACT YOUR VALLEY DEALER.
SCREEN DARK.	CONTRAST SET TOO HIGH OR LOW.
	CONTACT YOUR VALLEY DEALER.
PIVOT WON'T AUTO RESTART.	START$ PROGRAM WRITTEN INCORRECTLY OR MISSING.
	RESTART CRITERIA HAS NOT BEEN MET.
	OFF DAY IN DAILY OPS.
	SYSTEM FAULT OTHER THAN POWER OR PRESSURE.
	CONTACT YOUR VALLEY DEALER.
PIVOT WON'T STOP WITH DAILY OPS.	START/STOP TIMES REVERSED.
	DAILY OPS NOT ACTIVE.
	A PROGRAM OTHER THAN DAILY OPS STARTS MACHINE.
	CONTACT YOUR VALLEY DEALER.

Figure 75-1

Troubleshooting

Sensor Value Error Codes

Sensor value error codes are displayed on the moisture screen in place of a sensor value for the current or prior reading. See figures 76-1 and 76-2.

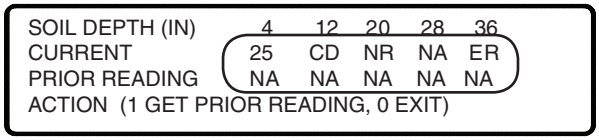


Figure 76-1

Hard Reset

A Hard reset, resets the Electrically Erasable Programmable Read-Only Memory (EEPROM).

SENSOR VALUE ERROR CODES			
CODE	**DESCRIPTION**	**LOCATION**	**CORRECTIVE ACTION**
NA	No available data, indicating that there is no data in the data base for the current date/time or prior date/time. Data has not yet been collected from the soil probe.	Shown in place of a sensor value.	Contact your Valley dealer.
NR	No response from sensor, indicating a possible bad electrical connection or sensor.	Shown in place of a sensor value.	Contact your Valley dealer.
CD	Corrupted data from sensor, indicating a possible bad cable, improper grounding of cable shield, and/or a noisy environment.	Shown in place of a sensor value.	Contact your Valley dealer.
ER	Error, data from sensor is out of range, indicating that sensor may need calibration, soil has pulled away from the access tube, and/or the selected soil probe constants are incorrect for the soil type.	Shown in place of a sensor value.	Contact your Valley dealer.

Figure 76-2

- Resets Current Status to factory settings.
- Restores all Constants to factory settings.
- Restores all Options to factory settings.
- Erases all current and stored programs except Auto Transitions.
- Clears Review history.
- Clears Error Log history.

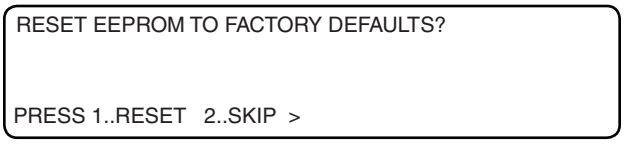


Figure 76-3

Executing A Hard Reset

To execute a hard reset, follow the steps below:

1. Turn the control panel disconnect to OFF.
2. While turning the control panel disconnect ON, press (ESC) and hold until the Reset screen is displayed. See figure 76-3.
3. Select one of the following:

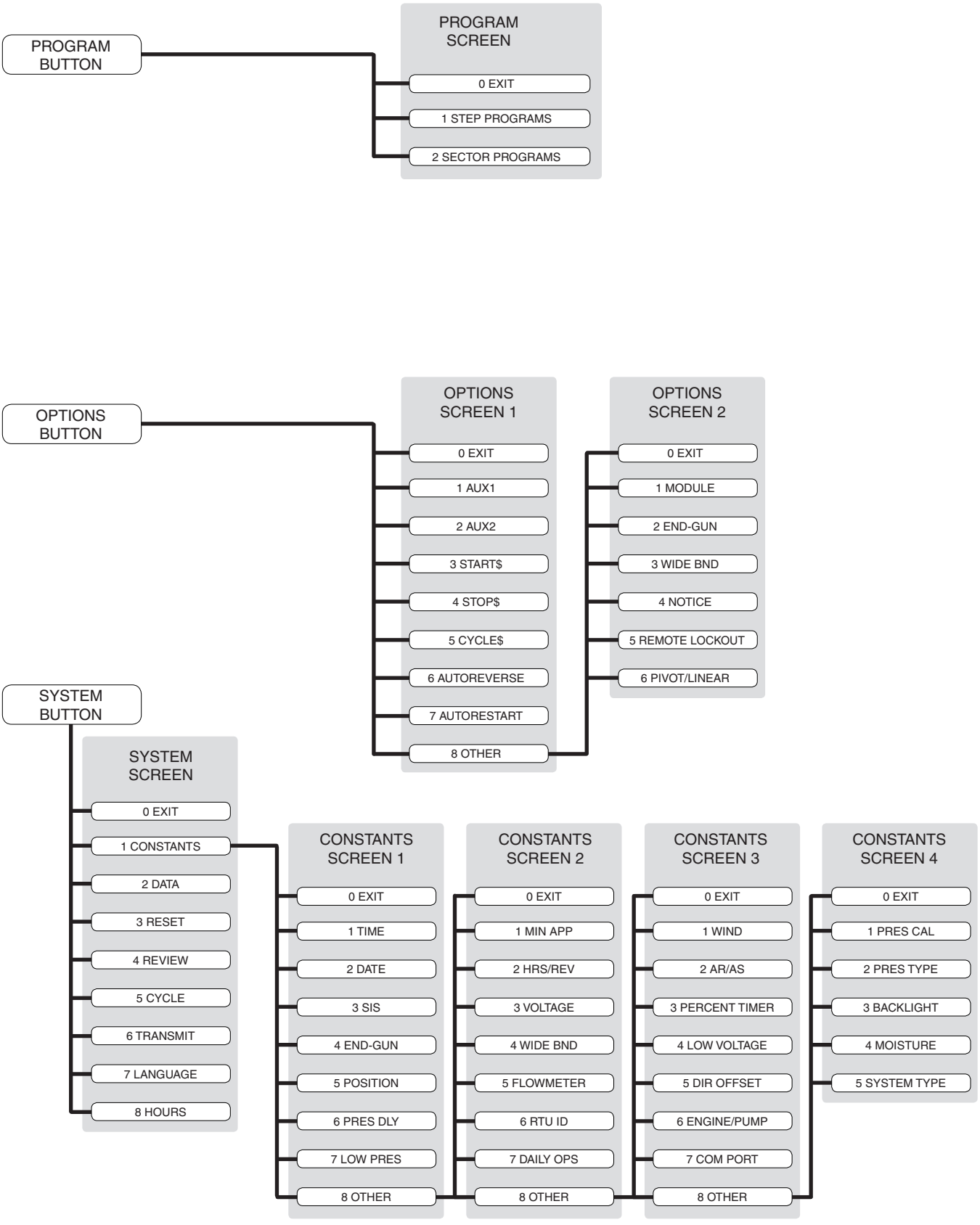
   (1) = Reset

   (2) = Skip the reset function

   If no selection is made within 60 seconds, the reset will be skipped.

Advanced Feature Guide

Shown below are the Advanced Features associated with the Program, Options and System buttons.



Advanced Feature Guide