

**BASIC
CONTROL PANEL**

OWNERS MANUAL

0996340_B

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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 systems sold in the United States and may vary outside the U.S.

ELECTRICAL SAFETY STATEMENT

INSTALLATION OF THE VALLEY ELECTRIC IRRIGATION MACHINE

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

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

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

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

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

SAFETY

The Valley center pivot irrigation system is designed with electrical and mechanical 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 first read and understand.

RECOGNIZE SAFETY INFORMATION

This is the safety alert symbol. If you see this symbol on your machine or in this manual, be alerted there is the potential for personal injury.



Read and follow recommended precautions and safe operating practices

SIGNAL WORDS

The following words:

- DANGER
- WARNING
- CAUTION

are used with the safety alert symbol to make the operator aware of potential hazards.

DANGER poses the most serious threat to the operator and in some conditions can lead to death if ignored.

DANGER or WARNING safety signs identify and locate specific hazards.

CAUTION safety signs list specific safety precaution instructions..

READ THE OWNER/OPERATORS MANUAL AND FOLLOW SAFETY INSTRUCTIONS

It is essential that you, maintenance personnel or any other operator of the system read and understand this manual before operating this equipment. Carefully read all safety messages in this manual and safety signs on the irrigation machine.

Do NOT let anyone operate this equipment without proper instructions.

Keep your machine in proper working condition. Unauthorized modifications may impair the function and/or safety of the machine.

If you do not understand any part of these safety guidelines or any other part of this manual and need further assistance, contact your Valley dealer.

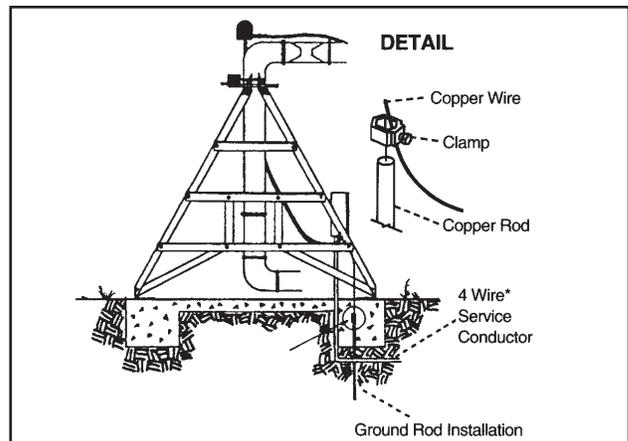
PROPER GROUNDING

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

As with any electrical machinery, if the power supplied to the center pivot 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 system as required by the National Electrical Code and by applicable local electrical codes.

If a system is properly grounded and fuse sizing is correct, there is extremely low probability of an individual being injured by electrical shock.



IMPORTANT: All 480 volt AC power supply services MUST be a 4 conductor service. Three 480 Volt AC power lines and one ground conductor which is as large as the power carrying conductors for that service.

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

Valley Basic Control Panel

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

If you are going to perform maintenance to the machine, YOU MUST shut off and lock the main power disconnect as shown below.



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

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



⚠ DRIVE SHAFTS START WITHOUT WARNING
An electric motor on each tower of the center pivot powers two drive shafts connected to wheel gear drives. These drive shafts start and stop without warning.

The Danger decal illustrated below is placed on each drive tower to warn the operator of this Danger!

IMPORTANT: DRIVE SHAFT SHIELDS MUST ALWAYS BE IN PLACE WHEN OPERATING THE SYSTEM.

NEVER depress the override button longer than 3 to 5 seconds.

The operator MUST inspect the entire system between each start attempt.

Repeated override start attempts can cause severe structural damage.

Call the local Valley dealer should the system fail to start.

⚠ 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.

⚠ PROPER USE OF THE SAFETY OVERRIDE
Caution MUST be taken by the operator when this button is depressed as it will by-pass or disable all of the system's automatic safety shutdown circuits.

NEVER depress this button for more than 3 to 5 seconds. If the system is not in full view by the operator, do not use the Safety Override switch.

⚠ LIGHTNING AND YOUR MACHINE
Stay away from the machine during an electrical storm.

The center pivot makes a good path to earth. It is also probably the tallest object in the field, which makes it a good lightning receptor!

⚠ CHECK WHEEL TRACKS BEFORE STARTING

Make sure all objects, livestock or persons are clear of the system before starting.

Center pivot drive trains are powerful and can climb over vehicles, equipment, etc.

⚠ AVOID CHEMICALS

Avoid exposure to system spray while chemicals are being injected into the water.

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 clean up procedures in case of a spill.

Use of protective clothing is recommended when handling chemicals. Safety glasses, gloves and protective outerwear should be available.

Contamination of the water supply may occur if effective safety devices are not installed/used in connection with injection equipment for chemigation.

Read EPA Label Improvement Program (PR Notice 87-1) and all instructions for chemical applications.

⚠ KEEP CHILDREN AWAY

Center 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.

AVOID HIGH PRESSURE WATER STREAMS Avoid body contact with high pressure water streams, such as end guns.

DO NOT crawl out on system overhangs to service end guns. The added weight of your body to the overhang may cause serious injury if it fails or you fall.

Do not attempt to adjust an end gun as it operates.

⚠ SUSPECTED SHORT CIRCUITS

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

⚠ 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 system down at 40 degrees Fahrenheit (4.5 degrees Celsius).

Do not operate system when temperature is below 40°F (4.5C).

Read and understand the Valley operator manual before operating this equipment.

Your Valley system is **NOT** equipped with a cold weather shut-off!

Cold weather shut-off controls are available from other vendor sources which will cause system shutdown when the air temperature reaches 40 F.

Installation of these types of shut down controls should not take the place of regular checks by the operator when the system must operate during marginally cold weather (40-50 F).

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 pipe line freeze-up during cold weather.

⚠ CHECK SYSTEM DIRECTION WHEN OPERATING

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

Forward should be clockwise and reverse counter-clockwise.

⚠ PLUG - IN CONNECTORS

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

⚠️ TOWING SAFETY

Avoid ditches, rough terrain, overhead power lines, etc. when towing a system from field to field.

The ground wire **MUST** be re-attached to the ground rod and checked for electrical integrity each time the system is towed and before restarting the system.

⚠️ QUALIFIED SERVICE PERSONNEL

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

Replace any guards and shields removed for maintenance.

DO NOT touch the system if you suspect a short-circuit situation.

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 system

⚠️ 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 system at full speed for the first revolution.

⚠️ PART CIRCLE OPERATION SAFETY

If your system reverses direction at a roadway or a physical object such as a building, tree line, power pole etc., then you **MUST** provide some backup device to stop the system if the reversing mechanism were to fail.

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

Drive Unit Mounted Auto Reverse/Auto Stop Option

⚠️ 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.

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

⚠️ GUARD ALL POWER TAKE-OFF DRIVES

This includes all belt and power line drives.

⚠️ 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.

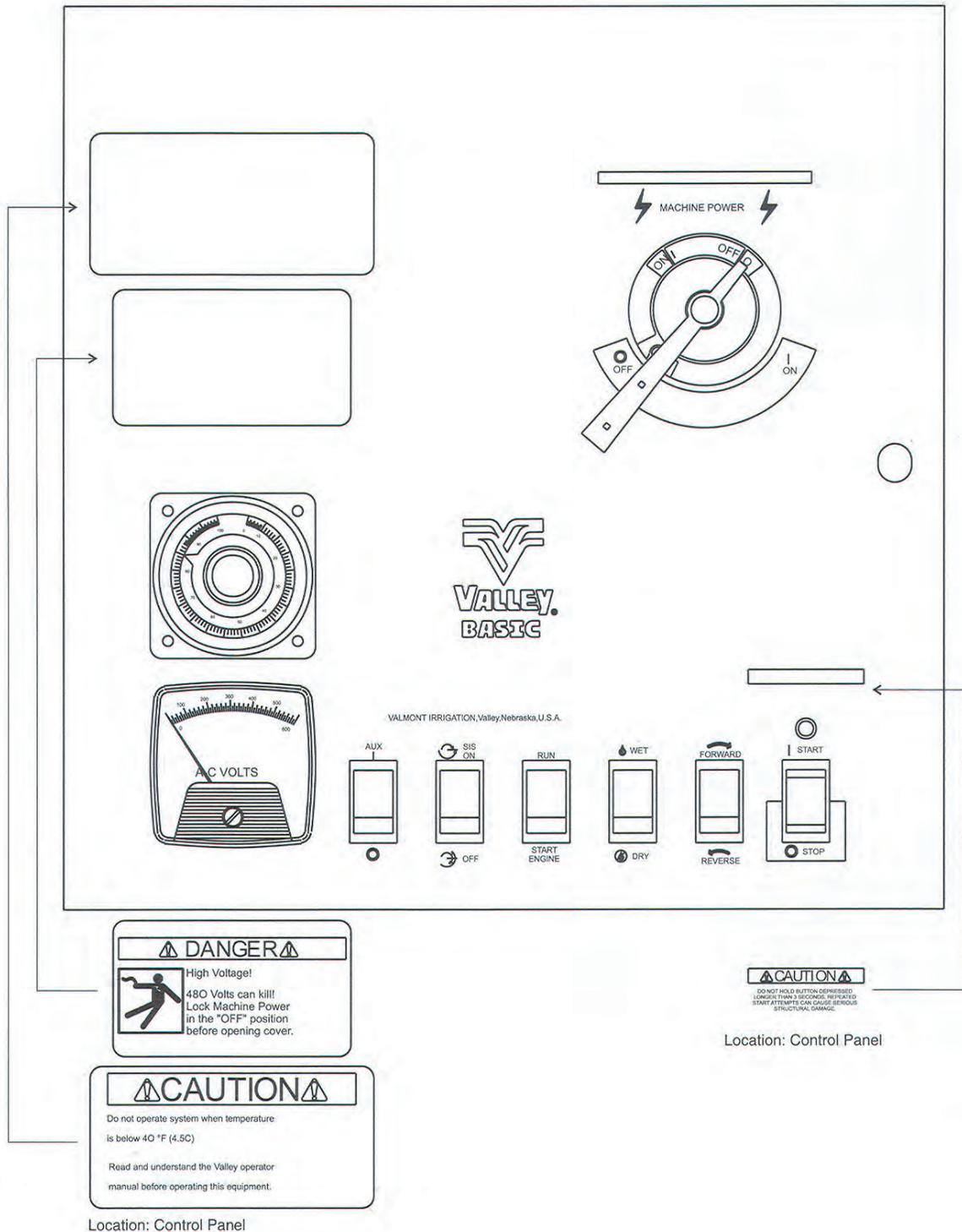
⚠️ EMERGENCY STOPPING

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, .

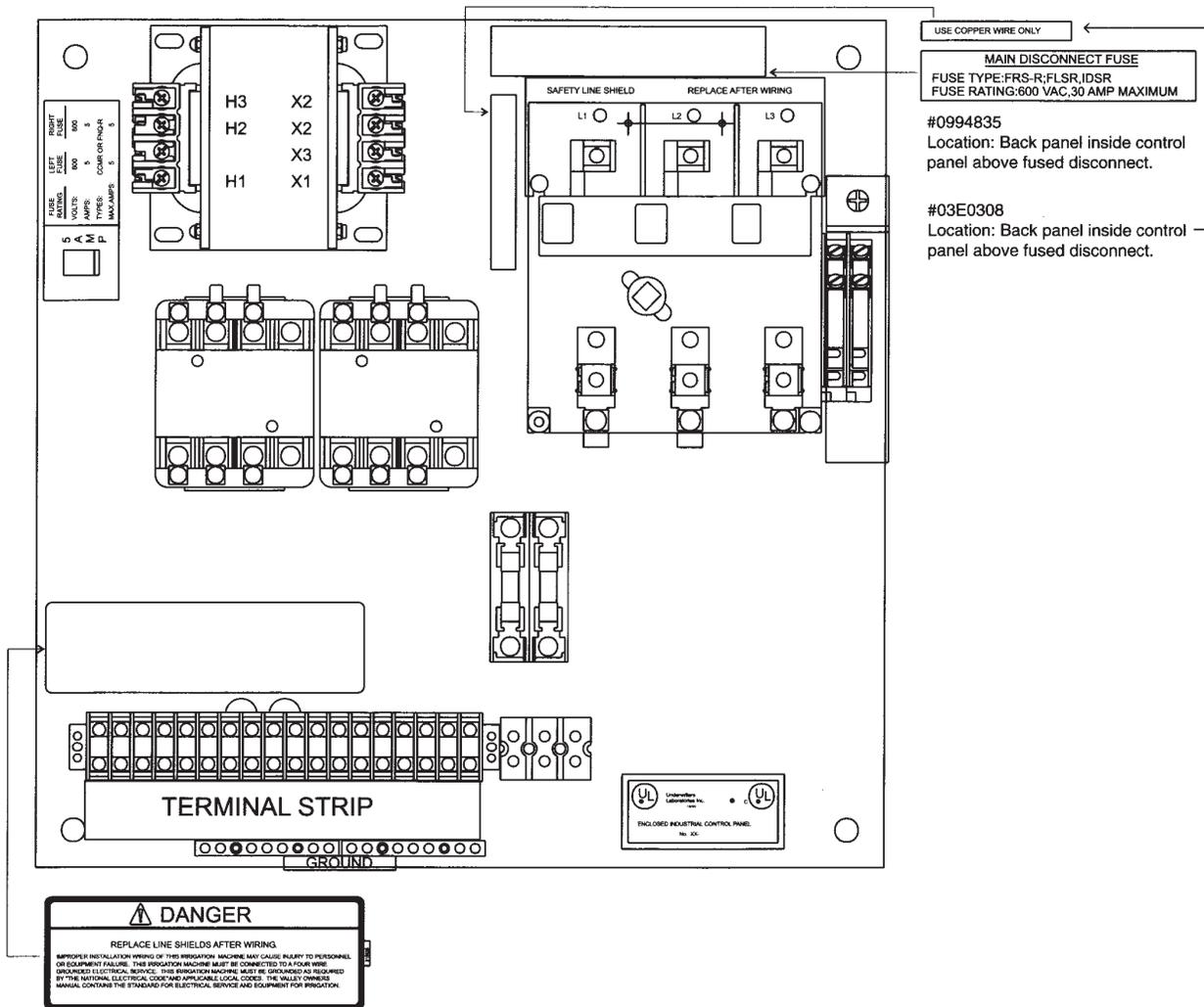


SAFETY DECALS

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.



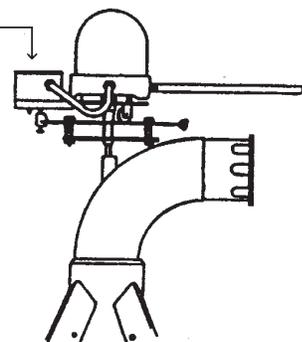
Valley Basic Control Panel



#315928
Location: Back panel inside control panel above fused disconnect.

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

#0991148
Location: End gun shut off/stop in slot box.



INTRODUCTION

Congratulations on the purchase of your Valley center pivot irrigation system with the Valley Basic Control Panel.

This panel has been designed for the operator with ease of use in mind. The large rocker switches and the easy to read percent timer, volt meter and hour meter all combine to give you the most user-friendly center pivot controls in the industry.

The modular design of the controls also gives the user maximum flexibility from a serviceability standpoint. Enjoy your new purchase!

ABOUT THIS MANUAL

This manual only covers the operation of the Valley Basic Control Panel.

Sections related to safety, pivot hardware, maintenance, towing, troubleshooting, winterization and electrical standards are covered in The Valley Pivot System Owners Manual.

You, as the owner/operator, should familiarize yourself with the capabilities of the system in order to obtain optimum system performance.

It should be remembered that the sprinkler will perform according to your knowledge of the equipment, soil and water relationships and equipment application concepts.

VALLEY BASIC PANEL CONTROLS/COMPONENTS

DANGER: 480 VOLTS – Do not open the interior control panel door. Electrical shock may occur. All needed controls and monitoring devices are on the outside of the interior control panel door. Service work done on the control panel is to be performed by a qualified service person only.

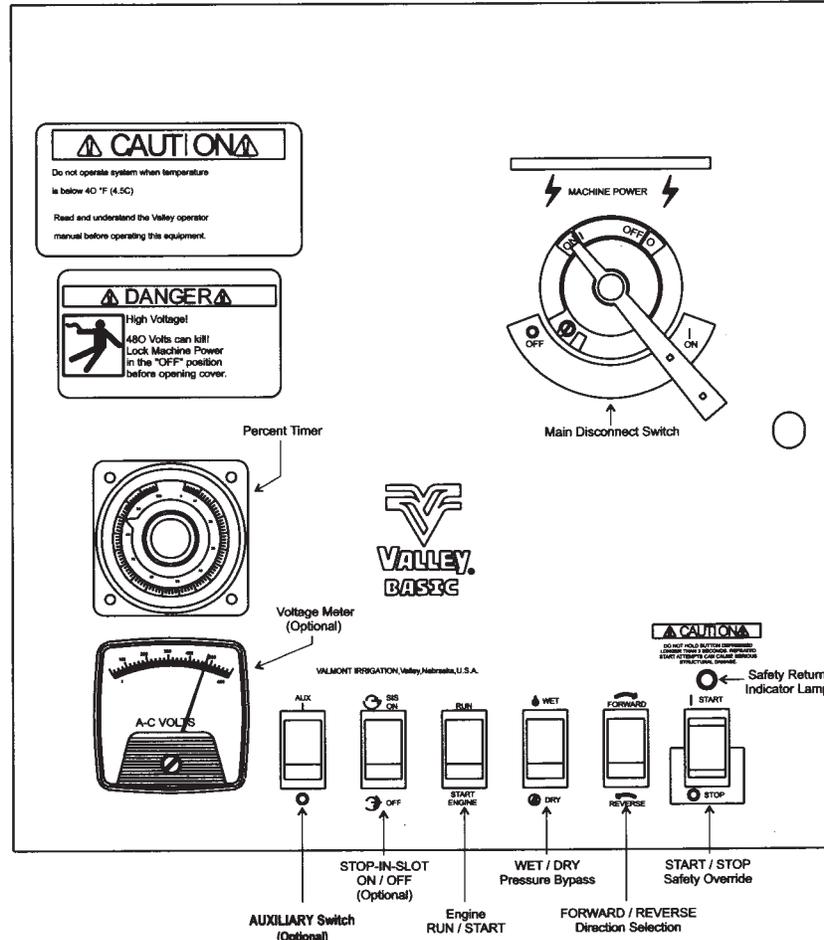


Figure 1.1

Valley Basic Control Panel

MAIN DISCONNECT

This switch disconnects all power to the system 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 OFF when doing any maintenance or repairs and when the system is not in use.

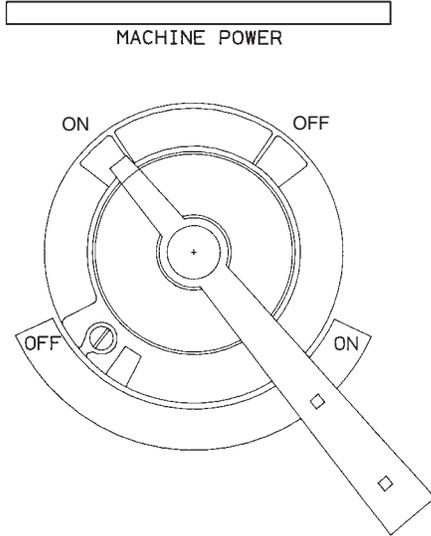


Figure 1.2

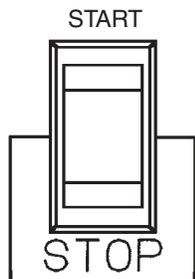
3 SECOND AUTO RESTART

A three second auto restart is standard equipment built into the circuitry of the Valley system. In the event of a momentary power loss or voltage drop, the system will automatically restart, if power is returned within three seconds.

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 PIVOT CONTROL PANEL AND THE PUMP.

START-STOP/SAFETY OVERRIDE



The Valley "Basic" Control Panel is equipped with a combination Start-Stop Safety Override rocker switch.

The Start-Stop rocker starts and stops the Center Pivot.

To start the machine, the switch is moved from the STOP to the START position.

Figure 1.3

The switch should be pressed and held in the START position for approximately three seconds and then released at which time the switch will return to a center neutral "RUN" position.

If Center Pivot safety circuit is complete, the machine will continue to run.

To stop the machine, move the rocker switch to the STOP position.

When the Start-Stop switch is placed and held in the START position, the Center Pivot safety circuit is bypassed! This is why the rocker switch should never be held in the START position for more than three seconds at anyone time.

If, for some reason, the Center Pivot misaligns and the safety circuit is broken (open), it will be necessary to override the safety circuit momentarily to realign the machine.

CAUTION

Caution must be taken by the operator when the Start-Stop rocker switch is held in the START positions. It will bypass or disable all the Center Pivot safety circuits! NEVER hold the Start-Stop rocker in the START position for more than three to five seconds. If the machine is not in full view by the operator, it is not recommended the Start-Stop switch be held in the START position.

NEVER hold the Start-Stop rocker in the START position for longer than three to five seconds. The operator MUST inspect the entire machine between each start attempt. Repeated safety override start attempts can cause severe structural damage. Call your local Valley dealer should the machine fail to start.

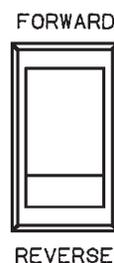
SAFETY RETURN LIGHT

The small light above the Start-Stop rocker switch is the Safety Return Light.

When lit, it indicates that there is power going out to the end of the machine and coming back to the control panel on the center pivot return safety circuit.

This indicator lamp will also light when the Start-Stop rocker switch is pressed to the start position.

FORWARD/REVERSE



Enables the operator to run the system in the forward (clockwise) or reverse (counter clockwise) direction assuming all safety circuits are complete.

The direction of travel can be changed while the system is moving or selected before start-up.

Figure 1.4

WET/DRY

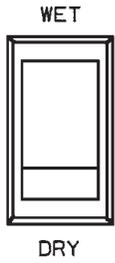


Figure 1.5

By-passes the optional low pressure switch. The low pressure switch can be adjusted to close at a range of pressures. For example, the operator may choose to set the switch at 15 psi. When the water pressure at the switch location reaches 15 psi, the switch will close which completes the safety circuit and allows the system to run.

Therefore, if the switch was in the WET position and the pressure dropped below 15 psi, the system would shut down, thus providing the operator a low pressure shutdown.

However, if the operator wants to run the system dry (without water), the low pressure switch **MUST** be by-passed. This can be accomplished by setting the switch in the DRY position. The low pressure switch is then removed from the safety circuit and the system will run without water pressure.

NOTE

If the switch is left in the DRY position when the operator is applying water the system will **NOT** shut down if the pressure falls below the low pressure setting.

PERCENTAGE TIMER

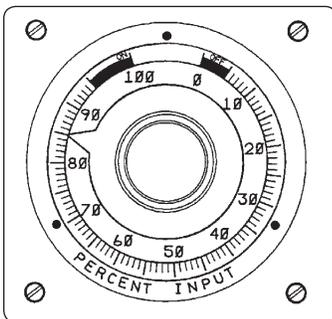


Figure 1.6

The percentage timer regulates the revolution time of the system.

The amount of water which the operator applies is determined by setting the percentage timer.

A percentage timer setting of 100 percent indicates the end tower of the system would move continuously, providing the shortest revolution time.

One hundred percent is also the setting at which the minimum amount of water can be applied.

If the percentage timer is set at 50 percent, the revolution time of the system and the water application amount is doubled. The end tower of the system would move for approximately 30 seconds out of each minute at a setting of 50%.

NOTE

The percentage timer determines the percentage of one minute which the end tower of the system will run, therefore, regulating the revolution time of the system.

Refer to the system's sprinkler chart to provide water application amounts at different settings.

The Percent Timer Setting Calculations section explains the calculation process for determining water applications at different percent timer settings.

OPTIONS

Options on the Valley Basic Control Panel include an AC Voltage Meter, Engine Run/Start, SIS On/Off and the Auxiliary On/Off rocker switches.

VOLTAGE METER

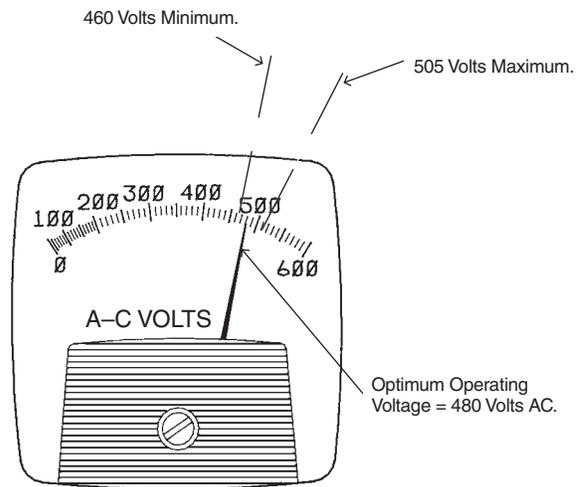


Figure 1.8

The voltage meter displays the voltage being delivered to the system in the panel. The meter should read 460 to 505 volts during normal operation.

NOTE

Some long or high amperage systems may need to be run at 500 volts minimum.

⚠ CAUTION

DO NOT operate the system if the meter reads below 460 or above 505 volts. Operating the system outside these limits could cause damage to the electrical components. 480 volts AC is the recommended operating voltage.

ENGINE RUN/START

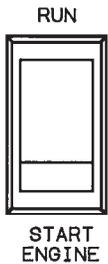


Figure 1.8

A standard engine RUN/START switch is installed for easy wiring of an engine shutdown circuit.

If the switch is in the RUN position, the engine would shut down if the pivot system stops for some reason.

The switch **MUST** be in the START position to start the engine.

SIS ON/OFF

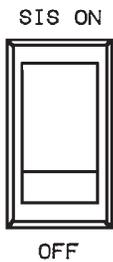


Figure 1.9

Allows the optional stop-in-slot to be activated or by-passed.

Stop-in-slot, stops the system at a preset location in the field (set by the operator) when the switch is in the ON position.

Setting the switch in the OFF position by-passes stop-in-slot, so the system will **NOT** stop at the preset location.

To set the stop location, refer to the End Gun Shut-Off and Stop In Slot Option section in The Valley Pivot System Owners Manual.

AUXILIARY ON/OFF

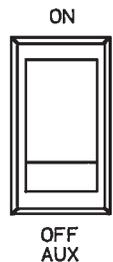


Figure 1.12

This optional switch is available for such uses as injector pump operation, manual end gun control or other options the operator may decide to install.

PANEL OPERATION

Starting The System Wet (With Water)

- 1) Inspect the wheel tracks to ensure there are no vehicles or other equipment which will obstruct the system upon start-up or operation.
- 2) Place the WET/DRY switch in the DRY position to by-pass the low pressure switch.
- 3) If an engine shutdown circuit is utilized, place the Engine RUN/START switch in the START position.
- 4) Partially close the mainline valve to the system. This will help to prevent “water hammer” if the pump is powered by an electric motor.
- 5) Start the pump. (The pump may be wired such that when the START switch on the center pivot control panel is pressed, the pump automatically starts. Check with your Valley dealer to determine how your pump has been wired into your pivot control panel.)
- 6) Slowly introduce more water into the system by either opening the mainline valve or by increasing the engine speed. Examine the Valley System’s pressure gauge to ensure the desired operating pressure.
- 7) Turn the 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 480 – 505 volts. DO NOT EXCEED 505 VOLTS.

- 8) Place the WET/DRY switch in the WET position.
- 9) Select the direction of travel by placing the FORWARD/REVERSE switch in either the FORWARD or REVERSE position. Remember, Forward is clockwise and Reverse is counter-clockwise.
- 10) Press the START-STOP switch to the START location for 1 – 2 seconds and release. The system should now start.
- 11) Place the Engine RUN/START switch in the RUN position.
- 12) Set the percentage timer to the desired speed setting.
- 13) If the system is equipped with the optional stop-in-slot, place the SIS ON/OFF switch in the desired position.

Starting The System Dry (Without Water)

To operate the system DRY (without water), follow the previous “Starting the System WET (With Water)” procedure, eliminating steps 4, 5, 6 and 8.

The WET/DRY switch must be in the DRY position.

STARTING THE SYSTEM

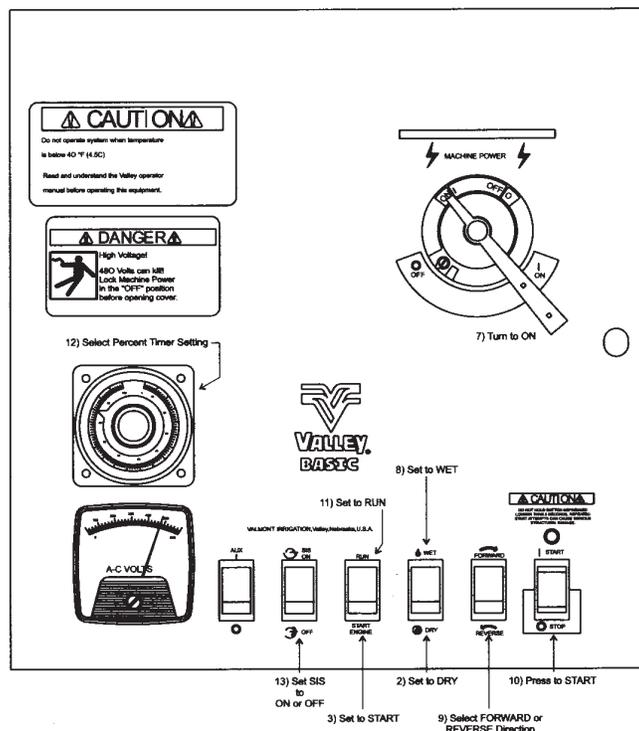


Figure 1.15

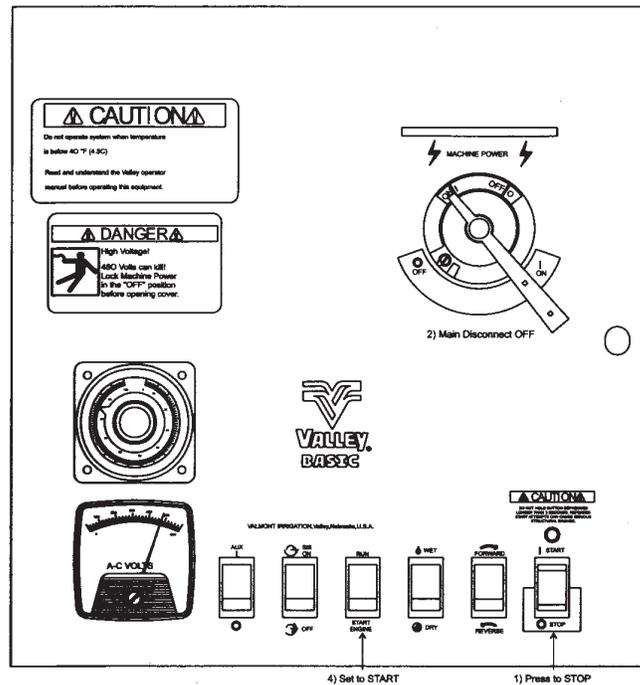
Stopping The System

- 1) Press the START-STOP switch to the STOP position.
- 2) Turn the main disconnect switch to the OFF position.
- 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 system off by slowly idling down the engine-generator set. This practice causes low voltage and will damage system components. ALWAYS STOP the irrigation system prior to shutting down the engine-generator set.

STOPPING THE SYSTEM



PERCENT TIMER SETTING CALCULATIONS

The percent timer regulates the system speed which controls the amount of water being applied per revolution.

A percent timer setting of 100% would indicate that the end tower moves continuously or 100% of the time.

A percent timer setting of 50% would indicate that the end tower runs 50% of the time or 30 seconds out of each minute, therefore, doubling the amount of water being applied.

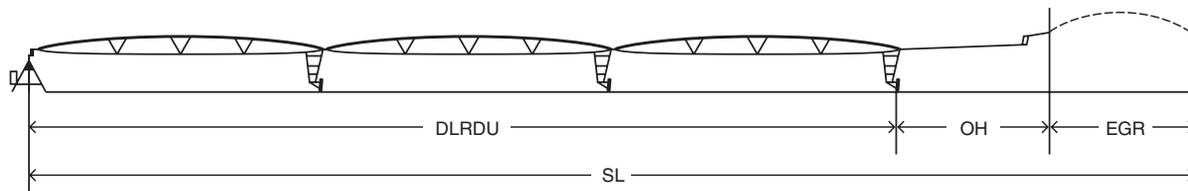
A sprinkler chart like the one illustrated in figure 1.23 will provide the operator with the necessary information to determine water application depths and revolution times at different percent timer settings.

INCHES PER REVOLUTION	PERCENT TIMER SETTING	HOURS PER REVOLUTION
.15	100	21
.20	77	28
.30	51	41
.40	39	55
.50	31	69
.60	26	83
.70	22	96
.80	19	110
.90	17	124
1.00	15	138
1.25	12	172
1.50	10	207
1.75	9	241
2.00	8	276
2.50	6	345
3.00	5	413
3.50	4	482

Figure 1.23

If the system length, flow rate in GPM and revolution times are known, these values can be calculated as described in the following procedure.

1. Determine The System Length



- SL = Total System Length (feet)
- DLRDU = Distance to the Last Regular Drive Unit (feet)
- OH = Overhang Length (feet)
- EGR = End Gun Radius (feet)

$$SL = DLRDU + OH + EGR$$

Example: DLRDU = 1260'
 OH Length = 64'
 EGR = 100'
 SL = 1260' + 64' + 100'
 SL = 1424'

Approximate End Gun Radius Coverages		
Rainbird 85	=	60 feet
Rainbird 95	=	65 feet
Nelson 100	=	100 feet
Rainbird 103	=	100 feet

Valley Basic Control Panel

2. Determine the End Tower Rotational Speed at 100% Timer Setting from the following chart:

LRDU*** Center Drive Output RPM	Standard Tires 11.2 x 24		Retread 11 x 24.5		High Float 14.9 x 24		Maxi-Float 16.9 x 24		11.2 x 38	
	ft./min.	M/min.	ft./min.	M/min.	ft./min.	M/min.	ft./min.	M/min.	ft./min.	M/min.
30	6.10	1.86	6.33	1.93	6.77	2.06	7.22	2.20	8.34	2.54
37	7.53	2.30	7.82	2.38	8.53	2.60	8.9	2.71	10.28	3.13
56	11.39	3.47	11.83	3.61	12.63	3.85	13.48	4.11		

*** RPM and speed for 480 V, 60 Hz service.

For 50 Hz service reduce travel by factor of 0.833.

LRDU = Last Regular Drive Unit

Example: 30 RPM center drive motor with 14.9 x 24 High Float Tires = 6.77 ft./min.

3. Determine Inches/Day the System will Apply

$$\text{Inches/Day} = \frac{(\text{GPM}) (735.3)}{(\text{SL})^2}$$

Example: Assume GPM = 800 gpm
SL = 1424'

$$\begin{aligned} \text{Inches/Day} &= \frac{(800) (735.3)}{(1424)^2} \\ &= \text{0.29 inches/day} \end{aligned}$$

4. Determine Hours/Revolution at 100 Percent Timer Setting

$$\text{Hours/Revolution} = \frac{(.105) (\text{DLRDU})}{(100\%) (\text{Speed in ft./min.})}$$

Example: DLRDU = 1260'
Speed in ft./min. = 6.77 ft./min.
Hours/Revolution = $\frac{(.105) (1260)}{(6.77)}$

$$= \text{19.5 Hours/Revolution at 100\%}$$

5. Determine Inches/Revolution at 100 Percent Timer Setting

$$\text{Inches/Revolution} = \frac{(\text{Hours/Revolution}) (\text{Inches/Day})}{(100\%) 24}$$

Example: Hours/Revolution = 19.5
Inches/Day = 0.29
Inches/Revolution = $\frac{(19.5) (.29)}{24}$

$$= \text{0.24 Inches/Revolution at 100\%}$$

6. Determine Inches/Revolution and Hours/Revolution for any percent timer setting using these two formulas:

$$\text{Inches/Revolution} = \frac{(\text{Inches/Revolution at 100\%}) (100)}{(\text{Percent Timer Setting})}$$

Example: Inches/Revolution = $\frac{(0.24) (100)}{(50)}$
at 50%

$$= \text{0.48 inches at 50\%}$$

$$\text{Hours/Revolution} = \frac{(\text{Hours/Revolution at 100\%}) (100)}{(\text{Percent Timer Setting})}$$

Example: Hours/Revolution = $\frac{(19.5) (100)}{50}$
at 50%

$$= \text{39 Hours/Revolution at 50\%}$$

Percent Timer Setting Calculation Worksheet

1. Determine System Length

$$SL = \text{_____} \text{ feet}$$

2. Determine the End Tower Rotational Speed at 100% Timer Setting

$$\text{Speed} = \text{_____} \text{ ft./min.}$$

3. Determine Inches/Day the system will apply.

$$\begin{aligned} \text{Inches/Day} &= \frac{(\text{GPM}) (735.3)}{(\text{SL})^2} \\ &= \frac{(\text{_____}) (735.3)}{(\text{_____})^2} \\ &= \frac{(\text{_____})}{(\text{_____})} \\ &= \text{_____} \end{aligned}$$

4. Determine Hours/Revolution at 100 Percent Timer Setting

$$\begin{aligned} \text{Hours/Revolution} &= \frac{(.105) (\text{DLRDU})}{(100\%) (\text{Speed in ft./min.})} \\ &= \frac{(.105) (\text{_____})}{(\text{_____})} \\ &= \frac{(\text{_____})}{(\text{_____})} \\ &= \text{_____} \end{aligned}$$

5. Determine Inches/Revolution at 100 Percent Timer Setting

$$\begin{aligned} \text{Inches/Revolution} &= \frac{(\text{Hours/Revolution}) (\text{Inches/Day})}{(100\%) 24} \\ &= \frac{(\text{_____}) (\text{_____})}{24} \\ &= \frac{(\text{_____})}{24} \\ &= \text{_____} \end{aligned}$$

Valley Basic Control Panel

6. Determine Inches/Revolution and Hours/Revolution for any percent timer setting using these two formulas:

$$\text{Inches/Revolution} = \frac{(\text{Inches/Revolution at 100\%}) (100)}{(\text{Percent Timer Setting})}$$

$$= \frac{(\quad) (100)}{(\quad)}$$

$$= \frac{(\quad)}{(\quad)}$$

$$= \underline{\quad}$$

$$100\% = (\quad) \text{ Inches Per Revolution}$$

$$90\% = (\quad) \div (.9) = \quad \text{ In./Rev.}$$

$$80\% = (\quad) \div (.8) = \quad \text{ In./Rev.}$$

$$70\% = (\quad) \div (.7) = \quad \text{ In./Rev.}$$

$$60\% = (\quad) \div (.6) = \quad \text{ In./Rev.}$$

$$50\% = (\quad) \div (.5) = \quad \text{ In./Rev.}$$

$$40\% = (\quad) \div (.4) = \quad \text{ In./Rev.}$$

$$30\% = (\quad) \div (.3) = \quad \text{ In./Rev.}$$

$$25\% = (\quad) \div (.25) = \quad \text{ In./Rev.}$$

$$20\% = (\quad) \div (.2) = \quad \text{ In./Rev.}$$

$$15\% = (\quad) \div (.15) = \quad \text{ In./Rev.}$$

$$10\% = (\quad) \div (.1) = \quad \text{ In./Rev.}$$

$$5\% = (\quad) \div (.05) = \quad \text{ In./Rev.}$$

$$\text{Hours/Revolution} = \frac{(\text{Hours/Revolution at 100\%}) (100)}{(\text{Percent Timer Setting})}$$

$$= \frac{(\quad) (100)}{(\quad)}$$

$$= \frac{(\quad)}{(\quad)}$$

$$= \underline{\quad}$$

$$100\% = (\quad) \text{ Hours Per Revolution}$$

$$90\% = (\quad) \div (.9) = \quad \text{ Hrs./Rev.}$$

$$80\% = (\quad) \div (.8) = \quad \text{ Hrs./Rev.}$$

$$70\% = (\quad) \div (.7) = \quad \text{ Hrs./Rev.}$$

$$60\% = (\quad) \div (.6) = \quad \text{ Hrs./Rev.}$$

$$50\% = (\quad) \div (.5) = \quad \text{ Hrs./Rev.}$$

$$40\% = (\quad) \div (.4) = \quad \text{ Hrs./Rev.}$$

$$30\% = (\quad) \div (.3) = \quad \text{ Hrs./Rev.}$$

$$25\% = (\quad) \div (.25) = \quad \text{ Hrs./Rev.}$$

$$20\% = (\quad) \div (.2) = \quad \text{ Hrs./Rev.}$$

$$15\% = (\quad) \div (.15) = \quad \text{ Hrs./Rev.}$$

$$10\% = (\quad) \div (.1) = \quad \text{ Hrs./Rev.}$$

$$5\% = (\quad) \div (.05) = \quad \text{ Hrs./Rev.}$$