



# Standard Center Pivot Operators Manual

**Reinke Puts You In Control  
with**

**RPM**<sup>®</sup>  
REINKE PRECISION MANAGEMENT



**Reinke**  
MORE RIGHT THAN RAIN



***Standard Center Pivot System***  
***Operator's Manual***  
***equipped with***

**RPM**

**P/N 117762** **REINKE PRECISION MANAGEMENT** **Revision J (10-15)**



*Our mission... to exceed our customers' expectations of quality, service, and innovation.*



# ELECTROGATOR II™

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*The Reinke Electrogator II System is designed with many electrical and mechanical safety features. However, each operator must read and understand this and all other accompanying owners manuals for the safe and efficient operation of the system. If this system is operated incorrectly, it can pose a safety threat to the operator and others. The following is a list of safety operating tips which all service and operating personnel must read and understand.*



*The safety Alert Symbol is displayed many places throughout this manual and on the system indicating there is a potential for personal injury.*



*The tower steps have been provided for access to the tower control boxes only. They are not intended for access to the span. For instance, should the sprinkler heads require service, use a ladder to reach them from the ground.*



*Throughout this manual and on system decals, the words “DANGER”, “WARNING”, “CAUTION” are used with the safety alert symbol to alert the operator of potential hazards. “DANGER” identifies the most serious hazards. “DANGER” or “WARNING” safety signs identify specific hazards. “CAUTION” signs identify specific safety instructions.*

*Exercise caution when handling fuel near systems equipped with combustion engine driven generators and pumps.*



*Any attempt to repair a system without complete understanding of the methods is not recommended. Call an authorized service person.*



*The movement of an electrically powered gear driven irrigation system is relatively slow. However, parts that are exposed and may present a potential hazard. Therefore, keep all equipment, vehicles, people, etc., out of the systems path.*



*Keep away from the system during thunderstorms or other severe weather conditions. Systems are grounded and the system is probably the highest object in the field, this makes it a good lightning receptor.*



*DO NOT attempt to perform any maintenance procedures until the main control panel disconnect switch and all pump or other disconnect switches are locked in the “OFF” position. Electrical component troubleshooting and replacement should be performed by a certified service technician to ensure built-in safety features remain intact. This also ensures system remains compliant with the National Electric Code and the manufacturers specifications. Replace all protective guards and shields before restoring power to the system.*



*Protect guards must be installed on all belts and drive shafts of ancillary equipment such as combustion engines, electric motors, pumps, etc.*



*If a short circuit is suspected or the system is not working correctly, do not touch the system and keep others away from it. Call an authorized service technician to ensure built-in safety features remain intact. This also ensures system remains compliant with the National Electric Code and the manufacturers specifications.*



*Do not allow anyone to ride or climb on the system unless they are qualified and required to do so for maintenance purposes.*



When towing a system from field to field, avoid ditches, rough terrain, overhead power lines, etc. The ground wire **MUST** be re-attached to the ground rod and checked for electrical integrity each time the system is towed.



Avoid any bodily contact with high pressure water streams from sprinklers and end guns.



Keep away from fields where the system is chemigating. Make sure the applied chemical and water does not blow or drift past the area of intended operation. A check valve must be installed between the system and the pump to prevent the mixture of water and chemical from siphoning back into the irrigation water source. Comply with all local, state, and federal regulations.



Do not oversize any fuses. Fuses are sized for a specific circuit. It is extremely important to make sure proper fuse size is in place before initially starting the system and when replacing fuses.



Do not operate system when temperatures are below 40°F (4.5°C). This can cause structural damage to the system.



In most states it is unlawful to spray water on state and county roadways. This is a serious hazard and must not be allowed.



If the system is equipped with any auto-stop or auto-reverse mechanism, make sure they are working correctly and a tower barricade is properly installed as per the pivot center or lateral move manual.

**Reinke disclaims any and all liability (including any liability created pursuant to the irrigation systems warranty) with regard to damage to the irrigation system, or to other property or personal injury or death, caused by improper installation or maintenance of Reinke-supplied tower auto-reverse or auto-stop switches or tower barricades, or by use of customer-supplied barricades.**




Driveshafts may start without warning. Keep away from driveshafts to prevent clothing or limbs from being entangled, resulting in severe injury or death.



Do not endanger anyone's life by being negligent with the operation of the system.





**Hazard of  
Electrical  
Shock,  
Burn, or  
Explosion**

- *Always place Disconnect Switch in the “OFF” position and lock before performing any maintenance on the System.*
- *NEVER stop or shut down a running System by turning the Main Disconnect Switch to the “OFF” position.*

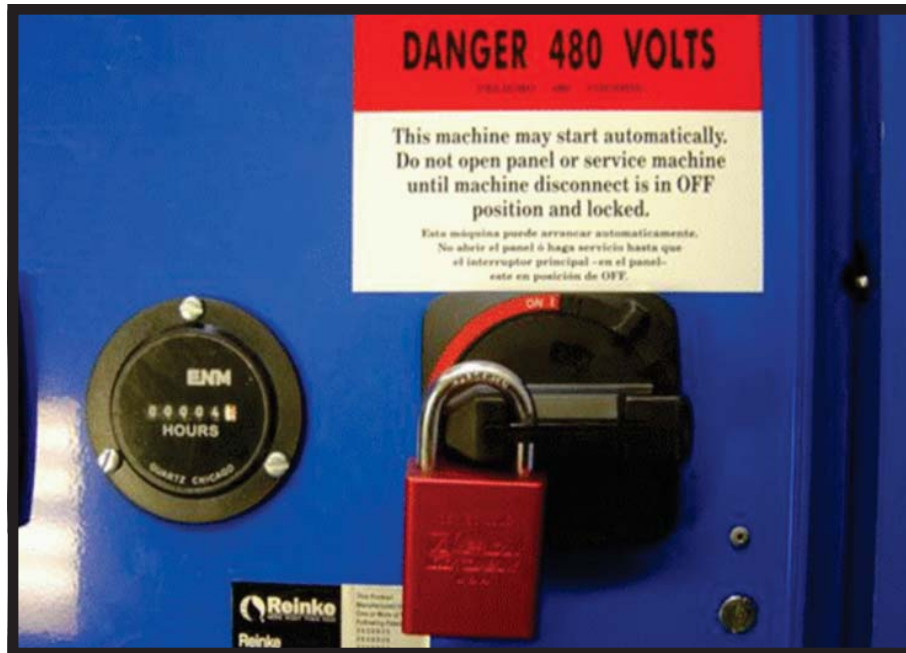


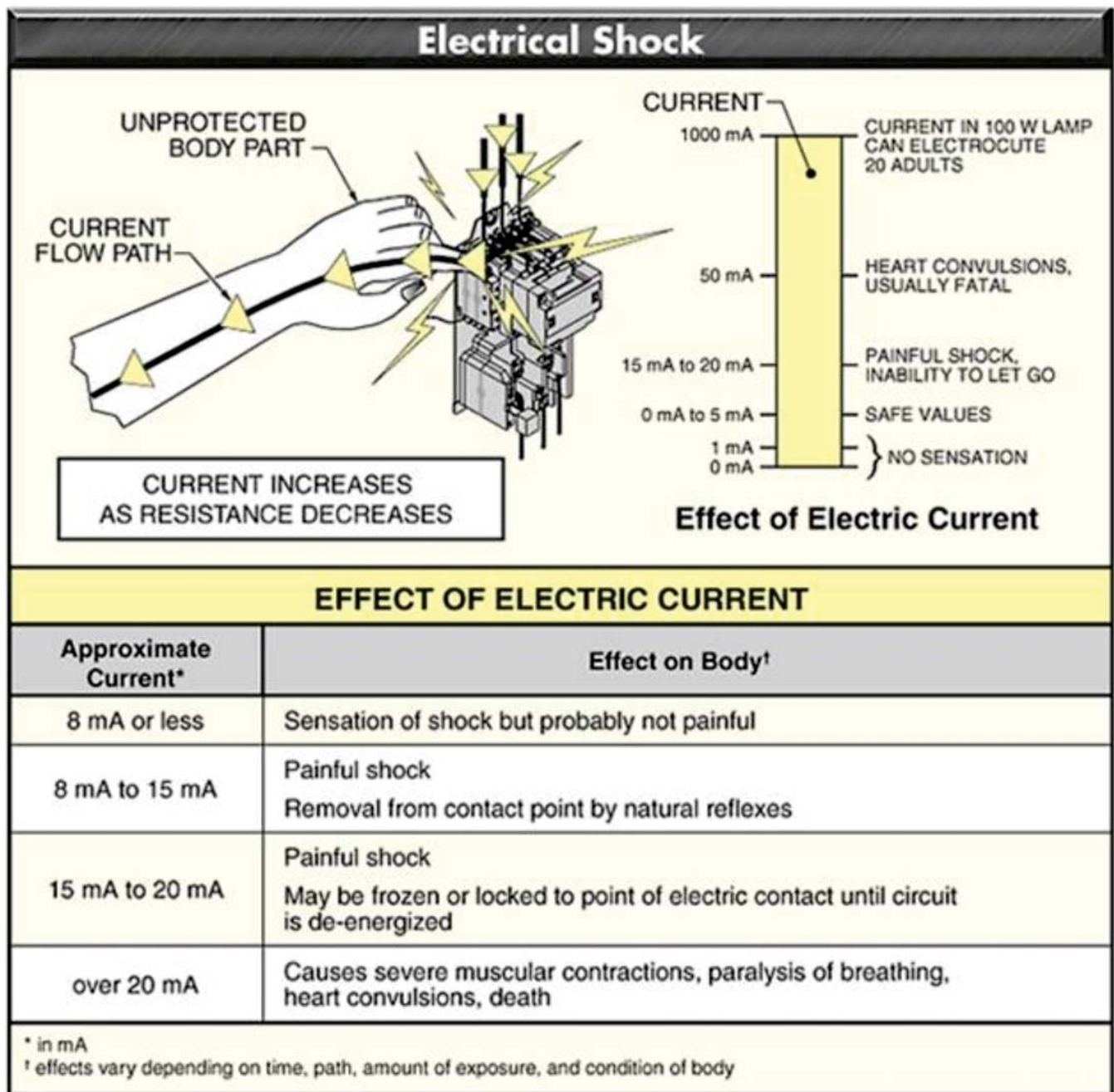
**CAUTION**

**AVISO**

1. KEEP ALL SHIELDS IN PLACE.
2. DISCONNECT POWER SOURCE TO ADJUST OR SERVICE.
3. MAKE CERTAIN EVERYONE IS CLEAR OF EQUIPMENT BEFORE APPLYING POWER.
4. DISCONNECT POWER BEFORE RESETTING MOTOR OVERLOAD.
5. KEEP HANDS, FEET, CLOTHING AWAY FROM POWER DRIVEN PARTS IN MOTION.

1. MANTENGA TODAS LAS CUBIERTAS EN SU LUGAR.  
2. DESCONECTE LA FUENTE DE POTENCIA PARA CUALQUIER AJUSTE, MANTENIMIENTO O REPARACION.  
3. ASEGURESE DE QUE TODO EL MUNDO ESTE SUFICIENTEMENTE ALEJADO DEL EQUIPO ANTES DE APLICAR LA POTENCIA.  
4. DESCONECTE LA POTENCIA ANTES DE REAJUSTAR LA SOBRECARGA DEL MOTOR.  
5. MANTENGA LAS MANOS, LOS PIES Y LAS ROPAS BIEN APARTE DE TODAS LAS PARTES ACTIVABLES DEL MOTOR QUE ESTEN MOVIENDOSE.





What factors determine the severity of an electrical shock?

- \*Amount of current
- \*Time of exposure
- \*Path through the body
- \*Body area exposed to electrical contact
- \*Size and condition of the body





# ELECTROGATOR II™

## **Welcome to the Advanced Age of Water Management**

Congratulations on choosing a Reinke Electrogator II Center Pivot Irrigation System. There is nothing more natural than overhead water application. Your Reinke Center Pivot Irrigation System, provides the most efficient and versatile method of irrigation. Your Reinke Irrigation System has been designed to take full advantage of this quality. Rising energy and water use restrictions make efficient use of water of utmost importance. Now that you are equipped to do it, take the time to do a good job of water management. Not only will you conserve a precious natural resource, but you will also maximize your profits.

Water management is critical in the market today. Here are several examples of what can be done, to make the best use of our precious water, and reduce your irrigation costs. Operating electric-powered irrigation systems during non-peak hours or during the night is more economical, and may be required in certain areas. Another method of water management, is using an accumulative water chart, this maximizes the use of any water already in the soil, and takes full advantage of any rainfall that might occur. Some universities provide irrigation scheduling information. There are also some irrigation scheduling companies that will keep track of the water being applied and suggest when to irrigate. In some areas, daily consumptive use based on weather conditions is printed in the newspaper. Tensiometers or electrical resistance blocks, can be used to monitor the amount and depth of soil moisture. Irrigating when you already have sufficient soil moisture can cost money, water, fuel, and time; leach nutrients beyond the active root zone; this can cause excessive wastewater, and expose your land to erosion. However, waiting to irrigate until the crop begins to suffer, or wilt can substantially reduce yields as well. Taking the time for good water management pays for itself, in better yields, and water conservation.

Your Reinke Irrigation System is a valuable investment designed to provide years of trouble-free service. As any piece of equipment required to be out-of-doors year-round, ***we strongly recommend you purchase adequate "all-risk" insurance coverage.***



# I. Center Pivot Overview

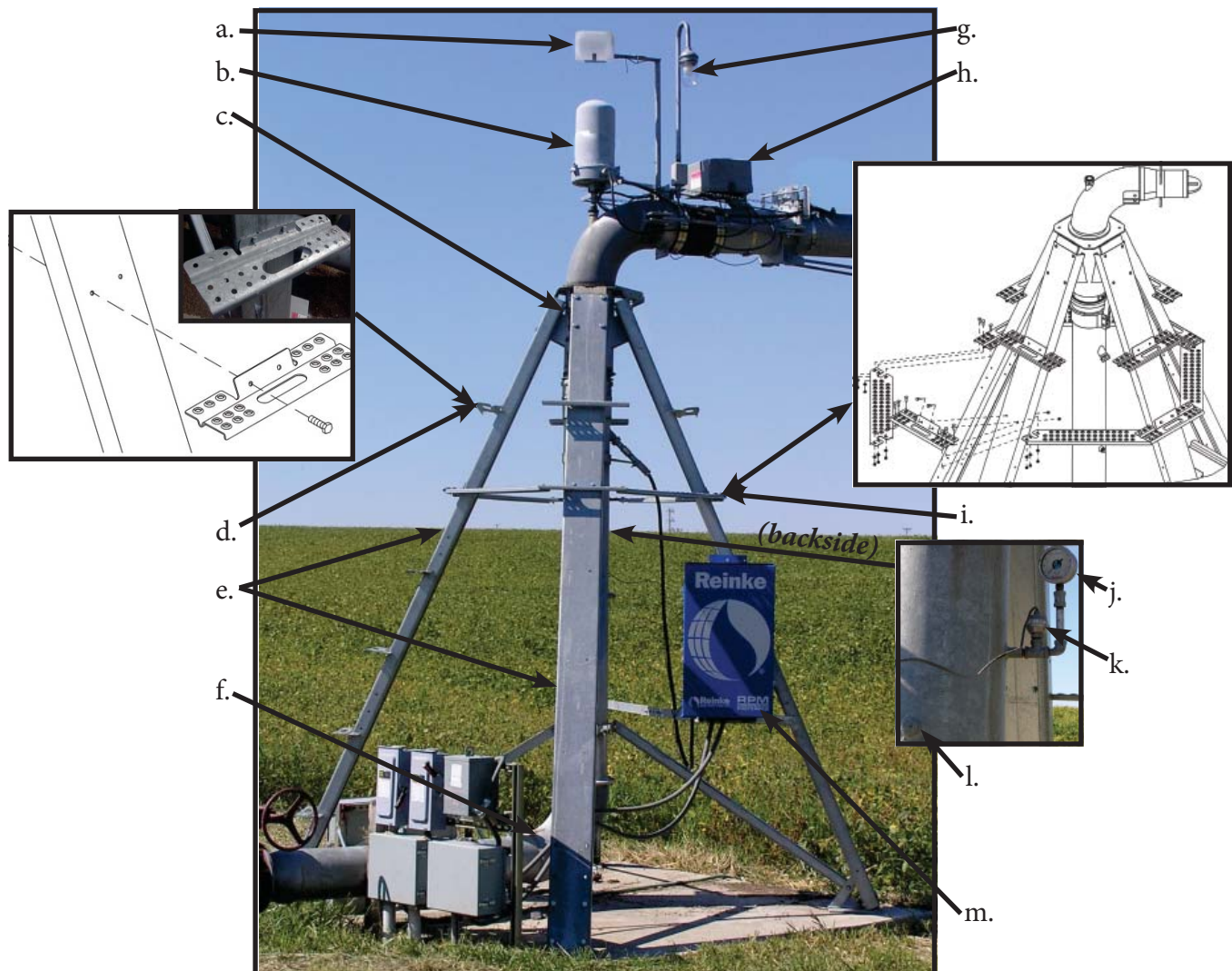
## A. Mechanical Structure

The Basic Electrogator II center pivot system is a combination of a pivot, span(s), span joint(s), tower(s), and possibly an end boom.

### 1. Pivot (available in Low, Standard, or Sugargator Profiles)

The pivot is the device the center pivot system rotates around. The standard pivot consists of a center pivot bearing assembly supported by four legs anchored to a concrete base. Water enters the pivot from either a bottom elbow, or pipe located at the base of the pivot; then it is conveyed up through the riser pipe, out the center pivot bearing assembly, then out to the span(s). The Electrogator II Pivot is further detailed below.

- |                                  |  |                       |
|----------------------------------|--|-----------------------|
| a. GPS Antenna (Optional)        | g. Pivot Light (Optional)                                  | l. Accessory Port     |
| b. Collector Reel                | h. GPS Base Box (Optional)                                 | m. Main Control Panel |
| c. Center Pivot Bearing Assembly | i. Pivot Platform (Optional)                               |                       |
| d. Pivot Steps                   | j. Pressure Gauge  |                       |
| e. Pivot Legs                    | k. Pressure Transducer (Optional with Touch Screen Panels) |                       |
| f. Bottom Elbow                  |  |                       |



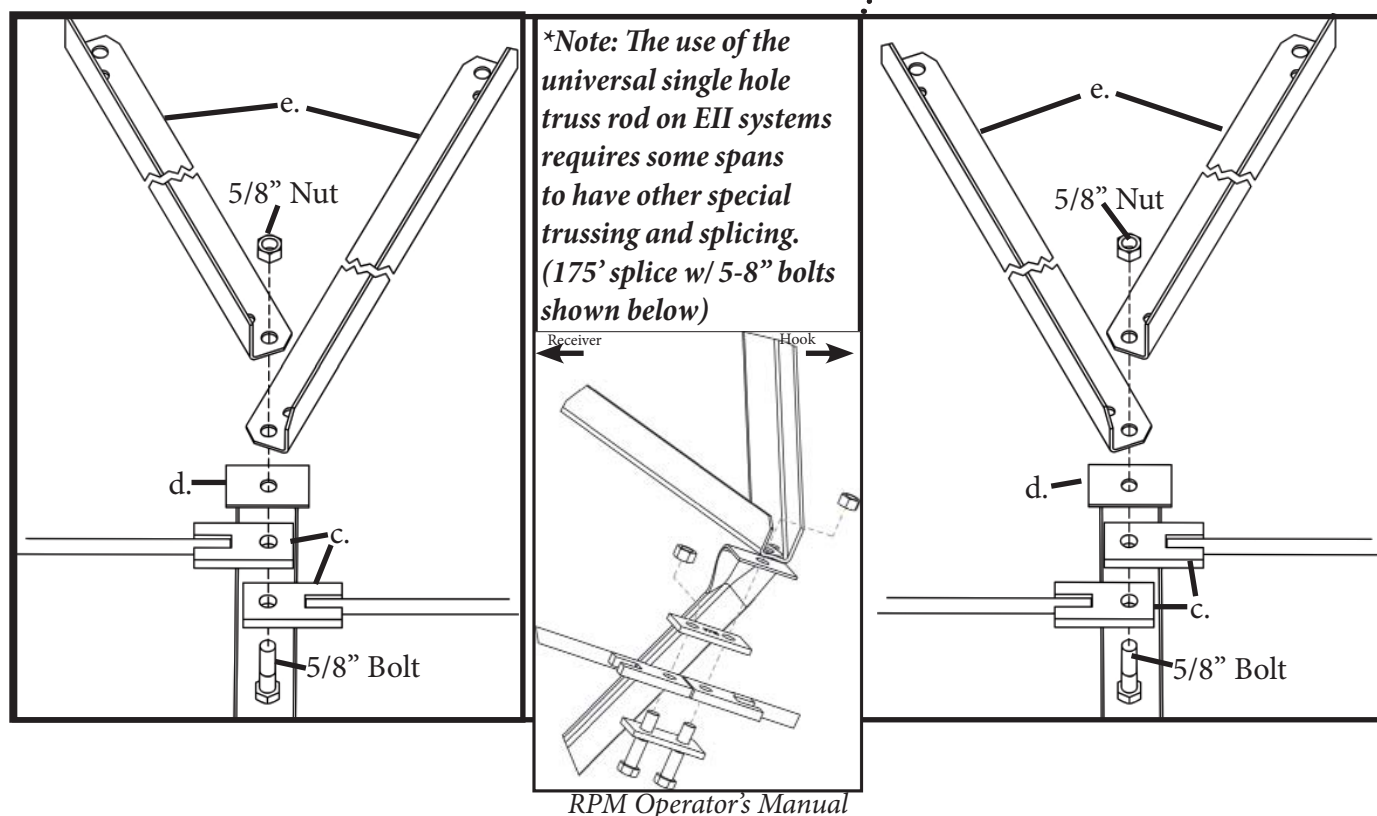
## 2. Spans

When the water leaves the pivot, it travels across the field through a series of suspended pipeline called spans. Spans consist of 6", 6-5/8", 8", 8-5/8", or 10" pipe diameter, with lengths from 80' to 213'. To resist various types of corrosion, each system is custom designed with one of the following galvanized steel, stainless steel, aluminum, or chromium nickel+; also 6-5/8" and 8-5/8" poly-lined steel \*.

As indicated below, the pipe is supported by galvanized or aluminum under-trussing which consists of truss rods, span struts, truss braces, and tower stiffeners.



- a. Tower Stiffeners
- b. Water Pipe
- c. Truss Rods
- d. Truss Braces
- e. Span Struts
- f. Span Joint (see next page)



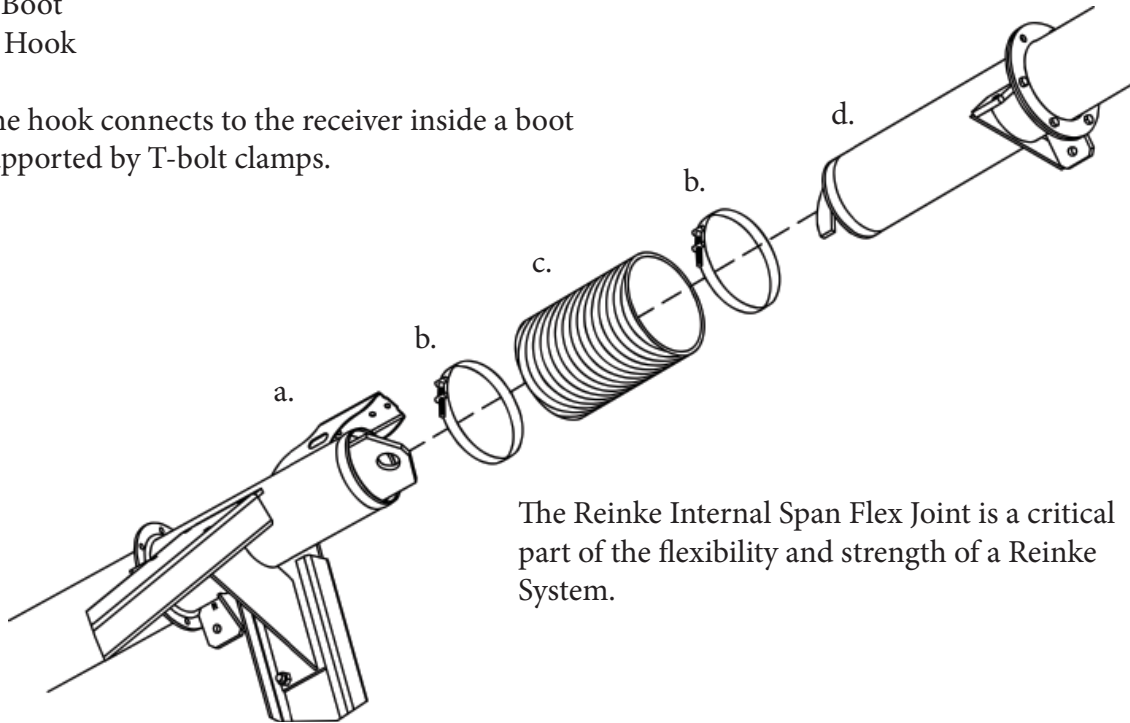


### 3. Span Joints

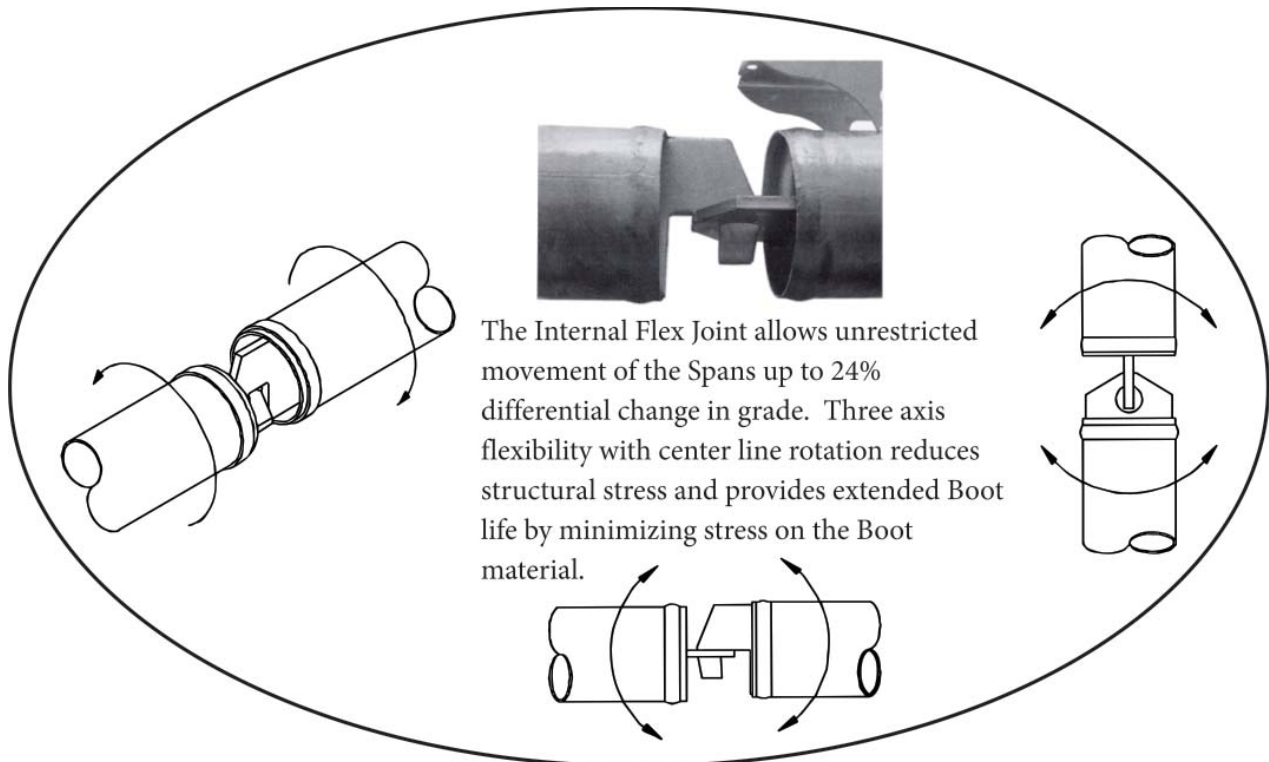
The Reinke internal flex joint, for the span, consists of the following:

- a. Receiver (tower top)
- b. T-Bolt Clamp x2
- c. Boot
- d. Hook

The hook connects to the receiver inside a boot supported by T-bolt clamps.



The Reinke Internal Span Flex Joint is a critical part of the flexibility and strength of a Reinke System.



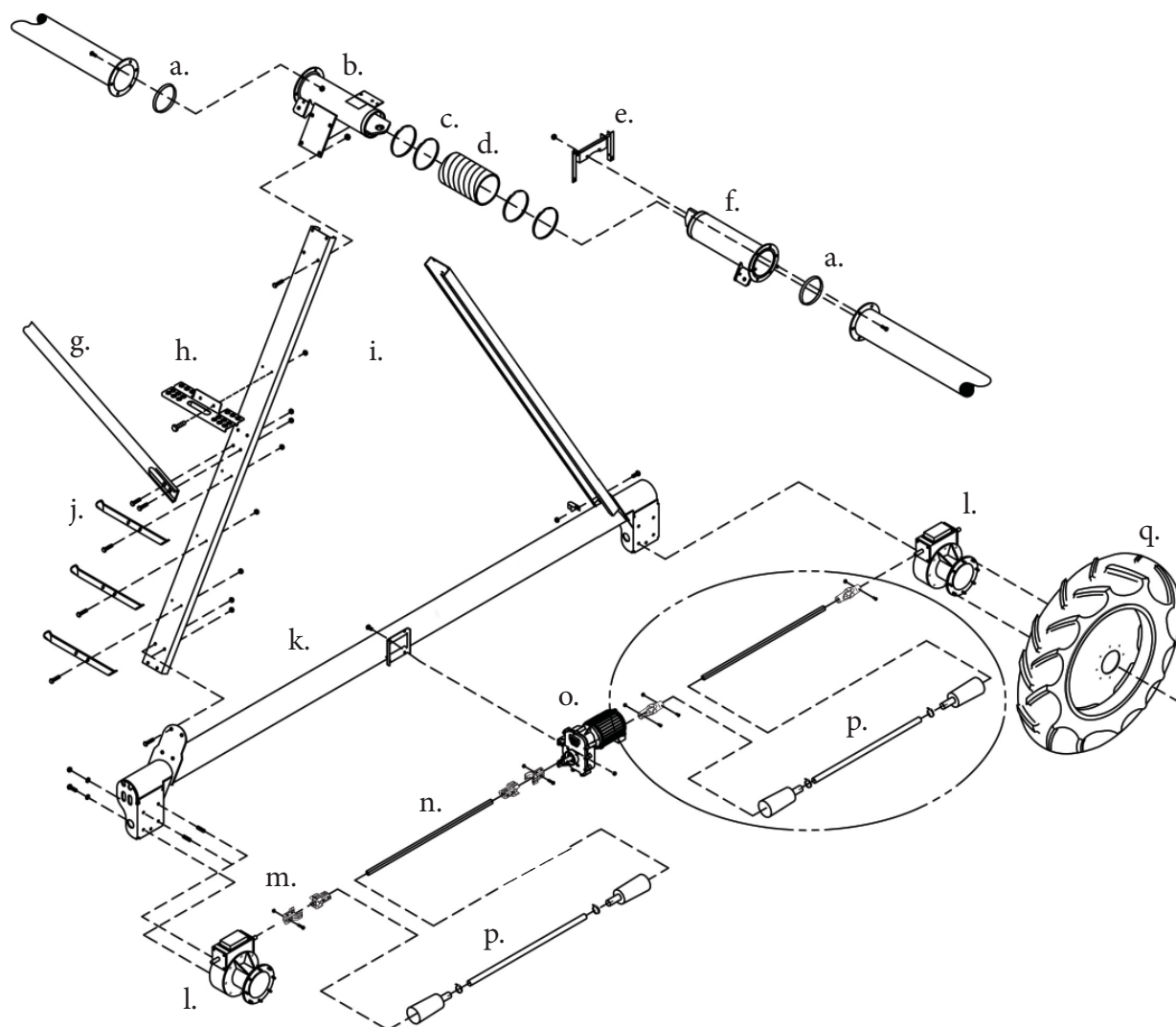


## 4. Towers

A tower is attached to the end of each span. A tower contains all the necessary components for the movement, alignment, and support of the entire system. The Reinke single-leg tower design is durable and flexible. Engineered to absorb stress that would normally be transferred to the pipeline, the Reinke tower design maximizes system life and reduces component fatigue. The Reinke tower components are pictured below.



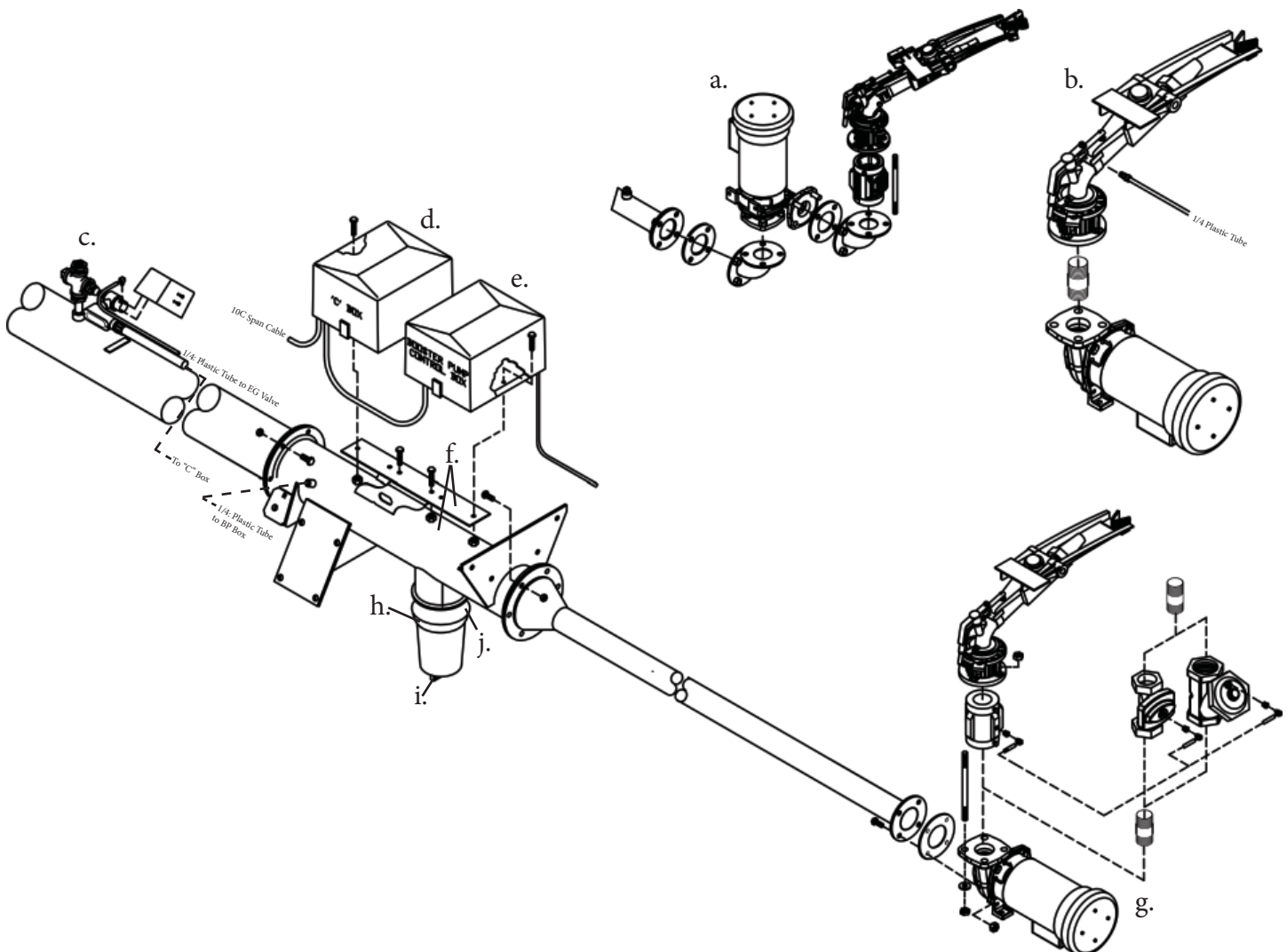
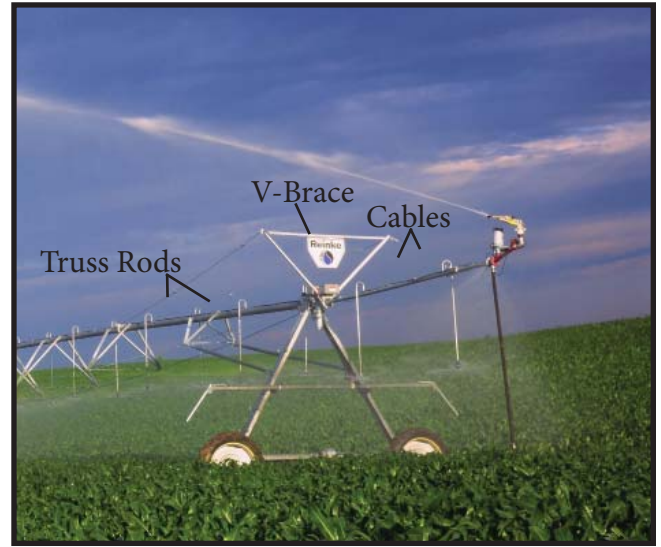
- |                                    |                                     |                                 |
|------------------------------------|-------------------------------------|---------------------------------|
| a. V-Ring (Steel) or O-Ring (Alum) | h. Step Formed EII (Optional)       | o. Helical Center Drive Gearbox |
| b. Receiver (tower top)            | i. Tower Legs                       | available in:                   |
| c. T-Bolt Clamps                   | j. Tower Steps                      | Low Speed (60:1, 29 RPM)        |
| d. Boot                            | k. Tower Base                       | Standard (40:1, 44 RPM)         |
| e. Control Arm Assembly            | l. 50:1 Wheel Gearbox available in: | High Speed (25:1, 67 PRM)       |
| f. Hook                            | Towable or Non-Towable              | p. Driveshaft Covers            |
| g. Tower Stiffener                 | m. High Torque Couplers             | q. Wheel/Tire Combinations      |
|                                    | n. Driveshaft                       |                                 |



## 5. End Booms

The end boom is the suspended pipeline beyond the last tower. The end boom lengths vary from 3' to 105', with pipe diameters ranging from 3" to 6". End booms, can be outfitted with many options, including a wide variety of end guns along with 2, or 5 horsepower booster pumps.

- a. Vertical Pump Mount (*Optional*)
- b. SR NV100 End Gun (*Optional*)
- c. Booster Pump Strainer Assembly (*Optional*)
- d. "C" Box
- e. Booster Pump Control Box (*Optional*)
- f. Last Tower Top
- g. 2HP or 5HP Booster Pump (*Optional*)
- h. Gasket
- i. Sand Trap
- j. Ring Lock
- k. Booster Pump Pressure Switch (*Optional not shown*)



## **B. Electrical Structure**

The Standard Electrogator II Center Pivot electrical structure is comprised of a main control panel, collector reel, and various control boxes.

### **1. Main Control Panel**

The Main Control Panel (MCP) is the control center of the center pivot system. In most cases, the MCP is located at the pivot center, but it can be remotely mounted at the edge of the field. The main control panel must be supplied with either 480 VAC (3 Phase systems), or 240 VAC (Single Phase) from public utility power lines, engine-driven generators, or phase convertors. A 480-120 VAC transformer inside the main control panel supplies the 120 VAC for the control circuit. The Reinke Precision Management (RPM) control panel is available with the four control modules pictured below. Section 2 details the layout and operation of all face plate switches, buttons and lights outside of main controls. If your system is equipped with a RPM Basic (117764), Advanced (117761) or Preferred (117112-1.0) manual, an additional manual has been provided to further detail the operation of the those panels.



RPM-Basic



RPM-Standard



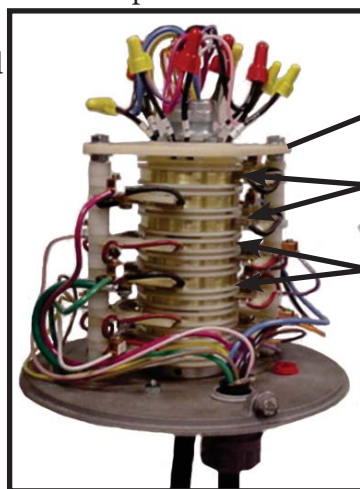
RPM-Advanced



RPM-Preferred

### **2. Collector Reel**

From the main control panel, the power cable is routed up through a J-pipe in the pivot riser pipe to the collector reel. This device allows the span cable to swivel at the pivot and not wrap around the pivot. The collector reel consists of stacked, insulated brass rings that remain stationary and are separated by insulators. The brushes, of the collector reel, revolve around the brass rings to provide a continuous electrical circuit; it does this without twisting the cable, as the system makes revolutions around the field.



Brushes

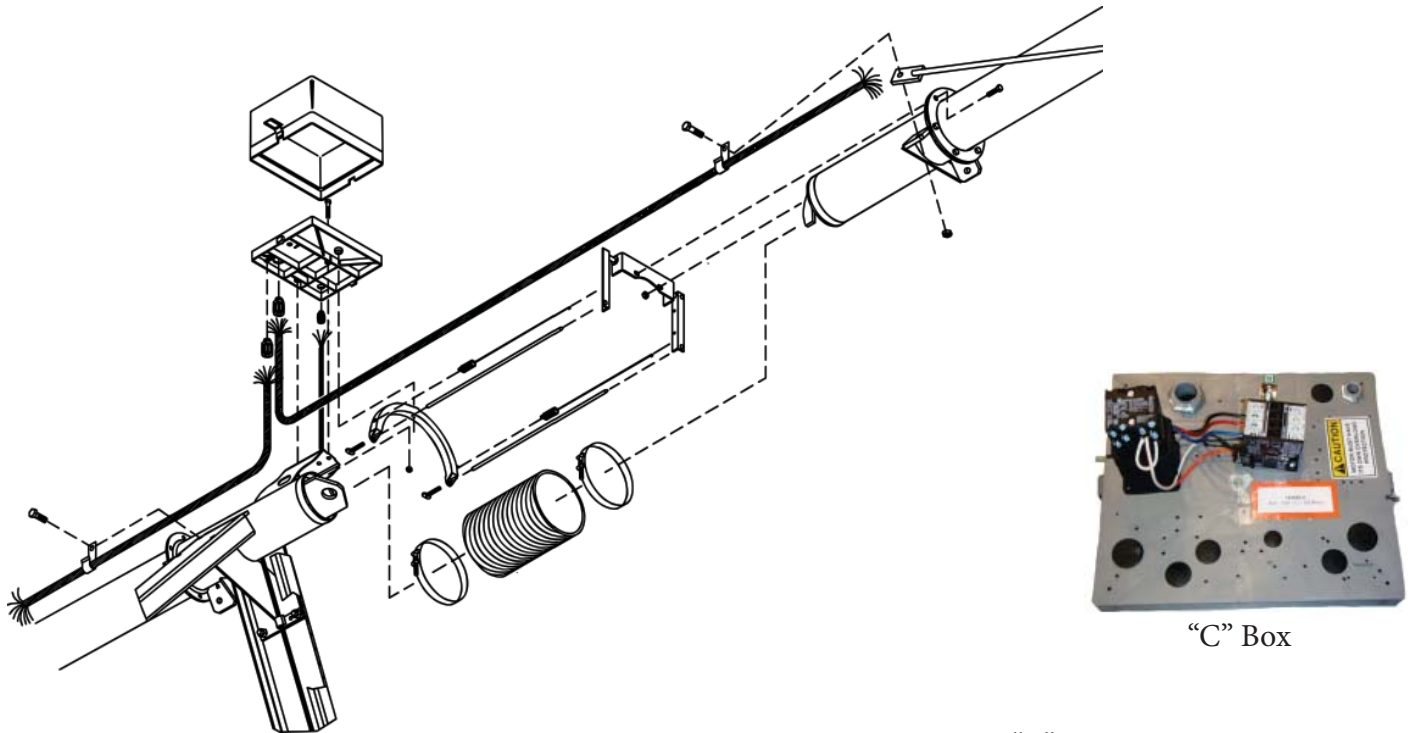
Brass Rings



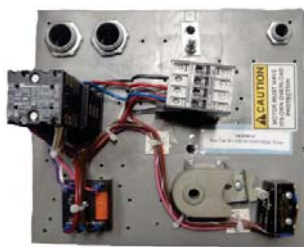


### 3. Tower Boxes

The span cable leaves the collector reel and runs the entire length of the system through the various tower boxes. The span cable, carries 120 VAC and either 480 VAC or 240 VAC to each tower box. The 120 VAC is the control voltage while the 480 VAC or 240 VAC powers the center drives. There are three basic tower boxes. The “C” box is located at the end tower. The “B” box is located at the next to last tower. The “A” boxes are located on all intermediate towers.



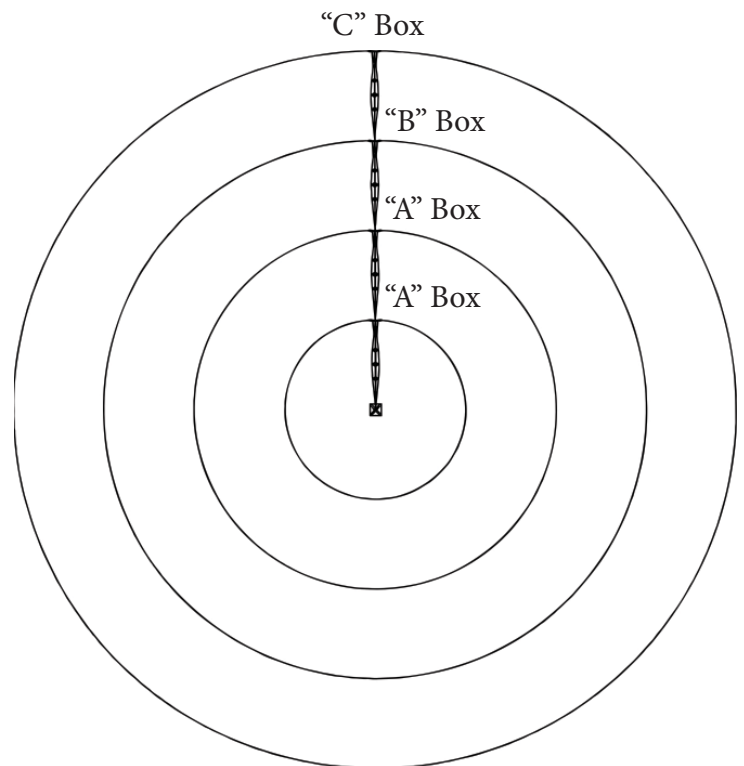
“C” Box



“B” Box



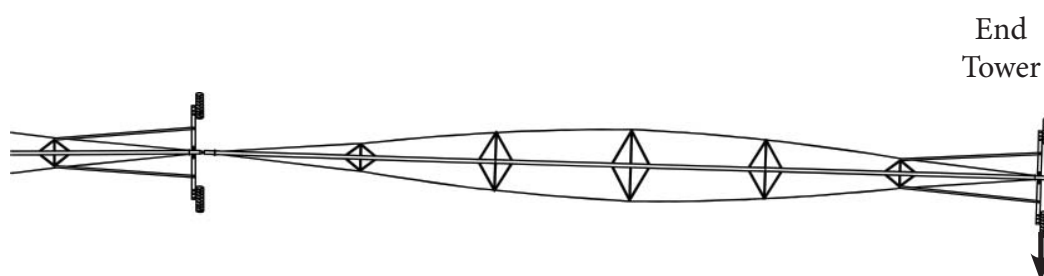
“A” Box



## C. Alignment Circuit

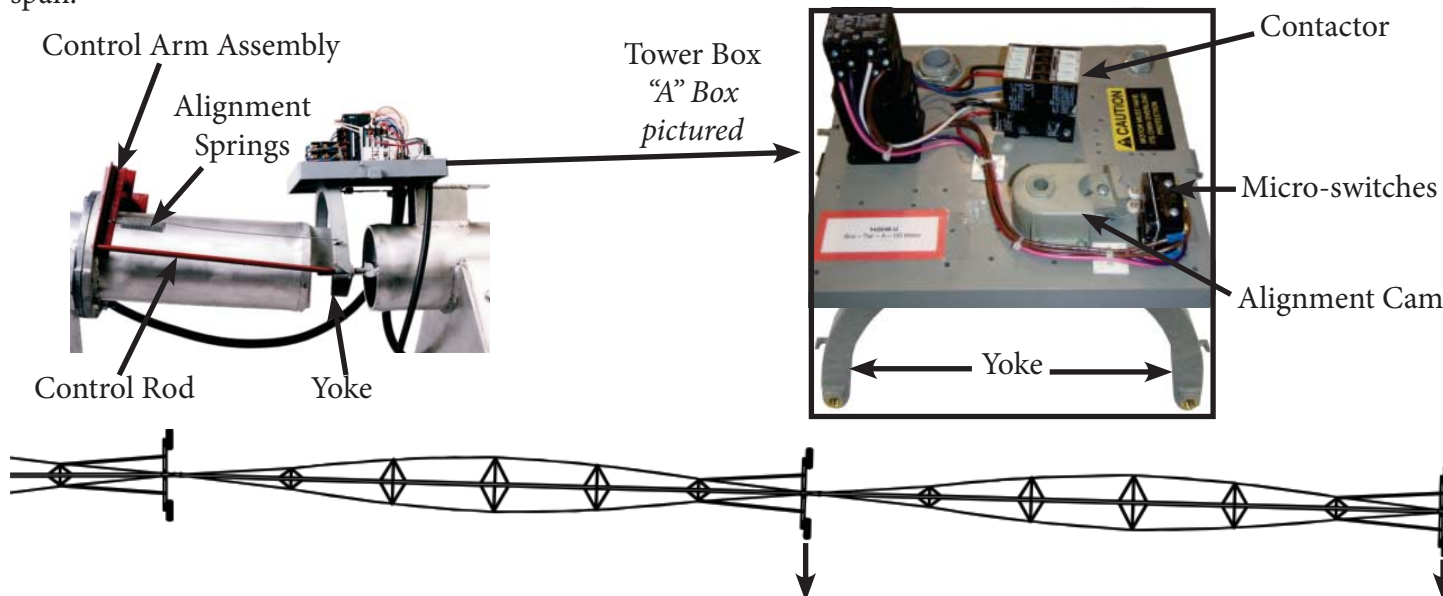
The alignment circuit is a parallel circuit that determines when a tower is to move. The standard percent timer, advanced PAC timer (optional), or preferred touch CPU (optional) controls the end tower. As the end tower moves, all the other towers move to keep “in-line” or maintain alignment with the end tower.

For example: If the percent timer is set at 100%, then the end tower would run all the time and all the intermediate towers will move to keep “in-line” or maintain alignment with the end tower. However, the slower the system runs, the more water will be applied. Therefore, if the percent timer is set at 50%, then the end tower would only run 30 seconds out of each minute or 50% of the time and all the intermediate towers will move to keep “in-line” or maintain alignment with the end tower and would apply twice the amount of water in relationship to the previous example.



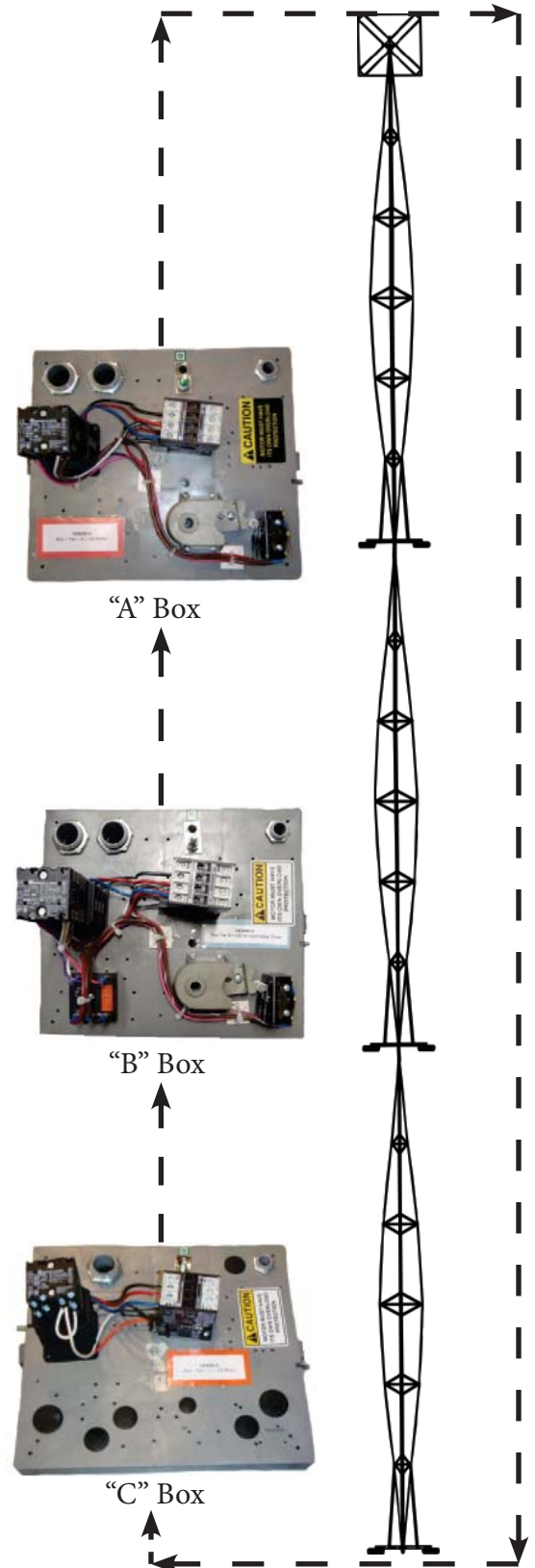
To maintain alignment with the end tower, each intermediate tower has a control yoke fastened to the bottom of the tower box and a control arm mounted at the joint on the hook, and first water pipe on the span. Found between the control yoke and arm, are control rods that allow the yoke to operate as the hook and receiver joint flexes. The control yoke rotates under the tower box operating a set of cams which operate the alignment and safety micro-switches in the tower box.

When the control yoke rotates on the next to end tower (caused when the end tower moves), the cam activates the alignment micro-switch. This causes the contact in the tower to engage and sends 480 VAC power to the tower center drive motor. The next to end tower will run for a period of time until it moves “in-line” with the end tower. All towers to the inside of the next to end tower will move respectively. As a result, any tower can move at any given time, if it senses movement, and there is an angular difference in relation to the next outer adjacent span.



## **D. Safety Circuit**

The safety circuit is a series circuit which carries the neutral for the reversing contactor in the main control panel. The safety circuit travels out to the last tower and returns through a series of tower box safety micro-switches. If for any reason a tower does not move, or if it runs too far ahead, the cam will open the safety micro-switch and cause the system to shut down. In the next to last tower (B-box), the safety circuit runs through the over-watering timer. In the event the tower doesn't move for a factory preset 20 minutes, the over-watering timer will open the safety circuit and shut the system down. Once the next to last tower moves, the over-watering timer is reset.



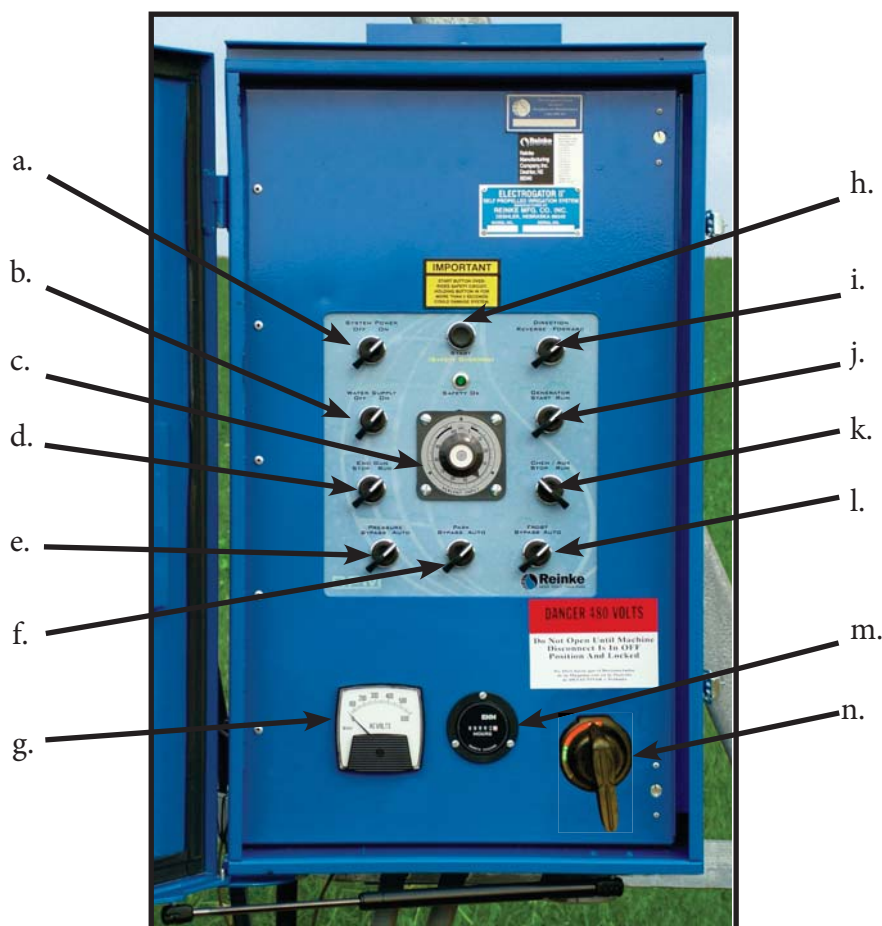
# RPM

REINKE PRECISION MANAGEMENT

## **II. Main Control Panel Layout**

The main control panel contains the necessary controls to direct the operation of the system. Opening the panel cover door will reveal the controls detailed in the following pages of this manual.

*Note: The “Main Control Panel Layout” section is for the RPM Standard Panel, Advanced and Touch Screen face-plates only. An additional manual has been provided for systems utilizing the RPM Basic, Advanced or RPM Preferred Touch Screen for the controller operation.*



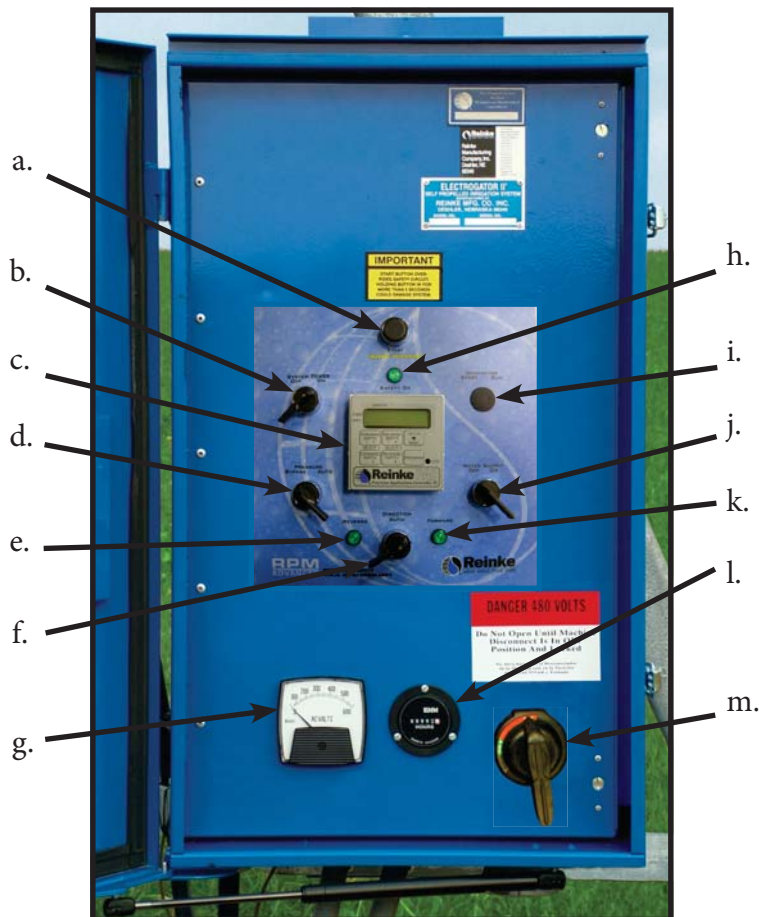
### ***RPM Standard Panel***

- |                             |   |
|-----------------------------|---|
| a. System Power Switch      | h. Start Button                         |
| b. Water Supply Switch      | i. Direction Switch                     |
| c. Percent Timer            | j. Generator Switch                     |
| d. End Gun Override Switch  | k. Chemigation/Auxiliary Control Switch |
| e. Pressure Override Switch | l. Frost Control Override Switch        |
| f. Park Override Switch     | m. Hour Meter                           |
| g. Voltmeter                | n. Main Disconnect Switch               |

# RPM

REINKE PRECISION MANAGEMENT

## Main Control Panel Layout



### *RPM Advanced Panel*

- |  |                            |
|--|----------------------------|
| a. Start Button  | h. Safety Indicator Light  |
| b. System Power Switch                                   | i. Generator Start/Run     |
| c. Advanced PACIII Control ( <i>has its own manual</i> ) | j. Water Supply Switch     |
| d. Pressure Override Switch                              | k. Forward Indicator Light |
| e. Reverse Indicator Light                               | l. Hour Meter              |
| f. Direction Switch                                      | m. Main Disconnect Switch  |
| g. Voltmeter   |                            |



# RPM

REINKE PRECISION MANAGEMENT

## Main Control Panel Layout



## *RPM Preferred Touch Screen Panel*


- a. Preferred Touch Screen Module (*has its own manual*)
- b. Start/Run Toggle Switch
- c. Light Sensor
- d. Voltmeter
- e. USB Port
- f. Safety Override Button (*Use with extreme caution; this will override all safeties throughout system.*)
- g. Emergency Stop Button
- h. Hour Meter
- i. Main Disconnect Switch



## **A. Start Button (safety override)**

After the direction switch has been placed in the FORWARD, REVERSE, or AUTO position, start the system by pressing the start button. This activates the magnetic contactor in the main control panel. The contactor “latches” if all safety circuits indicate they are in a closed position. Listen for the contactor to engage when the start button is pressed. If after the button is released another “thump” is heard, the contactor did not stay engaged (latched) and the system will not continue to run. This indicates the safety circuit has an “open” or “no go” condition that needs correcting.



 ***Do not hold your finger on the button, forcing the system to override the safety circuit. This can and will cause damage to your system in as little as three seconds. A reason for a “no go” safety circuit could be a stuck tower that has caused misalignment. Call your dealer or authorized service person for assistance.***

## **B. System Power Switch**

The system power switch must be in the “ON” position for the system to operate in either direction. When the switch is in the “OFF” position the system will not operate. Place the switch in the “OFF” position to shut down the system.



## **C. Water Supply Switch**

The water supply switch breaks the well kill circuit and allows the system to operate without the pump on for Rural Electrical Association (REA) systems. When the switch is placed in the “OFF” position, the well kill circuit is open and the pump will not start when the system is started. When the switch is placed in the “ON” position, the well kill circuit is closed and the pump will start when the system is started. For generator systems always leave the water supply switch “ON”.



## **D. Percent Timer**

The rate the system travels around the field is controlled by a percent timer intermittently engaging the last tower gear drive motors. The timer is based on a 60-second cycle. For example, if the percent timer is set at 50%, then the last tower will run for 30 seconds, off for 30 seconds, then back on for 30 seconds, etc. 100% provides continuous end tower movement, the maximum speed. The lower the percent timer setting, the slower the last tower will move and the longer it takes to move the system around the field.



## **E. End Gun Override Switch (Optional)**

If your System is equipped with an optional end gun, a two-position override switch labeled STOP/RUN will be located on the main control panel. Turn the end gun switch to RUN to operate the end gun. Turn the switch to STOP to turn the end gun off. See pages 26-27 for controlling end guns.



## **F. Pressure Override Switch (Optional)**

If your system is equipped with an optional low pressure shutdown, a two-position switch labeled BYPASS/AUTO will be included on the main control panel. In the BYPASS position, the pressure switch is bypassed. Use this position when you start the system or want to move the system without supplying water to it. In the AUTO position, the pressure switch is activated and the system will shut down if the pressure falls below the preset level. Be sure the switch is in the AUTO position after pressure has built in the system. This assures proper function of the switch during water application and normal operation.



All panels except  
Touch Screen



Pressure  
Switch

## **G. Voltmeter**

This meter monitors the voltage between two incoming legs of the supplied power. This meter should read 456-504 VAC, 60 HZ (380-420 VAC, 50 HZ) on 480 VAC systems or 230-250 VAC, 60 HZ on 240 VAC systems. In no event should the operational voltage read outside these parameters.



## **H. Hour Meter**

This meter displays the number of hours the system has operated (excluding the pump) since it was new.



## **I. Safety OK-Indicator Light**

The safety OK indicator light will illuminate when the safety circuit is complete and the system is running. If the safety circuit is open, the problem must be corrected before the system can safely start. One reason for a “no go” safety circuit could be a stuck tower that has caused misalignment. Call your dealer or authorized service person for assistance.



## **J. Direction Switch**

This switch is used to select the system's direction of operation. To run the system clockwise, the switch must be placed in the FORWARD position before pressing the start button. To run the system counterclockwise, the switch must be placed in the REVERSE position before pressing the start button. To change the system's direction, simply move the direction switch to the FORWARD or REVERSE position and press the start button. To enable auto-reverse (optional) place the direction switch in the AUTO position and press the start button. When in auto the system will start in the direction it was last moving. Refer to tower auto-reverse switch on page 28 for more information.



Direction Switch



Auto Reverse Option

## **K. Generator Switch (Optional)**

If the system is equipped with an engine driven generator or pump, the generator switch is used to bypass the engine shutdown during start up. The START position is used when starting the engine. Then the switch is turned to RUN after the RPM system is running.



**Caution:** If the generator switch is left in the START position, the engine shut-down is bypassed and the engine will not kill in the event the system stops.



Not  
Touch Screen



Touch Screen  
Only

## **L. Chemigation/Auxiliary Control Switch**

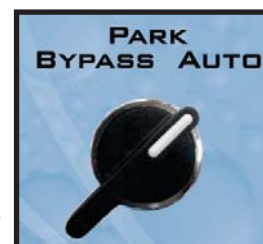
Systems equipped with chemigation, or fertigation and a standard main control panel will have this switch; it is used to manually turn on and off the chemigation or fertigation 120V or 480V pump.





## **M. Park Override Switch**

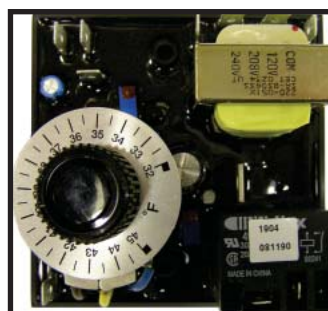
If your system is equipped with an optional cam plate auto-stop (park) switch, a two-position override switch labeled “BYPASS/AUTO” will be located on the main control panel. Turn the park override switch to the “BYPASS” position if you would like the auto-stop switch bypassed. This means the system will not stop when the auto-stop switch is activated. In the “AUTO” position, the system will shut down when the cam plate auto-stop switch is activated. If your system is equipped with the optional auto-stop cam plate option, it may be necessary to turn the park override switch to the “BYPASS” position until the system moves off the auto-stop ramp. See page 27 for controlling cam plate auto-stop switches.



Park  
Override Switch

## **N. Frost Control Override Switch**

If the system is equipped with the optional low temperature shutdown kit, a two-position override switch labeled “BYPASS/AUTO” will also be on the main control panel front. In the “BYPASS” position, the temperature sensing switch is bypassed. Use the “BYPASS” position to move the system without pumping water through it at temperatures below 45°F. In the “AUTO” position, the system will shut down if the temperature falls below the temperature set on the frost control board. The frost control board is located on the back plate of the main control panel. Be sure the switch is in the “AUTO” position during normal operation. In no case should the system be operated with water in potential icing conditions.



Frost Control  
Mechanism



Low Temperature  
Shutdown (Frost  
Control)  
Override Switch

## **O. Main Disconnect Switch**

The main disconnect switch controls the 480 or 240 VAC power supply to the system. The switch is mounted on the back plate of the main control panel and is interlocked with a disconnect handle on the main control panel inner door. The switch must be in the “ON” position for the system to operate. To open the inner panel door and view the inside of the control panel, place disconnect switch in the “OFF” position. Do not turn main disconnect switch to the “ON” position with the inner door open.

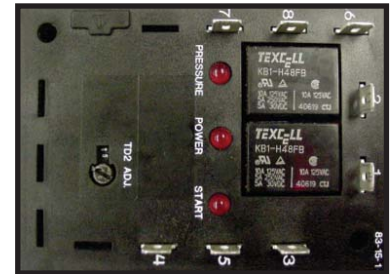
Push in both sides to attach  
up to three padlocks.



Main Disconnect Switch

## **P. Auto-Restart (Optional)**

If your System is equipped with Auto-Restart, the System will automatically restart 5 minutes after the interrupted power has been restored to the main control panel. To prevent unwanted starts, should the 480 or 240 VAC power to the system be interrupted and then restored, always turn the system power to the OFF position.



**WARNING:** Systems equipped with the auto-restart option may restart unexpectedly!

## **Q. Pressure-Restart w/Auto Reverse(Opt.)**

When changing from “BYPASS” to “AUTO” while system is pressured, follow the instructions below.

Press and hold start button. Switch the pressure switch from “BYPASS” to “AUTO”. Release the start button.



## **R. Safety Override-Touch Screen**



Extreme CAUTION must be exercised when using the safety override. This button will override all safeties throughout the system!! Doing so can cause serious damage to equipment and possibly the operator.



## **S. Stop Button-Touch Screen**



This button is for emergency shutdown of the system and will completely shut the entire system down. This should only be used in emergency. It is recommended that the STOP button on the touch screen be used first.



## **T. USB Port-Touch Screen**

The USB Port is for downloading new versions of the touch screen program onto the touch screen hard drive using a removable thumb drive or connecting to a laptop.



# III. Cam & Tower Controls (Opt.)



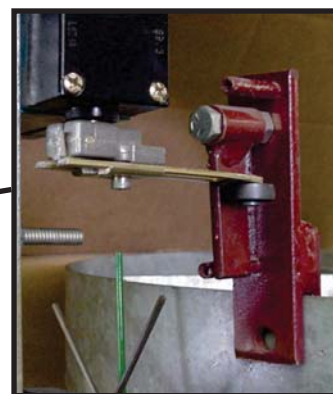
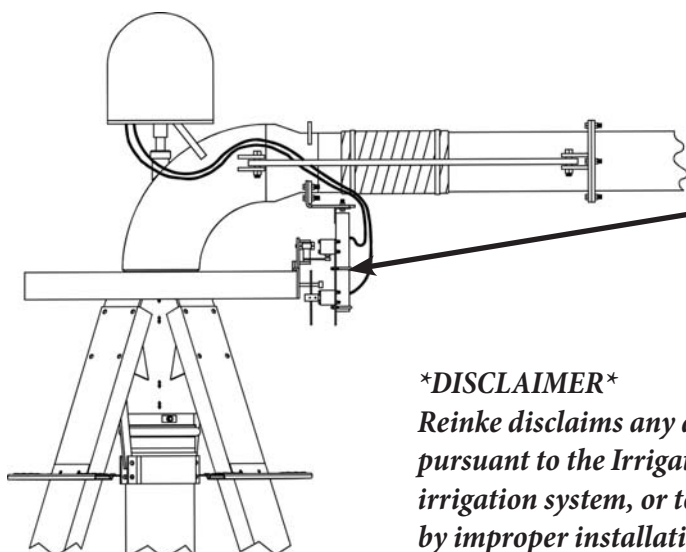
*Before starting the system, check cam switches and make sure they are in the desired position. When initially starting the system, make a point of being near when the switches are due to trip. This could prevent a catastrophe if a trip is located in the wrong position on the cam wheel or cam plate.*

**WARNING!!!!** All auto-stop and auto-reverse devices require the construction of a barricade in the tower wheel track. The barricade should extend to the inside of the track to accommodate possible movement of the tower. The system may become shorter due to misalignment, but it cannot grow longer. See the barricade drawings on page 29.

## A. Cam Wheel Switches (Optional)

### 1. Pivot Auto-Stop Switch

The auto-stop switch is the top switch on the switch mounting plate. This switch has a wide trip arm with a roller on the end. The heads of the auto-stop switch have a momentary contact. This allows the switch to “TRIP” from side to side and return to the center position. The auto-stop trip is a short arm with a “FLAP” attached to it. A pin on the bottom stops the rotation of the flap. There is a left and right trip provided with each auto-stop switch assembly. Each “TRIP” is differentiated from the other by the location of the pin at the bottom of the trip. The pin on the right trip will be on the left side of the “FLAP” when it is observed mounted on the cam wheel. The left trip will be the opposite. This alignment allows the switch to pass through the trip when you wish to reverse the system the other direction. To restart the system after it has been stopped by the auto-stop switch, the switch arm must be returned to the center position. To do this, simply move the switch arm beyond the stopped position, rotate the flap up and allow the auto-stop switch to pass through the trip. This will allow the switch to rotate the “FLAP” when the system reverses the other direction. Be sure you have changed the direction switch to move the system in the opposite direction!

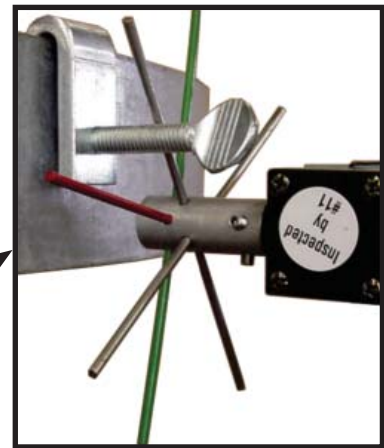
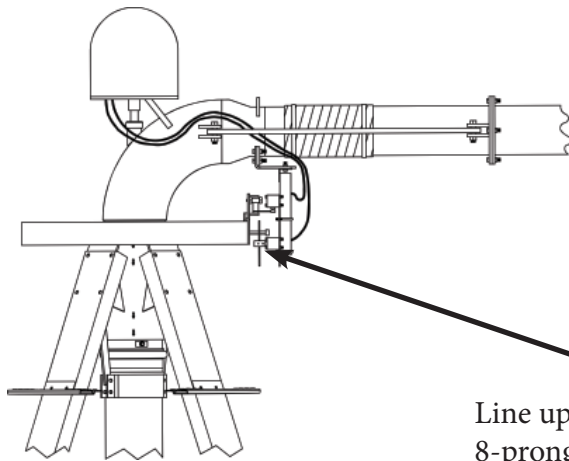


#### **\*DISCLAIMER\***

*Reinke disclaims any and all liability (including any liability created pursuant to the Irrigation Systems Warranty) with regard to damage to the irrigation system, or to other property, or personal injury or death, caused by improper installation or maintenance of reinke-supplied auto-reverse or auto-stop switches or tower barricades, or by use of customer-supplied barricades.*

## 2. End Gun Switch

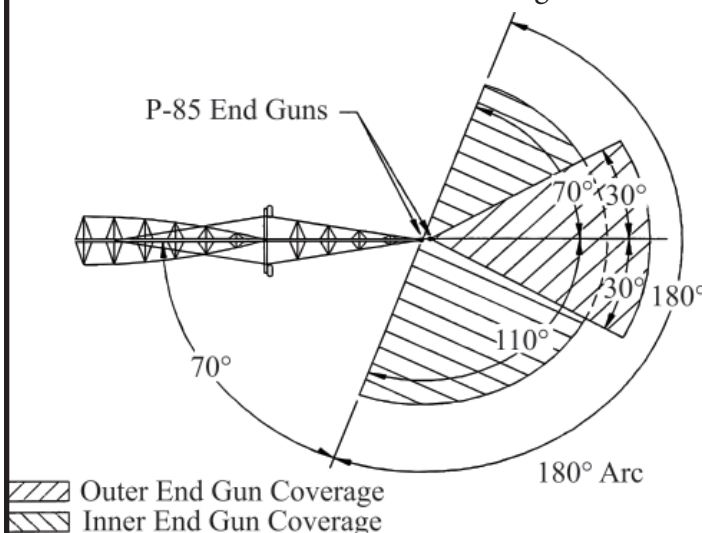
The end gun switch is the bottom switch on the cam wheel mounting plate. It utilizes a 90-degree increment switch and is activated by an 8-prong actuator contacting a movable clamp-on trip on the cam wheel. Line up 45 degree prong of 8-prong actuator so that it hits the center of clamp-on trip thumbscrew. When the green bar of the 8-prong actuator is in the horizontal position, the switch is “ON.” When the red bar of the 8-prong actuator is horizontal, the switch is “OFF.” To activate the end gun, place a clamp-on trip on the cam wheel so it turns the 8-prong actuator. (Make sure the end gun is properly set to the arc settings below before installing the clamp-on trip on the cam wheel.) Install the next clamp-on trip on the cam wheel when the end gun starts to reach its boundaries. Repeat this procedure in each of the corners where you desire to operate the end gun.



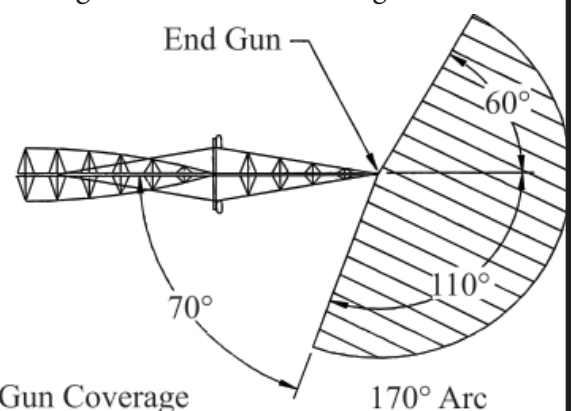
Line up 45 degree prong of 8-prong actuator so that the center of the 45 degree prong hits the center of clamp-on trip thumbscrew.

### End Gun Arc Settings

Double End Gun Arc Setting



Single End Gun Arc Setting

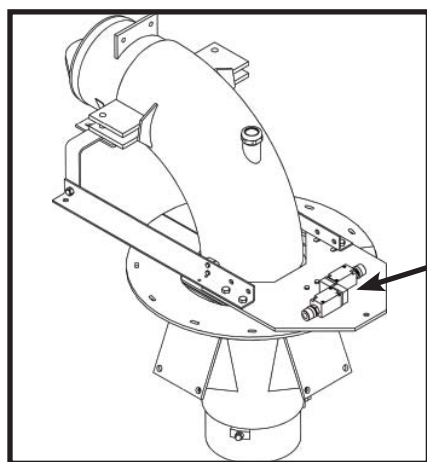




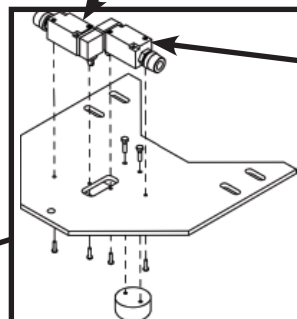
## **B. Cam Plate Switches (Optional)**

Reinke Manufacturing also has an optional cam plate switch assembly for end gun control and pivot auto-stop. This is an alternative to the traditional Reinke cam wheel switch assembly.

End gun and pivot auto-stop switches are plunger switches activated by rubber ramps located on top of cam plate. (See illustration below for details.)



Pivot auto stop switch



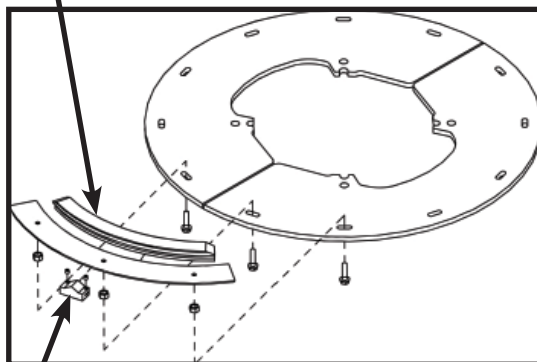
End gun switch

### ***\*DISCLAIMER\****

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### **1. End Gun Switch Ramp**

The end gun switch ramps fit onto a metal retainer plate bolted to the cam plate. Place ramp so end gun plunger switch contacts ramp where end gun is to be activated and end gun plunger switch exits ramp where end gun is to be deactivated. Ramp may have to be trimmed to achieve desired area. (Make sure the end gun is properly set to the arc settings on the previous page.)



### **2. Pivot Auto-Stop Switch Ramp**

The pivot auto-stop switch ramp fits onto a metal retainer plate bolted to the cam plate. To adjust ramp, simply loosen set screws and move ramp to desired point where system is to auto-stop. Then retighten set screws.

## **C. Tower Switches (Optional)**



**WARNING!!!!** All auto-stop and auto-reverse devices require the construction of a barricade in the tower wheel track. The barricade should extend to the inside of the track to accommodate possible movement of the tower. The system may become shorter due to misalignment, but it cannot grow longer. See the barricade drawing on the next page.

### **1. Tower Auto-Reverse Switch**

Systems equipped with the tower auto reverse option have the auto reverse mechanism mounted on one of the outer towers. The tower auto reverse switch is activated by a spring-loaded cable coupled to two auto-stop pipes. As shown below, when the tower moves and the auto-stop pipe contacts a barricade placed in the tower wheel track, the cable moves tripping the tower auto-reverse box reversing the direction of the system.

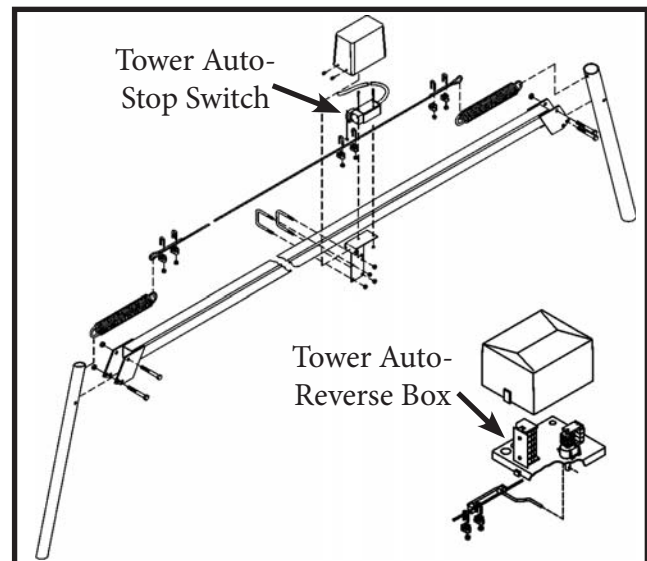
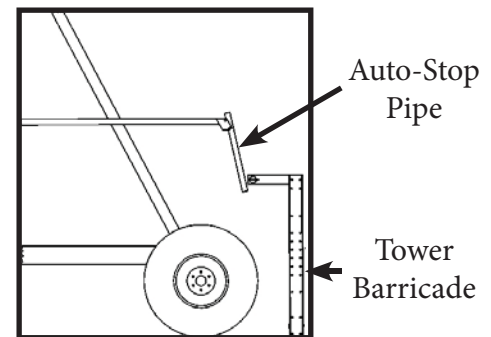
The system can be reversed between barricades by placing the direction switch in the desired direction of travel and pushing the start button. It can then be restarted with the direction switch in the "AUTO" position. The system will continue to run in the direction that it was last moving. Two indicator lights have been placed in the inner panel door to indicate the direction of travel. After any idle period the auto-reverse system must be tested to ensure proper operation. Visually check the lever and switch mechanism for damage. With the system running in auto reverse, manually push the auto-stop pipe opposite the direction of travel. The system should immediately reverse and the pipe return back to normal position. Repeat the process in the opposite direction to ensure the system reverses from both



directions of travel. Pushing the auto-stop pipe beyond the auto-reverse position will open the safety circuit and shutdown the system. The safety function must also be verified to ensure proper operation.

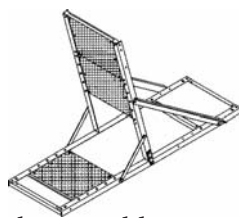
### **2. Tower Auto-Stop Switch**

The tower auto-stop switch is activated by a spring-loaded cable coupled to two auto-stop pipes. As shown below, when the tower moves and the auto-stop pipe contacts a barricade placed in the tower wheel track, the cable moves, tripping the tower auto-stop switch. This action sends a signal to the main control panel and disengages the starter contactor.

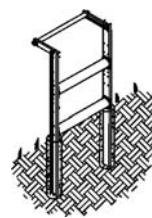


## **D. Tower Barricade (Optional)**

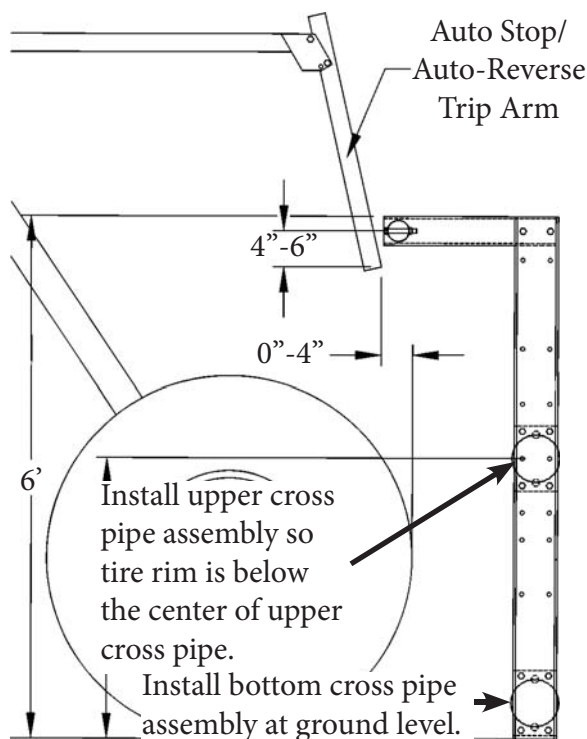
Some installations contain obstacles (roads, buildings, ponds, etc.), which prevent the system from making a complete circle. These systems are usually equipped with the auto-stop option mounted on the cam wheel. However, in many cases, the improper setting of the trip, the misalignment of the switch or a malfunction can cause catastrophic results. Therefore, a suitable barrier must be constructed in the path of the tower that will stop the system. Reinke Manufacturing builds barricades for these applications. See the drawings below. Contact your dealer for details.



Reinke Portable Barricade



Reinke Stationary Barricade



**WARNING!!!!** Great care must be taken to make sure the system alignment is maintained and the barricade remains centered on the wheel track.

### **Notes:**

***These barricades are designed to be used on Reinke Systems equipped with any auto-reverse or auto-stop option.***

- The barricades are designed for use with systems having the following tire sizes: 11.2 x 24, 11 x 22.5, 14.9 x 24, 16.9 x 24, and 11.2 x 38.
- Center the barricade in tower wheel track where tower auto-stop or tower auto-reverse switch is mounted.
- The portable barricade must be adequately staked down on all four corners to prevent barricade movement. Stake size will vary depending on soil type and field conditions. The minimum stake size is 1" x 36" with cap heads. ***The system warranty is void if the barricade is not adequately staked.***
- The stationary barricade channels must be set in concrete in a 10" diameter hole and 48" deep.
- The system must be kept properly aligned. changes in system alignment will vary the distance from the pivot point to wheel tracks. Severe misalignment may cause the tower to miss the barricade completely.

### **\*DISCLAIMER\***

***Reinke disclaims any and all liability (including any liability created pursuant to the Irrigation Systems Warranty) with regard to damage to the irrigation system, or to other property, or personal injury or death, caused by improper installation or maintenance of Reinke-supplied auto-reverse or auto-stop switches or tower barricades, or by use of customer-supplied barricades.***

## ***IV. Starting the System***

***Note: These starting instructions are for the RPM Standard Panel only. A separate manual has been provided if your system utilizes the RPM Advance, RPM Preferred Panel or RPM Preferred with Touch Technology.***

- If the system has just been installed; the generator or its direction of rotation been changed; or the power service has been worked on or changed; have your service person check the system for proper phasing.
- Knowing the functions of the various controls in the main control panel is necessary for the operation of your irrigation system. The system is electrically connected to your water supply so that if one fails the other will shut down. For this reason, you must coordinate the operation of the water supply and the System controls. The following procedures are for typical installations. If your installation is other than typical, consult your dealer or service person. See pages 49-51 for instructions on optional equipment.

1. Observe field and system conditions to be sure the system and system's path are clear of people and obstacles. See "System Safety" section at the beginning of this reinke system owners manual.
2. If you want to run water with the System, ensure the Electric Pump Control is enabled and safe to start as recommended by your pump manufacturer. Then turn Pump Panel Disconnect Switch to the "ON" position.
3. If your system utilizes an optional generator switch to control a combustion engine driven well and/or generator, turn the generator switch to the "START" position. Start the engine following all engine manufacturer's safety and operating instructions.
4. Turn main disconnect switch to the "ON" position.
5. Observe the voltage on the main control panel voltmeter. This meter should read 456-504 VAC, 60 HZ (380-420 VAC, 50 HZ) on 480 VAC Systems or 230-250 VAC, 60 HZ on 240 VAC systems. In no event should the operational voltage read outside these parameters.
6. Turn system power switch to the "ON" position.
7. Ensure "Safety OK" indicator light is on. If it is not on, the safety circuit is open. See "Safety OK" indicator light on page 21.
8. Turn water supply switch to the "ON" position if you want to run water with the system. Turn water supply switch to the "OFF" position if the system is to run dry.
9. If the system is equipped with an optional low pressure shut down, turn the pressure override switch to the "BYPASS" position .
10. When the system is equipped with the optional auto-stop cam plate option, it may be necessary to turn the park override switch to the "BYPASS" position until the system moves off the auto-stop ramp. See "Cam Plate Switches" on page 27.
11. If the system is equipped with the optional low temperature (frost) shutdown kit, turn the switch to the "AUTO" position for normal operation. This will ensure the system will shut down if the temperature falls below the temperature set on the frost control board on the back plate of the main control panel.

In no case should the system be operated with water in potential icing conditions. Set the switch to the “BYPASS” position if you want to move the system without pumping water through it at temperatures below 45°F.

12. Set the percent timer to desired speed. See speed chart in main control panel or “Speed Chart” on page 32.
13. Turn direction switch to desired direction. “FORWARD” = Clockwise and “REVERSE” = Counterclockwise. See “Direction Switch” on page 22.
14. Push start button and hold for three (3) seconds or less. You should hear the magnetic contactor engage (snap) and the system should start. If not, repeat step 14 and release the button. If another snap is heard, a malfunction is indicated. See “Start Button” on page 20. Do not hold the start button in for more than three (3) seconds as this will override the safety circuits.
15. If the system is equipped with an optional low pressure shut down, turn the pressure override switch to the “AUTO” position.
16. When the system utilizes an optional generator switch to control a combustion engine driven well or generator, turn the generator switch to “RUN” position.
17. If the system is interlinked with a chemigation pump or other auxiliary device, turn the chemigation/auxiliary switch to the “ON” position.
18. When the system is equipped with an optional end gun, turn the end gun switch to “RUN” if you desire to operate the end gun. Turn the switch to the “STOP” position if you do not desire to operate the end gun.
19. If your system is equipped with the optional auto-stop cam plate option, and you desire to park the system, set auto-stop ramp to desired location and turn park override switch to the “AUTO” position. See “Cam Plate Switches” on page 27.

## **About the Generator**

Reinke Mfg. Co., Inc. supplies compact generator models that are a suitable source of electrical power for an irrigation system. The generator is normally driven from the same engine as the well pump. The drive consists of a double V-belt arrangement. The generator can be mounted near the engine regardless of whether the engine is trailer-mounted or secured to a concrete base.

The generator voltage is controlled by the engine speed. The voltage should not fall below 456 or go above 504 Volts. This should correspond to a generator RPM of 1750 to 1825. The generator RPM for 60 HZ output is 1800 (1500 RPM for 50HZ output). ***In no event should the operational voltage read in excess of +5%.*** The generator pulley may initially be rotated either direction to generate power. ***Caution. If the generator rotation is ever reversed later, the system will be out-of-phase.*** Call your dealer or service person to correct the phasing problem if you plan to operate the generator while rotating it in the opposite direction.


***NOTE: The generator warranty requires that all combustion engines coupled to a generator, driving the system, must have a governor, a tachometer, and a safety load meter. The generator and system controls will be damaged by over or under engine speeding.***



## V. System Speed

A speed chart with an adhesive back is provided with each system. The information given on the chart has been specifically calculated for each particular installation. Two sets of numbers are given on this chart, the percent timer setting for various application amounts and the time it takes to complete one revolution at these settings. Place the sticker on the main control panel front where it can be referenced in the future.

### Speed Chart

 <b>REINKE</b> <b>IRRIGATION</b> <b>SYSTEMS</b> ®		<b>Reinke Manufacturing Co. Inc.</b> 101 Reinke Road P.O. Box 166 Deshler, Nebraska 68340 USA (402) 365-7251 www.reinke.com			
		System Serial No:		System Flowrate (gpm)	
Owner's Name:		System Press. (psi):		Dist. To End Tower (ft.):	
End (H) Tower Tire Size:		(H) Center Drive Spd:		(H) Speed @ 100% (fpm)	
		End Gun Model No:			
Water Application Depth (in):					
Percent Timer Setting 60 Hz.:					
Application Duration (hr : min):					
End Gun Trip Adjustment:					

The speed chart has been calculated for ideal conditions. Actual conditions may vary from chart accuracy. When the system is used to apply fertilizer or pesticides, a high level of accuracy is desirable. The operator can calculate speed chart data based on the actual performance of the system. Ask your dealer representative for assistance calculating the actual rotation time and the correct percent timer setting before you start.

The percent timer setting can be calculated using the following formula:

$$\% = \frac{\text{GPM} \times 320 \times W}{D \times L \times L \times S}$$

Where:

GPM = Gallons per minute supplied to the pivot.

W = distance from the pivot to the end wheel track in feet.

D = desired depth of water to be applied in inches.

L = length of the system coverage in feet.

S = speed of end tower in feet per minute.

“L”  
LENGTH OF THE SYSTEM

In most cases, the length of the system coverage varies because end gun sprinkler(s) are used in the corners only. Therefore, using an “L” value equal to the average coverage length will give the best results.

“S”  
GROUND TRAVEL SPEED

Ground travel speed is measured in feet per minute. Derive the speed from the following table on the next page.

## Reinke Center Drive Specification Chart

Reinke Part #	Description	Motor Label Color	Tire Size	Center Drive Ratio	Voltage (V AC)	Center Drive		Wheel Gear Ratio	Ground Speed (ft/min)		Hours/Revolution @ 100% (60 HZ)			
						Output RPM	50 HZ		60 HZ	50 HZ	Distance to End Tower			
											939 ft (286 m)	1095 ft (334 m)	1251 ft (381 m)	1407 ft (429 m)
117772	Low Speed	Red	11 x 22.5	60:1	480	29	24	50:1	6.66	5.55	14.8 Hours	17.2 Hours	19.7 Hours	22.1 Hours
117772	Low Speed	Red	11.2 x 24	60:1	480	29	24	50:1	6.26	5.22	15.7 Hours	18.3 Hours	20.9 Hours	23.5 Hours
117772	Low Speed	Red	14.9 x 24	60:1	480	29	24	50:1	7.18	5.98	13.7 Hours	16.0 Hours	18.2 Hours	20.5 Hours
117772	Low Speed	Red	16.9 x 24	60:1	480	29	24	50:1	7.52	6.27	13.0 Hours	15.3 Hours	17.4 Hours	19.6 Hours
117772	Low Speed	Red	11.2 x 38	60:1	480	29	24	50:1	8.35	6.96	11.8 Hours	13.7 Hours	15.7 Hours	17.7 Hours
112255	Standard Speed	Blue	11 x 22.5	40:1	480	44	35	50:1	9.98	8.32	9.9 Hours	11.5 Hours	13.1 Hours	14.8 Hours
112255	Standard Speed	Blue	11.2 x 24	40:1	480	44	35	50:1	9.38	7.82	10.5 Hours	12.2 Hours	14.0 Hours	15.7 Hours
112255	Standard Speed	Blue	14.9 x 24	40:1	480	44	35	50:1	10.76	8.97	9.1 Hours	10.7 Hours	12.2 Hours	13.7 Hours
112255	Standard Speed	Blue	16.9 x 24	40:1	480	44	35	50:1	11.27	9.39	8.7 Hours	10.2 Hours	11.6 Hours	13.1 Hours
112255	Standard Speed	Blue	11.2 x 38	40:1	480	44	35	50:1	12.51	10.43	7.9 Hours	9.2 Hours	10.5 Hours	11.8 Hours
117769	High Speed	Black	11 x 22.5	25:1	480	68	56	50:1	15.97	13.31	6.2 Hours	7.2 Hours	8.2 Hours	9.2 Hours
117769	High Speed	Black	11.2 x 24	25:1	480	68	56	50:1	15.01	12.51	6.6 Hours	7.6 Hours	8.7 Hours	9.8 Hours
117769	High Speed	Black	14.9 x 24	25:1	480	68	56	50:1	17.22	14.35	5.7 Hours	6.7 Hours	7.6 Hours	8.6 Hours
117769	High Speed	Black	16.9 x 24	25:1	480	68	56	50:1	18.03	15.03	5.5 Hours	6.4 Hours	7.3 Hours	8.2 Hours
117769	High Speed	Black	11.2 x 38	25:1	480	68	56	50:1	20.01	16.68	4.9 Hours	5.7 Hours	6.6 Hours	7.4 Hours
112557/112257	Standard Speed	N/A	11 x 22.5	80:1	230	21	N/A	50:1	5.00	N/A	19.7 Hours	22.9 Hours	N/A	N/A
112557/112257	Standard Speed	N/A	11.2 x 24	80:1	230	21	N/A	50:1	4.70	N/A	20.9 Hours	24.4 Hours	N/A	N/A
112557/112257	Standard Speed	N/A	14.9 x 24	80:1	230	21	N/A	50:1	5.40	N/A	18.2 Hours	21.3 Hours	N/A	N/A
112557/112257	Standard Speed	N/A	16.9 x 24	80:1	230	21	N/A	50:1	5.05	N/A	17.4 Hours	20.3 Hours	N/A	N/A
112557/112257	Standard Speed	N/A	11.2 x 38	80:1	230	21	N/A	50:1	6.27	N/A	15.7 Hours	18.3 Hours	N/A	N/A

For 50 Hz electrical service increase Hrs/Rev by a factor of 1.2 (Example: 14.8 x 1.2 = 17.76 hrs)

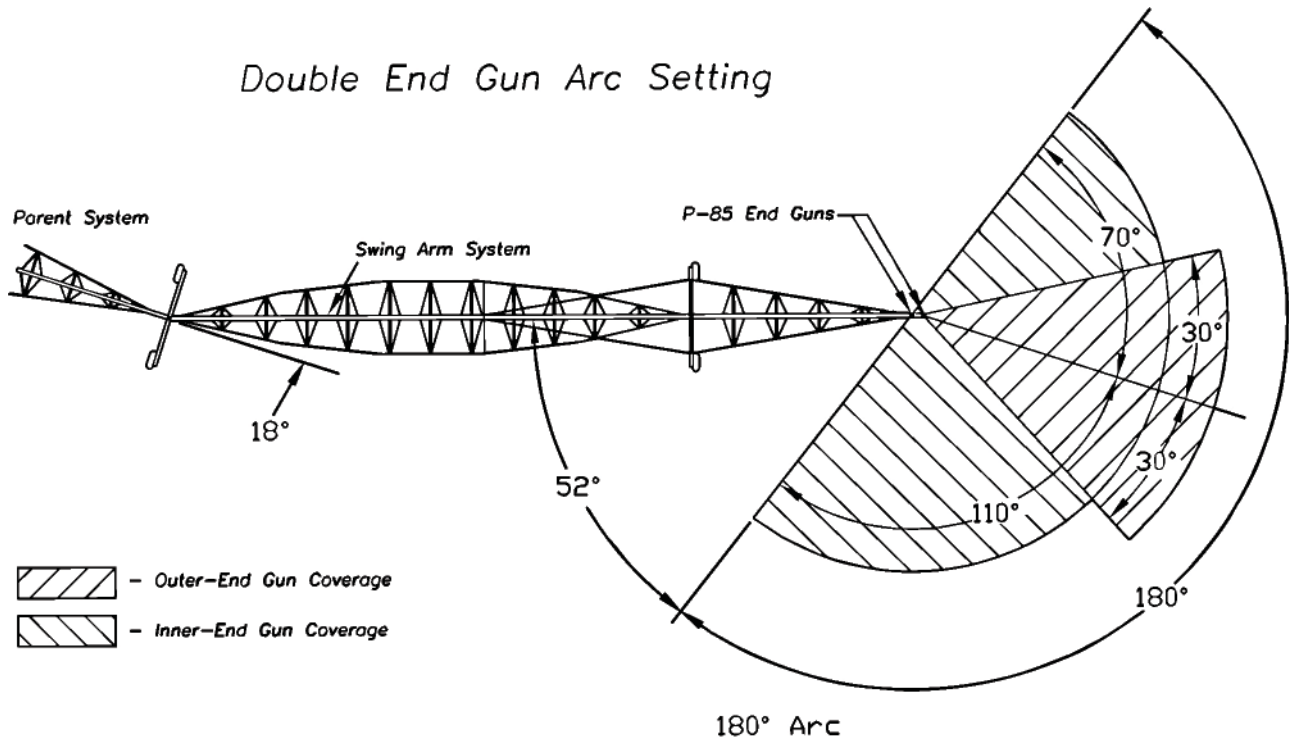
Hours per revolution at 100% = (.105) (System Length, pivot to last tower)

Speed (ft / minute)

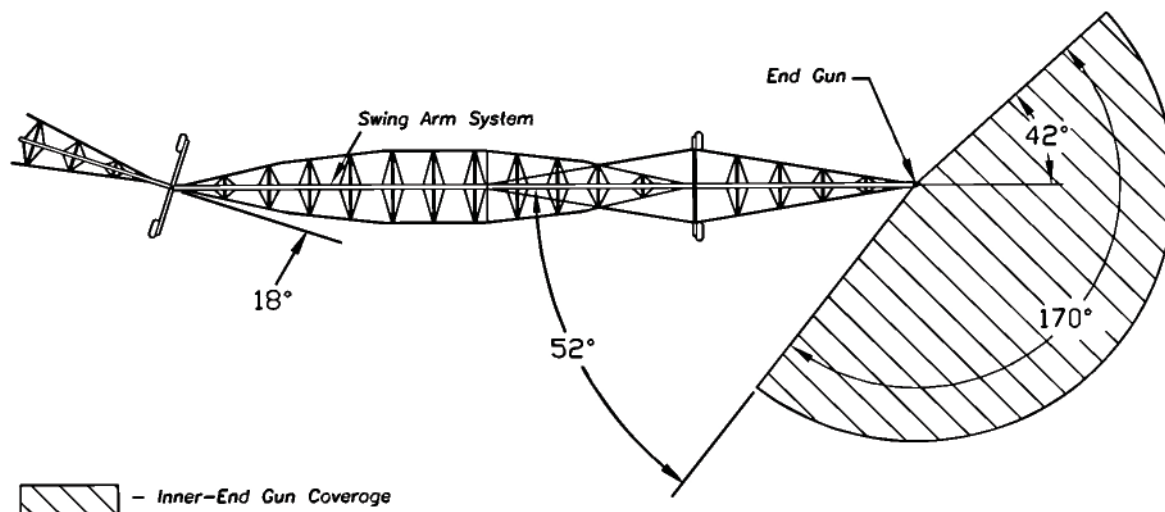
# **VI. Swing Arm Corner System**

## **A. End Gun Settings**

*Double End Gun Arc Setting*

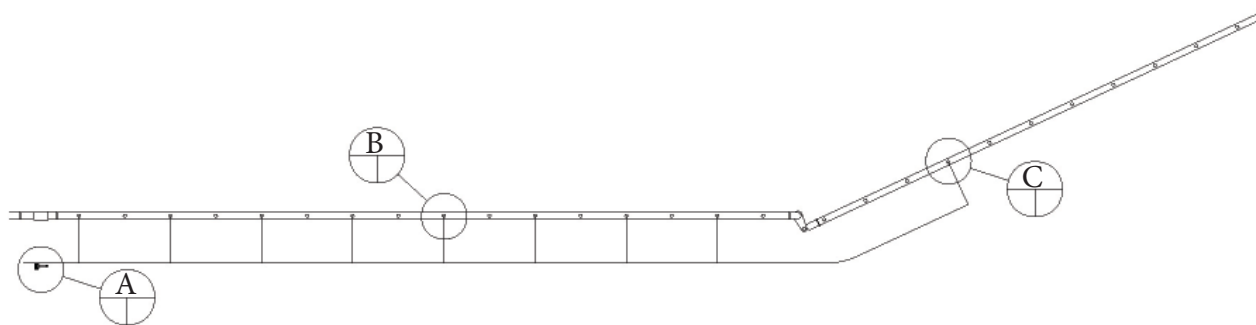


*Single End Gun Arc Setting*

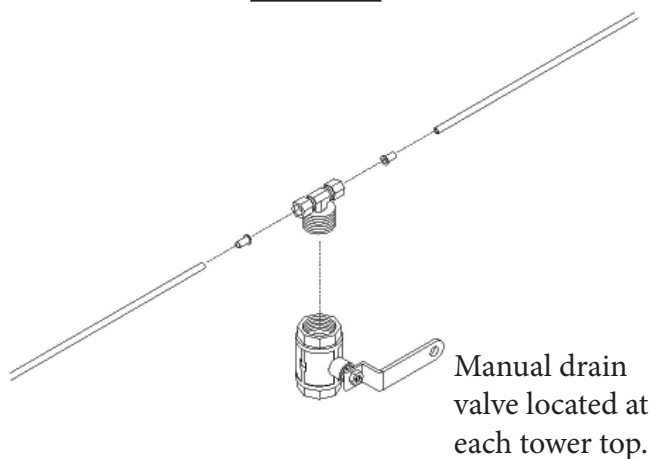




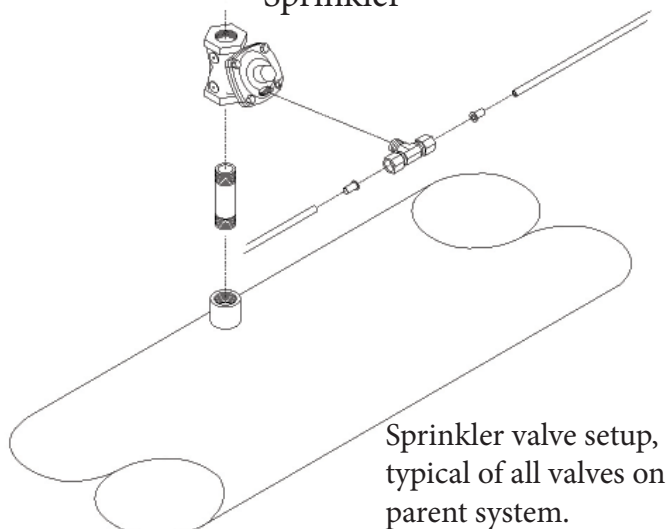
## B. Energy Saver Package Option - ESP



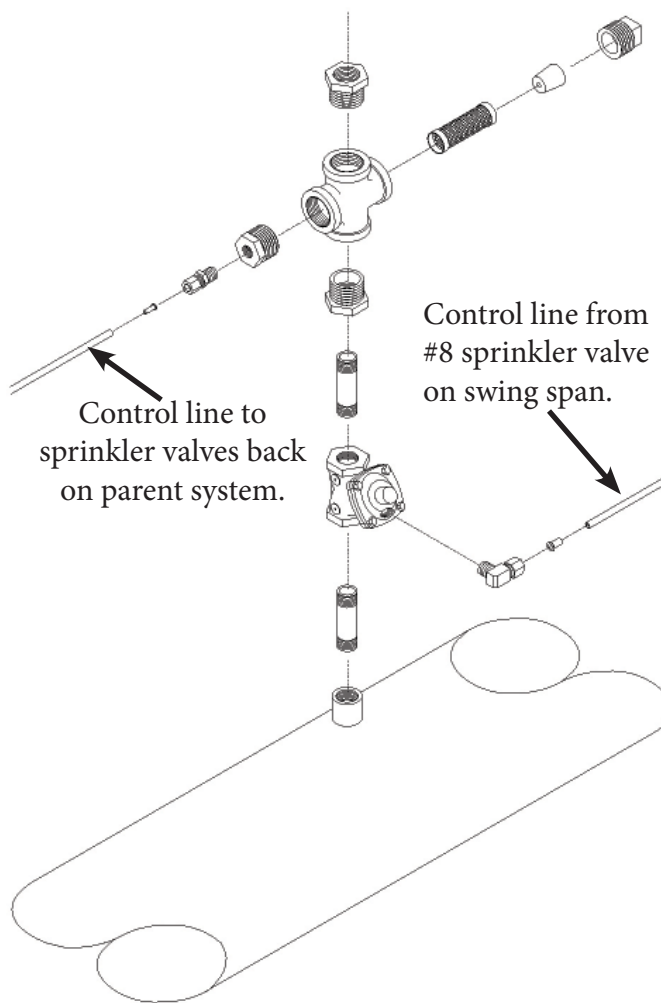
**Detail A**



**Detail B**  
**Sprinkler**



**Detail C**  
**Sprinkler**



## ***C. Additional Maintenance for SAC Systems***

Check the sprinklers to make sure they are operating properly. When the system enters the corner, the swing span starts to steer out. This steering motion activates the sprinkler cams. There are seven cam steps in all, each activated by the steering of the swing span. If further details are required please contact a Reinke dealer.

## **VII. Towable Options**

### **Towing Tips:**

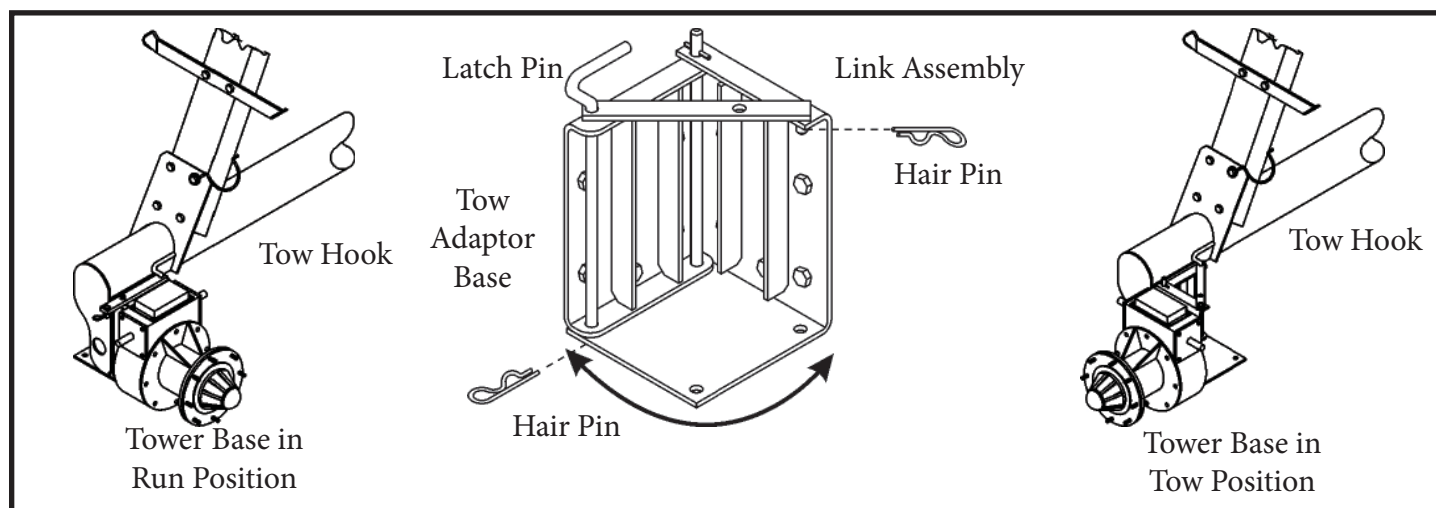
- ***Pull - DO NOT push system.***
- The tow lane should be as smooth and uniform as possible.
- Avoid pulling the system through ditches or over terraces.
- Do not attempt to tow the system down an incline if it is steep enough to allow the system to push the tractor. This situation can collapse the first span and endanger the tow vehicle operator.
- Towing the system at an excessive speed or hard, abrupt braking can have the same effect. When coming to a stop, gradually slow the tow vehicle. The system has momentum that can cause structural damages when halted abruptly.
- Maximum recommended towing speed is two miles per hour.
- An assistant watching the opposite end of the System while towing is also required.
- When reverse towing reverse tow systems; use a tractor that has a cab or roll bar that conforms to roll over protection standards.

### **Towing Precautions:**

***Position the system so it lines up with the intended towpath. Turn “OFF” and “LOCK” the main control panel disconnect switch and all junction box disconnect switches before the main control panel. Disconnect electrical service to system and detach ground wire from ground rod. We suggest beginning preparation for towing at the end tower. When towing the system is complete, reverse the steps and return the towers to the run position. Reconnect electrical service to system and attach ground wire to ground rod. The following are specific instructions for different system configurations.***

### **A. Forward Tow System**

At each tower, lift and turn each wheel into the tow position. This is done by positioning a jack underneath a piece of channel iron under the leg plate at the tower base end. Raise the tower one end at a time. Do not lift or jack any tower base from the center. Loosen the drive shaft from the gear. Place drive shaft in tow hook, remove the hair pins from the latch pin and link assembly. Remove latch pin by pulling upwards on the handle. Also, remove link assembly. Next, rotate the wheel into the tow position. Reposition link assembly so the shaft on the link assembly fits into the tow adaptor plate. Replace latch pin through link assembly and tow adaptor base. Replace hair pins into both the latch pin and shaft on the link assembly. See diagrams below.

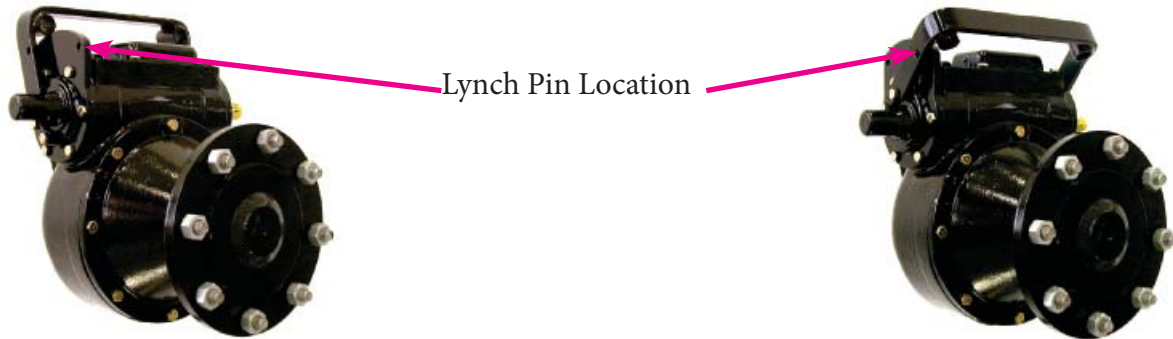


Before lowering the tower base, remove the lynch pin securing the gearbox handle on the wheel gearbox as pictured below. To disengage, or place in tow position, rotate handle assembly toward system gear mount. Due to space confinements, a piece of pipe has been welded on gear handle in case extra leverage is necessary. Replace lynch pin in handle assembly. Be sure the wheel turns freely before lowering tower base. See pictures below.

**Important: Failure to disengage the wheel gearbox can cause severe damage to the System.**

Disengaged

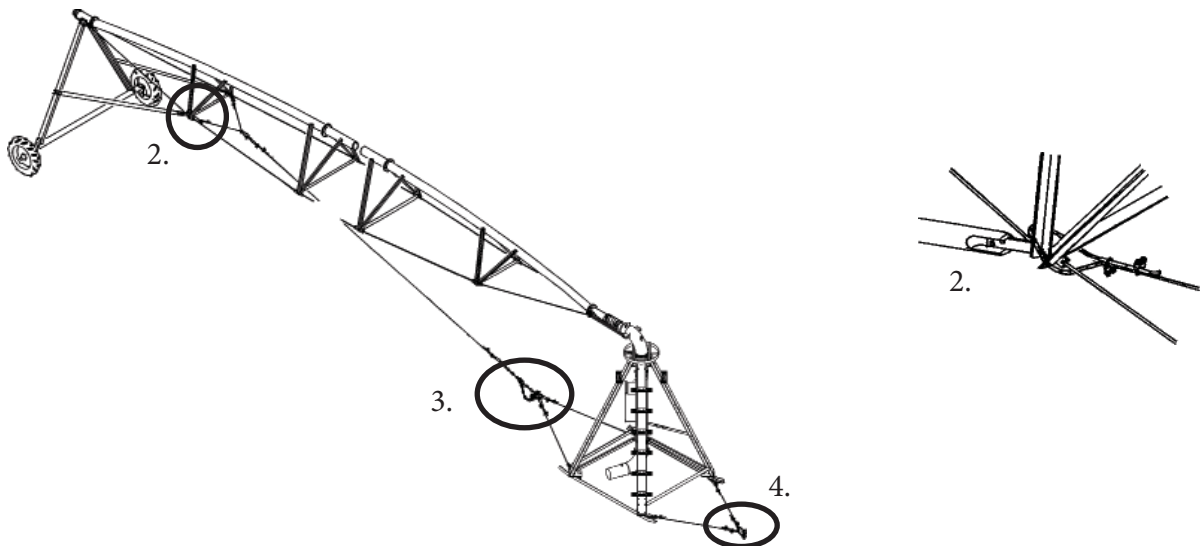
Engaged



Tow Position

Run Position

## **1. Towing a Standard Tow system with Pivot Skids**



1. Make sure main control panel disconnect switch and all disconnect switches before the main control panel are in the "OFF" position. Disconnect the water and electrical supply to the pivot and remove the ground rod connection.

2. Hook the slip hook on one end of the 3/8" tow cable (length of this cable varies to the length of the span) in the loop of the cables attached to the truss.

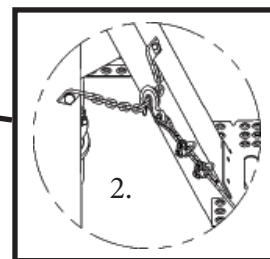
***Make sure the cables are attached to the inside of the truss.***

3. Hook the grab hook through the clevis on the tow cables attached to the pivot skids. Remove as much slack as possible. Using a large screwdriver, aligning punch, or other tool, "jack" the chain so the cable is tight as possible. Move the hook on the chain so the cable will remain tight.

4. Place the clevis through the two tow cable loops. Release the pivot from the pad by unfastening the four anchor chains.

## 2. Towing a Standard Tow system with 4 Wheel Pivot Mover

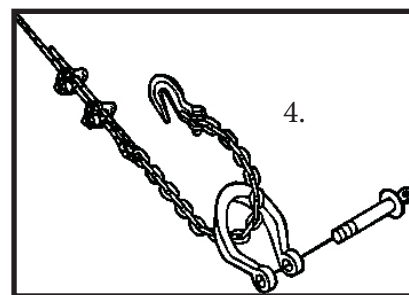
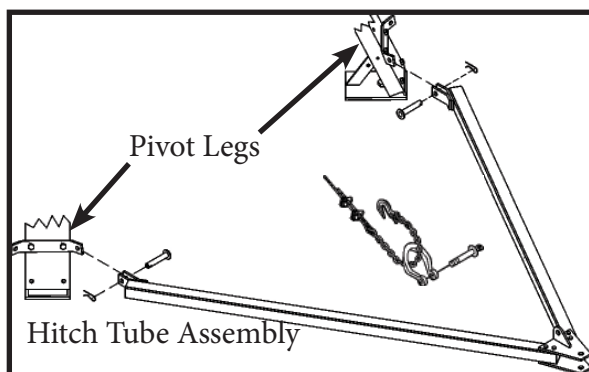
1. Make sure main control panel disconnect switch and all disconnect switches before the main control panel are in the “off” position. Disconnect the water and electrical supply to the pivot and remove the ground rod connection.



Hitch Tube Assembly

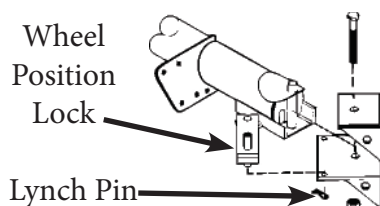
2. Hook the cable assembly in the center of the chain attached to the pivot center.

3. Attach hitch tube assembly to the hinge mounted on the bottom of the pivot legs.



4. Place the cable assembly chain through the clevis. Attach the clevis to the eye in the top plate of the hitch. The cable assembly should have slack in it. This will provide support when towing and still allow the pivot to cross uneven terrain.

If it is desired to tow the system perpendicular to the 4 wheel pivot mover bases, the hitch assembly will need to be moved accordingly. To rotate the gear mounts, lift the corner of the 4 wheel pivot mover base. Remove the lynch pin and lift wheel position link that secures the gear mount. Rotate the gear mounts and replace the lynch pin and lift wheel position link. If 4 wheel pivot mover needs to be spun onto pivot path, the gear mounts can be set at 45° to allow 4 wheel pivot mover to accomplish this. See illustration below.



RPM Operator's Manual



5. Loosen the anchor chains or turnbuckles from the pivot skids. (See instructions below for details.)

Reinke Manufacturing recommends pivot pad be 5-1/2" above grade to allow 4 wheel pivot mover to rest on skids allowing the tires to come slightly off the ground. (See figure A) The 4 wheel pivot mover should be secured to pivot pad with (2) 1/2" x 16" anchor chains in each corner of pivot pad.

If pivot pad is level with grade, Reinke Manufacturing requires turnbuckle package (P/N 392308). (See figure B)

**Pivot Pad 5-1/2" Above Ground Level**  
*Recommended*

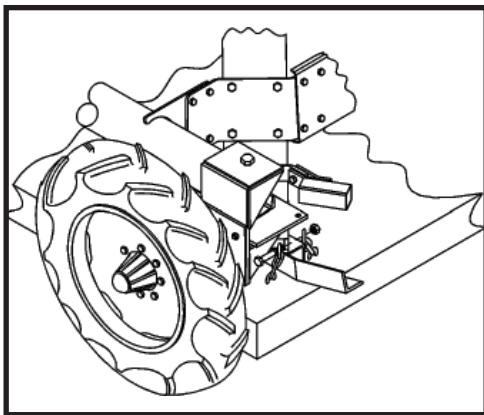


figure A

**Pivot Pad Level with Ground**  
*(Optional)*

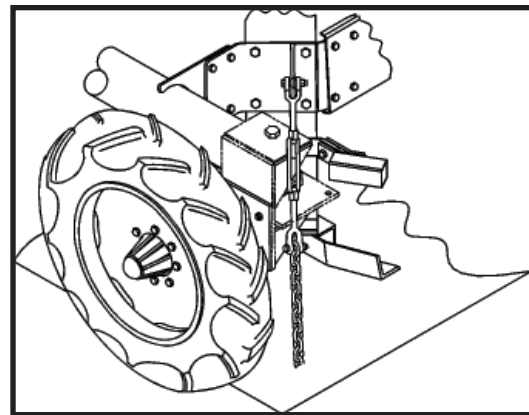
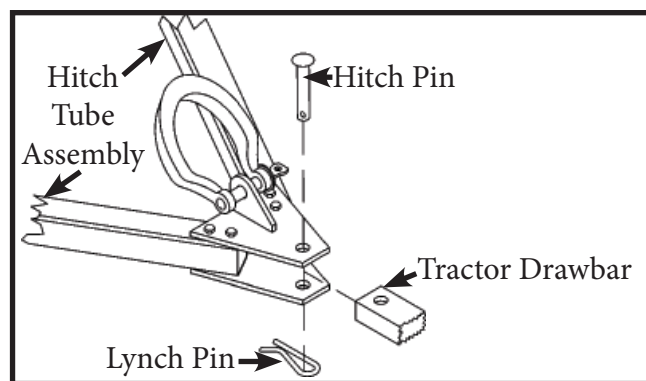


figure B

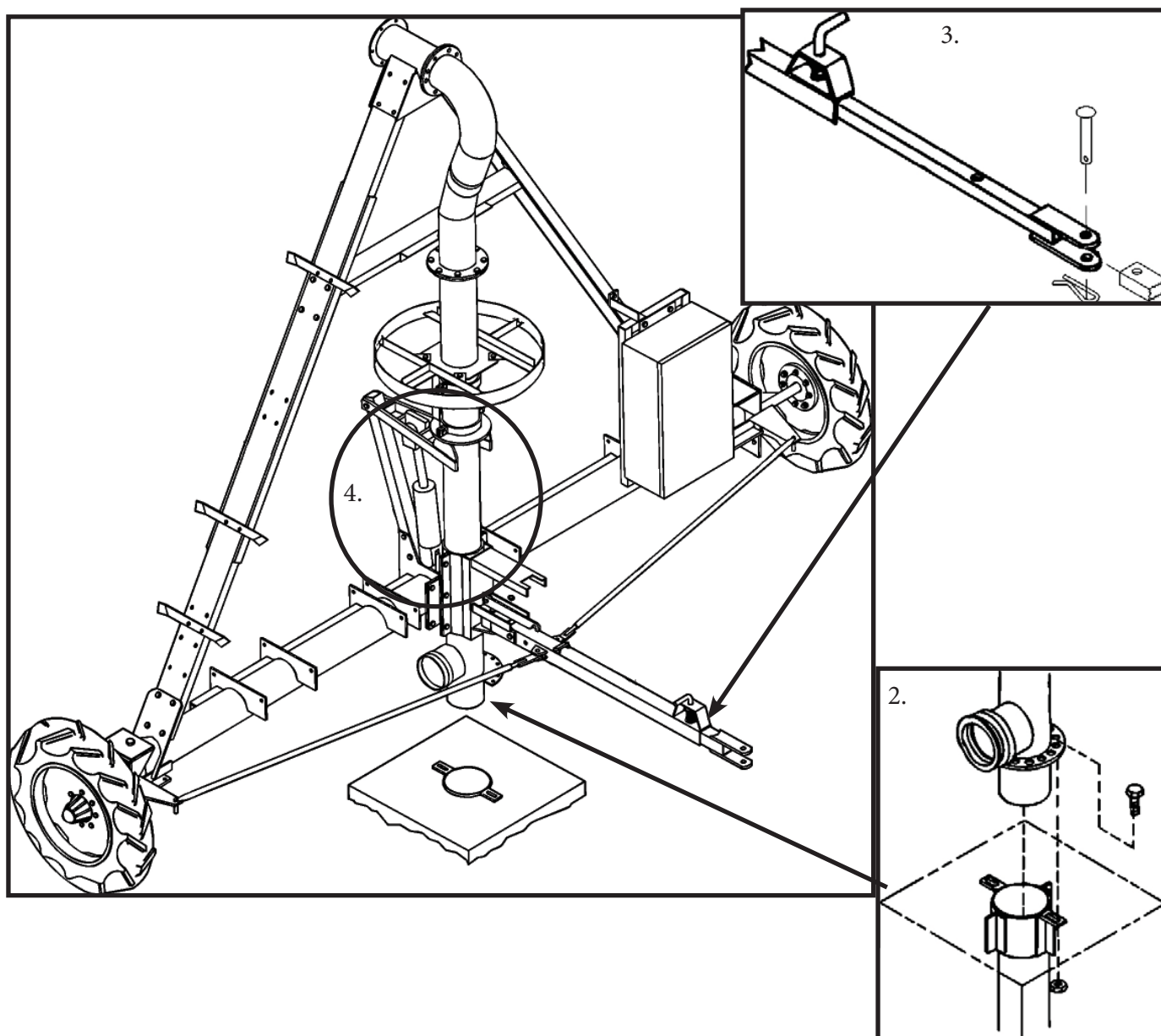
6. Connect the hitch to the tractor drawbar using a 3/4" minimum diameter hitch pin.



**Note:** *The front wheels of the 4 wheel pivot mover will come off the ground when towing. This is normal and will allow the system to be maneuvered easier.*

### **3. Towing a Standard Tow with a Kwik Tow Pivot Center**

1. Make sure main control panel disconnect switch and all disconnect switches before the main control panel are in the “OFF” position. Disconnect the water and electrical supply to the pivot and remove the ground rod connection.
2. Remove the two 1/2” x 1-1/2” Bolts securing the Movable Pipe and Mounting Assembly to the Pivot Anchor.
3. Lower the hitch assembly into position. Lift up on securement pin and slide tongue out to connect to tractor drawbar. Connect the hitch to the tractor drawbar using a 3/4” minimum diameter hitch pin. Back up tractor to latch securement pin.
4. Grease the fittings on the movable pipe and mounting assembly. Lift the movable pipe with a hydraulic cylinder (not supplied-see next page).

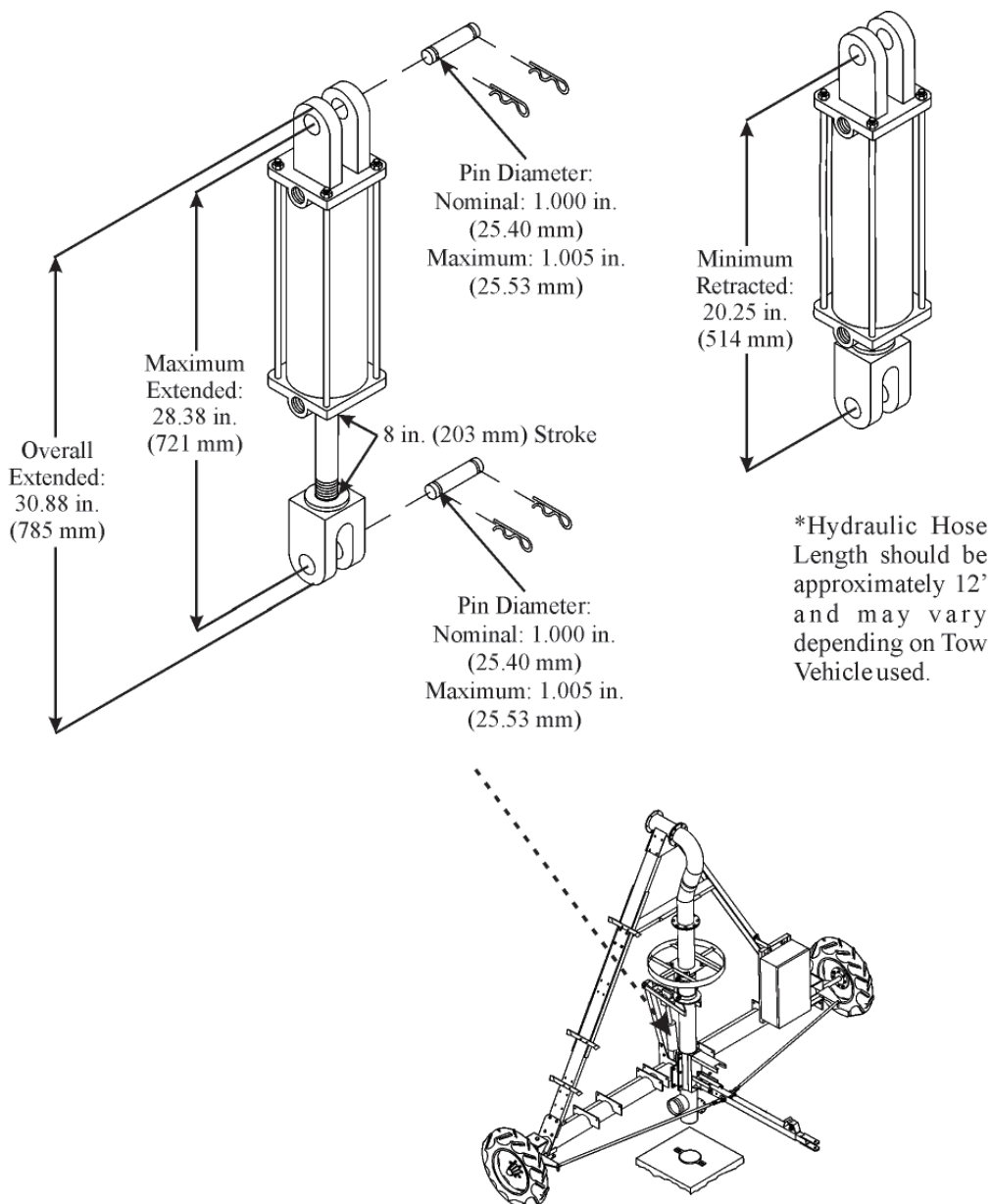


The Kwik Tow Pivot Assembly does not include the hydraulic cylinder. However, Reinke Part # 115350 can be ordered to fit this application or any standard agricultural hydraulic cylinder with an 8 inch stroke can be used. In situations where a standard agricultural hydraulic cylinder with an 8 inch stroke is unavailable or not compatible, any cylinder matching the specifications below can be used.

### General Specifications - Reinke Part # 115350 -Hydraulic Cylinder

8 inch (203 mm) stroke with 3 inch (76 mm) piston

- Includes pins and clips illustrated below

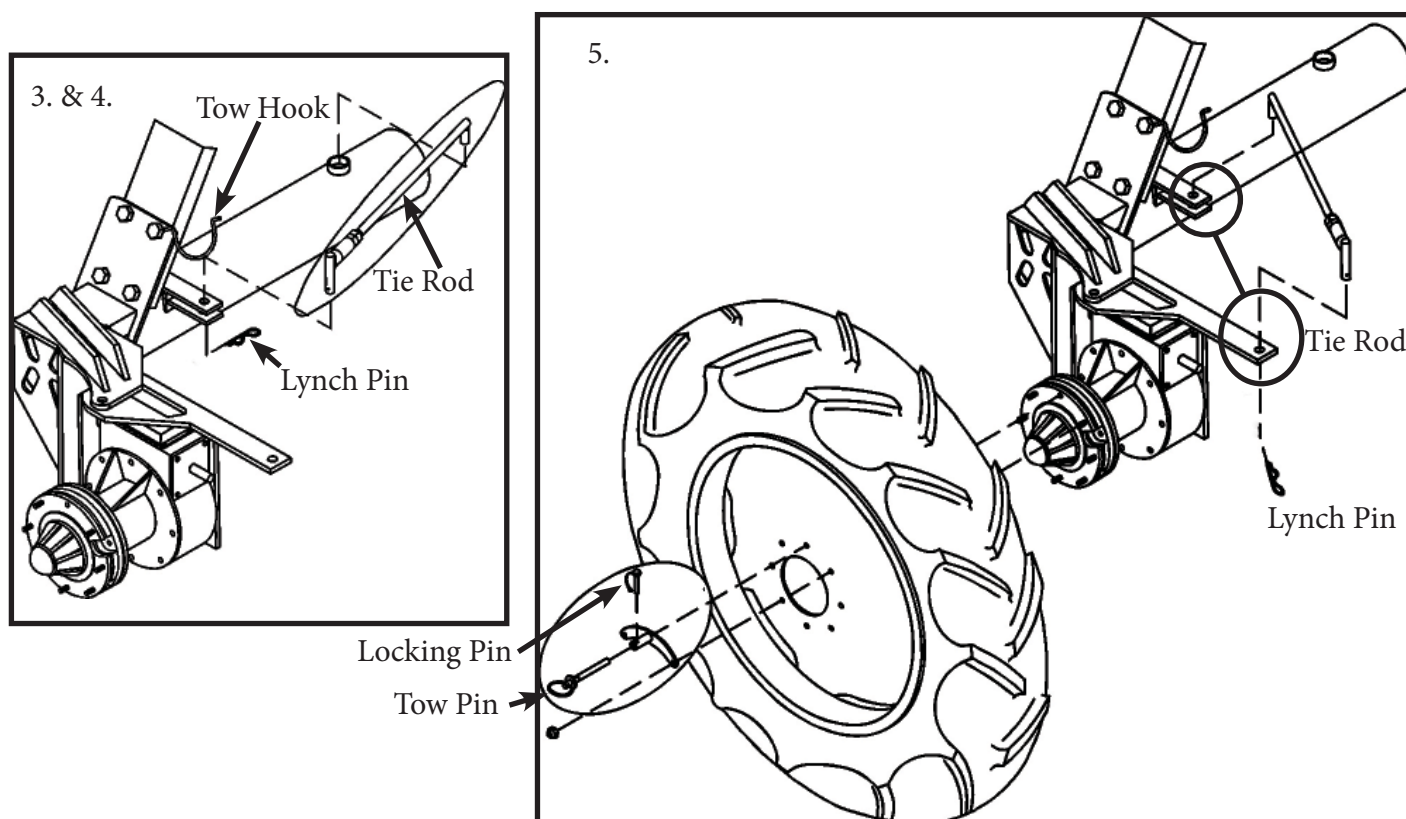


## **B. Reverse Tow System Instructions**

### **Reverse Tow Systems only**

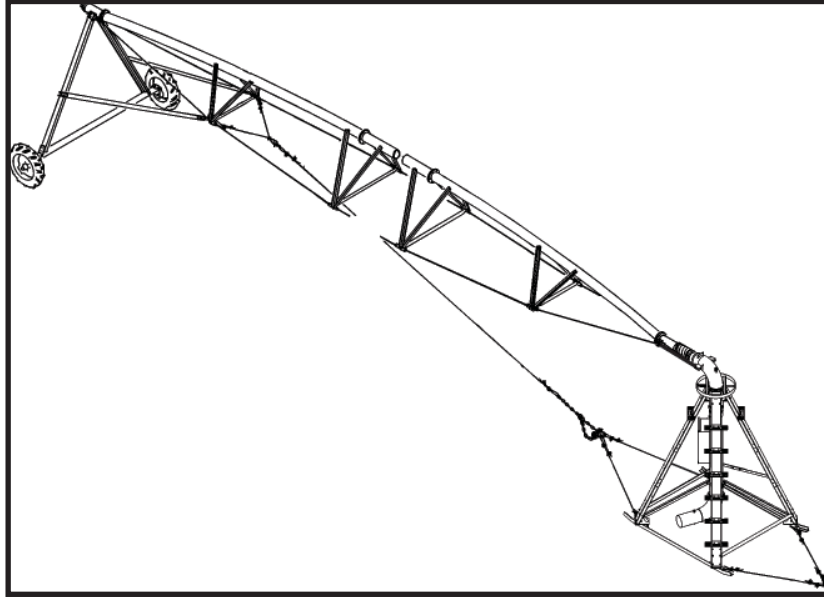
#### **1. Forward Towing a Reverse Tow System**

1. Position a jack underneath the channel at the tower base end. Raise the tower one end at a time. Do not lift or jack the tower base from the center.
2. Remove the drive shaft from the wheel gear. Place the drive shaft in the tow hook located above the tower base on the tower leg. (See illustration below.) This will secure the drive shaft, preventing damage during the towing process.
3. Remove the lynch pin from the tie rod located in the holes on the tower base. Remove tie rod. (See illustration below.)
4. At each tower, rotate each gear mount into the tow position. (See illustration below.) Place one end of the tie rod in the end hole of the gear mount and the other in the ear welded on the tower base. You may need to adjust the length of the tie rods for proper alignment.
5. Before lowering the tower base, remove the locking pin securing the tow pin in the wheel hub. Pull the tow pin out of the wheel hub. While the tow pin is still in the bracket, replace the locking pin. Wheel should now turn freely. Failure to disengage the wheel can cause severe damage to the system. (See illustration below.)



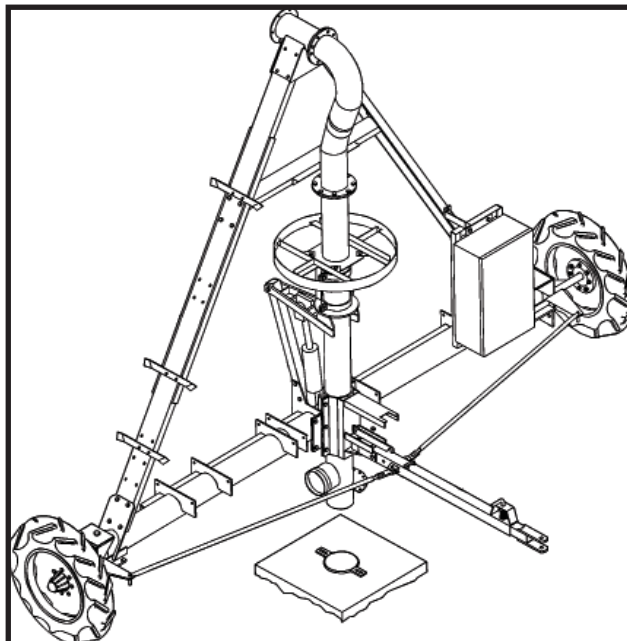
**a. Forward Towing a Reverse Tow System  
with Pivot Skids**

With the exception of rotating the intermediate tower wheels into the towing position (see previous page), this procedure is the same as forward towing a standard tow system with pivot skids. (See page 38.)



**b. Forward Towing a Reverse Tow System  
with a Kwik Tow Pivot Center**

With the exception of rotating the intermediate tower wheels into the towing position (see previous page), this procedure is the same as forward towing a standard tow system with a kwik tow pivot center. (See pages 41-42.)

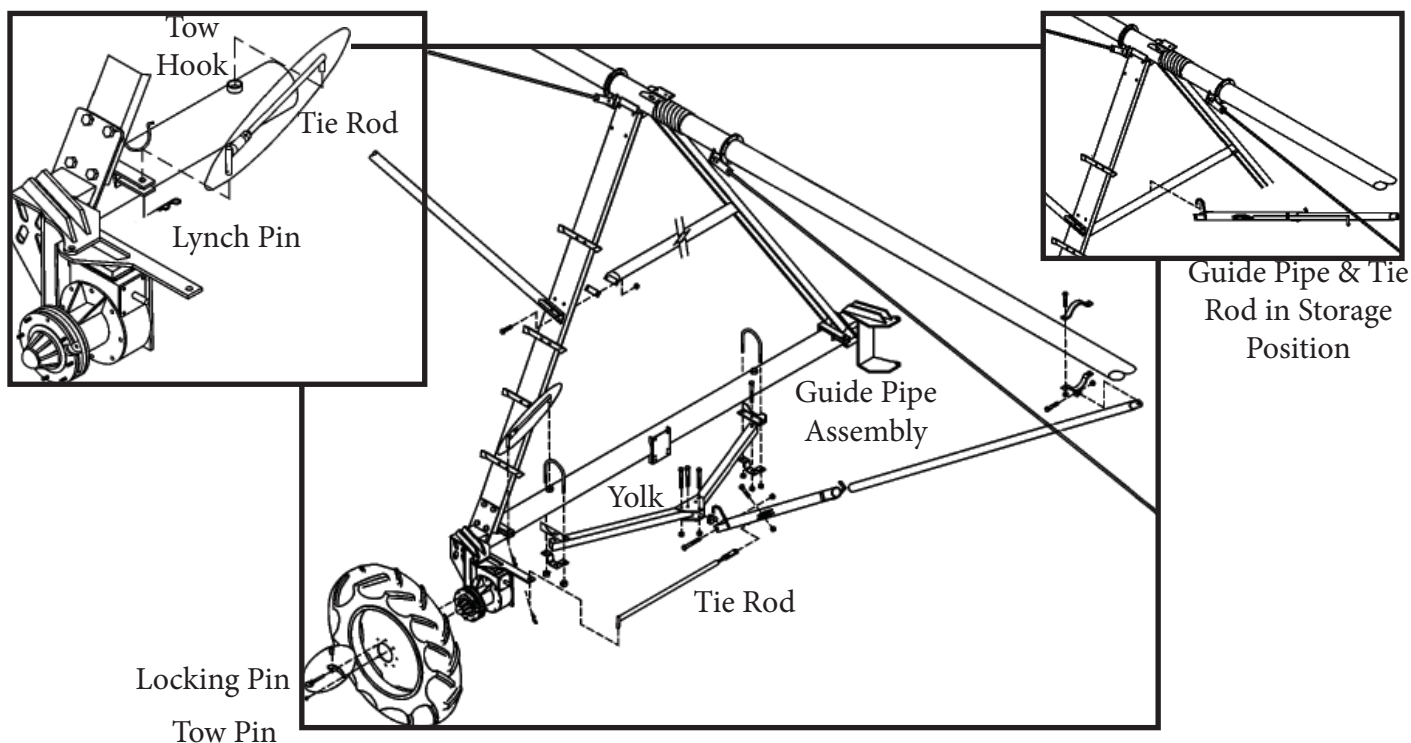




## **2. Reverse Tow a Reverse Tow System**

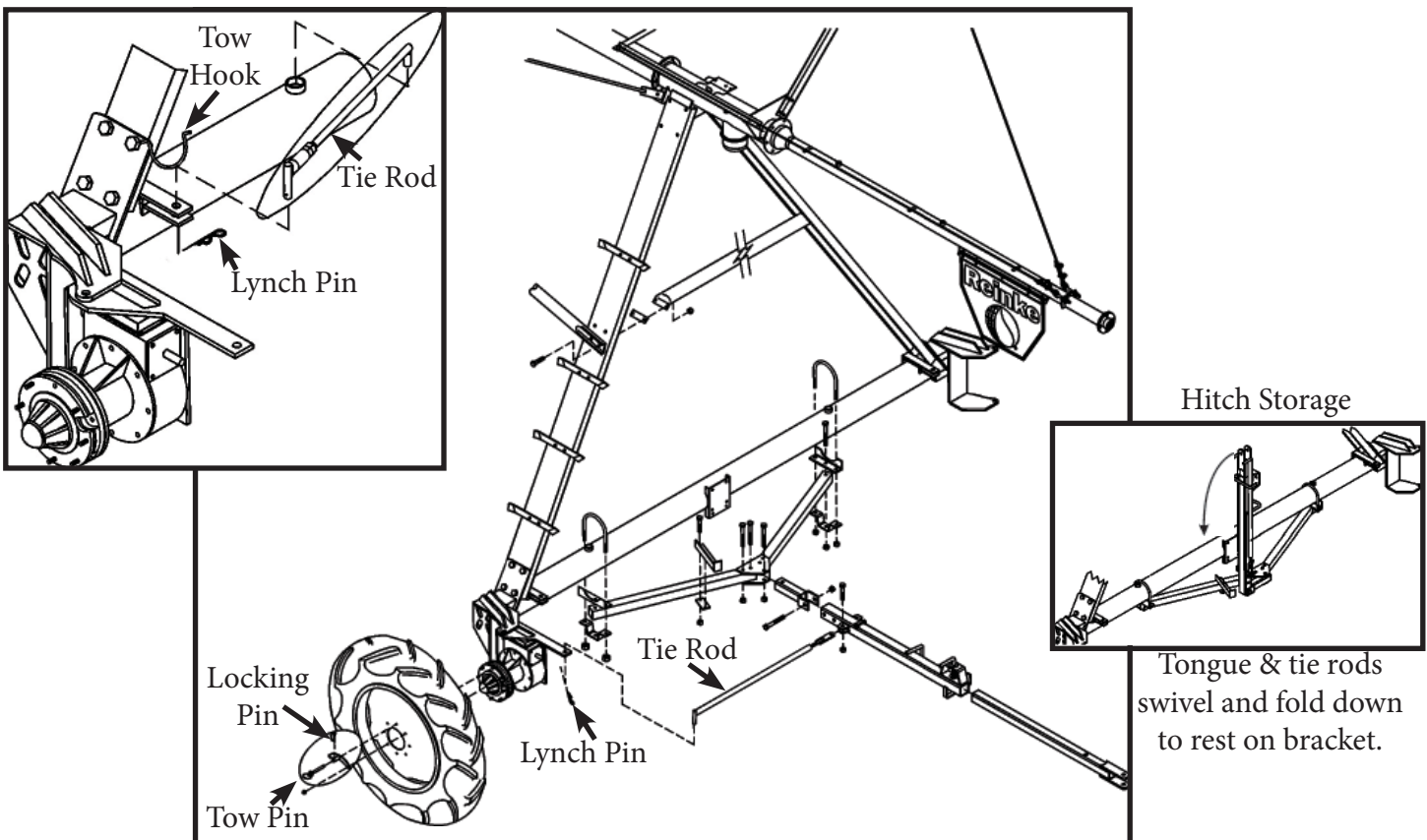
### **a. Setting up Intermediate Reverse Tow Tower**

1. Position a jack underneath the channel at the tower base end. Raise the tower one end at a time. Do not lift or jack the tower base from the center.
2. Remove the drive shaft from the wheel gear. Place the drive shaft in the tow hook located above the tower base on the tower leg. (See illustration below.) This will secure the drive shaft, preventing damage during the towing process.
3. Remove the lynch pin from the tie rod located in the holes on the tower base. Remove tie rod. (See illustration below.)
4. At each tower, rotate each gear mount into the tow position. Place one end of the tie rod in the hole in tower base and the other in the ear welded on the tower base. You may need to adjust the length of the tie rods for proper fit. (See illustration below.)
5. Before lowering the tower base, remove the locking pin securing the tow pin in the wheel hub. Pull the tow pin out of the wheel hub. While the tow pin is still in the bracket, replace the locking pin. Wheel should now turn freely. Failure to disengage the wheel can cause severe damage to the system. (See illustration below.)
6. Lower the guide pipe assembly from its storage position on the tower cross brace. Attach the guide pipe to the yoke assembly. Hinge the tow rods and place the ends in the outer hole on the reverse tow gear mount. (See illustration below.)



### **b. Setting up End Reverse Tow Tower**

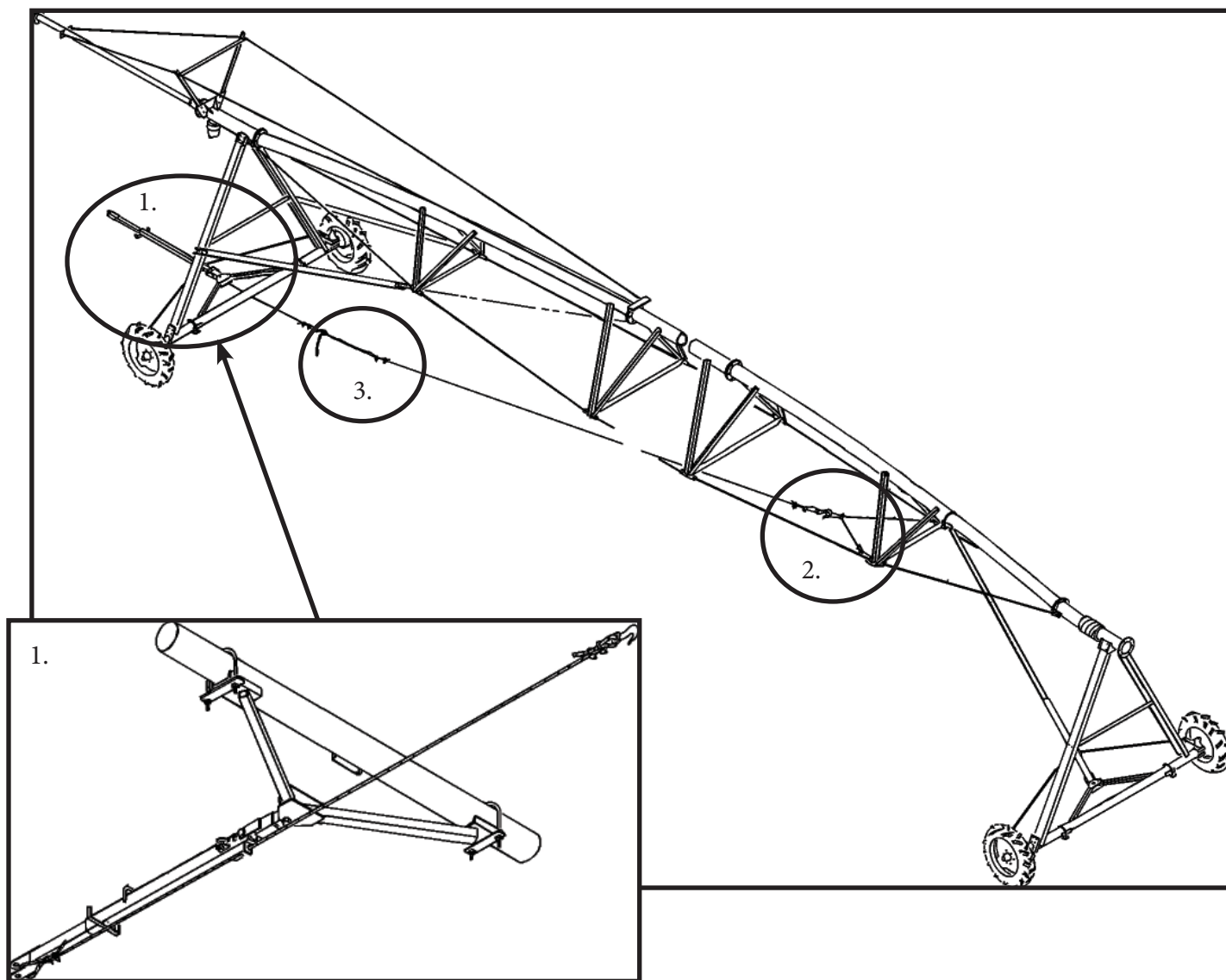
1. Position a jack underneath the channel at the tower base end. Raise the tower one end at a time. Do not lift or jack the tower base from the center.
2. Remove the drive shaft from the wheel gear. Place the drive shaft in the tow hook located above the tower base on the tower leg. (See illustration below.) This will secure the drive shaft, preventing damage during the towing process.
3. Remove the lynch pin from the tie rod located in the holes on the tower base. Remove tie rod. (See illustration below.)
4. At each tower, rotate each gear mount into the tow position. Place one end of the tie rod in the hole in tower base and the other in the ear welded on the tower base. You may need to adjust the length of the tie rods for proper fit. (See illustration below.)
5. Before lowering the tower base, remove the locking pin securing the tow pin in the wheel hub. Pull the tow pin out of the wheel hub. While the tow pin is still in the bracket, replace the locking pin. Wheel should now turn freely. Failure to disengage the wheel can cause severe damage to the system. (See illustration below.)
6. On the end tower, swivel the hitch tongue assembly down to the tow position.



### **c. Installing Tow Cable on Reverse Tow Systems**

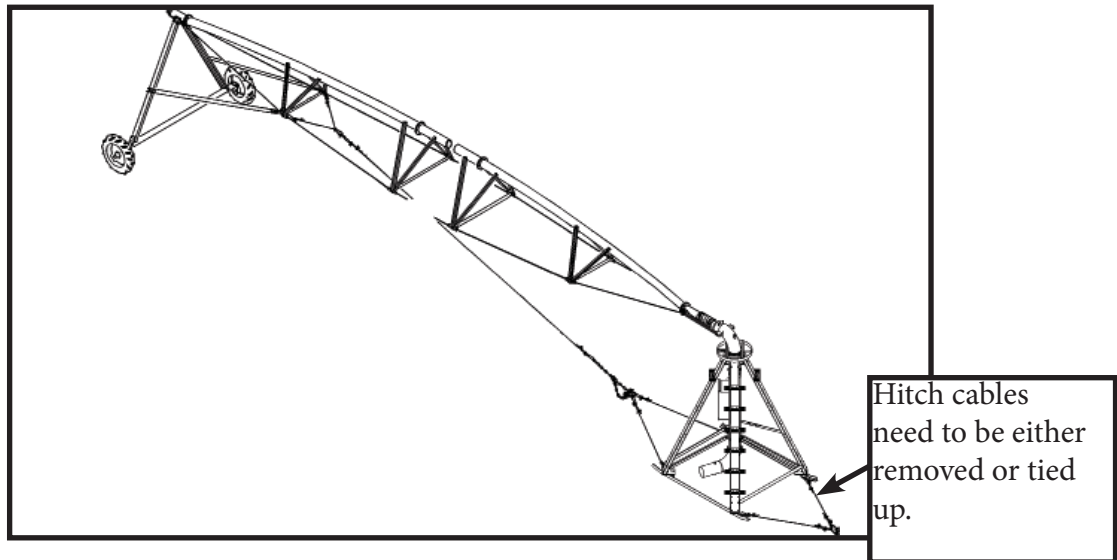
*Note: Systems longer than 660' or if the last Span is 175' or longer, tow cables must be assembled to the last span!*

1. Loop the Tongue cable around the end of the tongue. (See illustration below.)
2. Hook the tow cable in the loop of the tow cable truss assembly.
3. Attach the tongue cable to the tow cable. Using two people, pull the tow cable tight as possible.



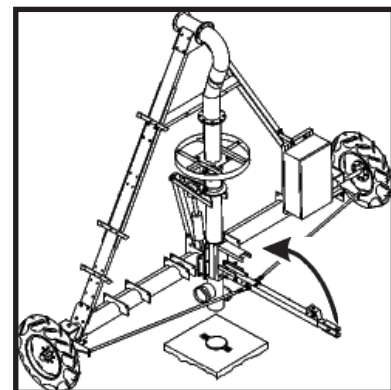
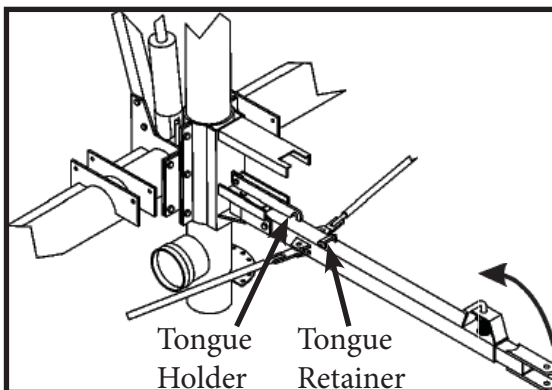
**d. Reverse Towing a Reverse Tow System with Pivot Skids**

Setup end and intermediate towers into the towing position. (See pages 45-46.) Setting up pivot center with skids is the same procedure as forward towing a standard tow system with pivot skids, only the hitch cables will not be needed. (See illustration below.)



**e. Reverse Towing a Reverse Tow System with Kwik Tow**

Setup end and intermediate towers into the towing position. (See pages 45-46.) Setting up kwik tow pivot is the same procedure as forward towing a standard tow system with a kwik tow pivot, only the hitch will need to be secured in the up position. Rotate hitch up and secure with tongue latch. (See illustration below.)



# VIII. Other Options

## A. Disconnecting Span

This option allows one person to disconnect and reconnect spans from the system. This enables the system to continue operating through the remainder of the field, leaving the unused tower(s) behind. Use the following instructions when disconnecting a span.



**WARNING!!! DO NOT attempt to disconnect or reconnect disconnecting span until the reinke main control panel disconnect switch and all pump disconnect switches are locked in the “OFF” position.**

1. Remove pin and lower leg stands. Replace pin to secure leg stands.
2. Disconnect the span cable receptacle connection typically located below the tower control box and plug into empty receptacle on disconnected span. Remove control rods.
3. Separate the drop pipes and insert the provided plug in the drop pipe on the tower side.
4. A winch (optional) or other device is used to lift the hook joint out of the receiver joint and lower the span. To lower or lift the span without the winch option, you will need equipment capable of lifting 2,500 pounds and something to support the disconnected span while not in operation.
5. Detach the Cable from the Hook Joint.
6. Switch the A/C toggle switch on the tower control box at the disconnected span to “C” (end tower). When disconnected span is reconnected, switch the A/C toggle switch on the tower control box located at the disconnected span; to “A” (intermediate tower).



7. This process is reversed when the span is reconnected. The system can be aligned by turning off all barriers in rpm preferred and advanced main control panels. Allow the auto-stop switch on the top of the disconnecting span, shut the system down for reconnecting.





## **B. Chemical Injection**

A flush time of at least ten minutes is typically recommended for center pivot systems. However, longer and low gallonage systems will require additional flush times. Allowance must also be made if the well and injection pump are not located at the pivot. A rough estimate for center pivot systems is one minute of flush time for each 100 feet of the center pivot system and mainline pipe. **THE SYSTEM WARRANTY IS VOID IF IT IS NOT FLUSHED AND MAINTAINED PROPERLY. CHECK AND ABIDE BY ALL LOCAL, STATE, AND FEDERAL LAWS AND REGULATIONS WHEN UTILIZING CHEMICAL INJECTION.**

### **1. Chemigation**

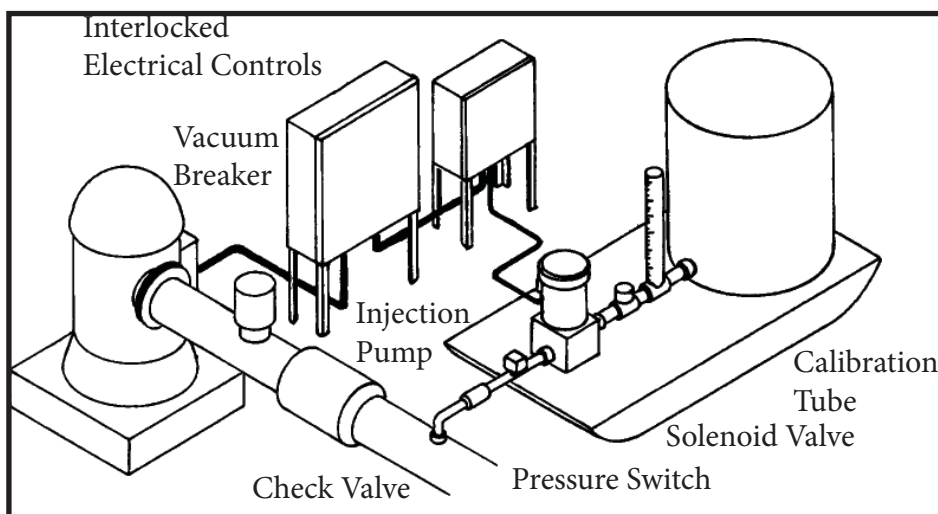
Chemigation is the application of agricultural chemicals through center pivot irrigation systems. The main advantages to this technique are lower application costs and uniformity of application. The biggest disadvantage is the possibility of groundwater pollution. Some potential hazards are:

- Water flowing back through the chemical injection system causing the chemical supply tank to overflow.
- Irrigation pumping plants shutting down from mechanical or electrical failures of the system, while the injection Equipment continues to operate.
- Lack of a check valve on the irrigation line may result in the mixture of water and chemical siphoning back into the irrigation well and polluting the groundwater.

You can avoid these hazards by:

- Utilizing a check valve in the chemical injection line to stop the flow of water from the irrigation system into the chemical supply tank when the chemical injection pump is not operating.
- Interlocking the irrigation pumping plant and the chemical injection pump so if one stops, the other will also.
- The use of check and vacuum relief valves (anti-siphon devices) on the irrigation pipeline.

Additional safety equipment could include a pressure switch in the injection line to detect a break in the line and a solenoid valve at the chemical tank outlet for a positive shutoff when the system shuts down. The Injection system equipment should also include a calibration tube and the system should be calibrated before each application. Most injection systems include a built in calibration tube, which allows the calibration to be rechecked periodically during application. (See illustration below.)



See your local Reinke dealer for available chemigation systems.

## **1. Fertigation**

Fertigation is the application of fertilizers through center pivot irrigation systems. Fertigation is more popular on sandy soils. Sandy soils are more prone to leaching of fertilizers beyond the root zone. Fertigation allows for time release fertilizer application, thus reducing the potential for leaching and loss of fertilizer, and allowing the farmer to “spoon feed” crops. A word of caution: Not all fertilizers are compatible with fertigation. Consult your fertilizer supplier before applying unfamiliar chemicals. Materials that should not be applied through irrigation systems include:

**Anhydrous Ammonia**: excessive nitrate loss, a calcium precipitate forms in water.

**Ammonium Polyphosphate**: causes a precipitate to form in water.

**Phosphoric Acid (or any acid)**: corrosive to steel and forms a precipitate in water.



See your local Reinke Dealer for available Fertigation Systems.

## **1. Insectigation**

Insectigation is the application of insecticides through center pivot irrigation systems. Always follow label directions! Allow time for a contaminated field to reach a safe level before re-entering the field.



See your local Reinke dealer for available insectigation systems.

## **IX. System Maintenance**

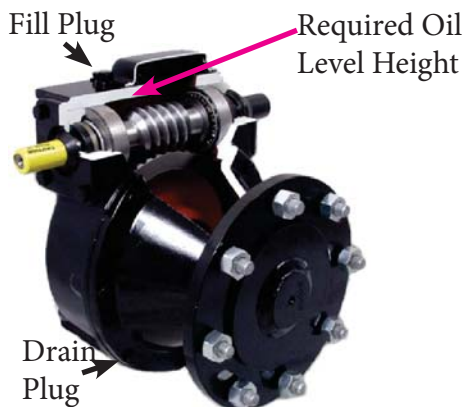
All Reinke Irrigation Systems are designed for many years of use. However, studies have shown Irrigation System reliability strictly depends upon good preventive maintenance. The following maintenance practices will help prolong the life of your Reinke System.



**WARNING!!! DO NOT attempt to perform any maintenance procedures until the Reinke main control panel disconnect switch and all pump disconnect switches are locked in the “OFF” position. Electrical component trouble-shooting and replacement should be performed by a certified Reinke service technician to ensure built-in safety features remain intact. Replace all protective guards and shields before restoring power to the system.**

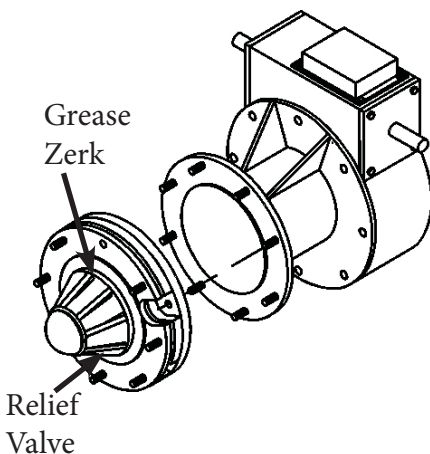
### **A. Wheel Gearbox Maintenance**

#### **1. Non Towable Gearboxes**



The Reinke 50:1 wheel gearboxes use a good quality S.A.E. 85W-140 that meets or exceeds A.P.I. - GL.5 and MIL.-21056 specifications. Change the oil after the first year of service and every three years thereafter. Fill gearboxes so oil level is just above worm gear. (See illustration to the right.) Oil capacity is approximately one (1) U.S. gallon. Do not overfill these gearboxes! Overfilling, may result in seal damage. Before and after each irrigation season, remove the drain plug just long enough to drain any condensed water.

#### **2. Non Towable Gearboxes with Towable Hubs** **(Reversible Tow Systems)**

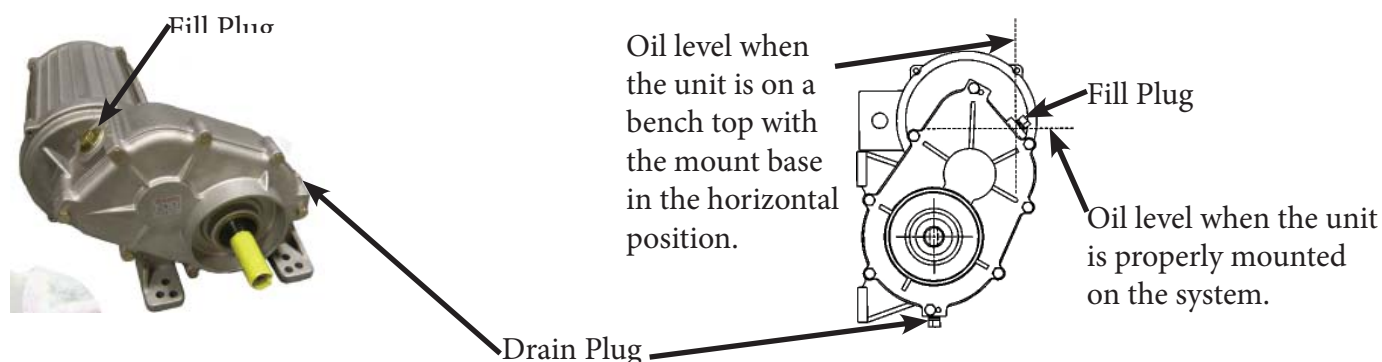


Reverse tow systems, utilize tow hubs coupled to a non towable gearbox. A grease zerk is located on each tow hub. This should be greased on every third towing, or annually at the end of the season if the system has not been moved. Pump grease until the relief valve releases, indicating that the tow hub is full of grease.

## **B. Center Drive Gearbox Maintenance**

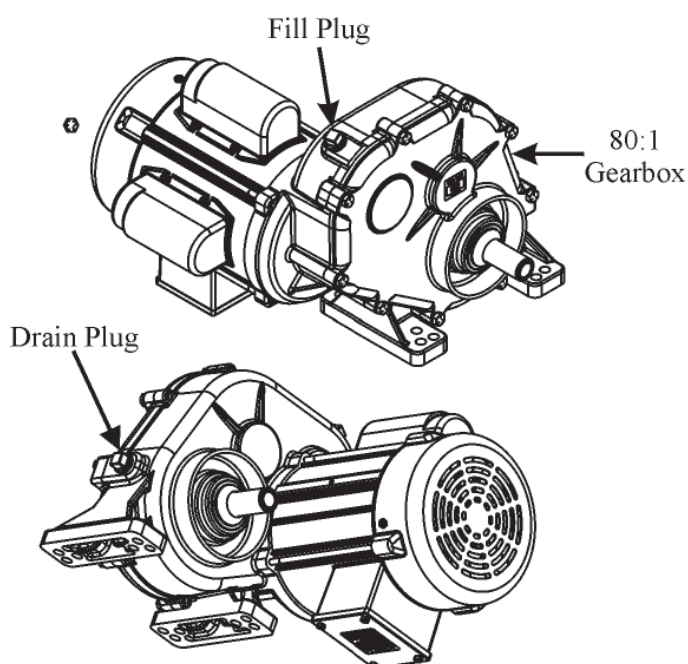
### **1. Three Phase (480 VAC) Center Drive Gearboxes**

The Reinke helical center drive gearboxes, use a good quality SAE 50W or SAE 20W-50 multi-viscosity engine oil; or ISO 460 or EP 460 gear oil. Change the oil after the first year of service and every three years thereafter. Fill gearboxes so oil level reaches the threads of the oil fill hole. (See illustration below.) Oil capacity is approximately one (1) U.S. gallon. Do not overfill these gearboxes! Overfilling may result in seal damage. Before and after each irrigation season, remove the Drain Plug just long enough to drain any condensed water.



### **2. Single Phase (230 VAC) Center Drive Gearboxes**

The Reinke 80:1 helical center drive gearboxes are composed of triple reduction 240 volt single phase 80:1 center drive, which is a complete integral gear and motor (P/N 112297) GR/MTR-UMC-CTR 80:1-06168-104A. These 80:1 gearboxes use a good quality SAE 50W or SAE 20W-50 multi-viscosity engine oil; or ISO 460 or EP 460 gear oil. Change the oil after the first year of service and every three years thereafter. Fill gearboxes so oil level reaches the threads of the oil fill hole. (See illustration on right.) Oil capacity is approximately one (9/16) of a U.S. gallon or 72 ounces. **Do not overfill these gearboxes!** Overfilling may result in seal damage. Before and after each irrigation season, remove the drain plug just long enough to drain any condensed water.



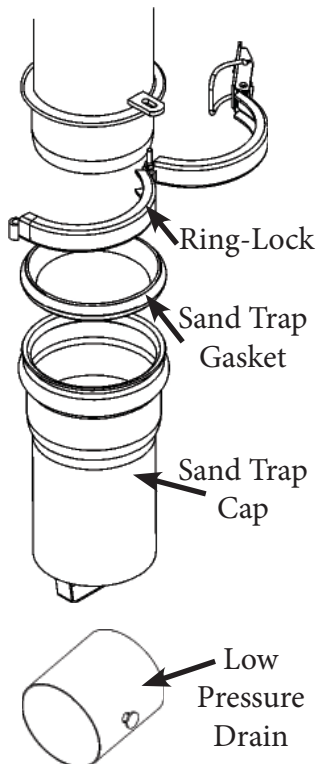
## **C. Initial and Preseason Maintenance**

Before placing the system into service each season, check the following:

1. Make a visual check of all bolts in the system making sure something has not become loose during the idle period. When the system has been newly installed, all the bolts should be checked with an end wrench to make sure they have been tightened by the erection crew. One loose bolt may cause serious structural damages.
2. Check the electrical boxes and wiring of the system to make sure the ground wires are secured and rodents or insects have not damaged the systems' mechanisms.



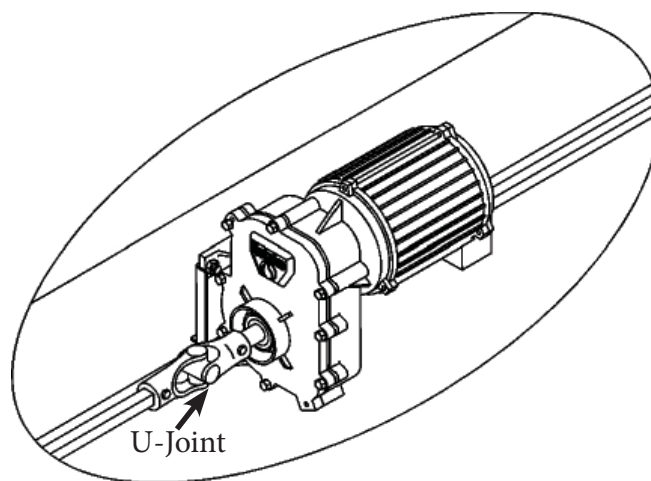
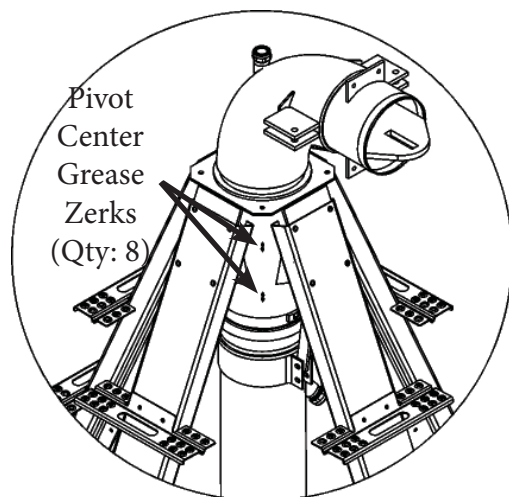
### **3. Flushing the System**



Place the disconnect switch in the "OFF" position. Only water is required for this procedure - the system does not need to move. **DO NOT** start the flushing procedure while the system is under water pressure. Removing sand trap caps while the system is under pressure can cause personal injury or death. Remove the sand trap cap and pump water through the system. This will flush out any foreign material that might plug the sprinkler heads or sprinkler valves. This is particularly important on newly installed systems, because of possible straw, dirt or any other material may be accumulated in the pipe during erection. After the sand trap cap is back in place, pump water through the system and check the sprinklers for proper operation. The arc travel of the end gun should be set as the diagrams show on page 26. Also, check the system water pressure to see if it is operating at the proper pressure. If the water pressure has fallen, your pump may need adjustment or repair, or after time, the sprinkler head nozzles may be worn. These problems will reduce the uniformity of water application and should be corrected. If a sprinkler nozzle is replaced, make sure the new one is the same size. After flushing the system, check the function of the low pressure drains by pushing each one upward in a rotating motion. Low pressure drains are located on bottom side of each hook joint, the last tower top and on the end boom pipe.



4. Grease fittings are located on the pivot (8), at any optional steel U-joints (1 each), and on any towable gearboxes (2 each). These fittings should be greased with good quality grease.



5. All automatic controls such as auto-stop, end gun, tower auto-stop and tower auto-reverse should be cycled to check for proper operation. *Consult your Reinke dealer or authorized service technician for assistance.*



6. If a booster pump is installed on your system, it should be inspected for proper operation. A second person should be located near the end boom. Turn the percent timer to zero and with power to the system, press the start button. When the system is at normal operating pressure, turn the end gun switch to the ON position and check the phasing of the booster pump. When viewing from above, the pump shaft should be turning in a clockwise direction when running. Operating the pump backward can damage the pump. When the end gun switch is OFF, the booster pump should be OFF. If the phasing needs to be changed, contact your Reinke dealer or service person.

7. Check the oil level in the center drive and wheel gearboxes. Water condenses in the gearboxes and should be drained. The water may be drained by loosening the drain plug on the bottom. When the plug is removed, if there is any water, it will be the first to drain out. Gears should be filled to the specifications on page 53. **Do not overfill any of these gearboxes!** Overfilling may result in seal damage.



Reinke Tire Inflation chart Based on Manufacturer's Recommendations	
Tire Size	Max. Load & Infl. (lbs @ PSI)
11R x 22.5 (Recaps)	4000 @ 52
11.2 x 24	3900 @ 35
11.2 x 38	4410 @ 23
13.6 x 38	6965 @ 29
14.9 x 24	4640 @ 16
16.9 x 24	7215 @ 23
18.4 x 26	No longer offered

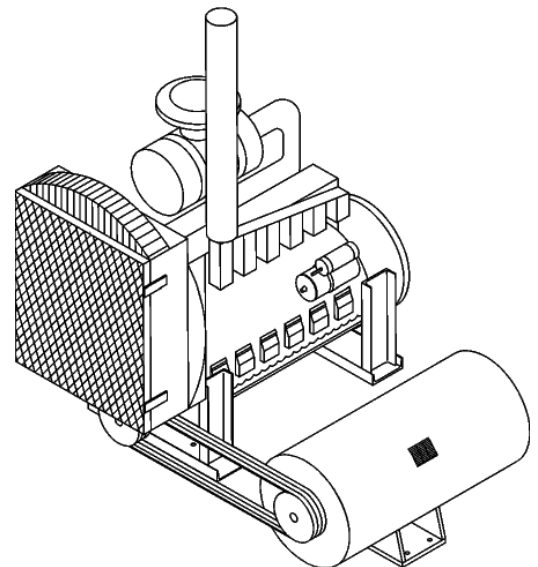
\* On 11R x 22.5 Tires, maximum load rating was based on manufacturer's irrigation testing.

8. Tire pressure should be maintained according to the chart to the above. Also, inspect the tires for impending problems (cuts, breaks, etc.).

9. Main control panel switches should be cycled and checked for proper system operation. (See pages 20-24.)

10. If the system utilizes generator belts, check them for proper tension. (See illustration to the right.) Before starting the engine, remove any rodent nests from the engine fan cover. The generator pulley may initially be rotated either direction to generate power. **Caution. If the generator rotation is ever reversed later, the system will be out-of-phase.** Call your dealer or service person to correct the phasing problem if you plan to operate the generator in the opposite direction.

**NOTE: The generator warranty requires that all combustion engines coupled to a generator, driving the system, must have a governor, a tachometer, and a safety load meter. The generator and system controls will be damaged by over or under engine speeding.**

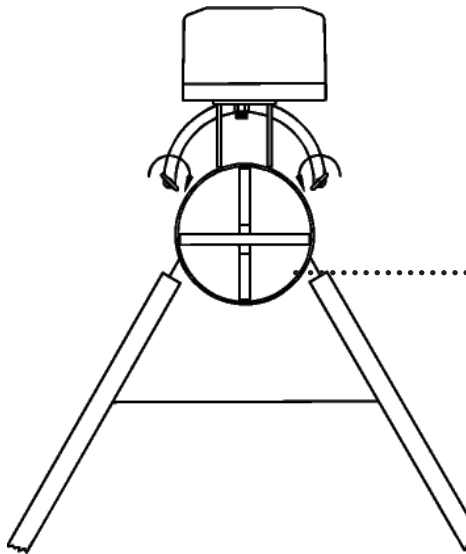


## **D. Maintenance During Season**

1. Periodically check the built-in voltmeter on the main control panel inner door and make sure it reads 456-504 VAC, 60 HZ (380-420 VAC, 50 HZ) on 480 VAC Systems or 230-250 VAC, 60 HZ on 240 VAC systems. ***In no event should the operational voltage read outside these parameters.*** If it does, find out why and correct it. This will prevent possible damage to the drive motors and other electrical components. If your system uses a generator, excessive voltage indicates it is running over speed. This can damage the generator and the system's controls. Also check the tension of the generator drive belts. Loose belts can cause slippage and low voltage output may result. Exercise caution if you manually check your system for proper voltage.
2. Grease fittings are located on the pivot, at any steel U-joints, and on any towable gearboxes. These fittings should be greased approximately three times a season, depending on use, with good quality grease. (See illustrations on pages 52-55.)
3. The system should be inspected periodically. Look for under-inflated tires, oil leakage from gear boxes, structural damage from the result of severe storms, etc.
4. Periodically check the alignment of the system. The system is initially aligned when it is erected. Alignment is a very important factor in the operation of an irrigation system. A misaligned system develops very high stresses which could cause structural damage and reduced center drive and wheel gearbox life. If the alignment of the system needs to be reset, it is done by turning the adjusting screws on the control yoke located at each tower. It is better to turn both screws (in opposite directions) rather than making an alignment adjustment with one screw. The illustrations below show which way to turn the screws for the desired alignment. The descriptions for turning the screws are given for someone looking toward the end of the system.
5. Reinke Manufacturing recommends that the alignment and safety switches be replaced after 10 years of service to ensure reliable system operation.

### Leading Bow

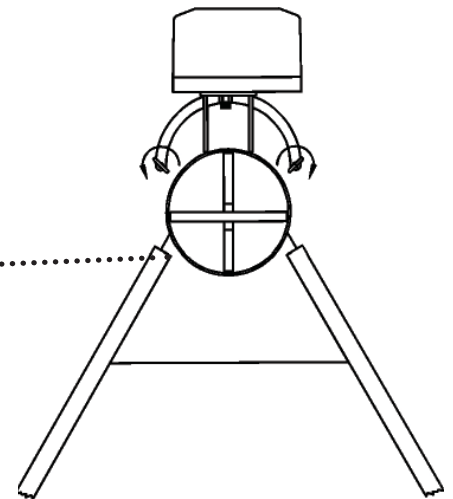
A leading bow can cause problems by creating extreme tension or pull that could cause structural damage.



Turn thumbscrews as shown above to correct alignment, if tower is ahead with the system running in the FORWARD direction or behind running in the REVERSE direction.

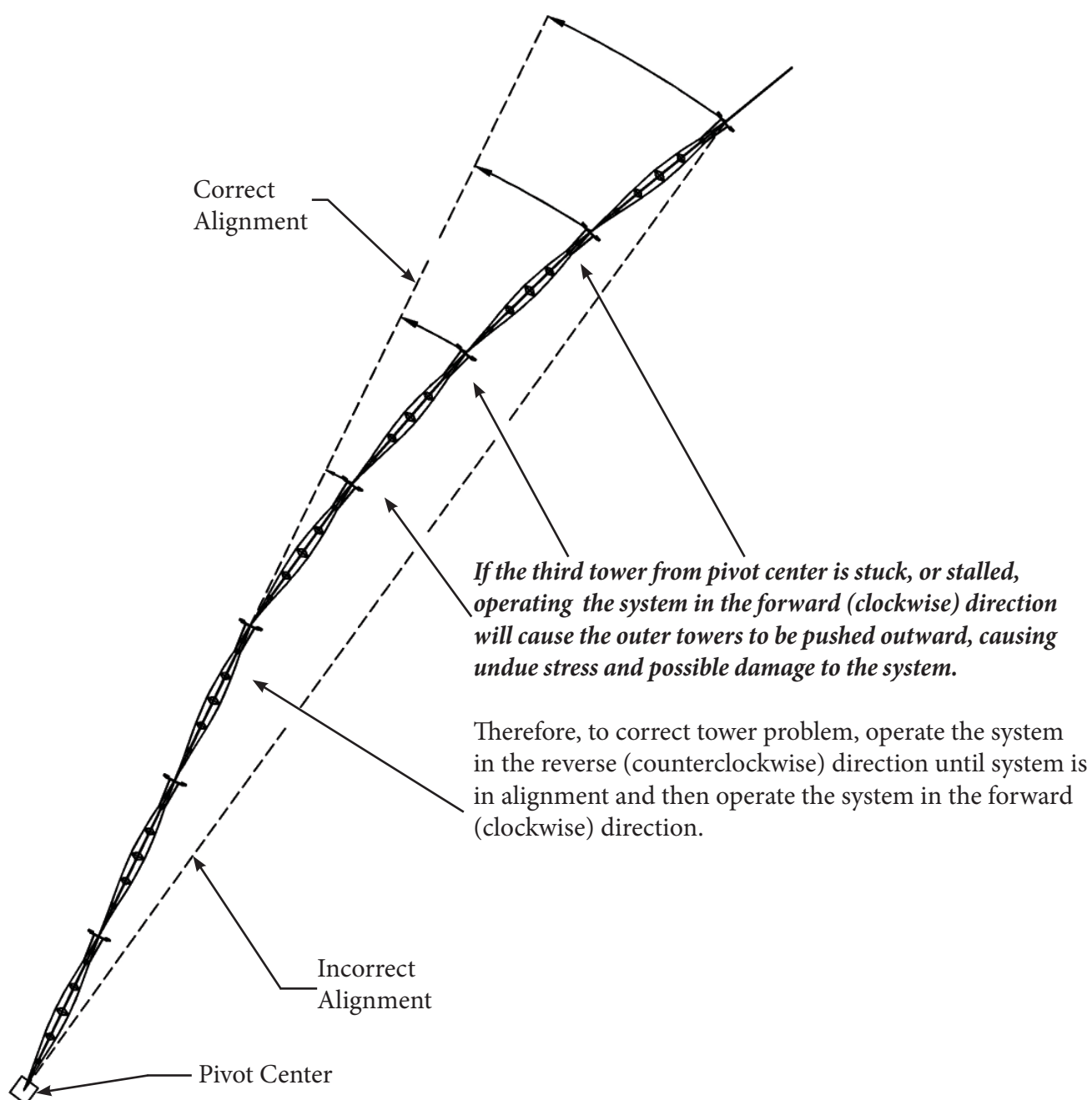
### Reverse Bow

A reverse bow is very critical as it causes a compression of the entire system. When the spans are compressed, they tend to lose their inherent strength.

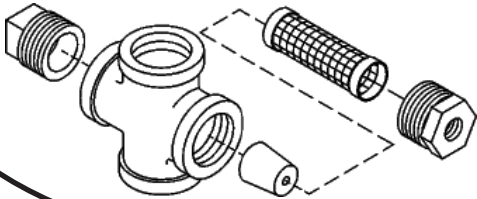


Turn thumbscrews as shown above to correct alignment, if tower is behind with the system running in the FORWARD direction or ahead running in the REVERSE direction.

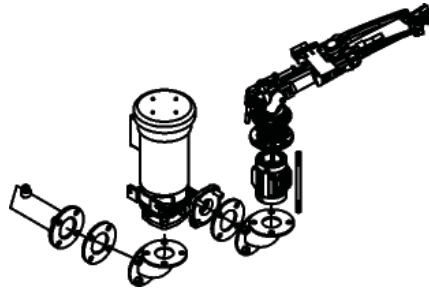
When the system is correctly aligned, it will have a slight bow with the center tower leading. When the direction of travel is changed, the system should bow the same amount only in the opposite direction. If a tower becomes stuck, or some other problem causes it to stop, the towers toward the end of the system will continue to run until the misalignment safety circuit shuts the system down. This results in a bend in the system at that tower. See the drawing below. If the lagging Tower is brought into alignment by continuing to run in the same direction, the outer towers will be forced outward to compensate. This causes considerable stress and possible damage to the system's structure. Therefore, after the problem has been corrected, run the system in the opposite direction so the outer towers run back even with the stalled tower. Then it is safe to operate the system in the desired direction.



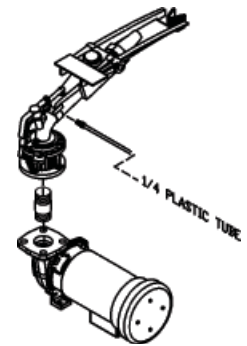




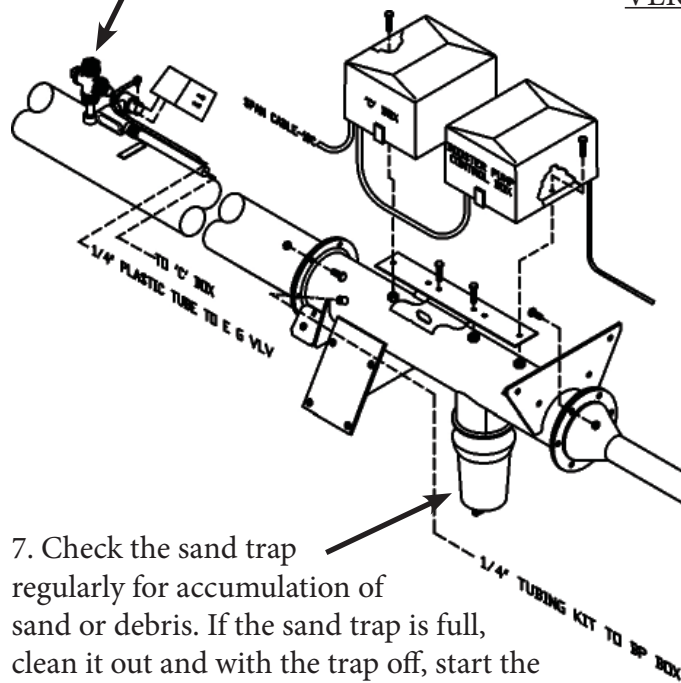
6. If the system is equipped with a end gun and/or booster pump, the strainer should be cleaned once a year. This is very important as a clogged strainer will prevent the end gun from properly shutting off.



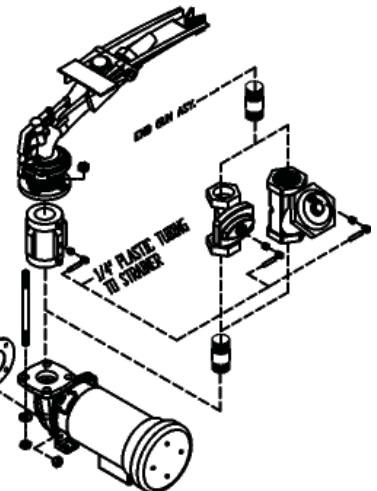
VERTICAL PUMP MOUNT  
(OPTIONAL)



SR NV100 END GUN  
(OPTIONAL)

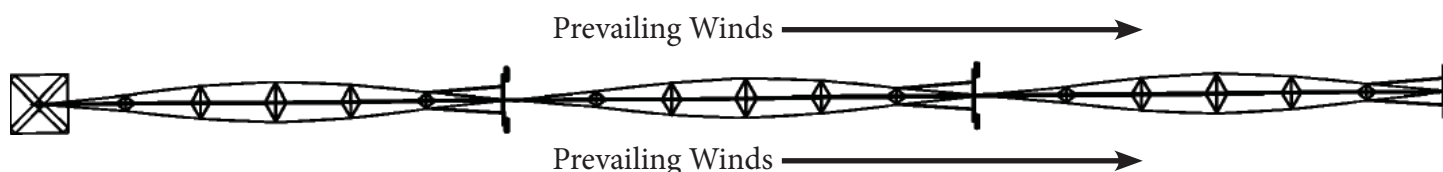


7. Check the sand trap regularly for accumulation of sand or debris. If the sand trap is full, clean it out and with the trap off, start the pump to flush the system. (See instructions on next page.) replace the trap once it has flushed. The sand trap may need to be cleaned weekly if the water supply is dirty or the well is pumping a large amount of sand.

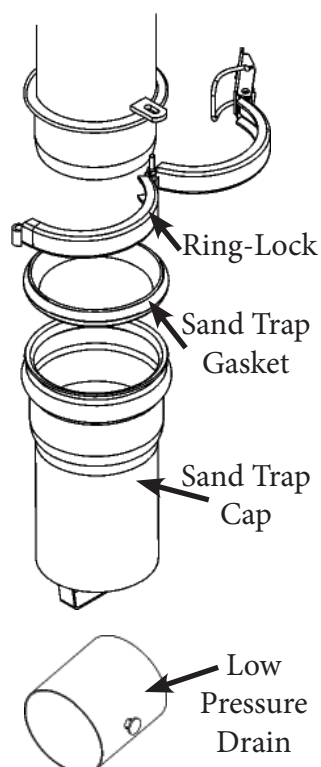


## **E. Winterization Procedure**

1. Park the system on a smooth surface out of the wheel ruts. Also, park the system parallel to prevailing winds to avoid, as much as possible, the effects of damaging winds.



### **2. Flushing the System**



Place the disconnect switch in the “OFF” position. Only water is required for this procedure - the system does not need to move. **DO NOT** start the flushing procedure while the system is under water pressure. Removing sand trap caps while the system is under pressure can cause personal injury or death. Remove the sand trap cap and pump water through the system. This will flush out any foreign material that might plug the sprinkler heads or sprinkler valves. This is particularly important on newly installed systems, because of possible straw, dirt or any other material may be accumulated in the pipe during erection. After the sand trap cap is back in place, pump water through the system and check the sprinklers for proper operation. The arc travel of the end gun should be set as the diagrams show on page 26. Also, check the system water pressure to see if it is operating at the proper pressure. If the water pressure has fallen, your pump may need adjustment or repair, or after time, the sprinkler head nozzles may be worn. These problems will reduce the uniformity of water application and should be corrected. If a sprinkler nozzle is replaced, make sure the new one is the same size. After flushing the system, check the function of the low pressure drains by pushing each one upward in a rotating motion. Low pressure drains are located on bottom side of each hook joint, the last tower top and on the end boom pipe.

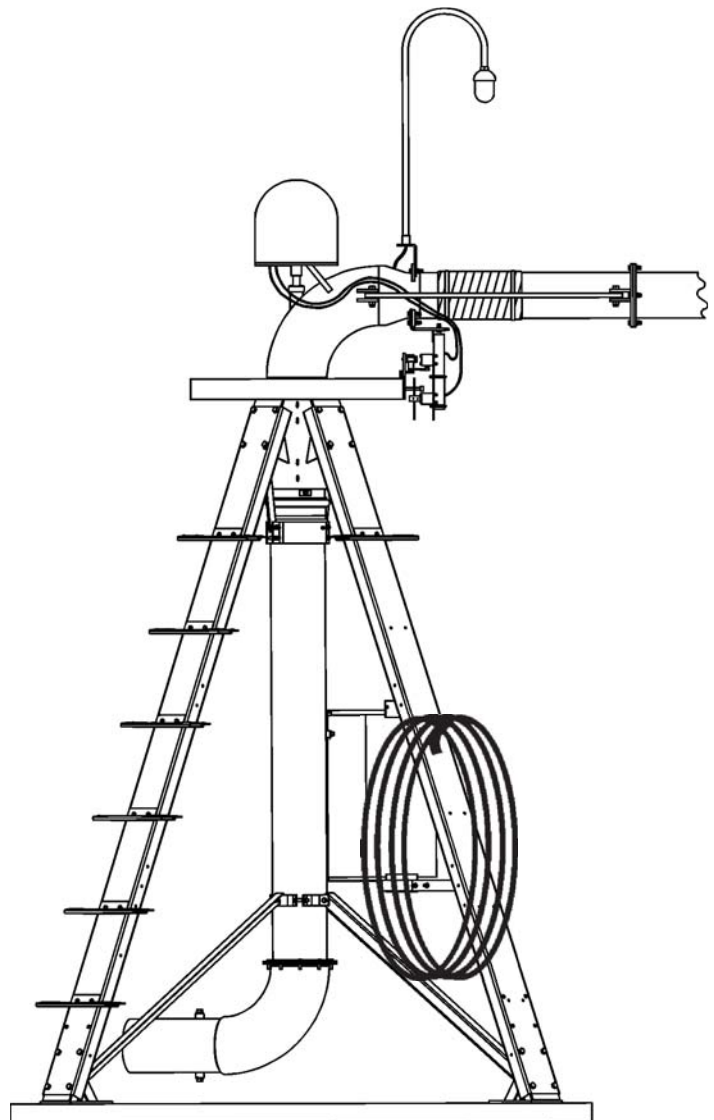
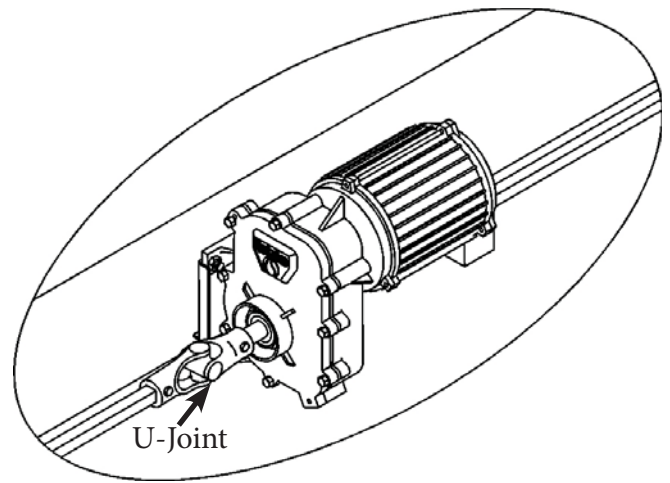
3. Grease fittings are located on the Pivot (8), at any optional Steel U-joints (1 each). These fittings should be greased with good quality grease. This will prevent corrosion and decrease the amount of moisture accumulation during the idle season.

4. Check the oil level in the Center Drive and Towable Gearboxes. Water condenses in the Gearboxes and should be drained. The water may be drained by loosening the drain plug on the bottom. When the plug is removed, if there is any water, it will be the first to drain out. Do not overfill any of these Gearboxes! Overfilling may result in seal damage. Gearboxes should be filled to the specifications on page 53.

5. Protect the drive train components from damage if livestock will be pastured during the off season.

6. Sometimes water is trapped between the Well and the Pivot Bottom Elbow. Some means of drainage should be installed (if none exists) on or near the Check Valve and in the Underground Pipeline.

7. Generator Power Cords, Plugs, and Receptacles should be protected with waterproof covers. Wrap the Cords up and hang them up off the ground.



## **X. Trouble-Shooting**

**WARNING!** Before trouble-shooting, turn the power at the main control panel “OFF” and “LOCK” it in position. If you attempt to repair your system and are uncertain of your methods, contact your authorized service person. If a repair is made, replace all protective guards and shields before restoring power to the system.

As a system is being checked for errors, make notes of each situation. This will help to explain the possible problem, and what measures have completed so far to correct it. The items on the following check list should be used as a guideline, before contacting a service technician.

- System Serial Number including Model Number.
- Optional Equipment (Auto Reverse, Auto Stop, Frost Control, etc.).
- Location of system in the field, approximate time when the system shut down.
- Alignment of the system.
- What has been done since the system shut down.

**PROBLEM I:** System will not continue to run when you release the start button.

Possible causes and solutions:

- Set the generator START/RUN switch to the “START” position.
- Set the pressure override switch to the “BYPASS” position.
- Set the park override switch to the “BYPASS” position.
- Make sure the system is not against a tower barricade.
- Check to see if the system is out of line. Check the alignment making sure a stuck tower, a flat tire, or broken U-joint has not caused the system to become out of line.
- A tower does not move. The center drive motors contain an internal overload switch that resets after shut-down. Contact your dealer or service technician if the problem persists.
- The tower auto-reverse system fails. Check the tower auto-reverse mechanism or contact your dealer or authorized service technician.

**PROBLEM II:** System shuts off in line.

Possible causes and solutions:

- Incoming power voltage surges or low voltage may cause the system to shut down.
- If a generator is used, check the belts to make sure they are tight. Make sure the motor is not overheating and shutting off.
- Check to see if the auto-stop switch is against a trip on the cam wheel or the tower is against the barricade. Adjust the switch trips or reverse the system away from the barricade if necessary.
- With the main disconnect switch in the “OFF” position, check the fuses in the main control panel with an ohmmeter. If no continuity is found in a fuse, replace it. Call your dealer or authorized service technician if you continue to blow fuses.
- Check fuses in the generator with an ohmmeter. Replace if necessary.

**PROBLEM III: System shuts off out of line.**

**Possible causes and solutions:**

- Check the tower where the misalignment occurs to see if the tower is stuck. If this is the case, reverse the system until it is back in line, then add rock or something to the wheel track so the tower can continue on its' path.
- Check for flat tires, damaged gearboxes, or broken U-joints where the misalignment occurred.

**PROBLEM IV: System will not move in either direction.**

**Possible causes and solutions:**

- No 480 VAC or 230 VAC power to the system
- A fuse is burned out in the main control panel.
- The start button is defective.
- The main control panel disconnect switch is bad.
- The direction switch is defective.

**PROBLEM V: Sprinklers on the swing arm are “ON” when they should be “OFF”.**

**Possible causes and solutions:**

- Check for any bad valve tubing. Replace any that are broken or cracked. Do not stretch the tubing tight between connections, it will shrink over time.
- Check each of the coils in the valve box for resistance. They should read 170 to 180 Ohms.

***CAUTION: Be sure the power is turned “OFF” at the main control panel.***



## Service Record

[illegible]

# Water Application Record

[illegible]



# Our Mission...

To Exceed Our Customers'  
Expectations of Quality,  
Service, and Innovation.

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