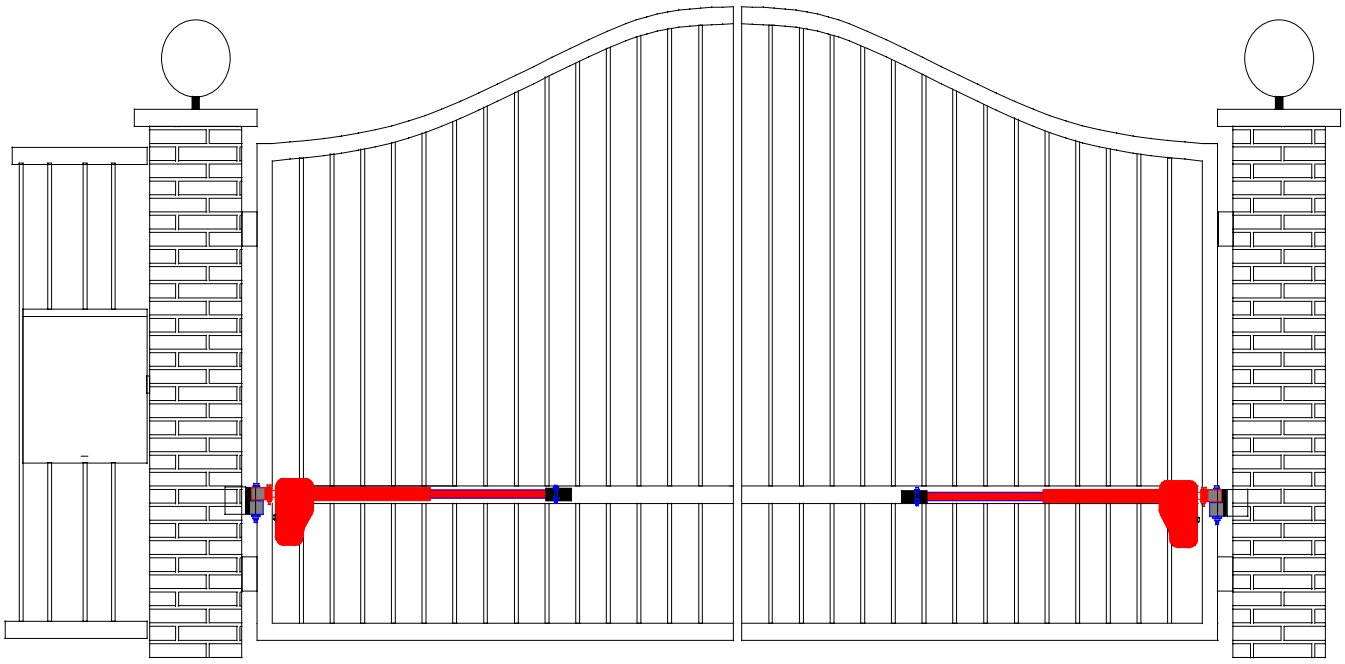
USAutomatic

★STAR★

High Quality Low Voltage
Vehicle Swing Gate Operator
Solar or AC Charged



STAR I Single Swing Gate Operator

STAR II Dual Swing Gate Operator

Installation/Owners Manual

PROUDLY MADE IN THE USA
www.usautomatic.com

INTRODUCTION

This operator is intended to be installed on vehicular Class I or Class II gates as defined by UL 325. Maximum gate load not to exceed 250 pounds.

PLEASE READ THIS ENTIRE MANUAL CAREFULLY PRIOR TO INSTALLATION. In doing so, along with performance of the installation in step-by-step order, you will achieve optimal results. We strongly recommend that all installation and service personnel pay particularly close attention to the safety systems section of this manual and UL325. In addition to the current sense feature that is provided, other safety devices are necessary to make each particular installation as safe as possible to reduce the risk of personal injury and/or property damage. A trained and authorized service technician or the factory should be consulted for assistance.

Cautions - Very Important

- ⇨ Do not attempt to enter the gate area while the gate is moving. Wait until the gate comes to a complete stop.
- ⇨ Operate the gate only when it is fully visible, free of persons or obstructions, and properly adjusted.
- ⇨ Do not allow children to play in the area of the gate. Do not allow anyone to ride on the gate.
- ⇨ Do not allow children to play with the remote control or any other activation device.
- ⇨ Do not attempt to "beat the gate" while the gate is opening or closing. This is extremely dangerous.
- ⇨ Test the current sense feature and all safety devices regularly to insure correct operation.
- ⇨ Study the entire Safety Section on pages 17-21 paying particularly close attention to the Entrapment zones, and be aware of these areas not only during use but also during any adjustments to the unit.

Other Safety Standards

- ⇨ All control stations should be located at least 6 feet from any moving part of the gate or operator.
- ⇨ Do not ever install any control device where a user will be tempted to reach through the gate or fence to activate a gate.

Table Of Contents

Page

GENERAL REQUIREMENTS

General hand/tools such as combination wrenches, tape measure, level, clamps, etc. are required. Your particular installation may require a drill or other hardware not provided. Welding by a qualified welder is the recommended method of securing the linear actuator mounts to the gate and hinge post. Bolt on brackets are options, but they must be very securely attached (i.e. carriage bolts with lock nuts and washers). Lag type bolts are not recommended. Loose or unstable operator mounts will result in improper operation.

BATTERY REQUIRED FOR OPERATION (NOT INCLUDED).

We recommend a 12-volt deep cycle marine battery. The actuator and charging device harness supplied with the operator is designed for bolt type post such as ones found on most marine batteries.

IMPORTANT CAUTIONS:

1. Do not perform any welding with the actuator cable plugged into the control board or the battery connected. Serious damage to the control board and/or battery will occur if attempted.
2. Always disconnect the battery power from the unit prior to connecting any devices.

GATE QUALIFICATIONS/APPLICATIONS

GATE LENGTH/WEIGHT

This gate operator is rated for vehicular class I and class II swing gates up to 10 feet in length and up to 250 pounds in weight as defined by UL325. If your gate exceeds either one of these limits, please consult a qualified technician or the factory for alternative solutions. (Example: convert one 20' gate into two 10' gates and use dual gate operators.)

Note: *The total gate opening normally cannot exceed 110 degrees. Consult a service technician or the factory if greater opening is required.*

GATE CYCLES PER DAY

Solar charged systems should not exceed 20 complete open/close cycles per day without additional solar panels. This actuator type opener, whether AC or Solar charged, should never be used in applications which exceed 100 complete open/close cycles per day. Cycles can be decreased by holding the gate open during high cycle time periods. If more cycles are required, a high traffic gate opener should be used.

IMPORTANCE OF A PROPERLY DESIGNED GATE

As a general rule a gate, which is to be automatically operated, must be stronger and smoother than one, which will be manually operated. Since the gate is a major component of the system, great care and concern must be given to the gate design.

A GATE OPERATOR CANNOT OVERCOME A POORLY DESIGNED GATE.

A. Does the gate swing smoothly without binds or excessive resistance? Swing gates should swing level and plumb to prevent the operator from having to lift the gate open or closed. Swing gates should not require a wheel to support them. Wheels usually create drag, which will cause operator problems. A wheel is generally a sign of a weak hinge system or a weak gate frame.
B. Is the gate frame of substantial strength without excessive weight? Will the frame withstand normal wind load conditions without sway or vibration? Will the gate close correctly without being hand-guided or lifted to close?
C. Are the hinges suited for the number of cycles expected per day? We recommend bearing type hinges to reduce friction drag.
D. Will a reinforcement brace be required to attach the operator to the gate or does a suitable cross member exist in the gate design?

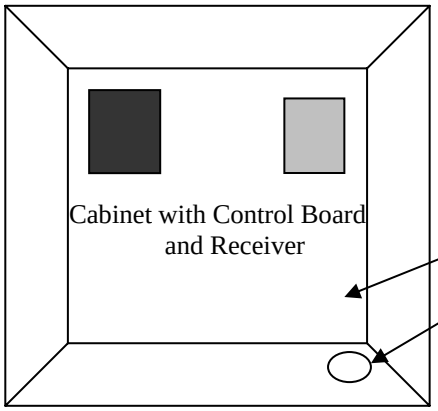
If any of these problems exist, they must be corrected to achieve a reliable automatic gate system.

MOUNTING SITE REVIEW

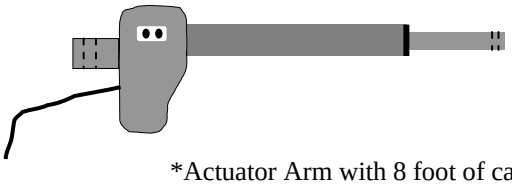
Installers should ask themselves these questions prior to installation and predetermine the solution to any problems, which may occur.

A. Does sufficient space exist for mounting and future servicing of the operator and control box?
B. Will the unit push the gate open to the outside or pull the gate open to the inside?
C. How will the actuator mounts be secured at the hinge and to the gate?
D. How will the control box be mounted securely enough to support the weight of the battery and can it be located within 8 feet to prevent splicing of the actuator cable?
E. How will power be brought to the control box if AC charged?
F. How and where will the solar panel mount if solar charged so that optimum sunlight is received?
G. How will exterior control wiring be brought to the control box?
H. Have all safety concerns been addressed? (See Safety Section Pgs. 17-21)

PARTS INCLUDED

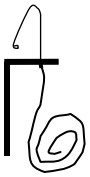


Cabinet with Control Board
and Receiver



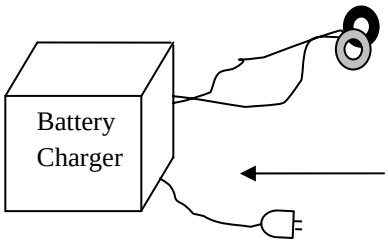
*Actuator Arm with 8 foot of cable

Actuator Cable
Strain Relief Clamp
Snap in Grommet



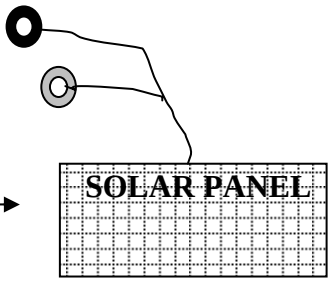
Antenna assembly
with coax and bracket

1-Transmitter

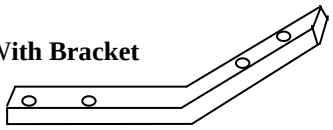


Battery
Charger

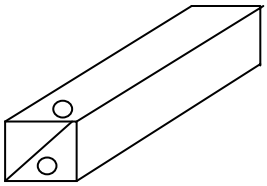
Or



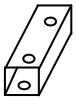
SOLAR PANEL



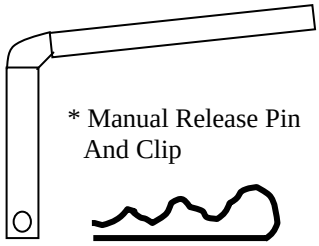
W**ith Bracket**



2” x 2” x 17”
*Hinge Mount Tube

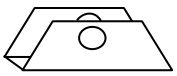


1 ¼” x 1 ¼” x 3 1/8”
*Extension Tube

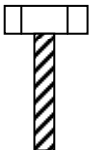


* Manual Release Pin
And Clip

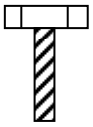
2- Placards



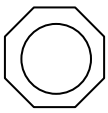
* Gate Bracket



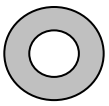
* Bolt ½” X 4 ½”



* Bolt ½” X 2”



* 2 - ½” Nuts



* 5 – ½ “ Washers

- ***For Star II quantity is doubled.**
- **Additionally, 30’ of Master/Slave Actuator cable provided with the STAR II**
- **Placards should be visible from inside and outside of gate.**

NOTE: *12 Volt DC deep cycle marine battery required. (Not Included)*

STEP 1 Hinge Mount Tube Installation (Part 1)

PULL TO OPEN / TOP VIEW (SEE BOTTOM OF PAGE FOR PUSH TO OPEN)

(Left-handed installation shown. Reverse for right-handed installation)

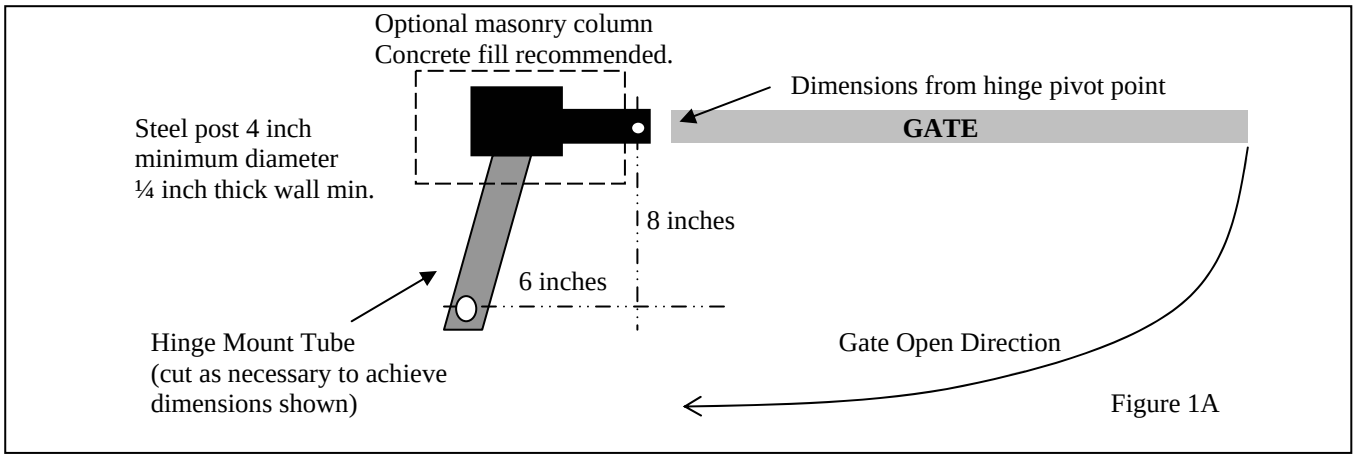


Figure 1A

Other Typical Methods for

Pull to Open Applications **Push to Open Applications**

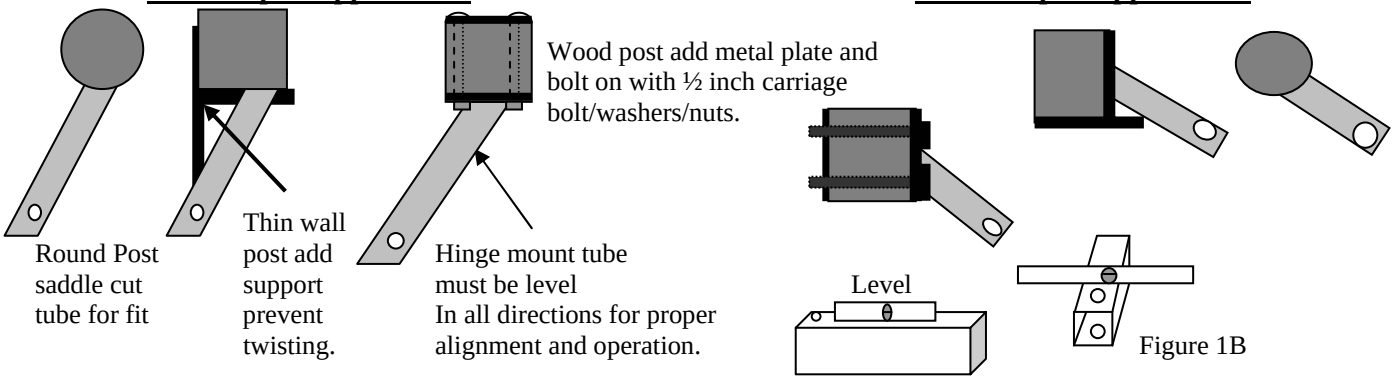


Figure 1B

STEP 1 Hinge Mount Tube Installation (Part 2)

PUSH TO OPEN / TOP VIEW (SEE TOP OF PAGE FOR PULL TO OPEN)

(Left-handed installation shown. Reverse for right-handed installation)

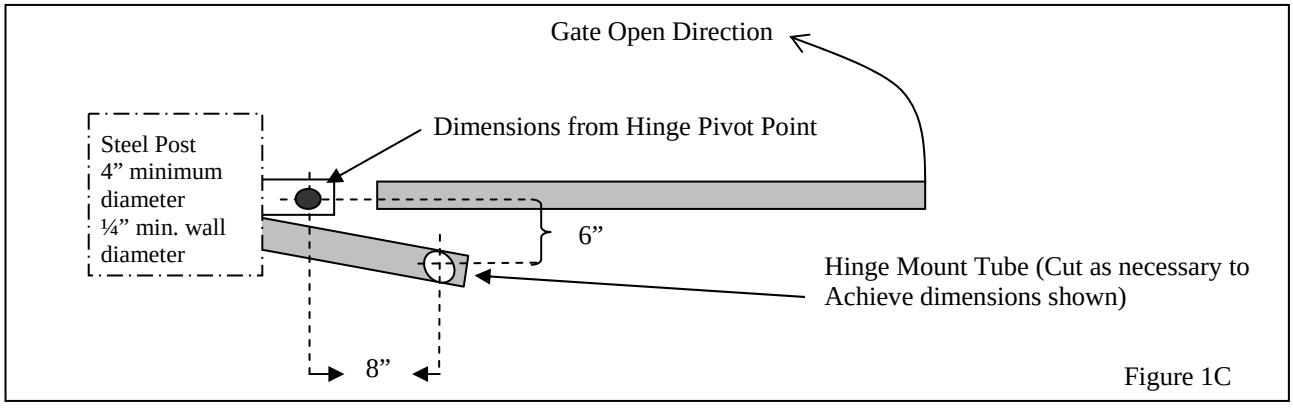


Figure 1C

Regardless of method used, the hinge mount tube should be very secure since the entire force of the gate is directed to this mount. The post must be of adequate strength to resist twisting as well.

Conform to dimensions shown at top of page in all cases. See page 7 to locate height of hinge mount tube on post.

Note: *USAutomatic is not responsible for failure to comply with UL325 standards, local building codes or improper installations.*

STEP 1 Hinge Mount Tube Installation (Part 3)

VERTICAL HEIGHT POSITIONING

Refer to figures 2B-2F to determine the best location for the actuator on the gate. Then use figure 2A to determine the height of the hinge mount tube and gate bracket. The middle of the gate is the ideal location for the actuator. The top or bottom of the gate frame are also possible locations.

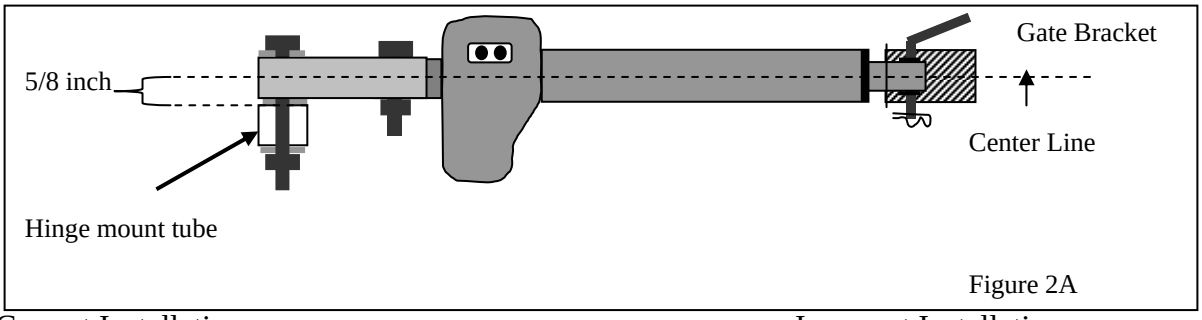


Figure 2A

Correct Installation

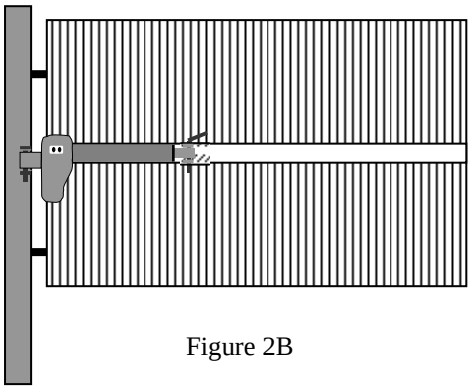


Figure 2B

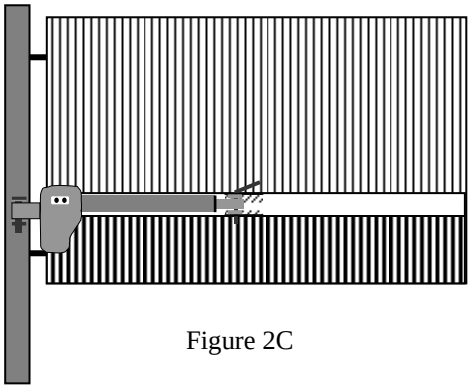


Figure 2C

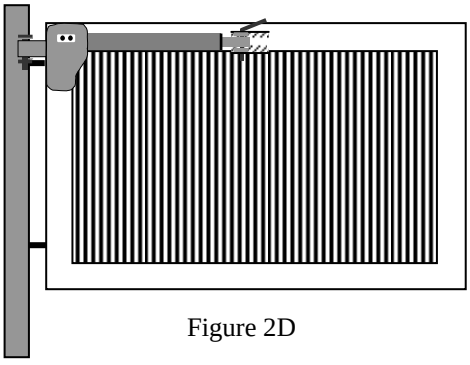


Figure 2D

Incorrect Installation

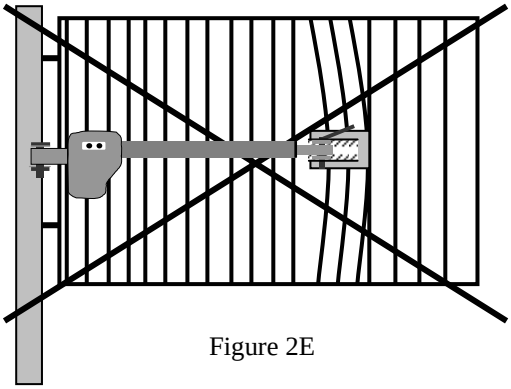


Figure 2E

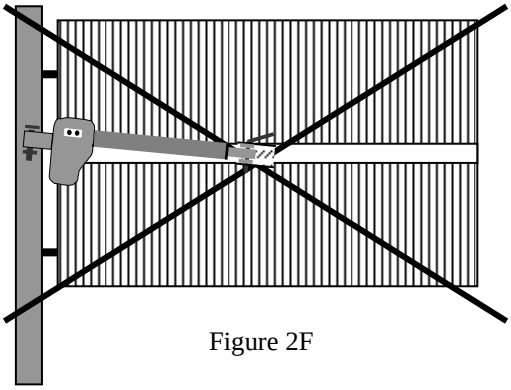


Figure 2F

IMPORTANT:

The gate bracket must be welded in an area that can withstand the full force of the gate. Do not simply weld across a few pickets or bending of the pickets will occur. Add a cross bar if necessary or weld the bracket to the gate frame.

STEP 2 Prepare Actuator for Installation

Assemble the actuator to the extension tube as shown in figure 3A.

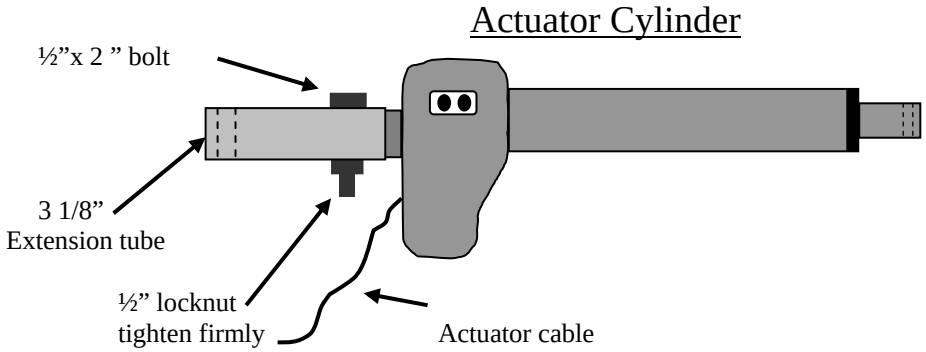
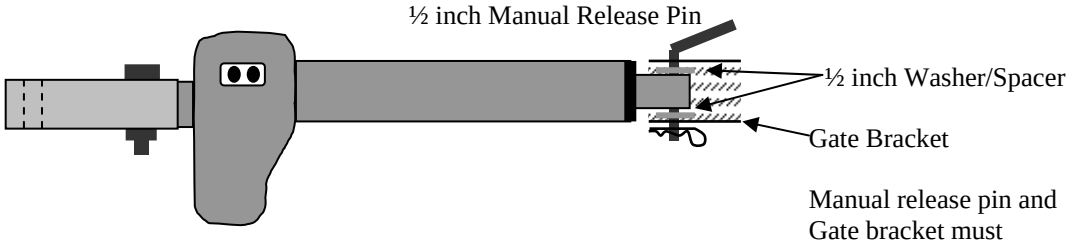


Figure 3A

Now assemble the actuator to the gate bracket as shown in figure 3B

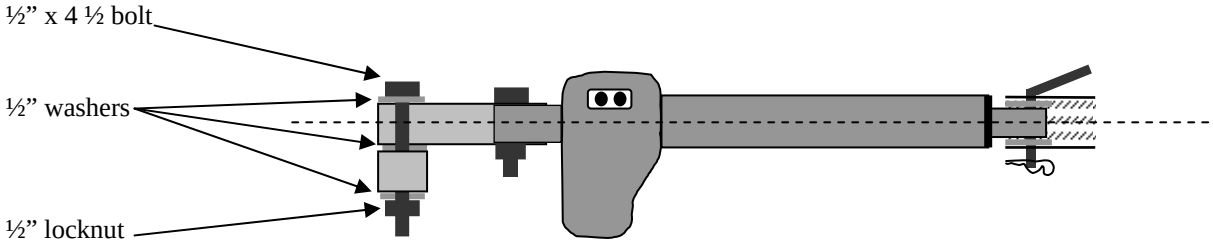


Manual release pin and Gate bracket must pivot freely.

Figure 3B

STEP 3 Actuator Installation

Mount the actuator to the hinge mount tube as shown in Figure 4A.
Support the free end of the unit while mounting.



Tighten firmly. Do not over tighten.
Actuator must pivot freely.

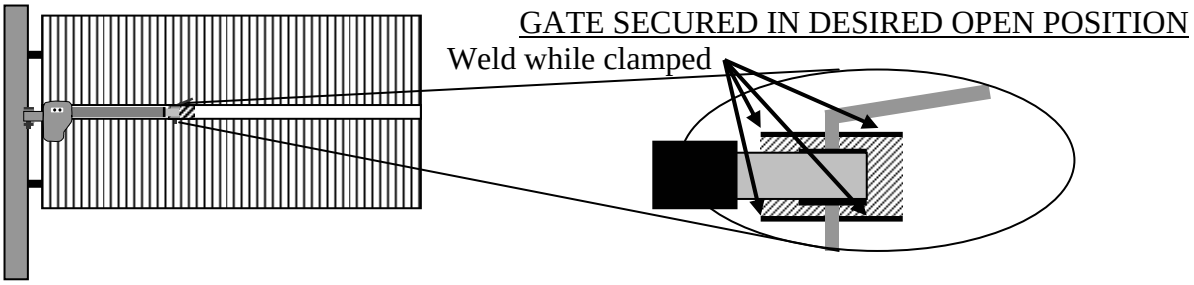
Figure 4A

Open the gate to the desired OPEN position and block in place to secure the gate and determine gate bracket weld point

.

NOTE: *The total opening cannot exceed 110 degrees. Consult a service technician or the factory if greater opening is required.*

Clamp the gate bracket to the gate at the previously determined point and weld to gate. Be sure that your gate does not move while clamping. The location of the gate will set your open position. The cylinder will be level if all steps were performed accurately.



STEP 4 Mounting of Gate Bracket (PUSH to Open Only)

Close the gate to the desired CLOSED position and block in place to secure the gate and determine gate bracket weld point. Clamp the gate bracket to the previously determined point and weld to gate. Be sure that your gate does not move while clamping. The location of the gate will set your closed position. The cylinder will be level if all steps were performed accurately.

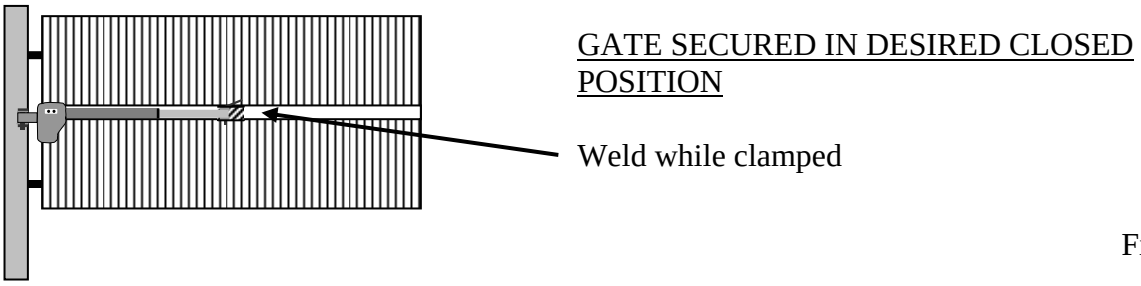
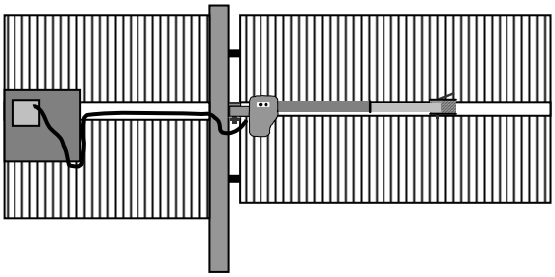


Figure 5B

STEP 5 Mounting Control Box/Actuator Cable Splicing

NOTE: *Push to open installations. See page 10* for more details.

Correct – Install control box to fence by welding or screws. Keep in mind that the actuator cable is 8' in length (avoid splicing cable if possible) if splicing is necessary water tight splices are a must. if drilling is required remove control board and all electronic devices to avoid damage from shavings.



Incorrect – Do not mount in areas by automatic sprinklers or flood prone areas. It is important that all electronics in the control box remain dry. Control box should be mounted at least 6 feet from gate

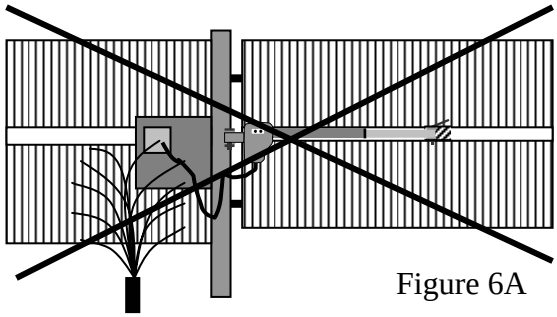
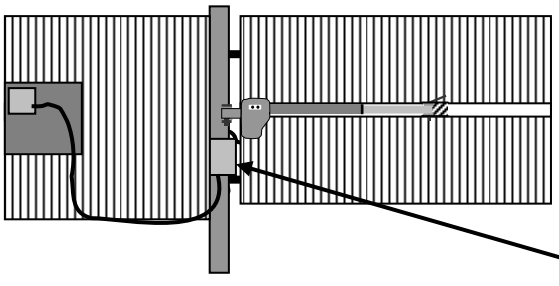


Figure 6A

After securely mounting control box install battery and all electronic components. Route actuator cable through the bottom of control box, do not connect to battery or control board at this time.

Splicing For Actuator Cable

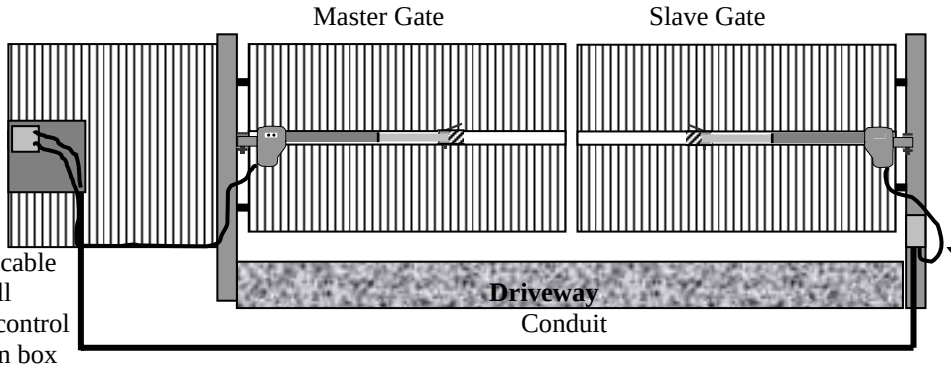
STAR I Single Gate Wiring (only if required)



If 8' actuator cable must be spliced a water tight junction box must be used to prevent moisture from splice. The wire used for the splice should be no smaller than the actuator cable wire provided. Use only approved wire nuts or crimp splices for connection. Make second splice inside control box.
5 conductor cable (2-12gauge, 3-18 gauge wires).
Extension cable is sold separately.

Junction Box (Water tight) Figure 7A

STAR II Dual Gate Wiring (Splice Required for Slave Actuator)



30' extension cable supplied install conduit from control box to junction box on slave gate post.

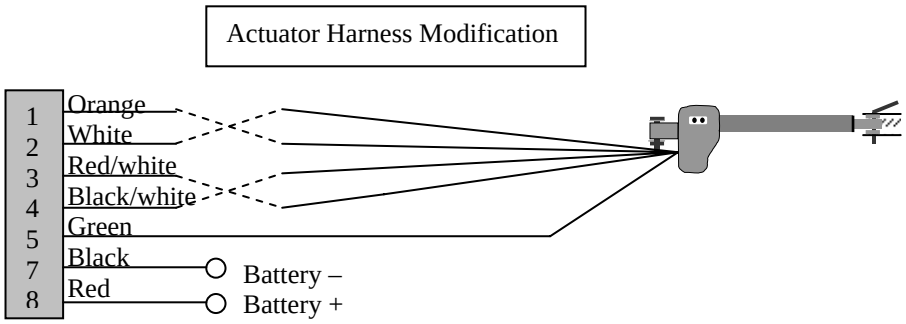
Junction Box (water tight)

Important: The length of the Slave cable should be as short as possible.

Push to Open Applications

Actuator cable modifications are necessary for push to open installations. For proper operation the open and close limit lines and the motor control wires must be reversed. Splicing should be performed only when actuator cable is disconnected from the control board.

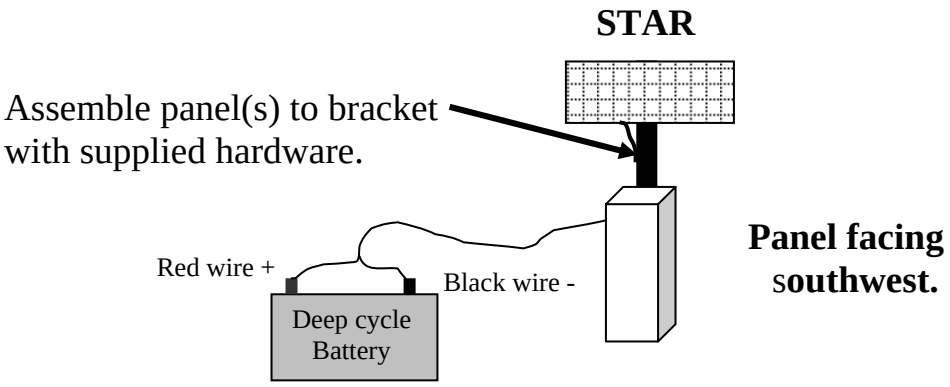
- USAutomatic push to open adapter can also be purchased separately.



STEP 6 Installation of Charging Source

SOLAR PANEL

Locate and mount the solar panel bracket so that the panel faces southwest and maintains the preformed 45-degree angle. The standard cable is 10' in length and must feed in through the bottom of the control box. Pay attention to the distance when determining you're mounting location. Although the cable can be extended with watertight connectors, charging power is diminished. Sometimes it is necessary to locate the panel farther away to achieve optimum sunlight, but consider that optimum sunlight might not mean optimum charging if the distance is to great. Use #16 gauge wire or larger and keep length as short as possible.

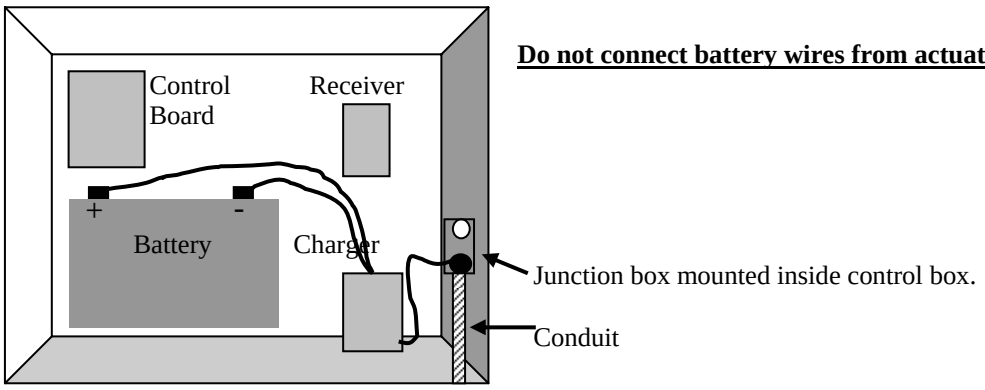


NOTE: *Avoid shaded areas if possible. Panels should face southwest for optimum charging. See explanation above for details.*

AC CHARGER

Locate and install the AC battery charger inside the control box. The charger requires a receptacle for 110-volt AC supply; recommended location is inside the control box. A licensed electrician per local building codes should install the receptacle.

Note: *USAutomatic recommends an AC surge protector on all 110-volt installations.* Especially *in lightning prone areas.*



Do not connect battery wires from actuator/control board at this time.

STEP 7 Installing Safety Placards

Mount safety placards on gate. Two signs are provided. Place one sign on each side of the gate where it will be highly visible to anyone on either side of the gate.

STEP 8 Installing Secondary Entrapment Siren

The secondary entrapment siren connects to the control board (see page 33). This siren is very loud and will be activated anytime the current sense circuit stops the gate twice prior to reaching a fully open or close limit. The reset button on the control board (see page 13) must be pushed to turn off the siren, and reset the control board.

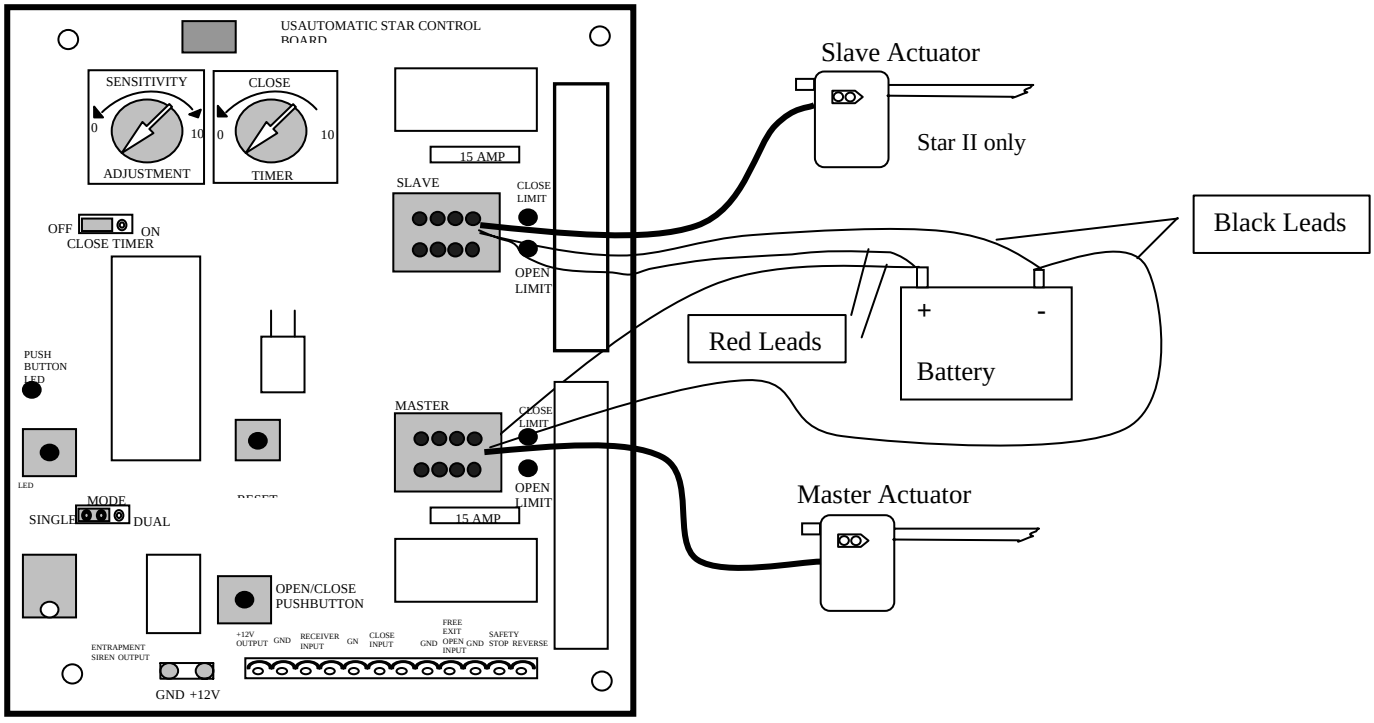
STEP 9 Making Final Adjustments

In order to make final adjustments, a signal device such as a radio control should be used. The control board is equipped with a pushbutton for this purpose. The button is designed to give an open/close signal. The gate will open if closed or close if in the open position. A signal in mid-travel will stop the gate.

- If your unit was purchased with a radio receiver, it is important that you change the dipswitch code settings on your receiver and on all of your transmitters. Please read the instructions found with your transmitter or consult a dealer for assistance.

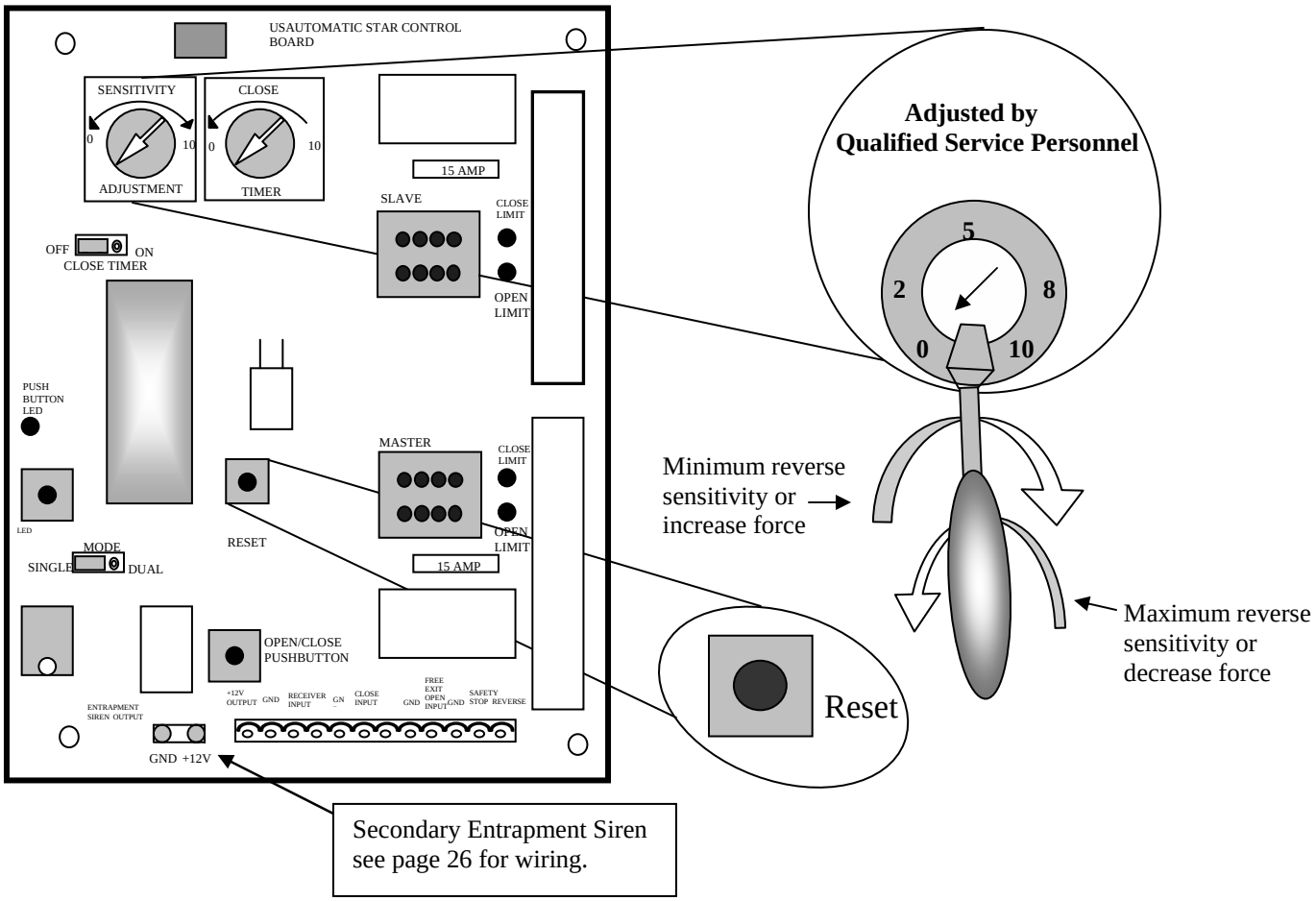
IMPORTANT NOTES

1. Locate the actuator cable plug and be aware that you may need to disconnect it if the cylinder over travels the desired stop points. You should be able to stop the motor with a signal from your transmitter without having to disconnect the plug, but in cases of incorrect wiring, the plug can be used as an emergency power shut-off.
2. Locate the sensitivity adjustment. We intentionally set the sensor at a highly sensitive setting. This may need to be adjusted to achieve gate movement without tripping the sensitivity circuit and causing the gate to reverse direction. See page 13 for details.
3. Study the limit switch section and instructions on adjusting the limit switches prior to battery hook up. See page 14 for details.



If you have an understanding of the sensitivity feature, how to disconnect the actuator plug in an emergency, and how to adjust the limit switches, then proceed to hook up the battery leads and connect the plug to the board. The red battery lead goes to the positive ⊕ terminal on the battery and the black lead goes to the negative - terminal on the battery.

Current Sense Adjust



- Adjust the sensitivity adjustment so that the gate reverses when it hits a solid object. Do not turn the dial beyond the stop points at 0 and 10.
- If sensitivity feature is activated twice before reaching a fully open or close limit the operator will stop operating and the secondary entrapment siren will sound (if connected see page 26 for wiring) and the control board will require a manual reset using the reset button on the control board.
- Remember if the gate reverses direction when operating without hitting and obstruction, then minimizing sensitivity (increasing pressure) may be required. Do not increase any more than necessary.

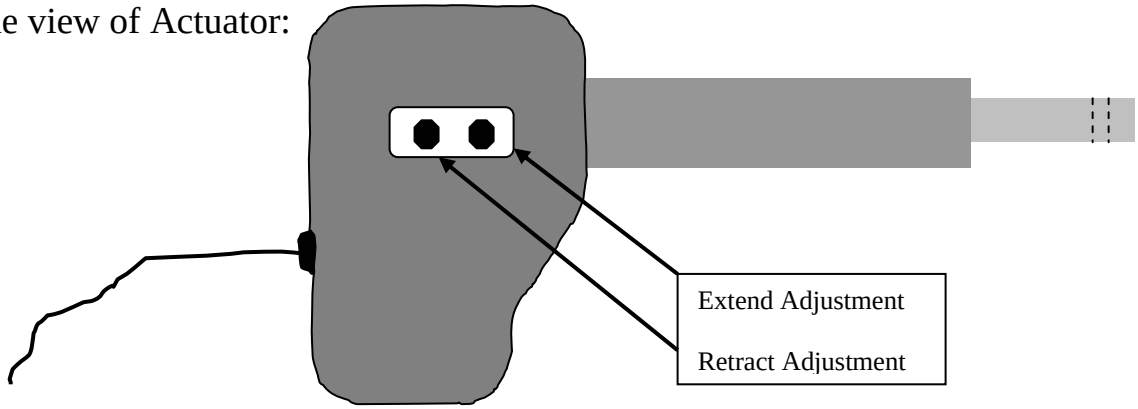
CAUTION: To reduce the risk of injury, USAutomatic strongly recommends the installation of additional safety devices such as Photo Eye Sensors and Safety Edges. Consult an authorized installing dealer or the factory for a complete explanation of options and see the Safety Section of this manual on pages 17 to 21.

LIMIT SWITCHES

The limit switch adjustments are located on the side of the actuator. Remove the dust plug to make adjustments. The normal settings from the factory allow for 16" of travel. You will most likely have to adjust the limits for your installation. The adjustments are labeled "Extend" and "Retract" on the dust plug. A 7/32 nut driver (provided) is required.

NOTE: *ALL ADJUSTMENTS SHOULD BE MADE IN THE MID TRAVEL (1/2 OPEN) POSITION. DO NOT FORCE THE ADJUSTMENT SCREWS TO TURN BEYOND THEIR MAXIMUM TRAVEL! FORCING WILL DAMAGE THE LIMIT ASSEMBLY. REMOVE THE ADJUSTMENT TOOL AFTER EACH ADJUSTMENT.*

Side view of Actuator:

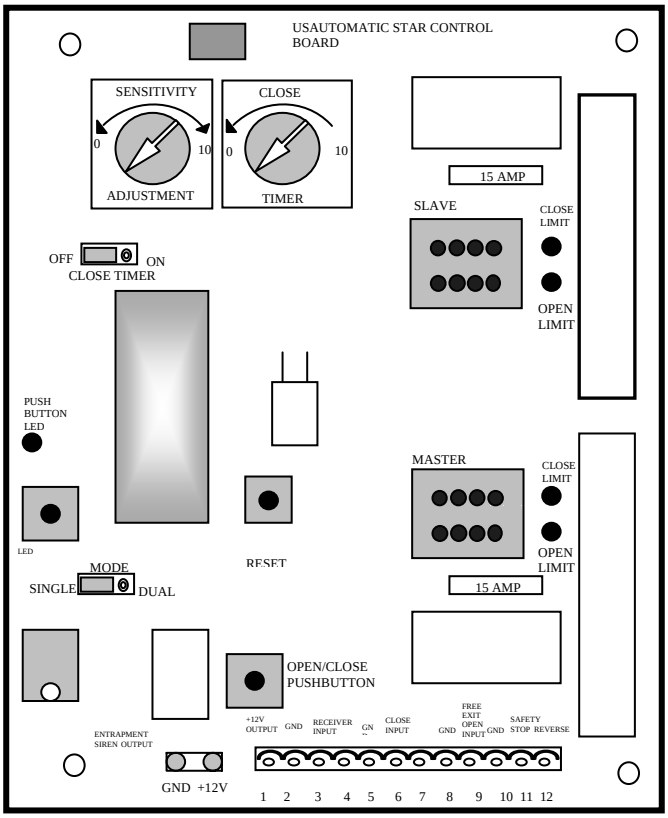


The following will assist you. Shown below are adjustments for all installations.

To extend more	Turn the extend adjust counter clockwise.
To extend less	Turn the extend adjust clockwise.
To retract	Turn the retract adjust clockwise.
To retract less	Turn the retract adjust counter clockwise.

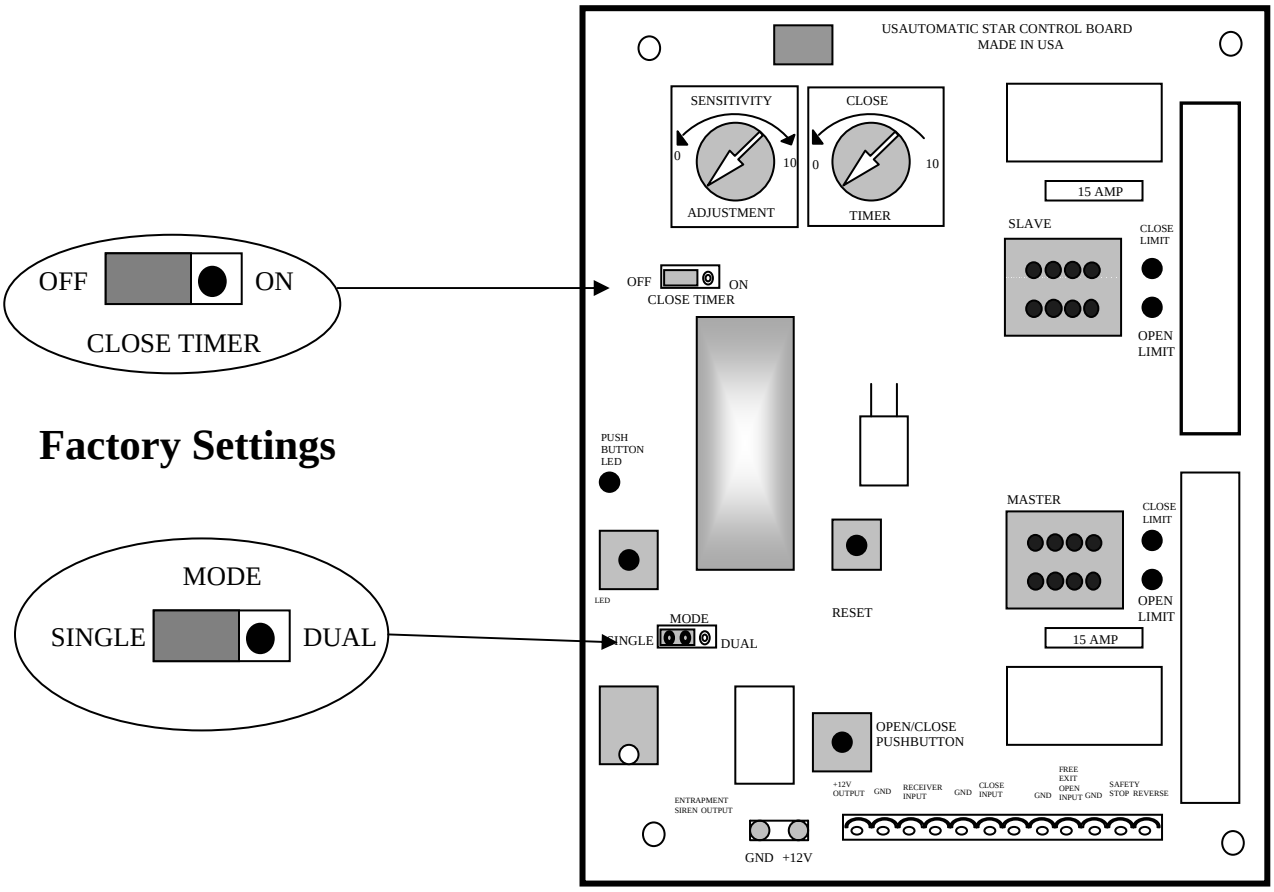
- Remember if the gate reverses direction without hitting an obstruction, then minimizing sensitivity (increasing pressure) may be required. Do not increase any more than necessary.

Circuit Board Terminal Description For Accessories



TERMINAL	DESCRIPTION
1	**+ 12 volt DC Output** Maximum current output 1.5 amp (1500 milliamps)
2	**Common Ground Input**
3	**Receiver Input. (normally open)** Push button, radio control, keypad, etc.
4	**Not used**
5	**Common Ground Input**
6	**Close input (normally open)**
7	**Not used**
8	**Common Ground Input**
9	**Free Exit/Open Input** (normally open contacts)free exit loop input or any hold open input such as a 7-day timer, telephone access unit, or maintain contact switch (normally open contacts). These devices open the gate and will prevent the gate from closing if the contact is maintained. Once the contacts have been released, the gate can be closed with a closing signal device or the automatic close timer feature.
10	**Common Ground Input**
11	**Safety Loop** (normally open). Stops a closing gate and reverses it to the open limit. Holds open an open gate and overrides the close timer. Timer will allow gate to close after safety loop clears.
12	**Safety Reverse** (normally open) Secondary Entrapment Device Input. Will stop and reverse gate. If two sequential inputs are received gate will shut down until reset button is pressed.

Function Jumper Settings



Factory settings are shown in bold italic type

S3 Automatic close timer circuit

ON Timer to close is activated

OFF ***Timer to close is disabled*** ***(Factory setting)***

S2 Mode Select (SINGLE/DUAL)

SINGLE ***Single Gate Jumper Setting*** **(Factory setting)**

DUAL Dual Gate Jumper Setting

SAFETY SECTION

USAutomatic gate operators are certified to UL325 Vehicular Class I and Class II swing gate standards.

UL325 identifies four different classes of gate operators these classes are listed below:

Class I: Residential vehicular gate operator- a vehicular gate operator (or system) intended for use in a home of one to four single family dwellings or a garage or parking area associated therewith.

Class II: Commercial/General access vehicular gate operator- a vehicular gate operator (or system) intended for use in a commercial location or building such as multi-family housing unit (five or more single family units), hotel garages, retail store, or other buildings servicing the general public.

Class III: Industrial/Limited access vehicular gate operator- a vehicular gate operator (or system) intended for use in an industrial location or building such as a factory or loading dock area or other locations not intended to serve the general public.

Class IV: Restricted Access vehicular gate operator- a vehicular gate operator (or system) intended for use in a guarded industrial location or building such as an airport security area or other restricted access locations not servicing the general public, in which unauthorized access is prevented via supervision by security personnel.

Patriot I and Patriot II gate operators are intended to be installed as Class I or Class II vehicular gate operators, and the maximum load of each gate leaf should not exceed 650 pounds with a length not to exceed sixteen feet.

SECONDARY ENTRAPMENT DEVICES

USAutomatic has designed all control boards with secondary entrapment device inputs and secondary safety devices must be installed with all installations. USAutomatic recommends the use of the following devices and has provided herein instructions for the connection of such devices.

NOTE: *USAutomatic recommends that these devices be CONNECTED after proper gate installation and operation has been verified. Then connect one device and verify proper operation before installing the next device. Ensure that power is disconnected from the control board prior to connecting any wires to the control board.*

Contact Safety Devices: Safety Edges

Manufacturer - Miller Edge

Model	Description
MGR20	3 sided protection fitted for 2” round frame
MGS20	3 sided protection fitted for 2” square frame
ME120	1-sided protection attaches to flat surface
MG020	1-sided protection attaches to flat surface
ME123	1-sided protection attaches to flat surface

Non-Contact Safety Device: Photo Eyes

Manufacturer – EMX Industries INC.

Model	Description
IRB-325	+12vdc Photo Eye

Manufacturer – Allen-Bradley

Model	Description
42GRU-9001	+12vdc Photo Eye

Entrapment Alarm Devices: Sirens

Manufacturer – USAutomatic

Model	Description
W12b-3	Piezoelectric siren, 108db +12vdc

NOTE: ***For information about installation or applications, consult factory***

SAFETY SECTION

INSTALLATION

Install the gate operator when:

- The operator is appropriate for the construction of the gate and the usage class is correct for the installation.
- All exposed pinch points are eliminated or guarded.
- Only install on vehicle gates, pedestrians must be supplied with a separate access opening.
- The gate is installed in a location where enough space is supplied between adjacent structures and the gate that when opening or closing the chance of entrapment is reduced.
- Swing gates shall not open into public access areas.
- The gate is properly installed and swings freely in both directions. Do not over adjust the sensitivity adjustment to compensate for an improper gate installation.
- Locate all controls at least six feet away from the gate to eliminate the chance of the person operating the gate from coming in contact with the moving gate. Do not install external buttons, which can be used to operate the gate within the reach of children.
- All placards must be installed one on each side of the gate visible in the gate area.
- Contact sensors used for secondary entrapment safety devices and their wiring must be installed in a manner protects them from mechanical damage.
- Non-Contact sensors used for secondary entrapment safety devices must be located so that the signal from the transmitter to the receiver is not interfered with by adjacent structures. All exposed wiring must also be protected from mechanical damage.

WARNING: TO REDUCE THE RISK OF INJURY OR DEATH

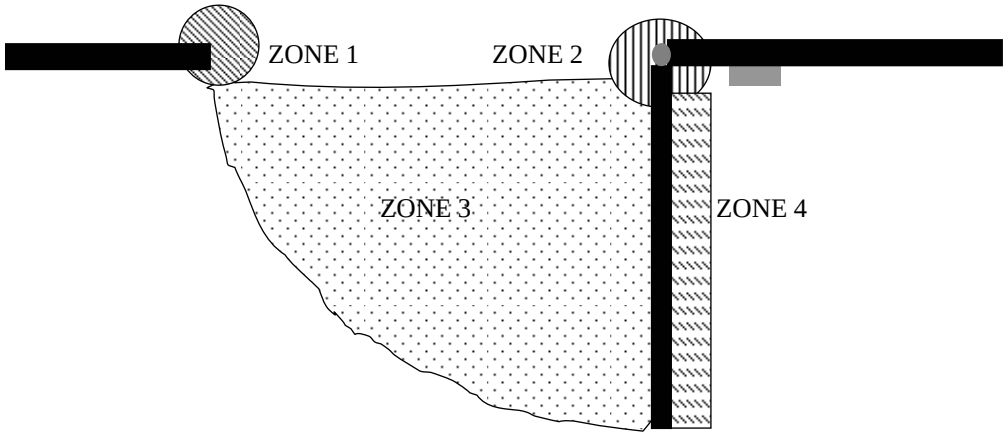
1. **READ AND FOLLOW ALL INSTRUCTIONS**
2. **Never let children operate or play with gate controls. Keep remote control away from children.**
3. **Always keep people and objects away from the gate.**
4. **NO ONE SHOULD CROSS THE PATH OF A MOVING GATE.**
5. **Test gate operator monthly. The gate must stop and reverse directions upon contacting a rigid object or when the secondary entrapment device is activated.**
6. **After all adjustments have been made to the limit switches, sensitivity (current sense) circuit, secondary entrapment devices and all other external devices installed, the safety devices must be checked again. Failure to adjust and retest the gate operator can increase the risk of injury or death.**
7. **Verify that the emergency release (manual release) pin can be easily removed. This should only be checked when power is disconnected from the operator.**
8. **KEEP GATES PROPERLY MAINTAINED. Read the installation/owners manual.**
9. **THE ENTRANCE IS TO BE USED BY VEHICLES ONLY. Pedestrians must use a separate entrance.**
10. **SAVE THESE INSTRUCTIONS**

SAFETY SECTION

All safety features required by UL 325 are incorporated in the capabilities of all USAutomatic Control boards and should be utilized, including but not limited to, safety edges, photo electric eyes, reverse sensing, and motion sensing.

Cautions - Very Important

- Do not attempt to enter the gate area while the gate is moving. Wait until the gate comes to a complete stop.
- Operate the gate only when it is fully visible, free of persons or obstructions, and properly adjusted.
- Do not allow children to play in the area of the gate. Do not allow anyone to ride on the gate.
- Do not allow children to play with the remote control or any other activation device.
- Do not attempt to "beat the gate" while the gate is opening or closing. This is extremely dangerous.
- Test the sensitivity feature and all safety devices regularly to insure correct operation.
- Study this entire Safety Section paying particularly close attention to the entrapment zones shown below and be aware of these areas not on during use but also during any adjustments to the unit.



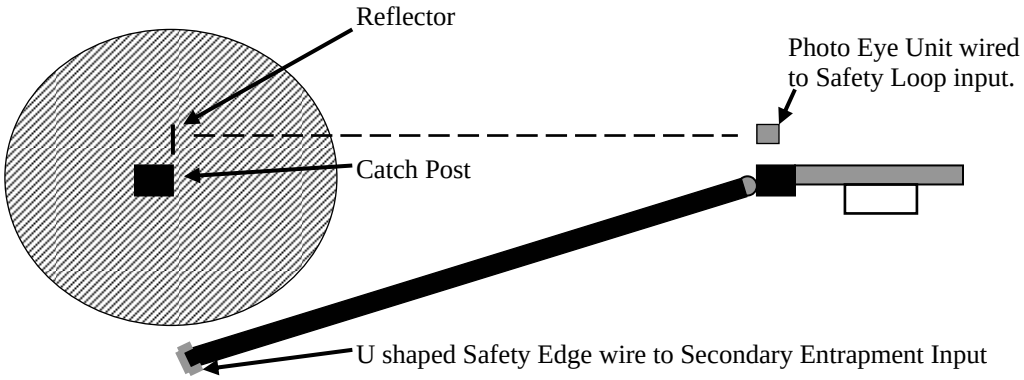
ENTRAPMENT ZONES

Zone 1 The leading edge of the gate & catch post.
Zone 2 Between the gate and hinge post.
Zone 3 The arc of the gate or gate path.
Zone 4 The space between the gate when open and any obstruction such as fence, wall, landscaping, etc.
Zone 5 (Not shown above see page 21) the point where two bi-parting gates come together when closing. This is similar to Zone 1.

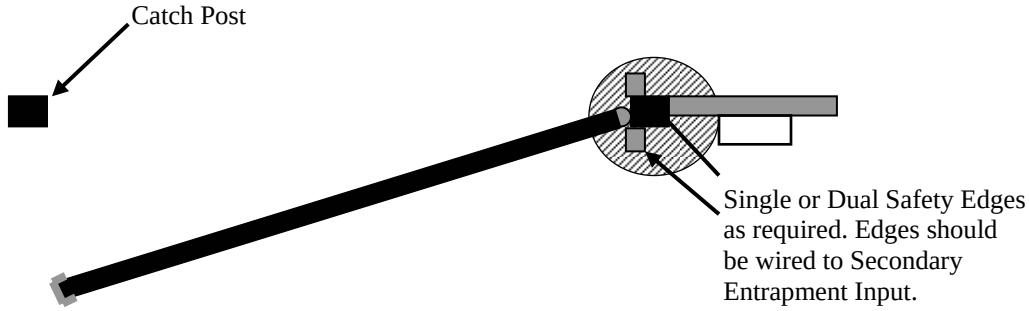
SAFETY SECTION

Remedies for Safety Concerns

Zone 1 Safety edges and photo electric eyes are the most common types of protection available.



Zone 2 A safety edge may also be utilized here but the best remedy is to eliminate pinch points when designing the hinges. Most injuries at this point result from negligence, such as reaching through the hinge area or the gate to activate a button, key switch, etc.



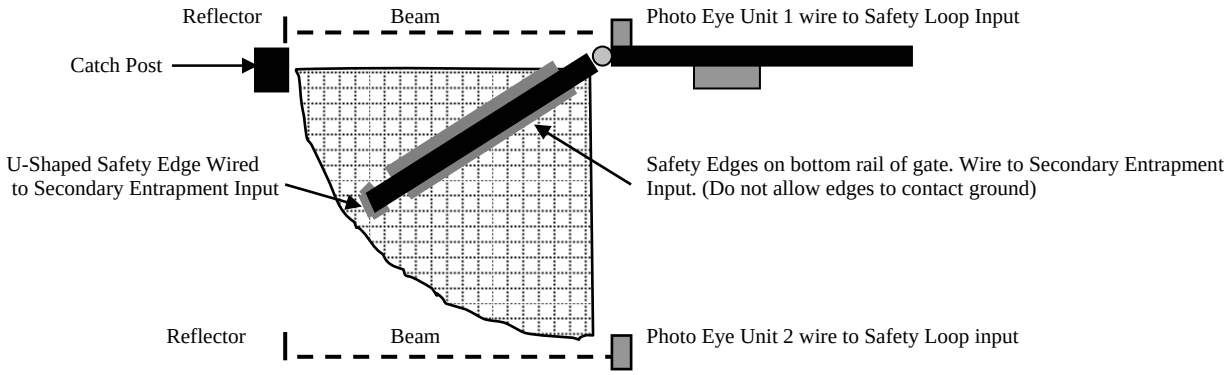
NOTE: *All control stations should be located at least 6 feet from any moving part of the gate or operator.*

Never install any control device where a user will be tempted to reach through the gate or fence to activate a gate.

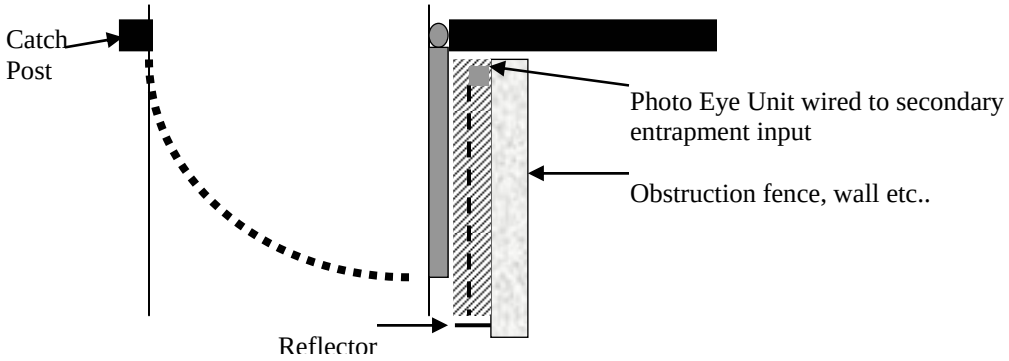
SAFETY SECTION

Remedies for Safety Concerns

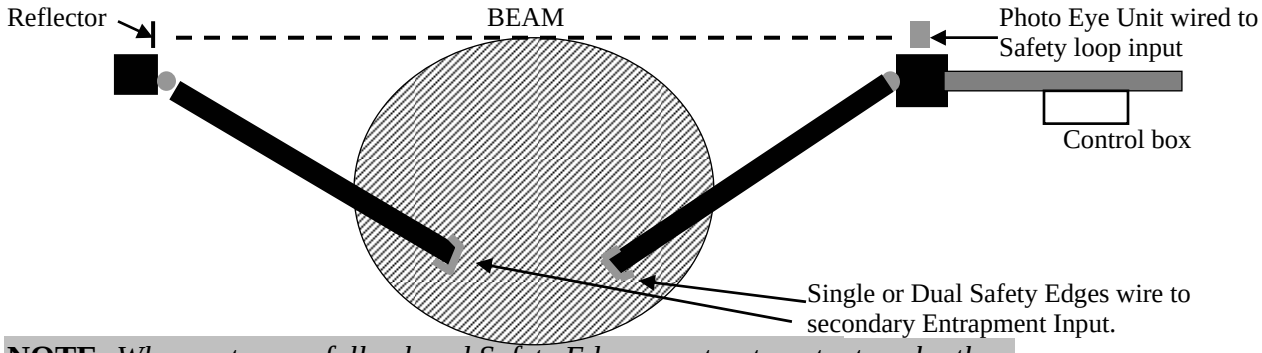
Zone 3 Safety edges are the best protection. A photo eye may also be used.



Zone 4 This area is best protected with a photo eye wired to the secondary entrapment input. The beam should be installed parallel to the gate in the open position or along the obstructing wall or fence.



Zone 5 Safety edges and photo eyes are the most common types of protection available.



NOTE: *When gates are fully closed Safety Edges must not contact each other. This can cause false obstruction sensing.*

Every installation is unique and it is the installer's responsibility to recognize and remedy all safety concerns. Please consult a qualified dealer or the factory for a complete explanation of the remedies shown above and additional tips pertaining to your installation.

Periodic Service

All gate operators require periodic checking and adjustments by a qualified technician of the control mechanism for force (load), speed and sensitivity. All external accessories and secondary safety devices must be checked. Secondary safety devices need to be checked at least once a month for proper operation.

Periodic checking is also advised for the following:

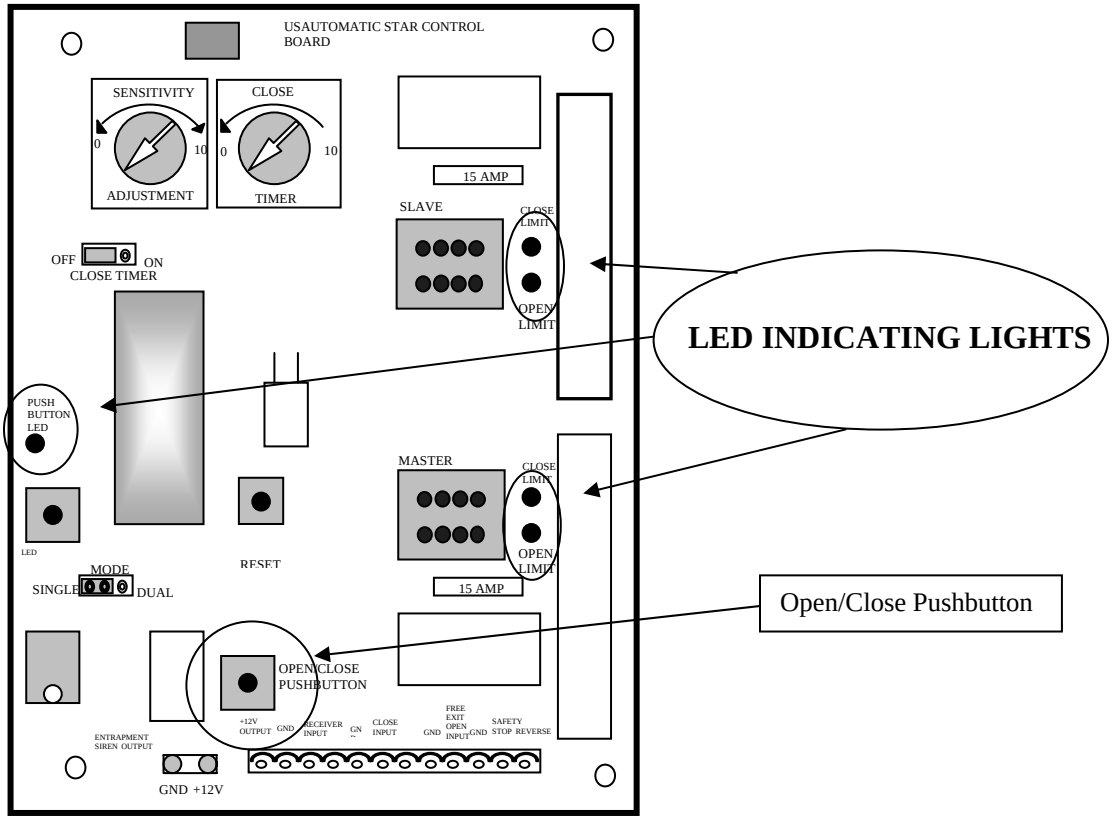
1. **Battery cells water level. (use distilled water if needed)**
2. **Hinges and pivot points need to be greased.**
3. **Bolts for correct tightness.**
4. **Inspect weld points for cracks or other defects.**
5. **Inspect wiring for cuts, knicks or other defects.**
6. **Inspect hinge post, ensure that it is not twisting or moving.**

Troubleshooting Guide

Introduction

The USAutomatic control board is equipped with two unique features to assist in troubleshooting a gate system.

1. The first and most helpful is the series of LED indicating lights. These lights will help to identify problems with the actuator limit switches and the receiver input. To use the indicators, press and hold the Push Button Led button on the control board. (The lights are not active at all times to save battery life). Any circuits or limit switches that are activated will be obvious by the illumination of the adjacent LED indicating light.
2. The second feature to assist in troubleshooting is the on board Open/Close Pushbutton.



TROUBLESHOOTING GUIDE

SYMPTOM	*POSSIBLE CAUSE*	*REMEDY*
1. Gate stops and reverses direction in mid-travel.	a. Current sense feature may be set too sensitive.	Readjust- see page 13. CAUTION: Sensitivity should be sensitive enough to avoid injury.
	b. Gate operator is not plumb & level.	Remount hinge mount tube or gate bracket.
	c. Gate or hinges are binding or are not plumb and level.	Repair gate and readjust all actuator and board settings.
	d. Low battery voltage.	Check battery/at least 12.5 volts DC.
	e. Control board is defective.	Replace control board.
	f. Shaft seal on actuator is binding due to dryness. This usually occurs in colder weather or first cycle in the morning.	Spray stainless actuator shaft with silicone spray lube or spread a very light film of all-purpose grease on shaft.
2. Gate travels OK but after closing, opens back up.	a. Too much travel distance on closing cycle.	Readjust closing limit switch See page 14.
	b. Actuator cable damaged or loose connections.	Check actuator plug at control board and cable for nicks or tears.
	c. Control board is defective.	Replace control board.
3. Gate doesn't move at all.	a. Blown fuse	Replace if blown with 15-amp max.
	b. Loose or incorrect battery connections or voltage.	Check battery connections, polarity and voltage/at least 12.5 volts DC.
	c. Actuator cable damaged or loose connection.	Check actuator plug at control board and cable for nicks or tears.
	d. Actuator limit switch assembly defective.	Replace or repair actuator.
	e. Control board is defective.	Replace control board.
	f. A control device such as a push-button, remote control, keyswitch, etc. is shorted, which will lock up the circuit board.	Remove signal wires from these devices one at a time until board will activate.

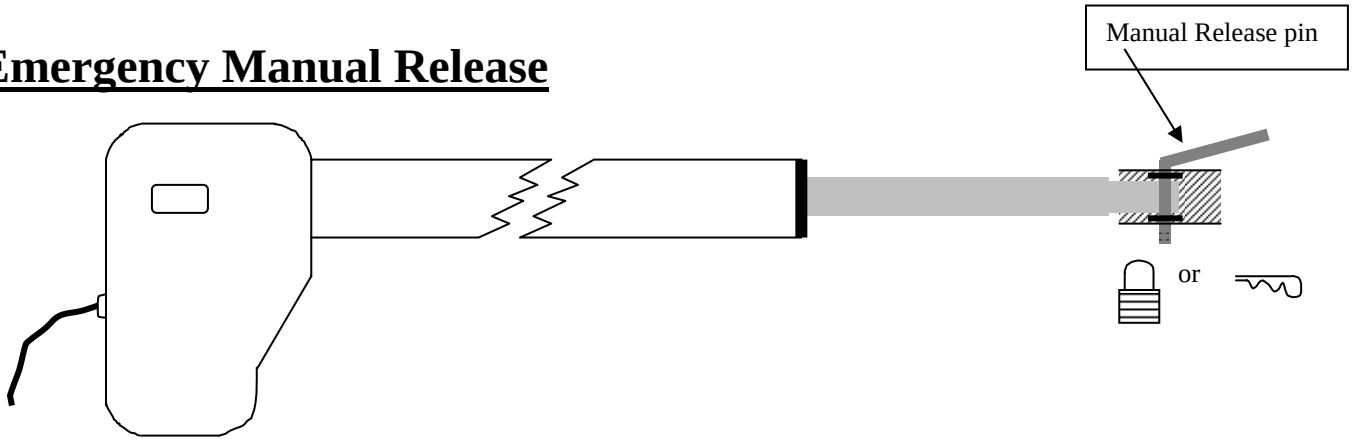
TROUBLESHOOTING GUIDE

SYMPTOM	*POSSIBLE CAUSE*	*REMEDY*
4. Gate will not open with remote control transmitter.	a. Improper code settings or wiring.	Check the code switches in the transmitter & receiver. Verify that they are identical. Check wiring of receiver.
	b. Weak transmitter battery.	Replace battery. LED light should illuminate on remote.
	c. Poor antenna connection.	Check all connections and/or raise the antenna to avoid metal objects.
5. Gate activates open or close for no reason.	a. A shorted signal is coming into the control board form an external control device such as a remote transmitter, pushbutton, key pad, etc.	Check all transmitters and pushbuttons for a stuck button. Remove signal wires from control board one at a time until unit returns to normal. Replace defective device or wires.
6. Automatic close timer will not close the gate.	a. An opening device such as a button, keypad, phone unit, or exit loop detector is shorted.	Remove each device from the system one at a time until gate times out to close.
	b. A safety device such as a safety loop detector or safety edge is shorted.	Remove each device from the system one at a time until gate times out to close. Use on board indicating lights to assist in locating the shorted circuit.
	c. A wire from one of these devices is shorted.	Test cables by removing one at a time until timer times out and gate closes. Use on board indicating lights to assist in locating the shorted circuit.
	Close timer jumper not properly installed or missing.	Install jumper (see page 16)
	e. Defective control board.	Replace control board.
7. Gate jerks excessively when activated and bounces during cycle.	a. Hinge mount tube dimensions are not correct.	Remount hinge mount tube per instructions.
	b. Hinge post is weak.	Replace or reinforce post.
	c. Gate design is weak.	Replace or reinforce gate.
	d. Gate bracket is not mounted secure enough.	Remount bracket and reinforce surrounding area.

TROUBLESHOOTING GUIDE

8. Gate began to operate increasingly slower and does not operate at all now.	a. Battery has one or more dead cells.	Replace battery.
	b. If AC charged, circuit breaker has tripped or power to charger is interrupted.	Check circuit breaker. Check for power at charger receptacle.
	c. Battery charging system (AC charger or solar panel) is not functioning.	Consult factory for testing instructions. (Test meter required).
9. On a dual gate, only one unit will open and close.	a. Blown fuse	Replace with 15-amp max.
	b. Defective actuator.	Repair or replace actuator.
	c. Defective cable.	Repair or replace cable.
	d. Defective control board.	Repair or replace control board.
	e. Master/Slave jumper not properly installed or is missing.	Install jumper (see page 16)
	Note: *Reverse actuator plugs on board and actuator locations to determine exact cause of problem.*	

Emergency Manual Release

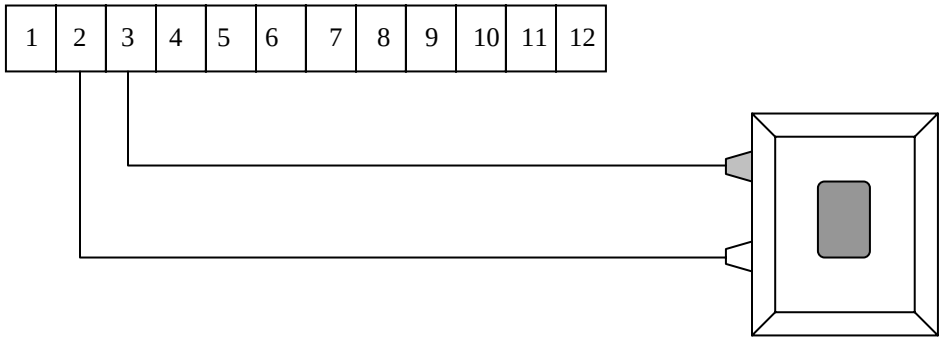


Remove the manual release pin at the gate bracket and open the gate by hand. Secure the gate before attempting to pass through.

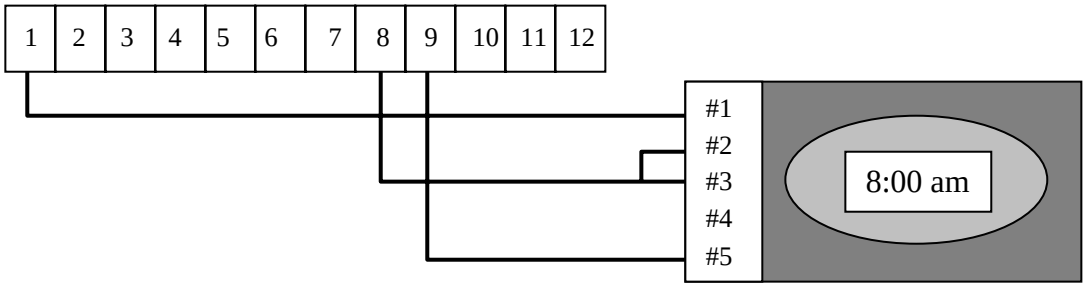
Accessory Wiring Diagrams

NOTE: Ensure that battery power is disconnected from the control board before wiring accessories to the control board.

Single Button Station to Open/Close

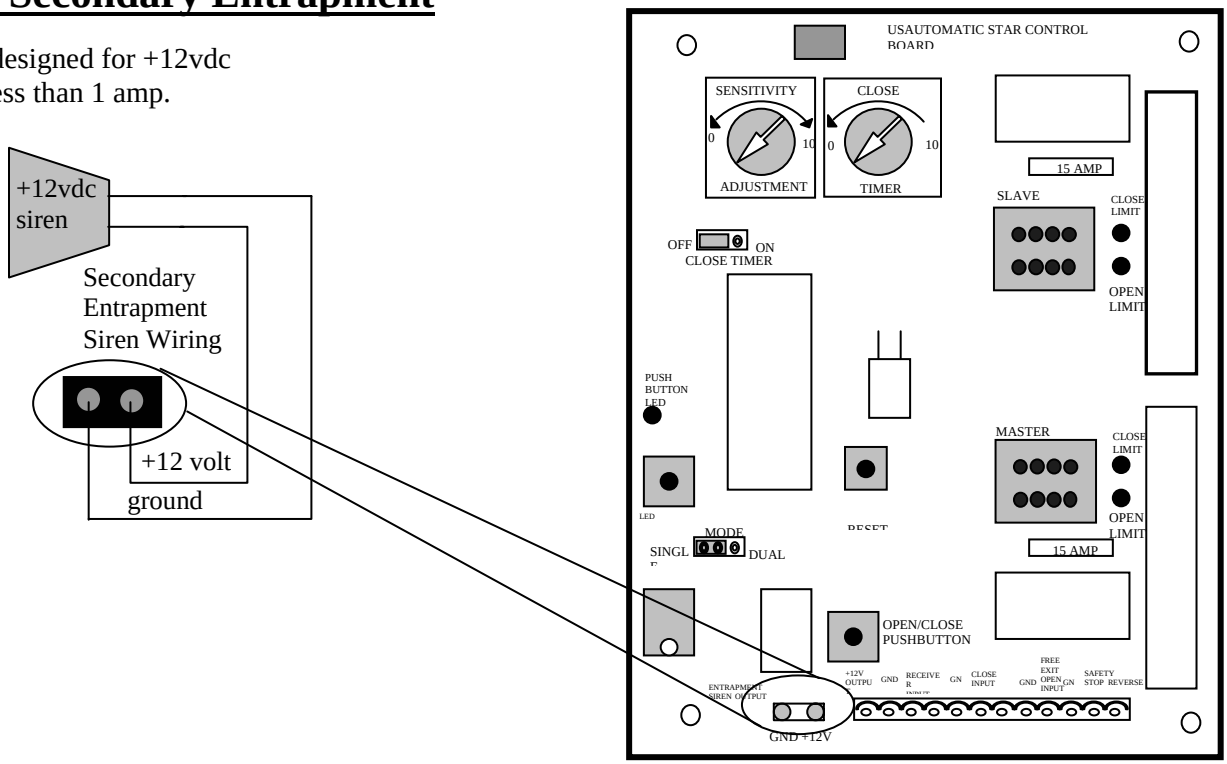


Seven Day Timer to Hold Gate Open – TH800-12

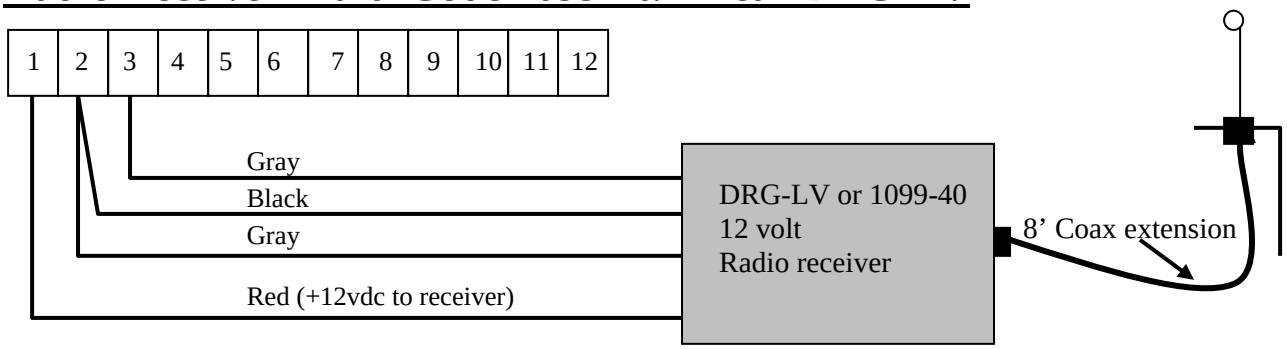


Siren Secondary Entrapment

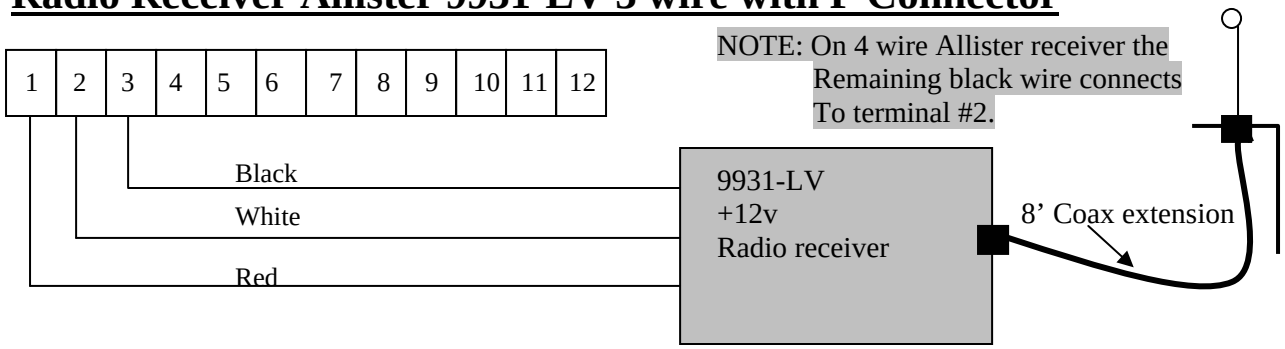
Output designed for +12vdc
Sirens less than 1 amp.



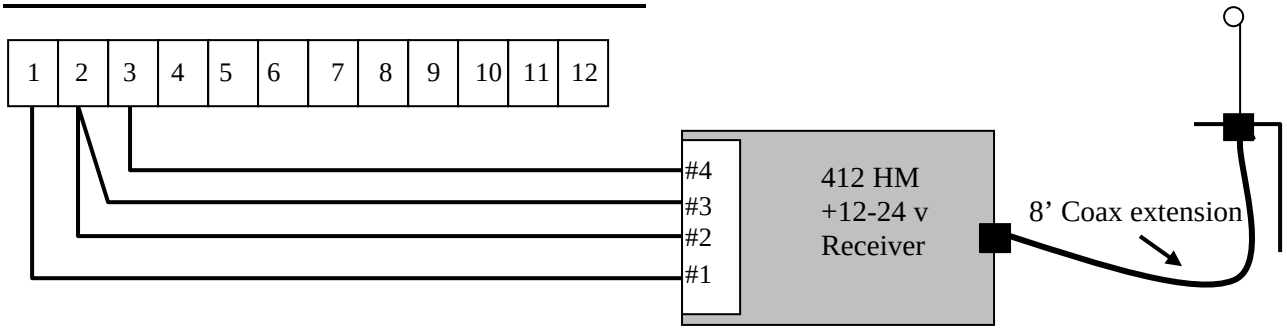
Radio Receiver Multi-Code 1099-40/Linear DRG-LV



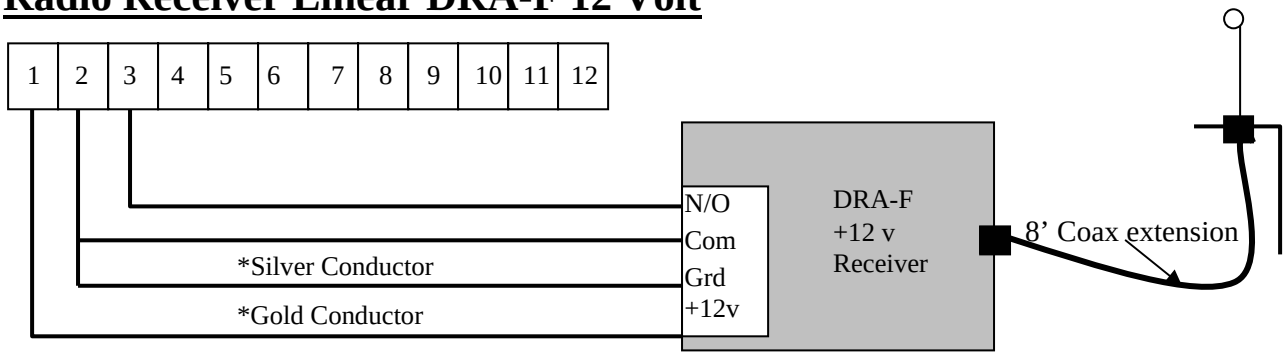
Radio Receiver Allister 9931-LV 3 wire with F Connector



Radio Receiver Liftmaster 412 HM

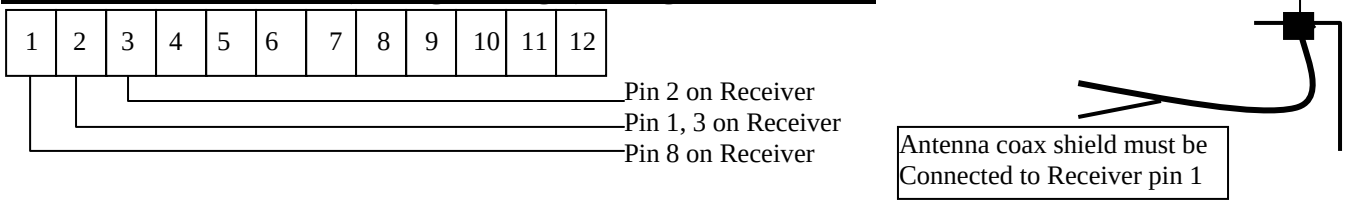


Radio Receiver Linear DRA-F 12 Volt



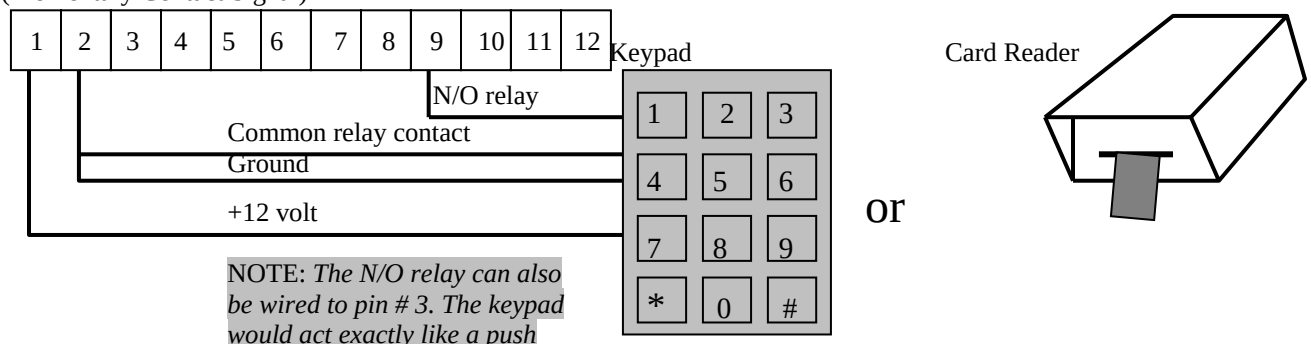
*Two conductor wire from receiver

Albano Receiver: (Long Range) Single Channel



Keypad (12 Volt D.C.)

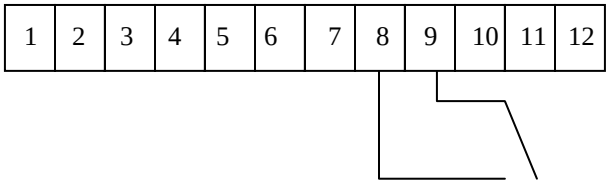
(Momentary Contact Signal)



NOTE: *The N/O relay can also be wired to pin # 3. The keypad would act exactly like a push button transmitter when code was entered. Maintain open pin # 9.*

Telephone Access Unit Wiring Signal or Hold Open Signal

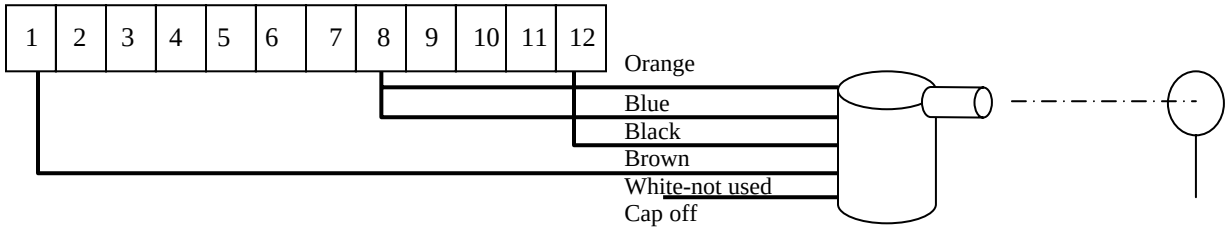
(Hold open circuit with timer to close override)



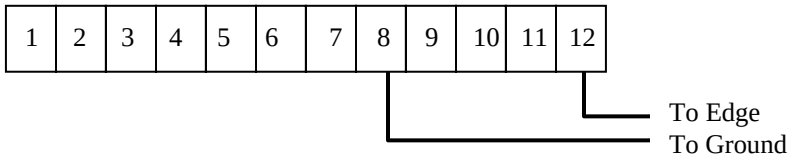
Normally open contacts from any device such as a Free Exit Loop, Maintain Contact Key switch, 7-Day Timer, Telephone Access Unit etc.
When the switch contacts close, the gate will open and remain open until the contacts are released. The close timer or any close signal will only operate after the switch contacts open.

Photo Eye Wiring for Secondary Entrapment Device

(+12 volt Photo Eye) Wiring shown for Allen Bradley Model # 42GRU-9001

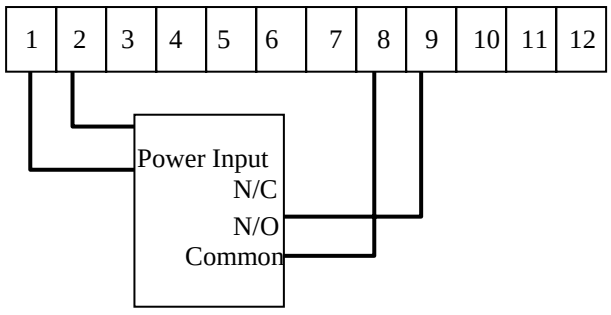


Safety Edge Wiring (Wired Type) Secondary Entrapment Device

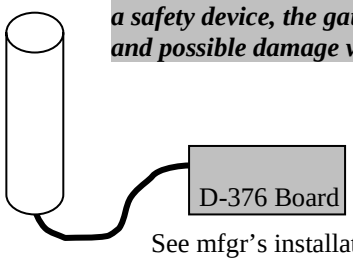


Probe Type Free Exit Magnetic Vehicle Detector

Wiring shown for MFM sensors Model # MFM-D376 LC



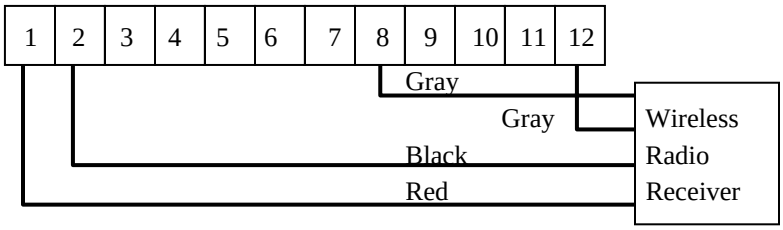
NOTE: ***This type of detector senses moving vehicles only. It should be utilized as an opening device only. If used as a safety device, the gate will close if the vehicle stops and possible damage will result.***



See mfgr's installation instructions
For probe wiring.

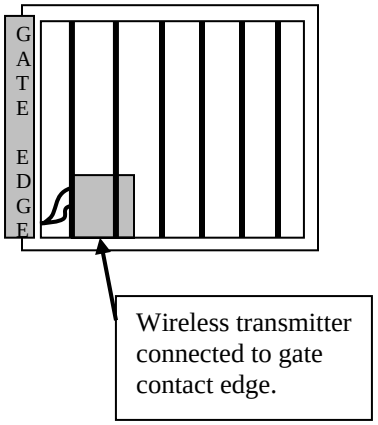
Safety Edge Wiring (Wireless Type) Secondary Entrapment Device

(Safety Edge Transmitter & Radio Receiver)



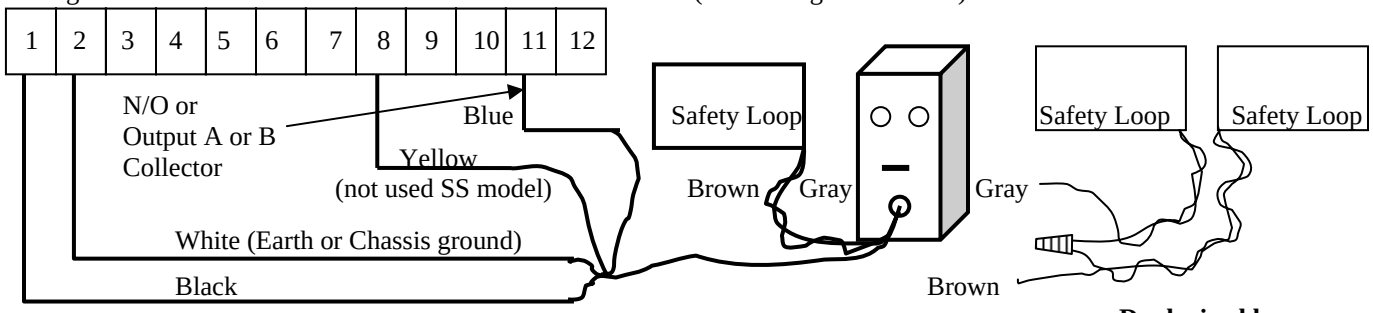
This receiver is for Safety edge only. Another receiver is required if a Transmitter is used to open the gate

NOTE: *Transmitter battery will be drained if Contact edge on gate is depressed constantly.*



Safety Loop Magnetic Vehicle Detector 12 Volt DC

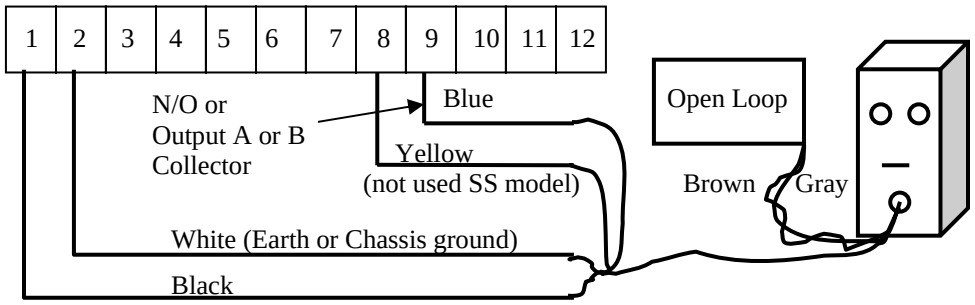
Wiring shown for Reno Model # BX-LP or BX-LP-SS detector (See Wiring Note Below)



Dual wired loops

Free Exit Loop Magnetic Vehicle Detector 12 Volt DC

Wiring shown for Reno Model # BX-LP or BX-LP-SS detector

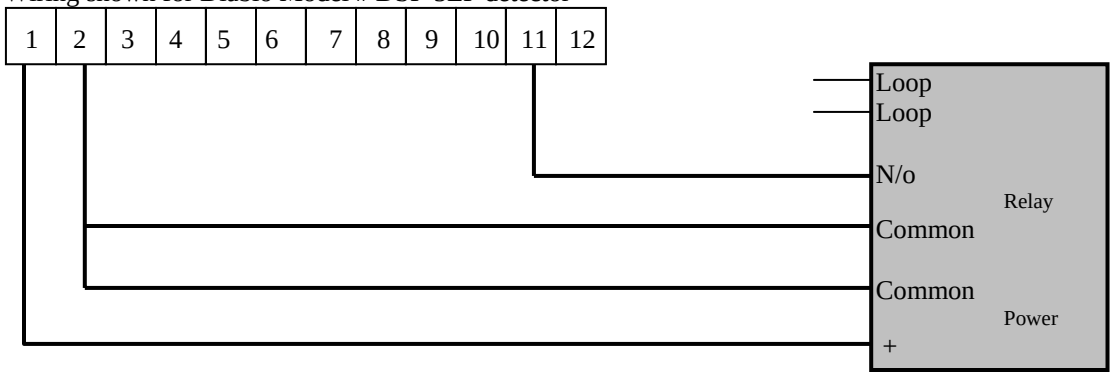


Wiring Note: When using the SS model detector connect detector pins 2 (“power –“) 5 and 9(“Output A, B Emitter”) together, then connect to pin 2 on the control board.

Connect the detector pin corresponding to “output A or B Collector” to pin 9 on the control board for free exit or pin 11 for safety loop..

Safety Loop Magnetic Vehicle Detector 12 Volt DC

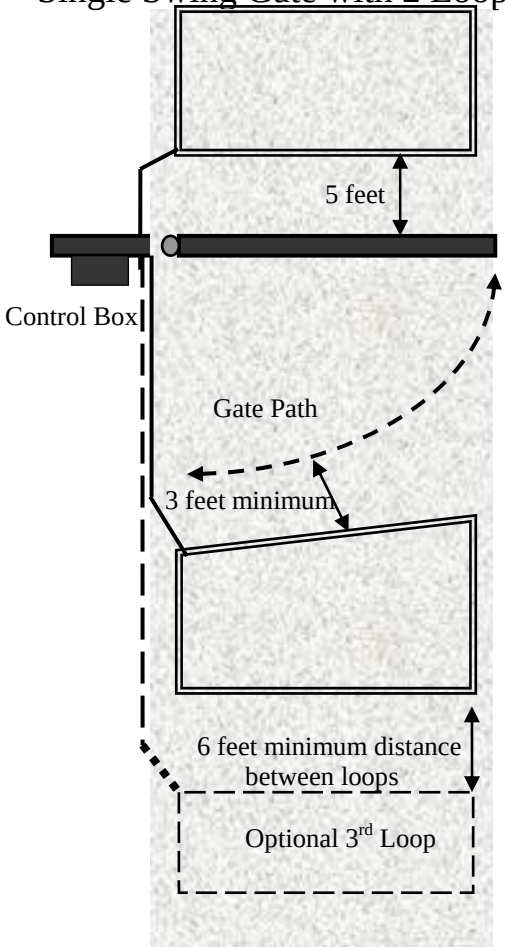
Wiring shown for Diablo Model # DSP-5LP detector



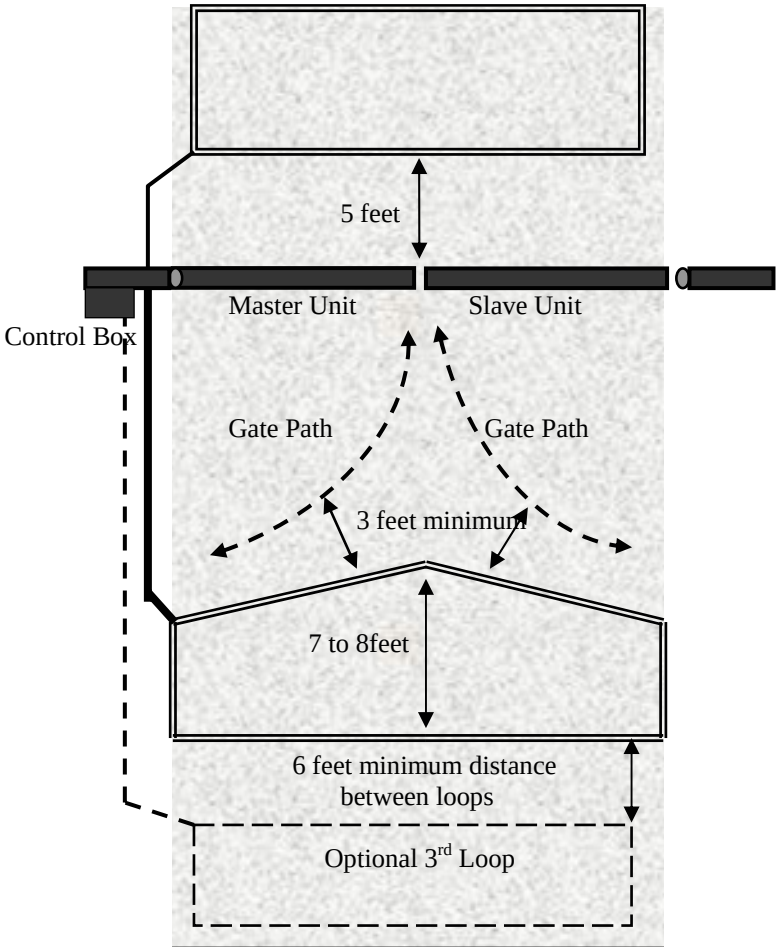
Loops

Loop Position Diagram

Single Swing Gate with 2 Loops

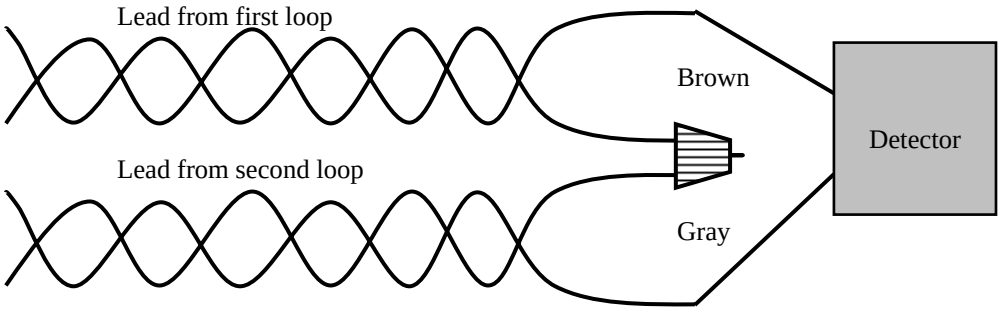


Dual Swing Gate with 2 Loops



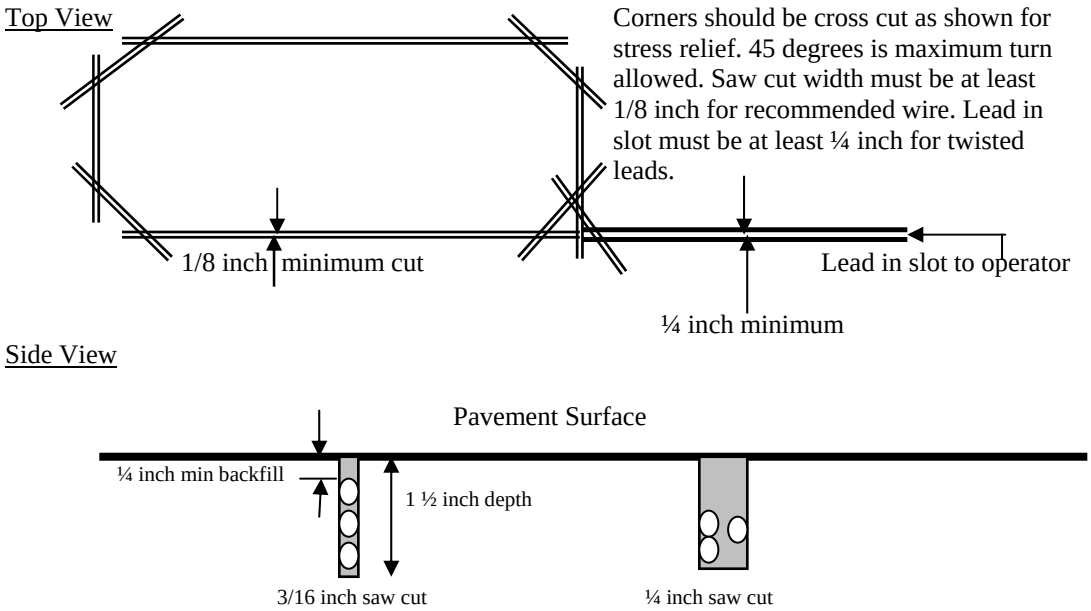
Proper wiring of two loops performing the same function.

Example: Inside and Outside Safety Loops



Loops

Typical Loop Saw cut



Loop Size Chart

The loop size is based on the width of the driveway. If the driveway were 14' wide, the loop would be a 6'x6', the minimum. This is determined by subtracting 4' off of each side of the drive, which would leave you 6'.

See chart below for number of turns per loop size, plus lead in.
The loop itself should contain between 90 & 125 feet of wire in the loop, plus lead in.

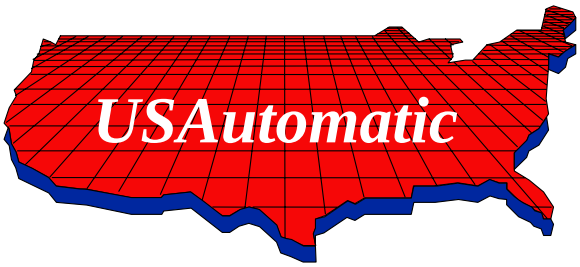
Drive Width	Loop Size	Number of Turns 2	3	4
14' & Under	6' x 6'			96'
16'	6' x 8'			112'
18'	6' x 10'		96'	
20'	6' x 12'		108'	
22'	6' x 14'		120'	
24'	6' x 16'		132'	
26'	6' x 18'	96'		
28’	6’ x 20’	104’		
30’	6’ x 22’	112’		
32’	6’ x 24’	120’		

The location of the loop is also important. If a loop is located too close to the gate, it will detect the gate itself, giving false operation. If the loop is too far away from the gate a small vehicle might not be detected. Loops should be approximately 5' from the centerline of a gate when closed. See Loop Position on previous 2 pages.

Loops

Other Loop Detector Facts

1. Always clean saw cuts thoroughly with water, air or brush to remove all debris prior to installing wire.
2. Recommended loop wire is TFFN #16 gauge stranded wire. It is available at electric supply distributors.
3. No splices are permitted in the loop or loop leads. One continuous wire should be used.
4. Lead wires should be twisted a minimum of 4 twists per foot to eliminate false sensing. Twists should begin at the edge of the loop and continue to detector.
5. Do not use metal or sharp objects to push the loop wire into the saw cut. The slightest nick or cut in the insulation will cause the loop to ground out and malfunction. To test for shorts, use a megohmeter or "Megger" between either loop lead and earth ground with both leads disconnected from the detector. The resistance should be greater than 50 megohms.
6. Use siliconized caulk for backfill. Gray for concrete, black for asphalt. 25-Year life rating is preferred.
7. Never set adjacent loops on the same frequency. False activation will occur.
8. Almost all brands of detectors have an external or internal sensitivity adjustment. Usually the factory setting is sufficient if internal adjust type. Be very careful and use extreme caution when decreasing sensitivity.
9. Most false activations are caused by an improperly installed loop or a shorted loop. The loop should be tested and validity determined before adjusting sensitivity. See # 5 above.
10. Most detectors used in the gate business are fail-safe. This means that if the loop fails, the gate will be given a continuous signal. When power is disconnected from a detector, the signal output is also given.
11. ASB, or automatic sensitivity boost is now available on most detectors. This feature should be activated if large truck or trailer traffic is likely.



Star I
Star II
Limited 5 Year Warranty

The Star Gate Operator is warranted to be free of defects in materials or workmanship for a period of 5 years from date of purchase on the electronic control board and 12months on all other components. Any part, parts, or complete unit found to be defective within this period will, at the manufacturer's option be repaired or replaced at no charge if returned freight prepaid. New or factory rebuilt replacement parts are warranted for the remaining portion of the original warranty period. The manufacturer will pay for standard ground freight on the return of the repaired or replaced items under this warranty. The manufacturer will not be responsible for field service or labor charges incurred in the removal or replacement of defective parts. Furthermore, the manufacturer will not be responsible for incidental or consequential damages.

This warranty is in lieu of all other warranties expressed or implied and shall be considered void if damage was due to improper use or installation, connection to an improper power source, or if caused by fire, flood, lightning and other acts of nature, or by vehicles or vandalism.

This warranty gives you specific legal rights, and you may have other rights, which vary from state to state. Some states do not allow limitations or exclusions of implied warranties so these may not apply to you.

Keep this portion for your records

Model:_____ **Serial Number*:**_____

Date of Purchase:_____ **Purchased from:**_____

CUT HERE

RETURN THIS PORTION TO:
USAutomatic
118 Hillside
Lewisville, Texas 75057
Toll Free 1-888-204-0174

Model: _____ Date of Purchase: _____
Serial #: _____ Purchased from: _____
Name: _____
Address: _____
City: _____ State: _____ Zip: _____

**Serial number can be found by removing cover and looking on control board.*