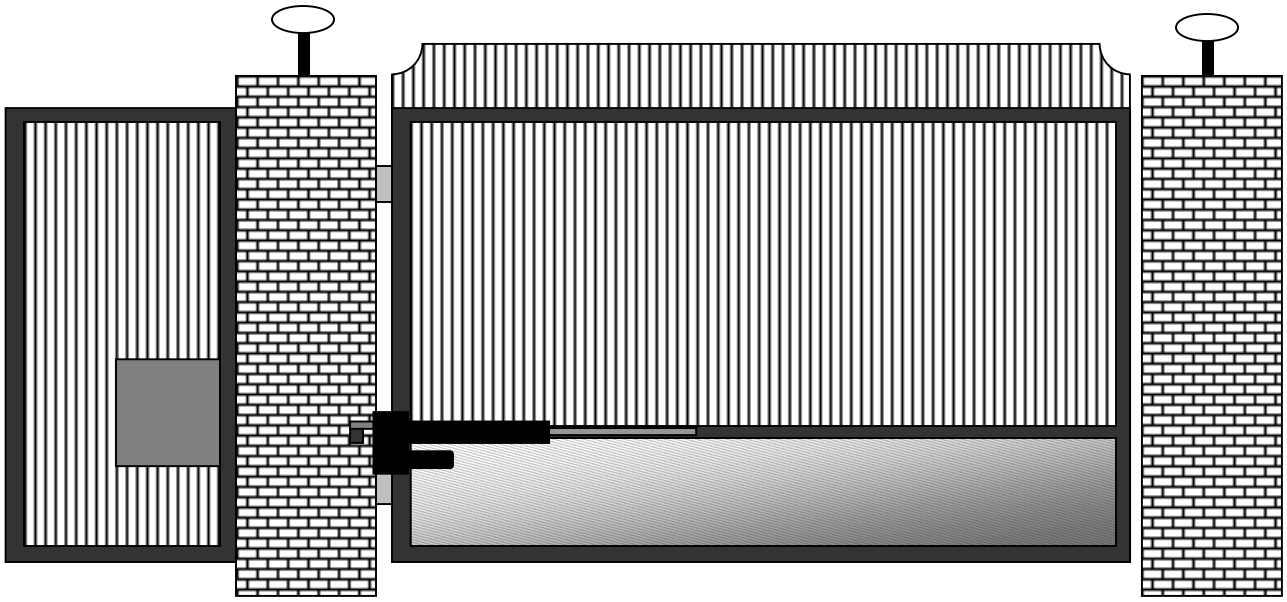
USAutomatic

PATRIOT

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



PATRIOT I Single Swing Gate Operator

PATRIOT 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 650 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 UL 325. 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 (page 17-21), paying particularly close attention to the Entrapment zones on page 19-21 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.

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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 is an option, 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 test or operate this unit without the actuator securely attached to the gate. Serious damage to the actuator limit switch assembly may occur if attempted.
2. 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.
3. 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 or class II swing gates up to 16 feet in length and up to 650 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 operator.)

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. Holding the gate open can decrease cycles 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?

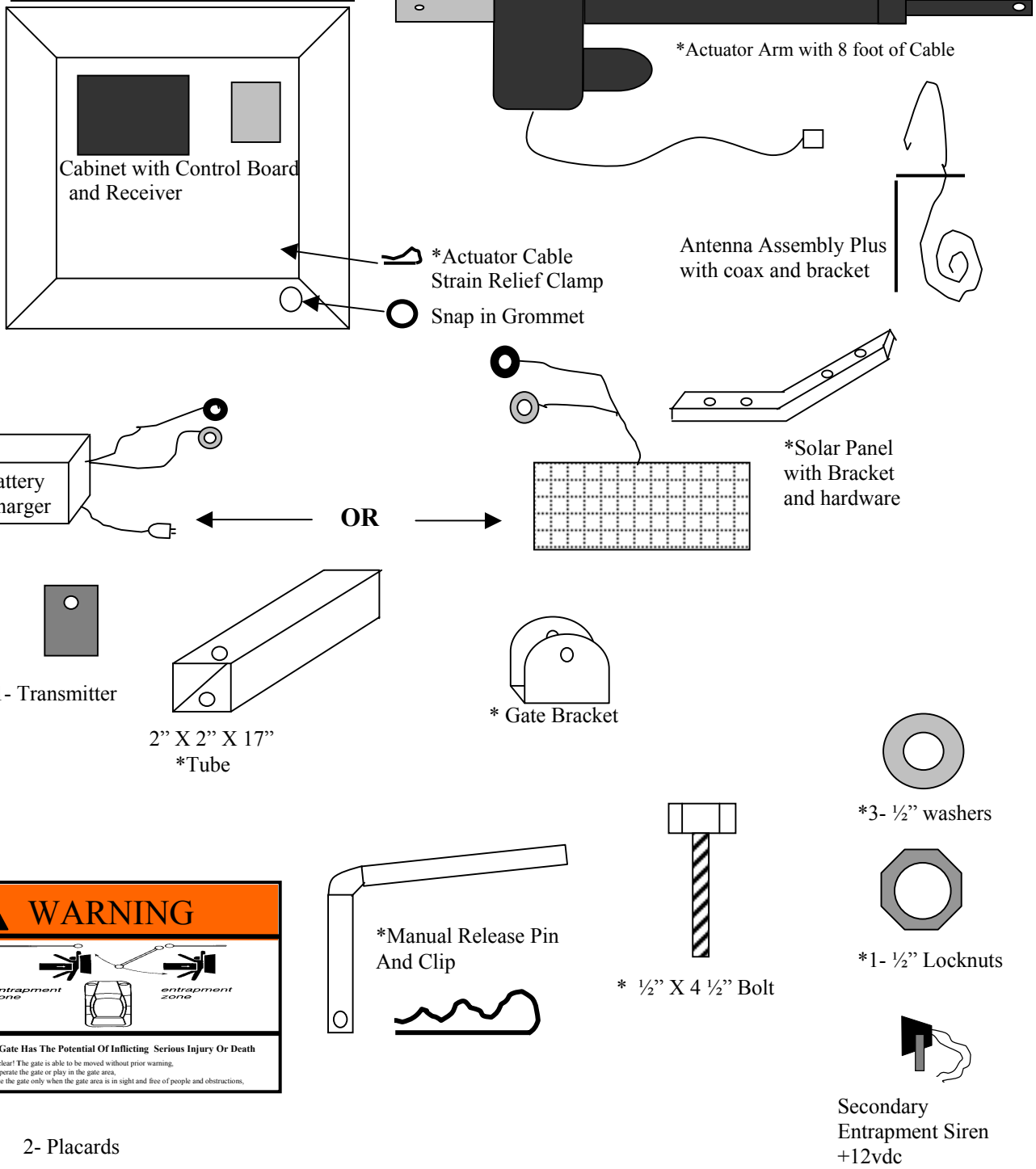
If any of these problems exist, they must be corrected to achieve a reliable automatic gate system.

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, if any, be brought to the control box?
H. Have all safety concerns been addressed? (See Safety Section Pgs. 17-21)

PARTS INCLUDED



- ***For Patriot II quantity is doubled.**
- **Additionally, 40' of Master/Slave Actuator cable provided with the Patriot II**
- **Placards (Two supplied) 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)

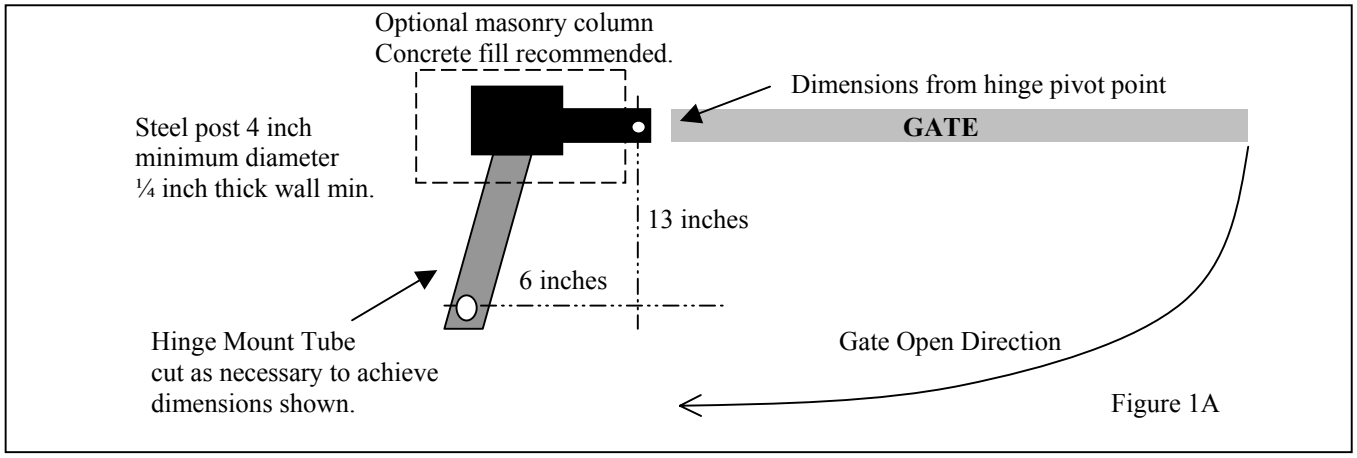


Figure 1A

Other Typical Methods for

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

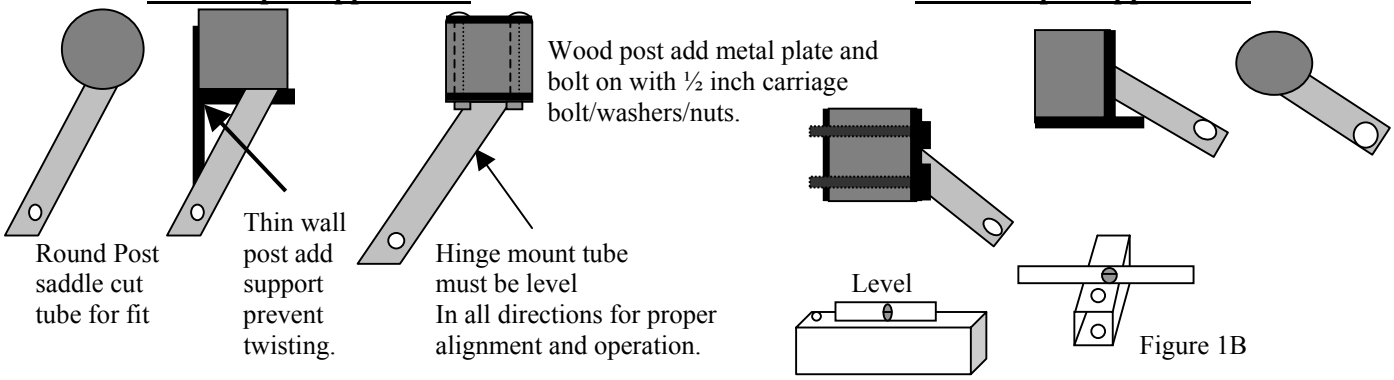


Figure 1B

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)

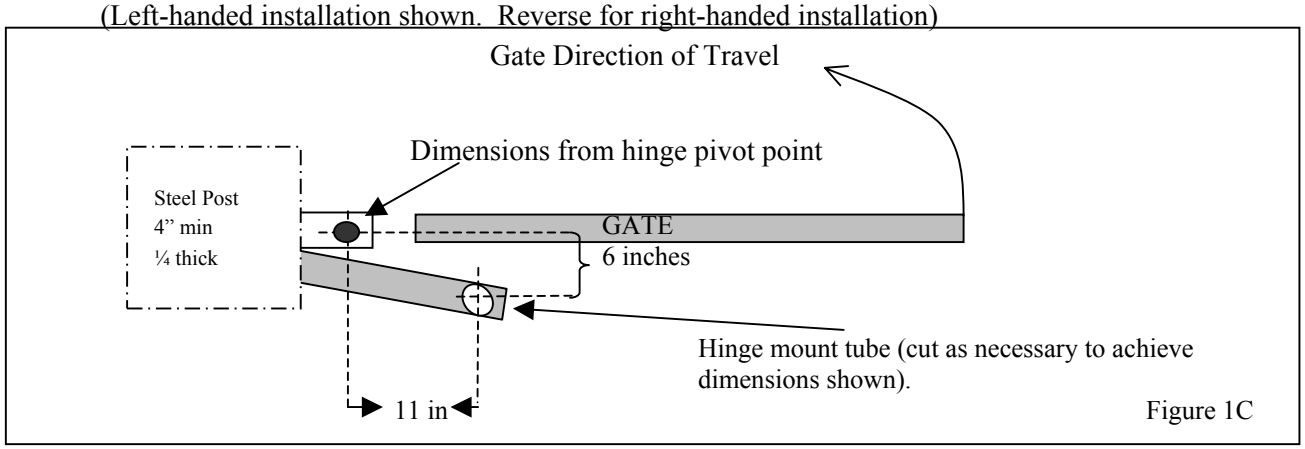


Figure 1C

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.

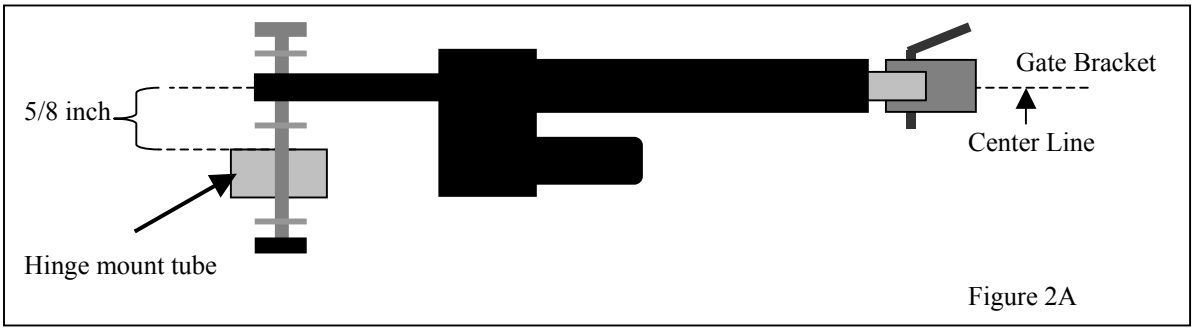


Figure 2A

Correct Installation

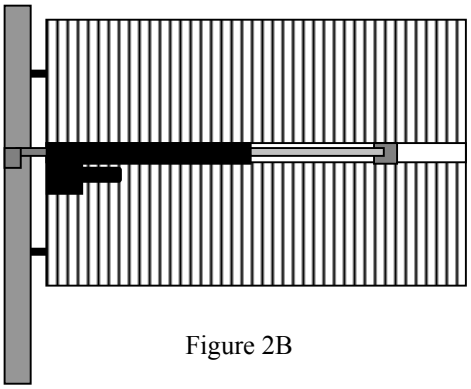


Figure 2B

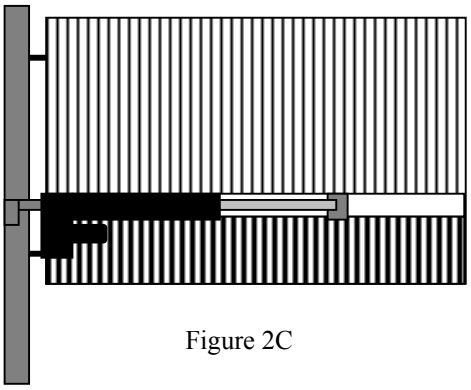


Figure 2C

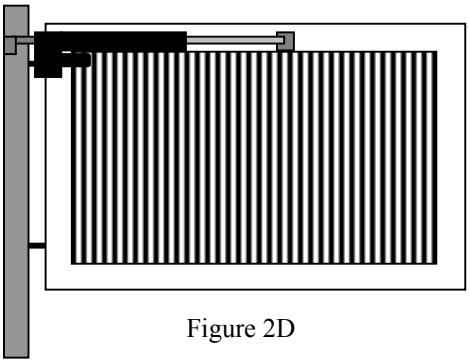


Figure 2D

Incorrect Installation

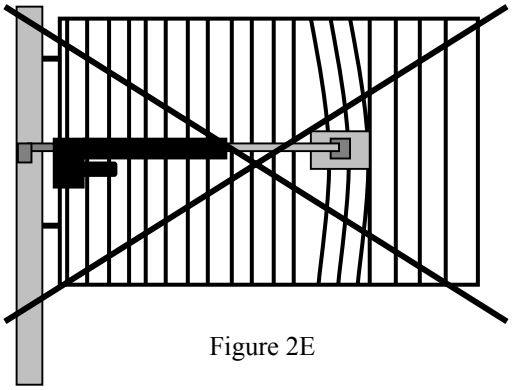


Figure 2E

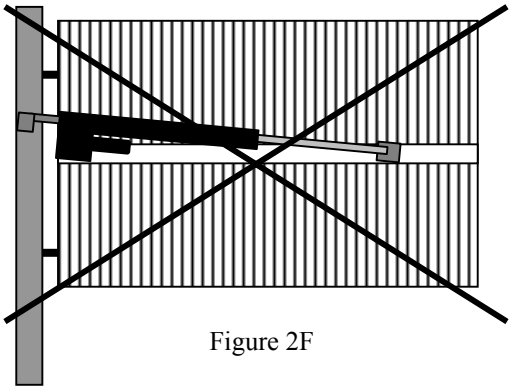


Figure 2F

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 1 Prepare Actuator for Installation

Assemble the actuator to the gate bracket as shown in figure 3A

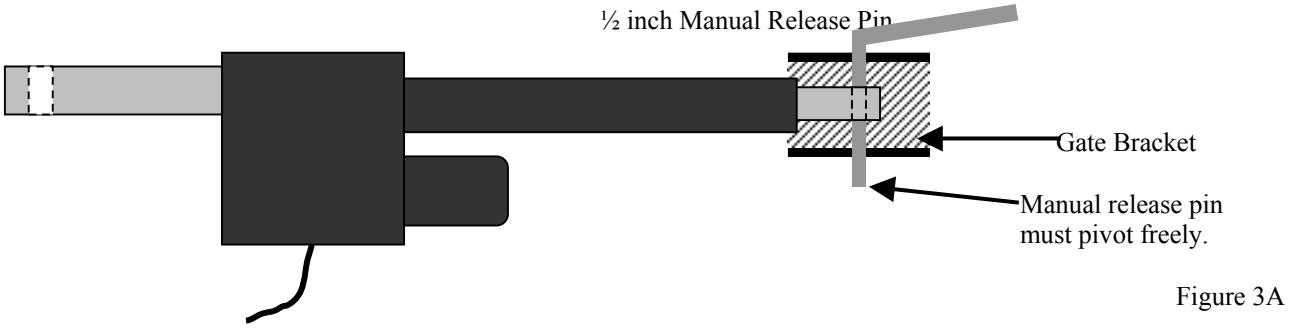


Figure 3A

STEP 2 Actuator Installation

NOTE: *To simplify Limit switch adjustment during installation, the actuator may temporarily be mounted upside down.*

The actuator is adjusted to the fully retracted or open position from the factory. Once the actuator is connected to the hinge mount tube, swing the gate to the desired fully open position and determine location of the gate bracket.

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

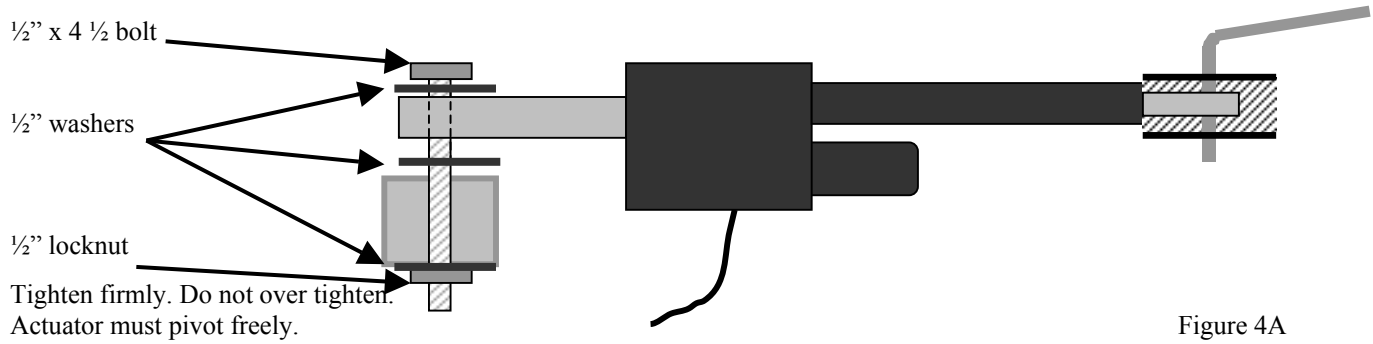


Figure 4A

Do not permanently mount the actuator upside down. Mount only as shown in the illustrations.

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.*

STEP 3 Mounting of Gate Bracket (PULL to Open Only)

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.

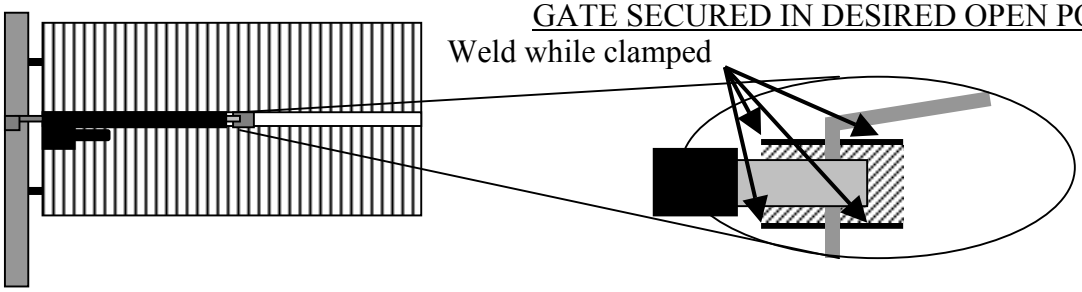


Figure 5A

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. 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.

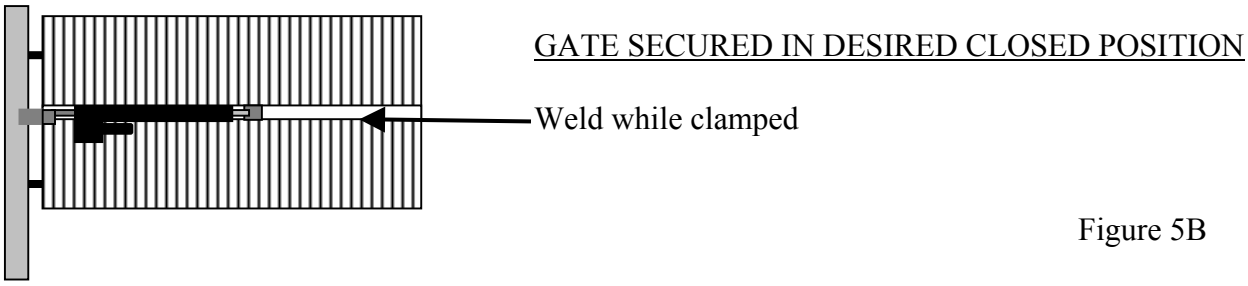


Figure 5B

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.

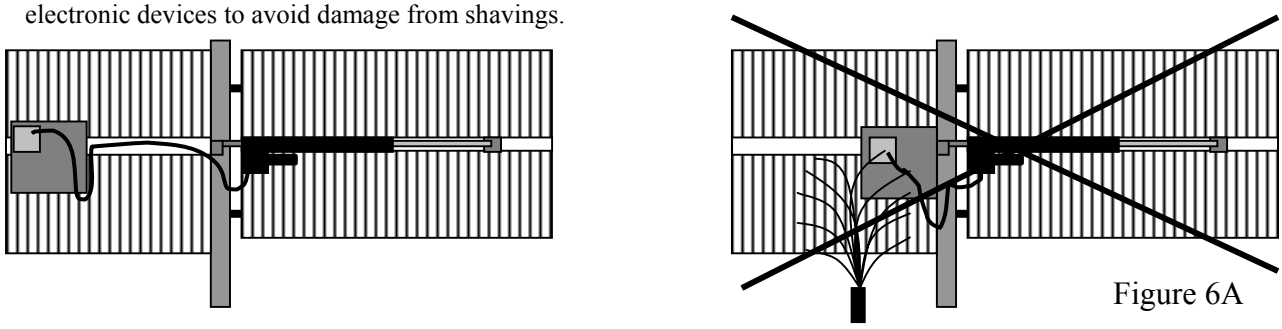
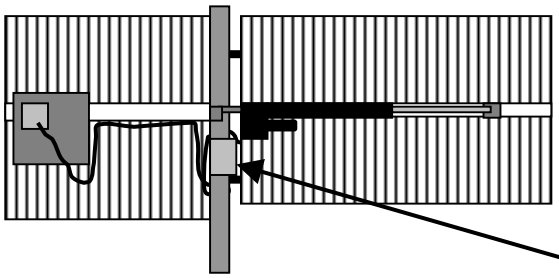


Figure 6A

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

PATRIOT I Single Gate Wiring (only if required)

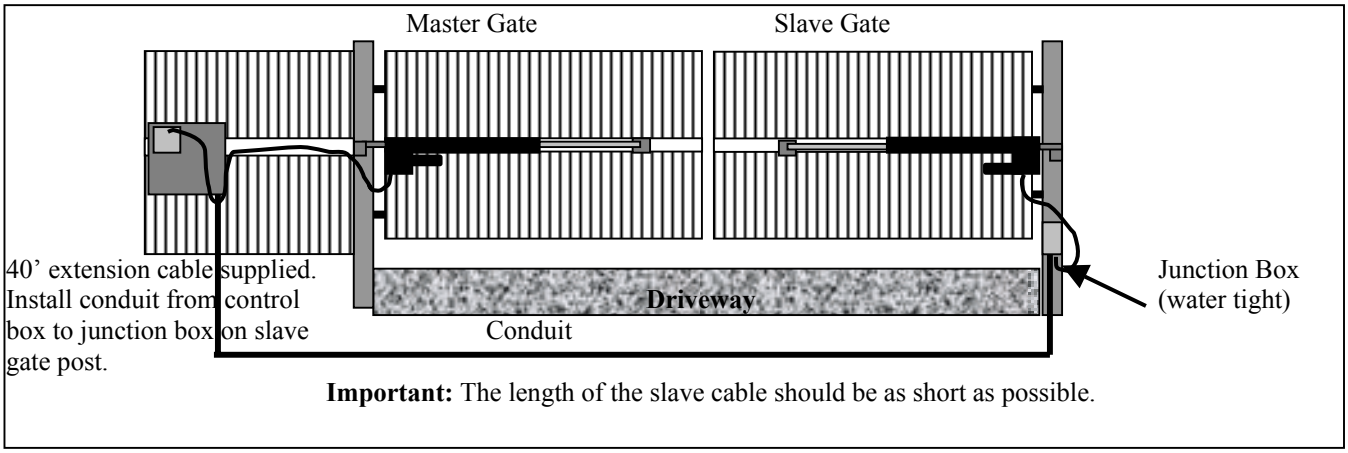


If 8' actuator cable must be spliced a watertight junction box must be used to prevent moisture from splice. The wire used for the splice should be no smaller than the actuator cable wire provided. Use only approved wire nuts or crimp splices for connection. Make second splice inside control box.
5-conductor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

Junction Box (Water tight)

Figure 7A

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



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

The extension cable supplied with the operator contains the same color wires as the actuator cable splice by matching the colors.

NOTE: *Failure to install extension cable into watertight conduit and keep all connections dry will result in future problems.*

Push to Open Cable Applications

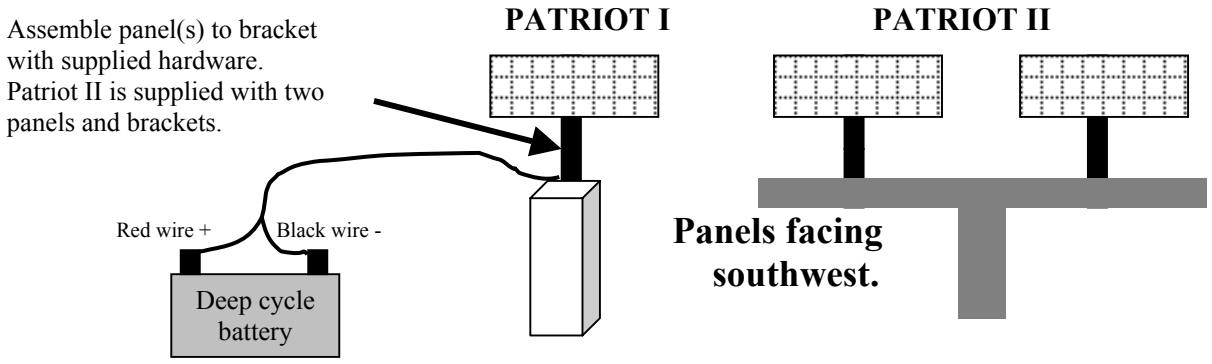
Cable modifications are not necessary for push to open or left hand slider installations. The microprocessor on the circuit board will take care of all wire reversing and logic associated with this type of installation. DS1 switch number 9 (see page 15) must be in the "ON" position.

NOTE: *The only thing to remember is that when DS1 switch 9 is on the Limit lights on the circuit board will show open when closed and closed when open.*

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.

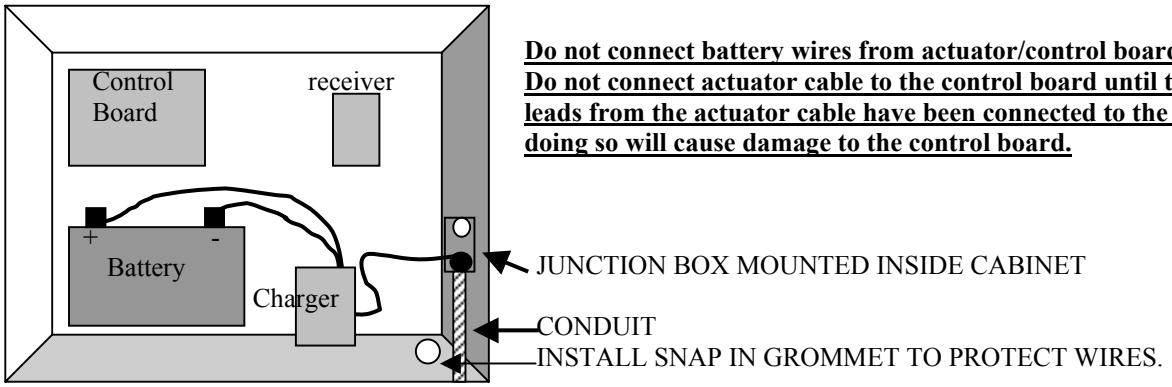


Note: *Avoid shaded areas if possible. Panels should face southwest for optimum charging. See explanation above for details.*

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. Do not connect actuator cable to the control board until the battery leads from the actuator cable have been connected to the battery, doing so will cause damage to the control board.

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 pages 12,30). 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 12) 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 consult a dealer for assistance.

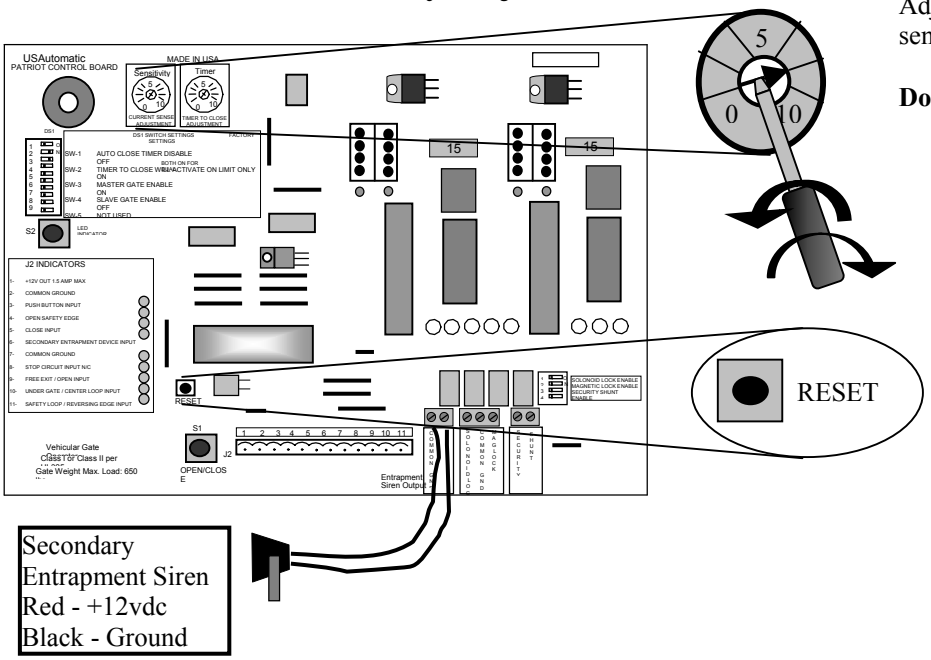
IMPORTANT NOTES

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 the open/close command button or the reset button on the control board or a signal from your device 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. If the gate reverses direction twice and then stops the control board will need to be reset. See Current Sense Adjustment and reset button location below.
3. Study the limit switch section and instructions on adjusting the limit switches prior to battery hook up. See page 13 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.

Caution: Connect battery leads before connecting actuator plug to the control board.

Current Sense / Sensitivity Adjust



Adjust sensitivity so that the gate force required to sense an obstruction is at the desired level.

Do not turn the adjustment screw past 0 or 10.

If the sensing circuit is activated twice before reaching an open or closed limit the unit will stop operating and sound the secondary entrapment siren and require a reset.

Remember if the gate reverses direction when operating without contacting an obstruction, then minimizing sensitivity (increase force) may be required.
Do not increase more than necessary.

Secondary Entrapment Siren
Red - +12vdc
Black - Ground

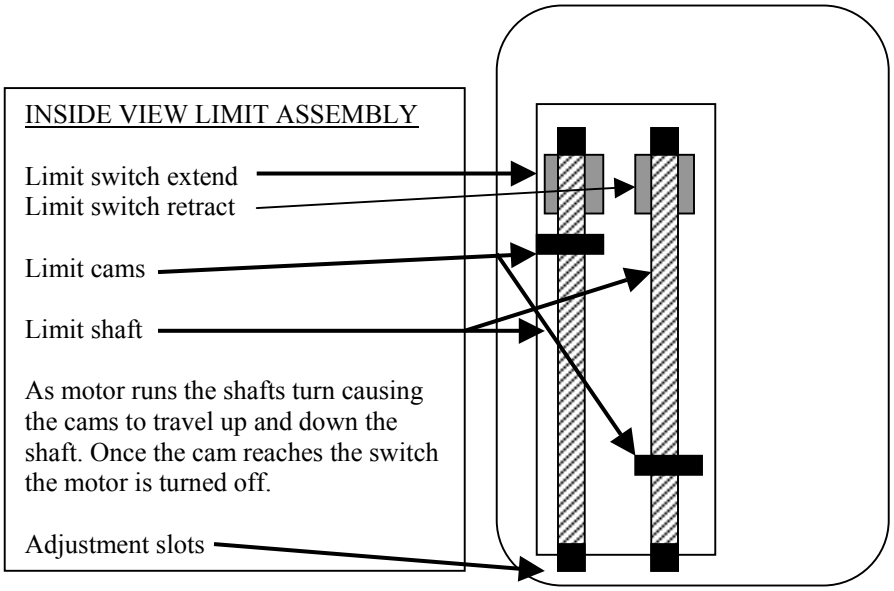
CAUTION: To reduce the risk of injury, USAutomatic strongly recommends the installation of additional safety devices such as Photo Eye Sensors and Safety Edges. Consult an authorized installing dealer or the factory for a complete explanation of options and see the Safety Section of this manual on pages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

LIMIT SWITCHES

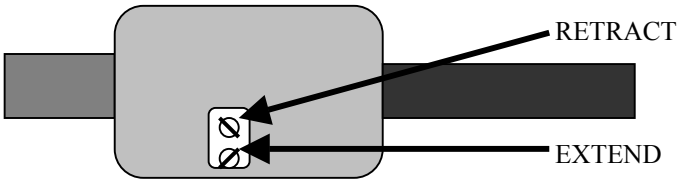
The limit switch adjustments are located on the underside of the actuator. Remove the dust plug to make adjustments. The normal settings from the factory allow for 18" of travel (approx. 70% opening). You will most likely have to adjust the extend or close limit for your installation. The adjustments are labeled "Extend" and "Retract" on the dust plug. Flat blade screwdriver is required and is included with the operator.

If soft start / stop is going to be used turn switch 6 or 7 (see page 15)on at this time. Prior to operation the retract limit will need to be adjusted about 5 turns counter clockwise before operating.

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



Bottom view of Actuator:

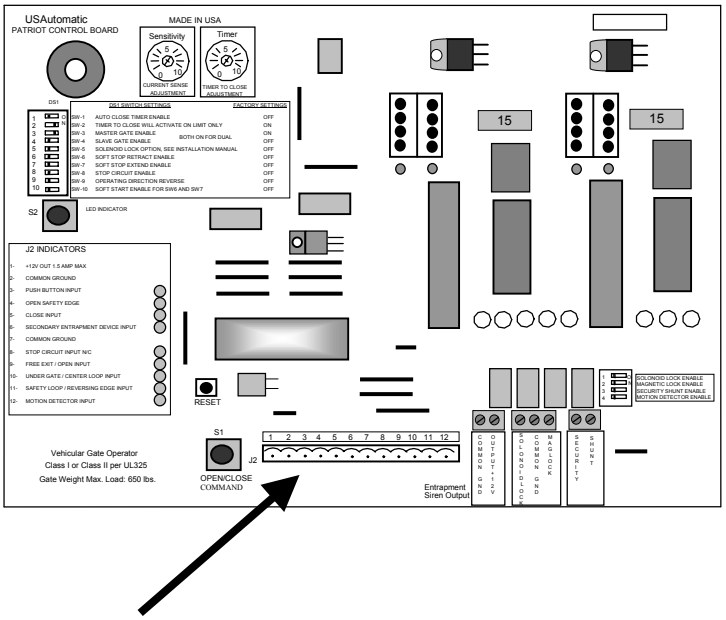


The following will assist you. Shown below are adjustments for pull to open installations. You can mount the actuator upside down to make adjustments easier, but do not leave actuator upside down.

To extend more or close gate more.	Turn the extend adjust clockwise.
To extend less or close gate less.	Turn the extend adjust counter clockwise.
To retract more or open gate more.	Turn the retract adjust clockwise.
To retract less or open gate less.	Turn the retract adjust counter clockwise.

Circuit Board Terminal Description For Accessories

Patriot Control Board



TERMINAL DESCRIPTION

1 **+ 12 volt DC Output**.
*Maximum current output 1.5 amp (1500 milliamps)

2 **Common Ground Input**

3 **Push Button Input**. (normally open contacts)
Push button, radio control, keypad, etc.

4 **Open Safety Edge** (normally open contacts)
(Stops gate while opening)

5 **Close Input** (normally open contacts)

6 **Secondary Entrapment Input** (normally open contacts)

7 **Common Ground Input**

8 **Stop Circuit Input** (normally closed contacts)
* DS1 switch #8 must be on for stop circuit function to be enabled.

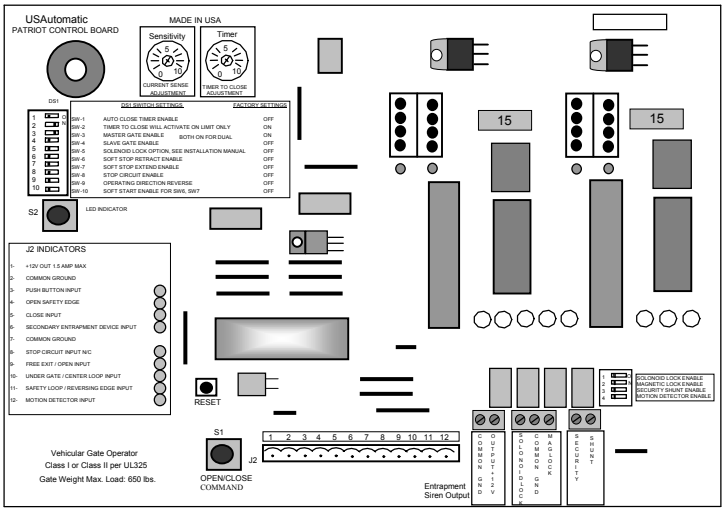
9 **Free Exit/Open Input** (normally open contacts)
Loop input or any hold open input such as a 7-day timer, telephone access unit, or maintain contact switch (normally open contacts). These devices open the gate and will prevent the gate from closing if the contact is maintained. Once the contacts have been released, the gate can be closed with a closing signal device or the automatic close timer feature.

10 **Center Loop or Under Gate Loop Input** (normally open contacts)

11 **Safety Loop/Reversing Edge Input** (normally open contacts)

12 **Motion Detector Input** (normally open contacts)
(Stops a closed gate from opening)(Active on close limit only)

DS1 Programming Switches



Factory settings are shown in bold italic type

1 Automatic Close Timer Enable
- ON — Timer to close is activated
- ***OFF*** — ***Timer to close is disabled***

2 Open limit timer to close function
- ***ON*** — ***Timer to close activates only if open limit is activated***
- OFF — Timer to close works from any point the gate is stopped

3 Master Gate Enable
- ***ON*** — ***Master gate operator enabled to function***
- OFF — Master gate operator disabled

4 Slave Gate Enabled (Both Master and Slave on for dual)
- ON — Slave gate operator enabled to function
- ***OFF*** — ***Slave gate operator disabled***

5 Solenoid Lock Option, See Installation Manual
- ON — DS2 SW 1 must be on, output +12vdc with delay when gate is operating
- ***OFF*** — ***No function, see DS 2 SW 1 for more information***

6 Soft Stop Retract Enable
- ON — Enables soft stop for retract position
- ***OFF*** — ***Disables soft stop for retract position***

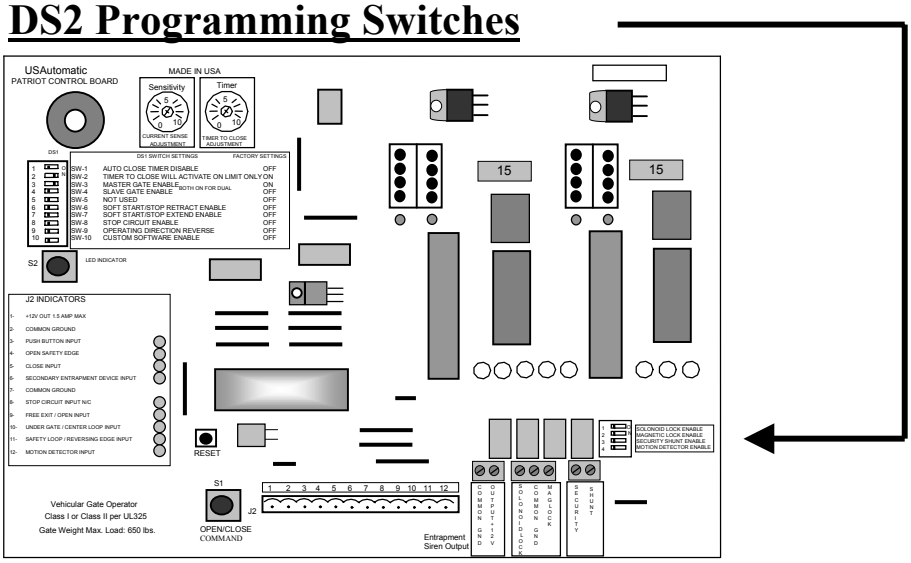
7 Soft Stop Extend Enable
- ON — Enables soft stop for extend position
- ***OFF*** — ***Disables soft stop for extend position***

8 Stop circuit enable
- ON — Allows for a stop button input to be utilized
  * A normally closed pushbutton is required
- ***OFF*** — ***Disables the stop button function***

9 Operating Direction Reverse
- ON — Push to Open or Left Hand Slider installation
- ***OFF*** — ***Pull to Open or Right Hand Slider Installation***

10 Soft Start Enable for SW6, SW7
- ON — Enable Soft Start for Extend or Retract, Only if SW 6 or SW 7 or Both are ON.
- ***OFF*** — ***No Soft Start (Must be used with SW6 and SW7)***

DS2 Programming Switches



Factory settings are shown in bold italic type

1 Solenoid lock enable / Gate in operation indicator

ON Solenoid lock output energizes half second before gate begins to move and releases 3 seconds after gate begins to move, for gate in operation indicator to operate DS1 SW 5 must also be ON.
(Energizes = +12 vdc output 1.5 amp max)

OFF ***Solenoid lock / gate in operation indicator is inactive***

2 Magnetic lock enable

ON Magnetic lock output energizes on Master Limit and releases half second before gate begins to open
(Energizes = +12 vdc output 1.5 amp max)

OFF ***Magnetic lock output is inactive***

3 Security Shunt Circuit Enable / Open Gate Indicator

ON Security shunt circuit relay is active (closed circuit)(wire in parallel)
Relay activates half second before gate begins to Open and stays activated until 4 seconds after gate reaches a closed limit.

OFF ***Security shunt circuit relay is inactive (open circuit)***

4 Motion Detector Enable

ON Enables motion detector input J2 pin 12 (if input is activated, gate will not open)

OFF ***Disables motion detector input J2 pin 12***

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

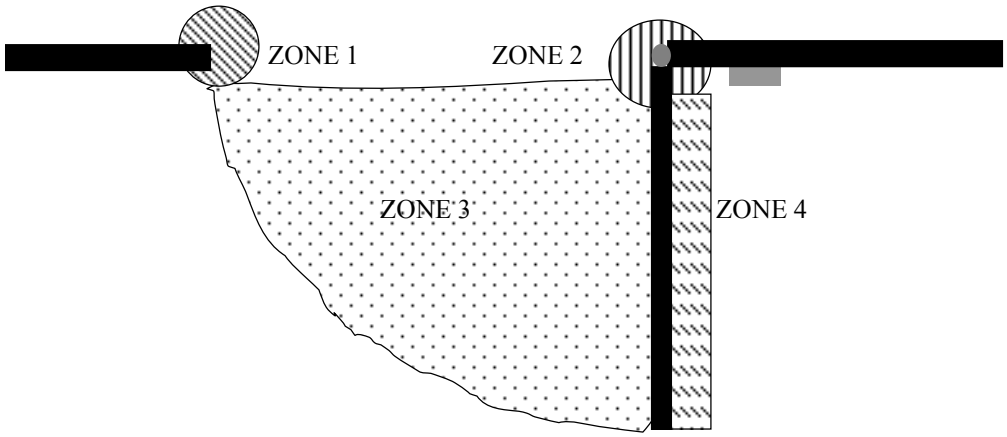
1. **READ AND FOLLOW ALL INSTRUCTIONS**
2. **Never let children operate or play with gate controls. Keep remote control away from children.**
3. **Always keep people and objects away from the gate.**
4. **NO ONE SHOULD CROSS THE PATH OF A MOVING GATE.**
5. **Test gate operator monthly. The gate must 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 user manual and have a qualified service technician make repairs to the gate hardware.**
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 current sense 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.



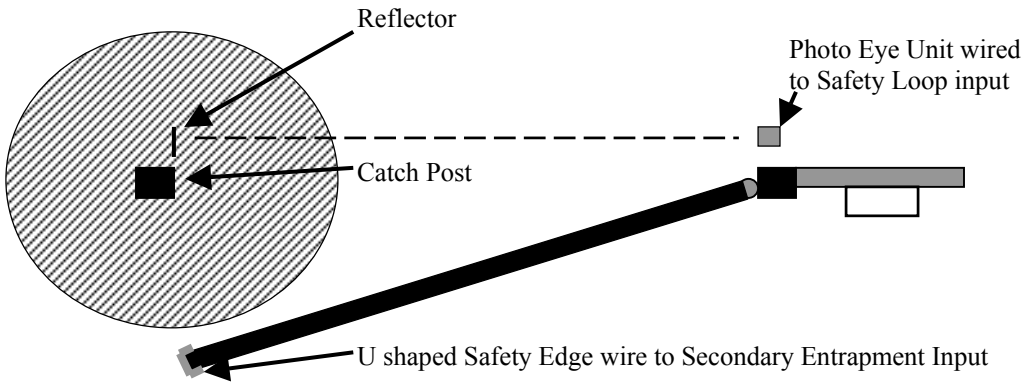
ENTRAPMENT ZONES

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.

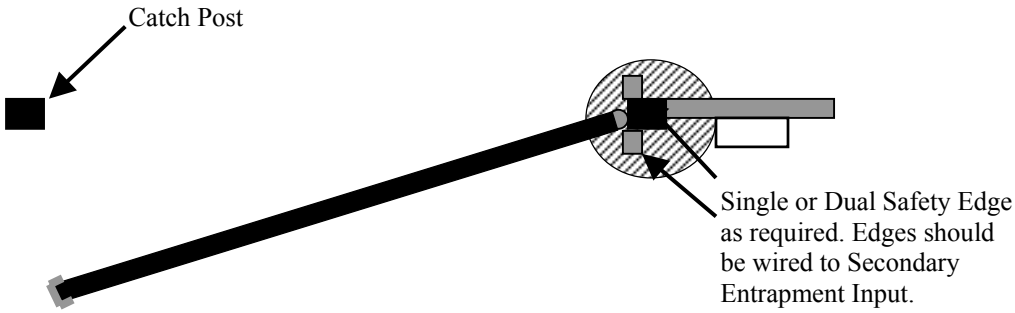
SAFETY SECTION

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.



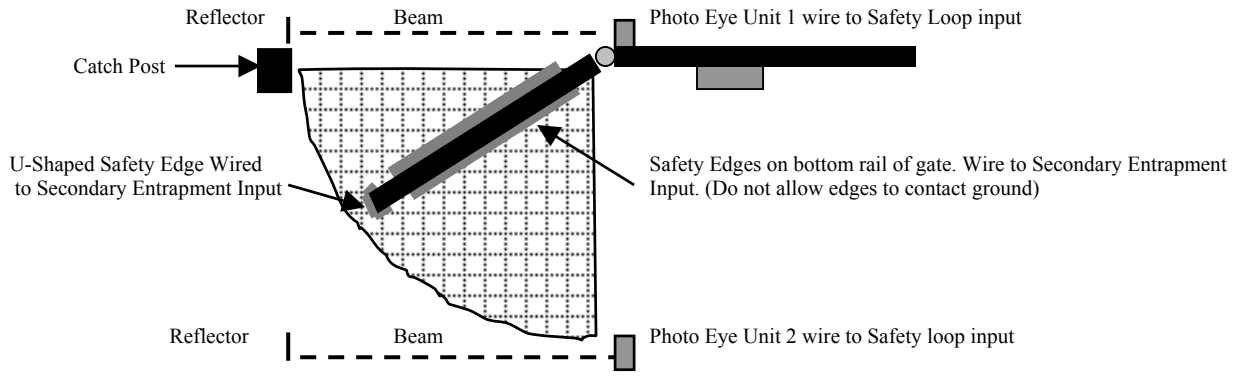
NOTE: *All control stations should be located at least 6 feet from any moving part of the gate or operator.*

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

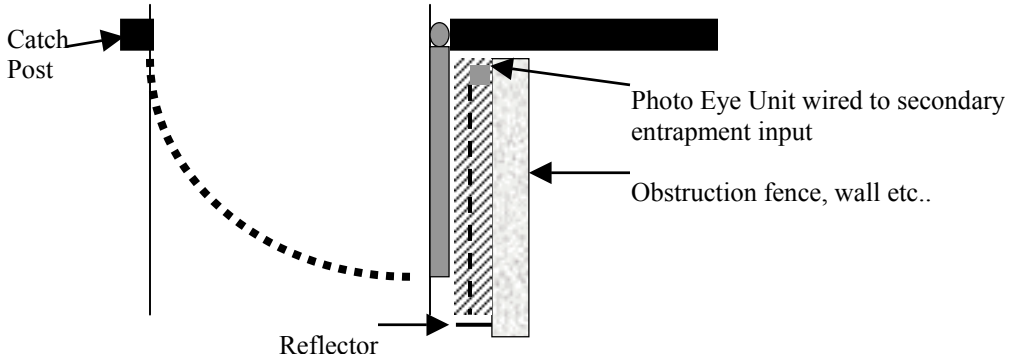
SAFETY SECTION

Remedies for Safety Concerns

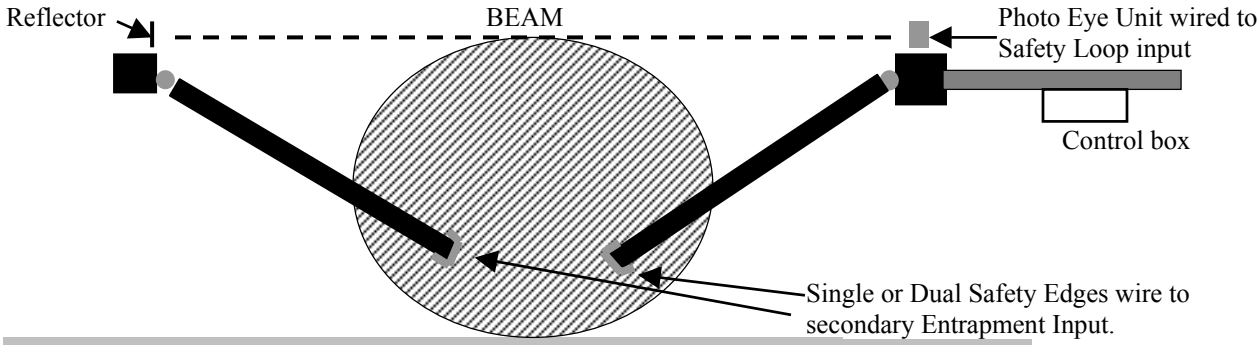
Zone 3 Safety edges are the best protection. A photo eye may also be used. For vehicle traffic, magnetic vehicle detectors and wire sensing loops are preferred.



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:

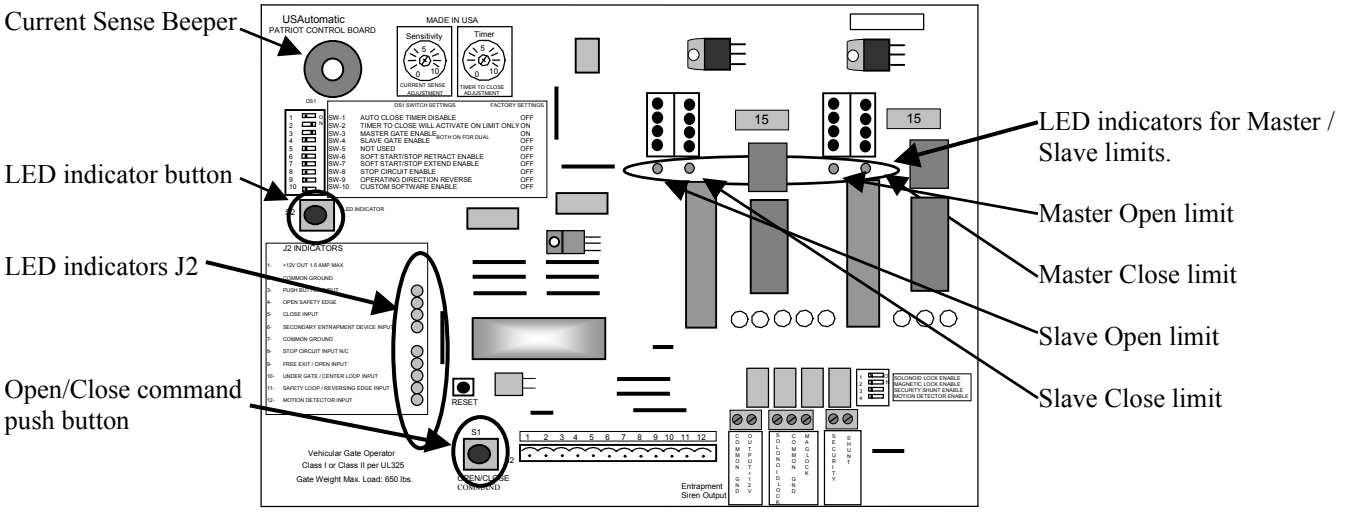
1. **Battery cells water level. (use distilled water if needed)**
2. **Hinges and pivot points need to be greased.**
3. **Bolts for correct tightness.**
4. **Inspect weld points for cracks or other defects.**
5. **Inspect wiring for cuts, knicks or other defects.**
6. **Inspect hinge post to ensure it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

Troubleshooting Guide

Introduction

The USAutomatic control board is equipped with three 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 all control circuits. To use the indicators, press and hold the LED indicator 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 current sense beeper. The beeper will sound anytime the current overload circuit is activated. This is useful in detecting a false reverse due to an improper or too sensitive current reverse setting or a gate, which is requiring excessive force to move the gate.
3. The third feature to assist in troubleshooting is the on board open/close command pushbutton. This button makes it possible to operate the gate with the twelve terminal wiring plug removed without having to short across terminal pins.



TROUBLESHOOTING GUIDE

SYMPTOM	*POSSIBLE CAUSE*	*REMEDY*
1. Gate stops and reverses direction in mid-travel.	a. Current sense feature may be set too sensitive. Listen for on board beeper to verify. Beep indicates current sense circuit activated.	Readjust- see page 12. 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 fully opening or closing reverses direction.	a. Too much travel distance on opening or closing cycle. Causing current sense to activate. Should hear beeper if sensing.	Readjust appropriate limit switch See page 13.
	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.
	d. Free exit.	If connected verify operation.
3. Gate doesn't move at all.	a. Current sense circuit activated twice prior to reaching fully open or close position.	Reset control board using reset button on control board.
	b. DS1 switch settings	Verify switch 3 or 4 is on. (Both 3 & 4 for a dual gate)
	c. Blown fuse	Replace if blown with 15-amp max.
	d. Limit switches misadjusted	Depress S2 and verify correct limit lights are on (D1,D2,D3,D4) readjust if necessary
	e. Loose or incorrect battery connections or voltage.	Check battery connections, polarity and voltage/at least 12.5 volts DC.
	f. Actuator cable damaged or loose connection.	Check actuator plug at control board and cable for nicks or tears.
	g. Press LED indicator and hold then press the Open Close Push button simultaneously	If gate operates call factory for instructions.
	h. Control board is defective.	Replace control board.
	i. 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

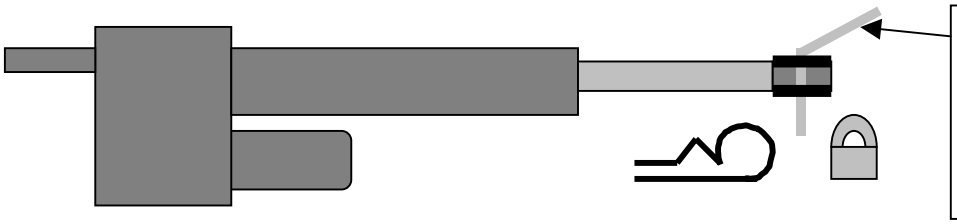
SYMPTOM	*POSSIBLE CAUSE*	*REMEDY*
4. Gate will not open with remote control transmitter.	a. Improper code settings or wiring.	Check the code switches in the transmitter & receiver. Verify that they are identical.
		Check wiring of receiver. If F1 on control board is hot the +12v output J2 pin 1 is wired incorrectly.
	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.
	d. Damage etch on control board between J2 pin 3 and open/close command.	Press open/close push button to verify it operates correctly.
5. Gate activates open or close for no reason.	a. A shorted signal is coming into the control board from an external control device such as a remote transmitter, pushbutton, key pad, etc.	Check all transmitters and pushbuttons for a stuck button. Use troubleshooting LEDs to identify which input is activated. Replace defective device or wires.
6. Automatic close timer will not close the gate.	a. DS 1 switch setting	Check switch 1 to verify it is enabled
	b. An opening device such as a button, keypad, phone unit, or exit loop detector is shorted.	Depress the LED indicator pushbutton paying attention to the troubleshooting lights on the control board. If a light illuminates identify the accessory it represents and correct problem.
	c. A safety device such as a safety loop detector or safety edge is shorted.	
	d. A wire from one of these devices is shorted.	See step above for LED indicator lights.
	e. DS 1 switch setting	Ensure that switch 2 is set correctly
	f. Primary or secondary entrapment circuit activated	Activate gate using a manual device (transmitter, exit probe etc.)
	g. 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. b. If AC charged, circuit breaker has tripped or power to charger is interrupted. c. Battery charging system (AC charger or solar panel) is not functioning.	Replace battery. Check circuit breaker. Check for power at charger receptacle. Consult factory for testing instructions. (Test meter required).
9. On a dual gate, only one unit will open and close.	a. Blown fuse b. DS 1 switch settings c. Defective actuator. (see note below) d. Defective cable. e. Defective control board. (see note below) Note: *Reverse actuator plugs on control board to help determine if the actuator or the control board is defective. Remove master and slave actuator plug and connect the master actuator plug to the slave connector on the control board and the slave actuator plug to the master connector on the control board.*	Replace with 15-amp max. Verify switch 3 and 4 are in the on position (Both 3 & 4 for a dual gate) Repair or replace actuator. Repair or replace cable. Repair or replace control board.

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.



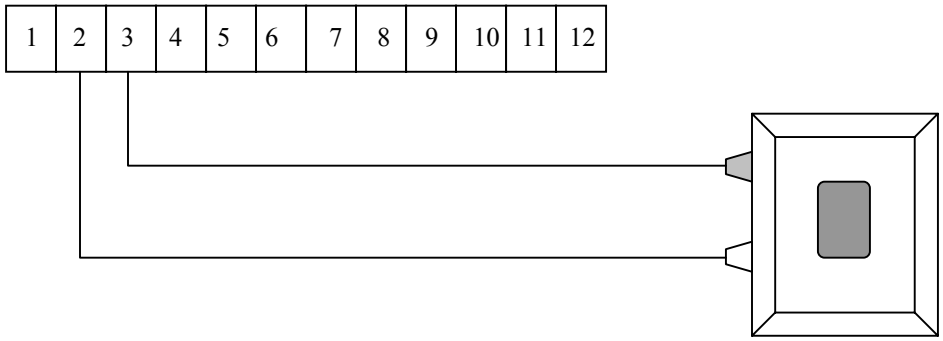
Manual Release Pin

Secure in place with pull clip or with #2 lock. Release pin is predrilled for this purpose.

Accessory Wiring Diagrams

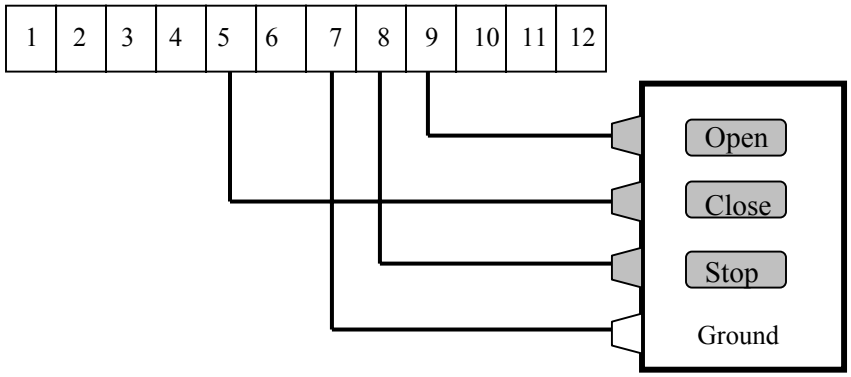
NOTE: Ensure that battery power is disconnected from the control board before wiring accessories to the control board.

Single Button Station to Open/Close



3 Button Station Wiring

Note: ***Program function switch DS1 #8 must be in the on position for stop button control***



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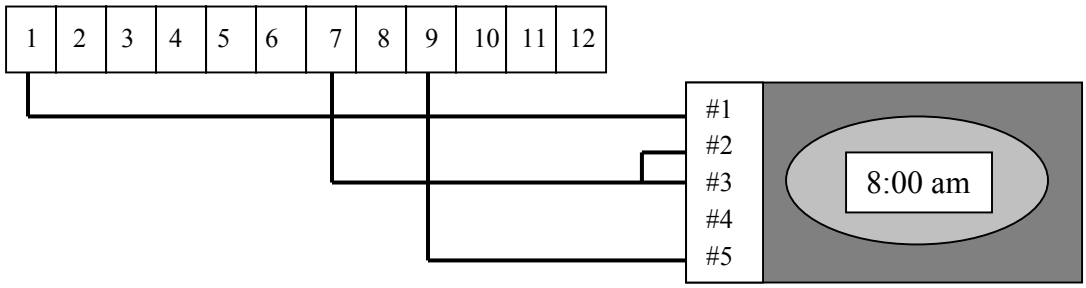
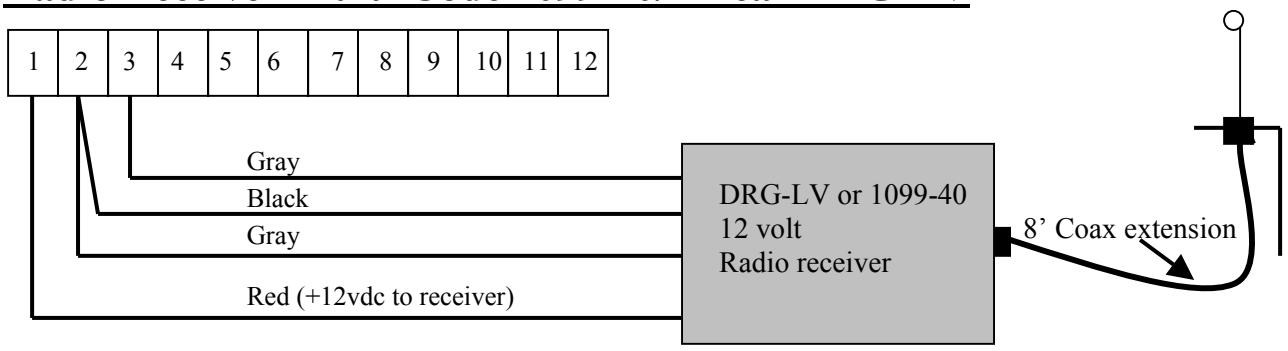
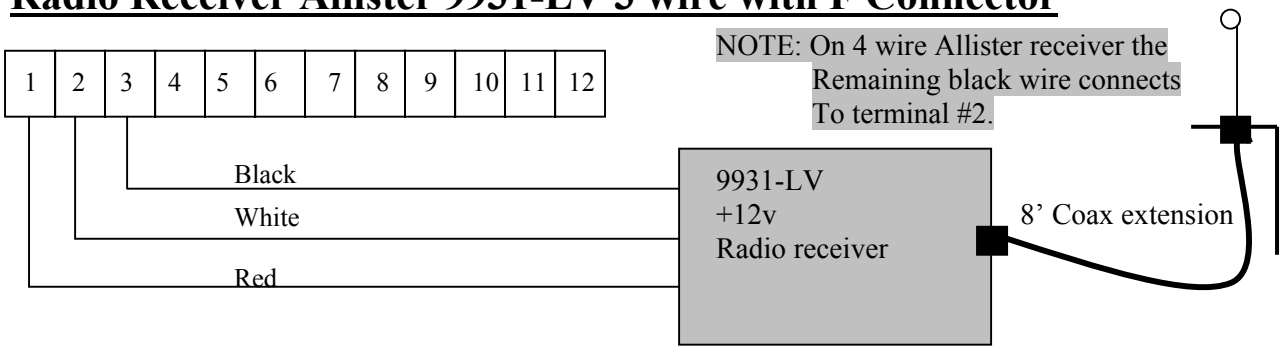
Seven Day Timer to Hold Gate Open – TH800-12



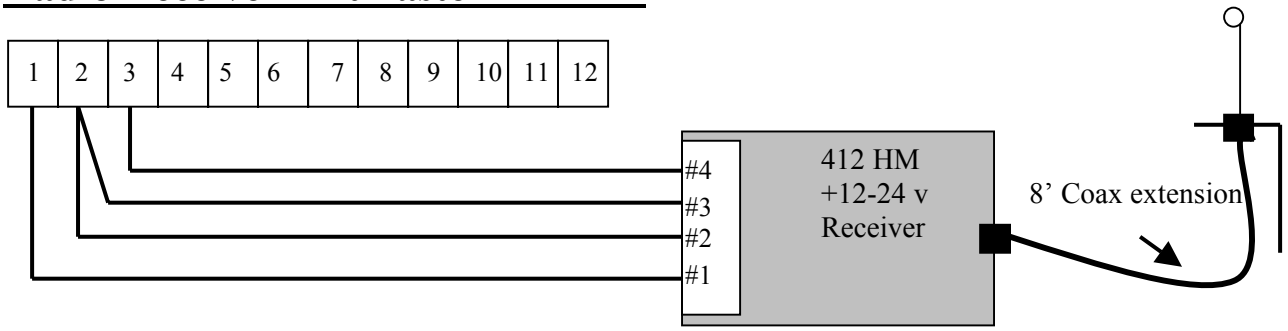
Radio Receiver Multi-Code 1099-40/Linear DRG-LV



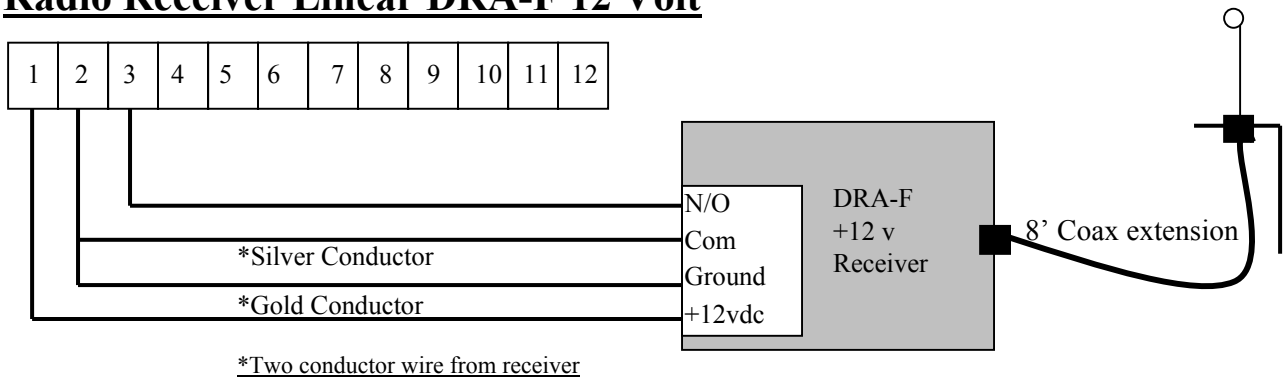
Radio Receiver Allister 9931-LV 3 wire with F Connector



Radio Receiver Liftmaster 412 HM

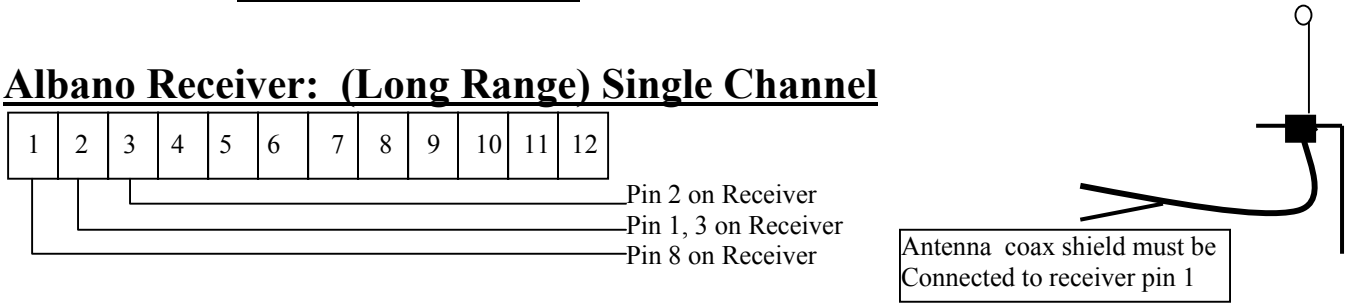


Radio Receiver Linear DRA-F 12 Volt



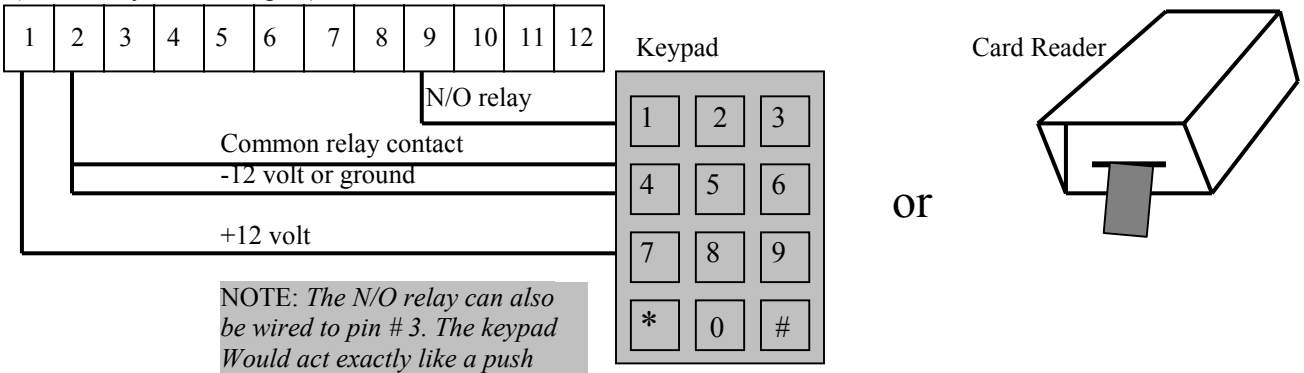
*Two conductor wire from receiver

Albano Receiver: (Long Range) Single Channel



Keypad (12 Volt D.C.)

(Momentary Contact Signal)

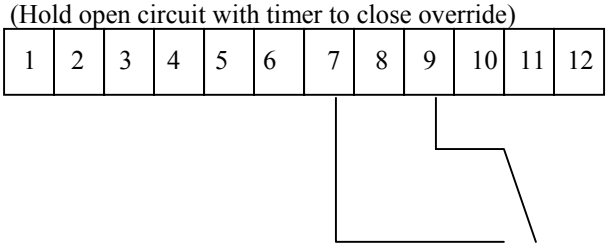


or

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

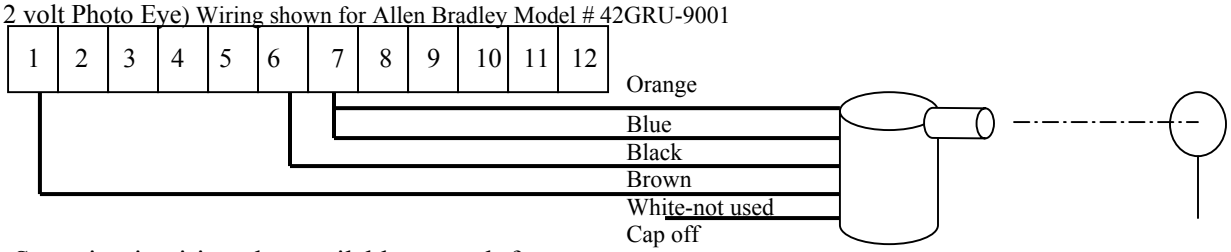
(Hold open circuit with timer to close override)



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.

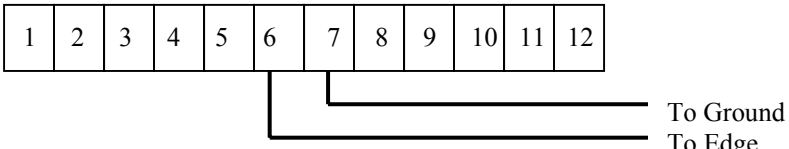
Photo Eye Wiring for Secondary Entrapment Device

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



- Stop circuit wiring also available, consult factory

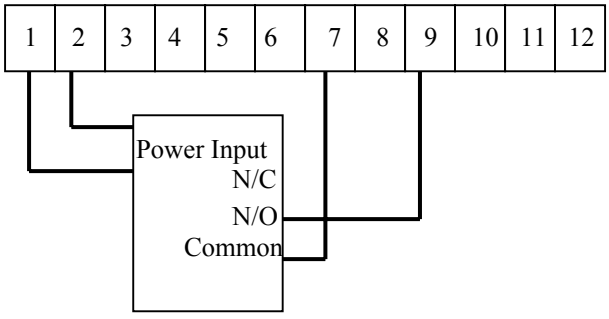
Safety Edge Wiring (Wired Type) Secondary Entrapment Device



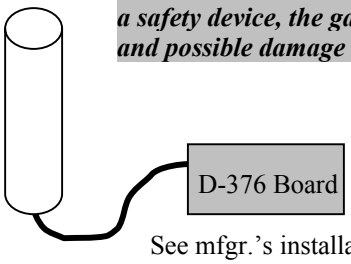
- Stop circuit wiring also available, consult factory

Probe Type Free Exit Magnetic Detector

Wiring shown for MFM sensors Model # MFM-D376 LC / EMX carsense 101



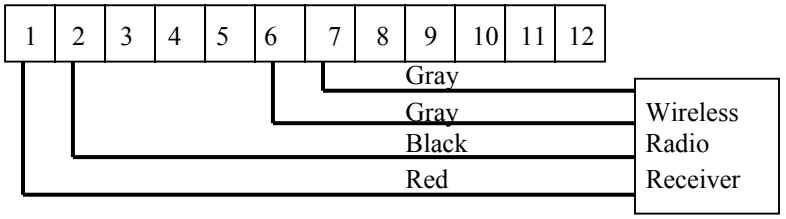
NOTE: ***This type of detector senses moving vehicles only. It should be utilized as an opening device only. If used as a safety device, the gate will close if the vehicle stops and possible damage will result.***



See mfgr.'s installation instructions For probe wiring.

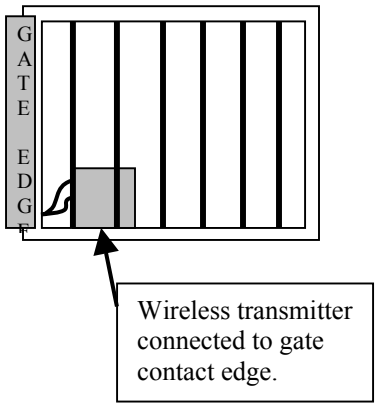
Safety Edge Wiring (Wireless Type) Secondary Entrapment Device

(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

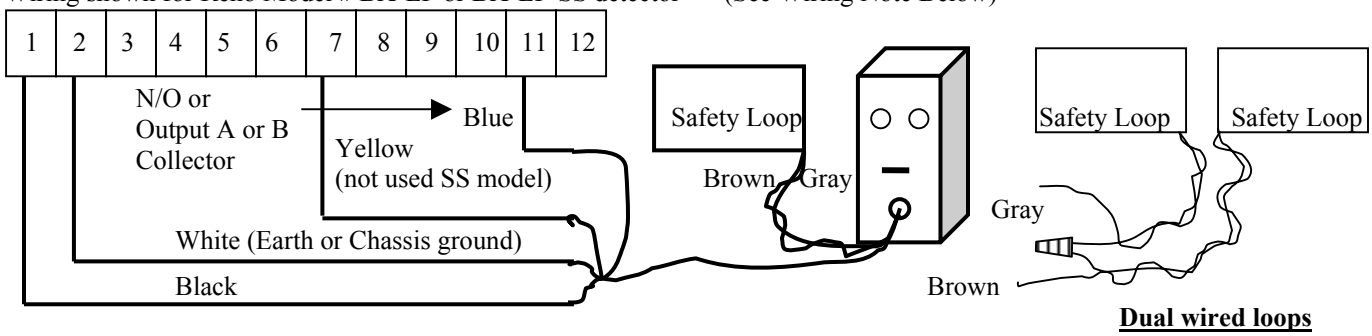
NOTE: *Transmitter battery will be drained if Contact edge on gate is depressed constantly.*



- Stop circuit wiring also available, consult factory

Safety Loop Magnetic Vehicle Detector 12 Volt DC

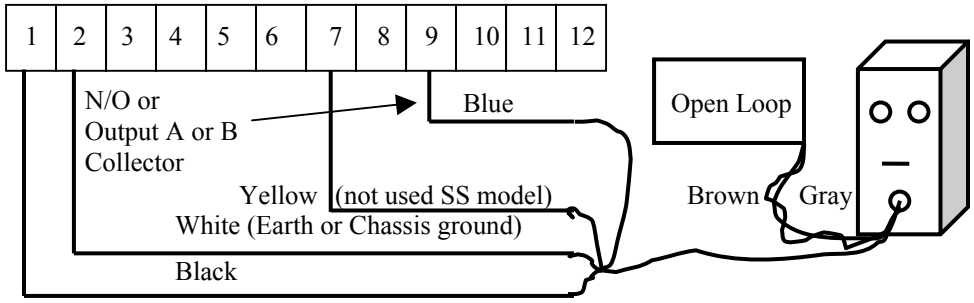
Wiring shown for Reno Model # BX-LP or BX-LP-SS detector (See Wiring Note Below)



Dual wired loops

Free Exit Loop Magnetic Vehicle Detector 12 Volt DC

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

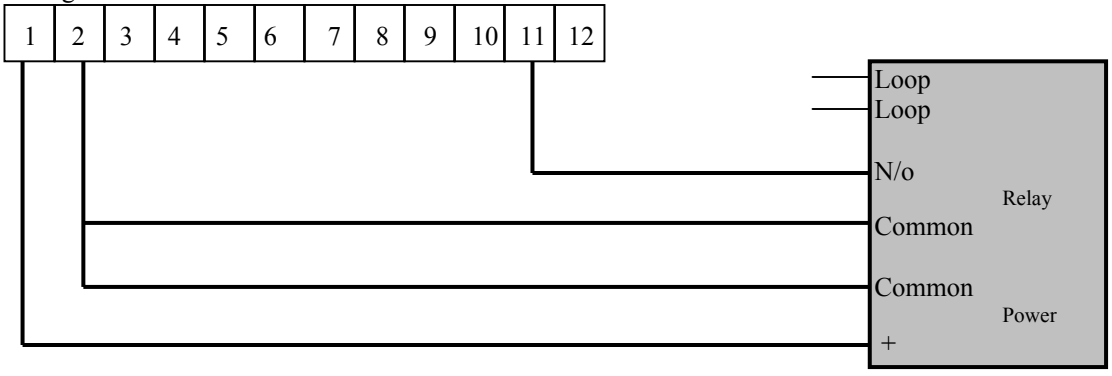


Wiring Note: When using the SS model detector connect detector pins 2 ("power –") 5 and 9("Output A, B Emitter") together and connect them to pin 2 on the control board.

Connect the detector pin corresponding to "output A or B Collector" to the desired pin on the control board. Pin 9 free exit, pin 11 for safety loop.

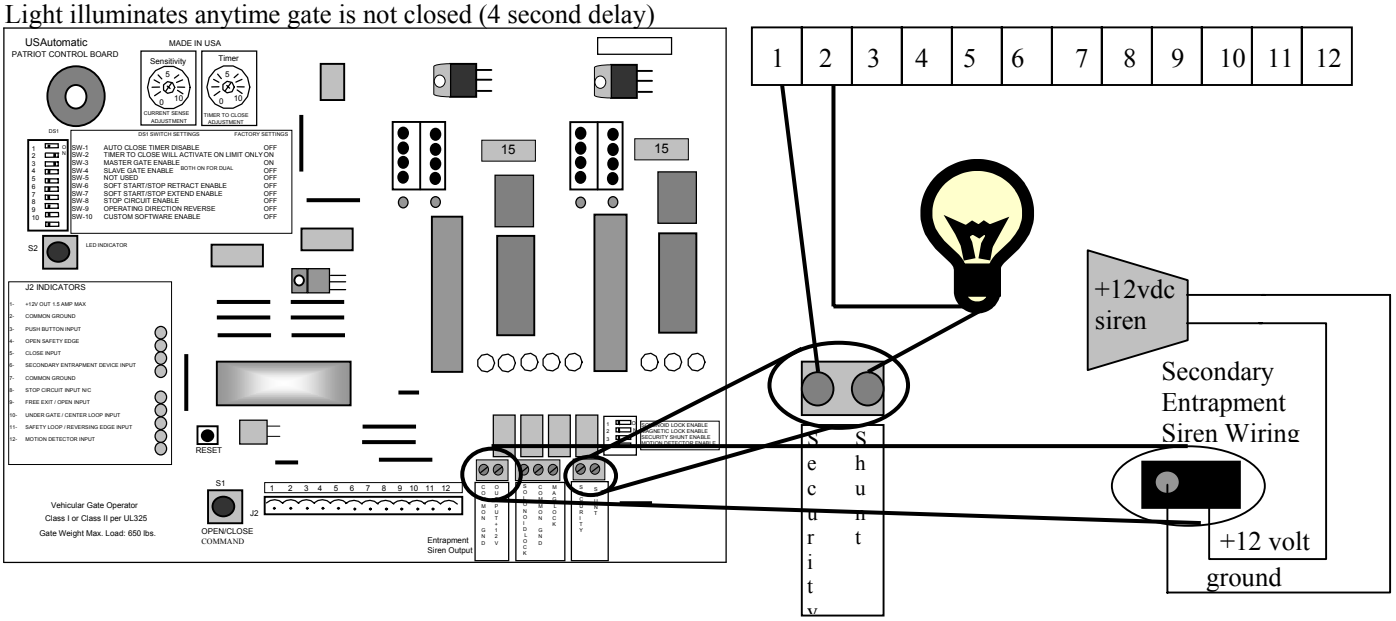
Safety Loop Magnetic Vehicle Detector 12 Volt DC

Wiring shown for Diablo Model # DSP-5LP detector



Siren Secondary Entrapment / Indicating Light For Gate Position

Light illuminates anytime gate is not closed (4 second delay)

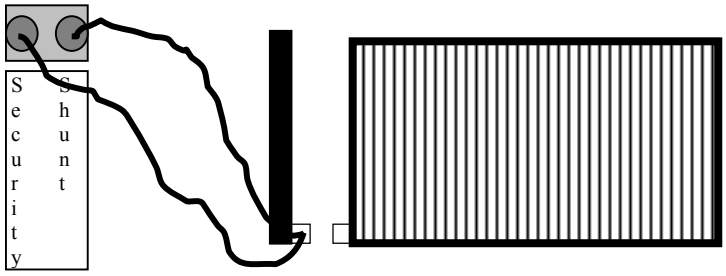


Security Shunt Circuit

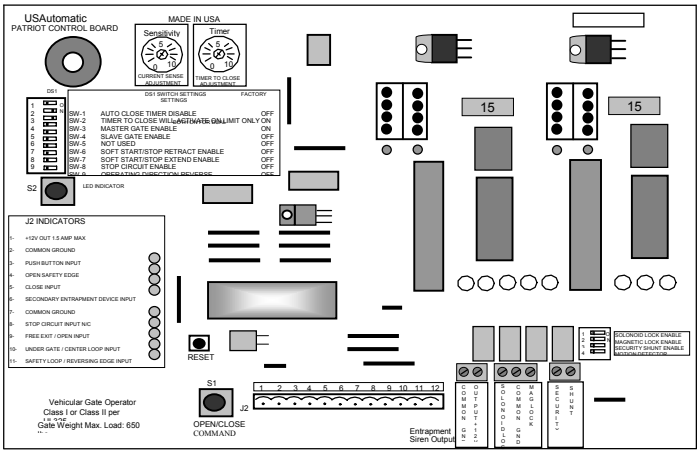
This option allows the gate to be activated by a control device without activating the alarm. The alarm will activate if gate is forced. Security shunt relay will release 4 seconds after close limit.

Program function switch DS2 Switch #3 must be "ON" for Circuit to operate.

Leading edge of gate and fence Post shown using closed type Proximity switch.



Magnetic Lock Wiring / Stone Lock or any 12 volt DC Solenoid Lock/Siren



Magnetic lock and Solenoid lock outputs are labeled On the circuit board. Take care when running wires to avoid pinch areas.

NOTE: The corresponding DS2 switch must be turned on for the desired output to function. Both outputs can be used as long as the current draw does not exceed 1.5 amps.

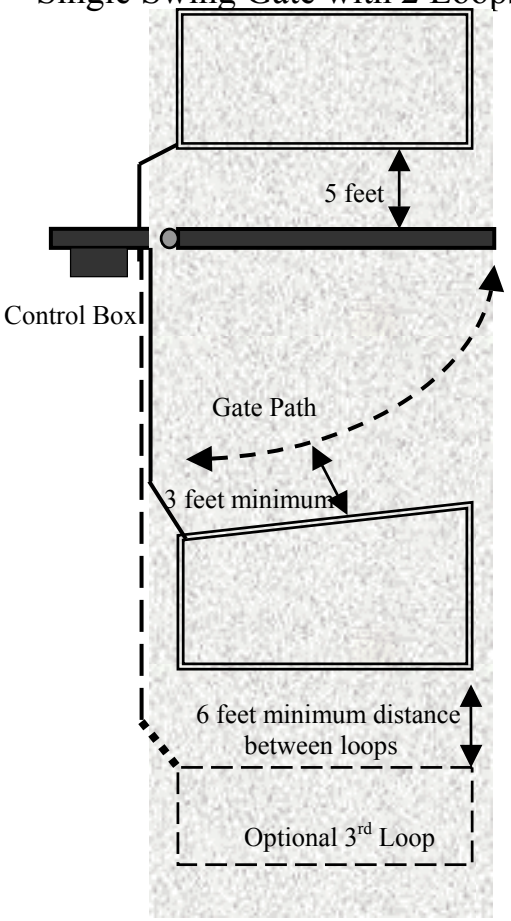
The Mag lock outputs +12vdc when the gate is on the closed limit. When the control board receives an open input the mag lock output goes to 0vdc .5 seconds before the gate begins to move.

The Solenoid / Siren output is +12vdc 1 second before the gate begins to open or close from a limit. The +12vdc output will remain until a limit is reached plus a 4 second delay. The control board will output the +12vdc 1 second before the gate begins to move and will output +12vdc for 4 seconds after the gate limit is reached. This also allows a siren or light to be operated prior to movement.
The output is regulated to 1.5 amps by a auto resetable fuse.

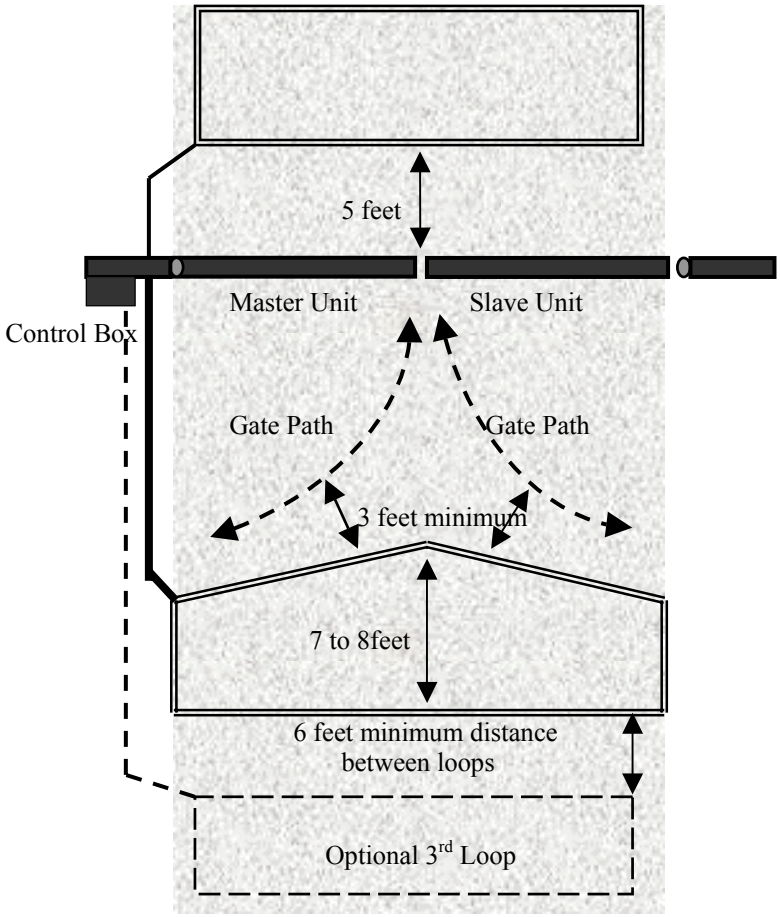
Loops

Loop Position Diagram

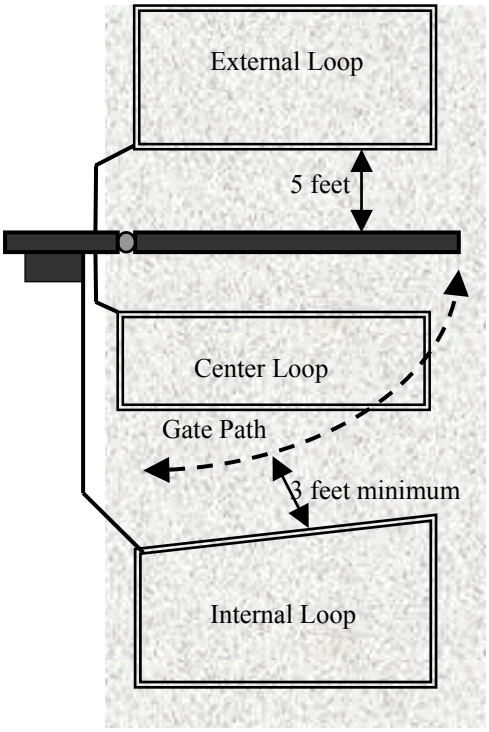
Single Swing Gate with 2 Loops



Dual Swing Gate with 2 Loops



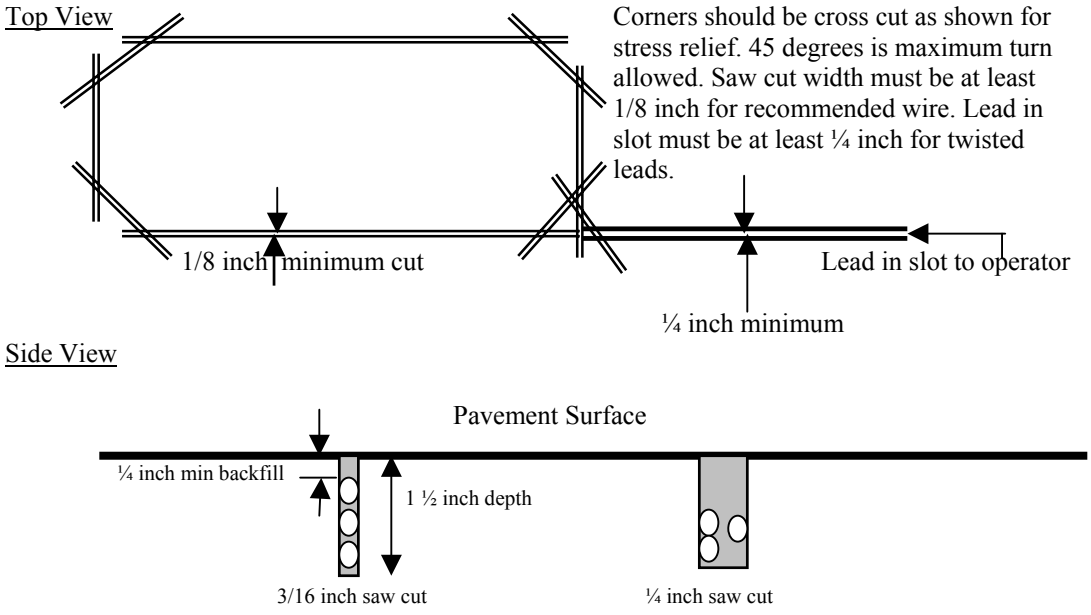
Center Loop



For larger gates, a loop can be placed directly under the gate, a separate detector is required. The loop will only be active when the gate is fully open and will ignore the signal at all other points. Consult a dealer or the factory for a complete explanation.

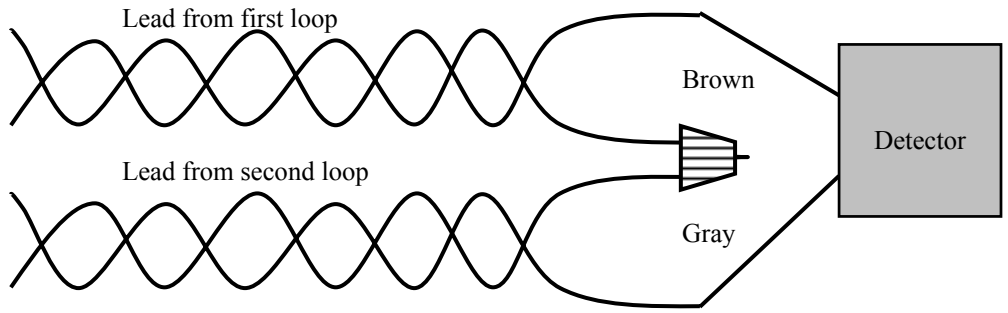
Loops

Typical Loop Saw cut



Proper wiring of two loops performing the same function.

Example: Inside and Outside Safety Loops



Loops

Loop Size Chart

The loop size is based on the width of the driveway. If the driveway is 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.

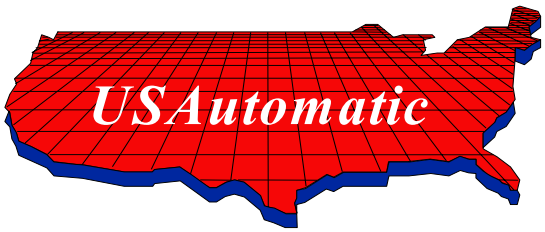
The loop itself should contain between 90 & 125 feet of wire in the loop, plus lead in.

Drive Width	**Loop Size**	**Number of Turns per foot**		
		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.



PATRIOT I
PATRIOT II
Limited 5 Year Warranty

The PATRIOT 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 would, 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.