

Installation Manual



DUAL Gate Operator System

WARNING!

This equipment is similar to other gate or door equipment and meets or exceeds Underwriters Laboratory Standard 325 (UL 325). However, gate equipment has hazards associated with its use and therefore by installing this product the installer and user accept full responsibility for following and noting the installation and safety instructions. Failure to follow installation and safety instructions can result in hazards developing due to improper assembly. You agree to properly install this product and that if you fail to do so GTO Access Systems, LLC, ("GTO") shall in no event be liable for direct, indirect, incidental, special or consequential damages or loss of profits whether based in contract tort or any other legal theory during the course of the warranty or at any time thereafter. The installer and/or user agree to assume responsibility for all liability and use of this product releasing GTO Access Systems, LLC, from any and all liability. If you are not in agreement with this disclaimer or do not feel capable of properly following all installation and safety instructions you may return this product for full replacement value.

READ ALL INSTRUCTIONS CAREFULLY AND COMPLETELY before attempting to install and use this automatic gate operator. This gate operator produces a high level of force. Stay clear of the unit while it is operating and exercise caution at all times.

All automatic gate operators are intended for use on *vehicular gates only*.



This product meets and exceeds the requirements of UL 325, the standard which regulates gate operator safety, by Underwriters Laboratories Inc.



For more information on the GTO ACCESS SYSTEMS, LLC full line of automatic gate operators and access controls visit our website at www.mightymule.com.

Class Rating

The Diamond Gate Operators is intended for use with **vehicular swing gates in single family residential applications**. The operator is system certified to be in compliance with UL 325, current edition, as of publication date.

Vehicular Gate Operator Class Categories:

Residential Vehicular Gate Operator—Class I: A vehicular gate operator (or system) intended for use in a home of one-to-four single family dwelling, or a garage or parking area associated therewith.

Commercial/General Access Vehicular Gate Operator—Class II: A vehicular gate operator (or system) intended for use in a commercial location or building such as a multifamily housing unit (five or more single family units), hotel, garages, retail store, or other building servicing the general public.

Industrial/Limited Access Vehicular Gate Operator—Class III: 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 service the general public.

Restricted Access Vehicular Gate Operator—Class IV: 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.

Converting Metric Units to English Equivalents

When You Know	Multiply By	To Find	Symbol
centimeters	0.3937	inches	in. (or ")
meters	3.2808	feet	ft. (or')
kilograms	2.2046	pounds	lb. (or #)

Converting English Units to Metric Equivalents

When You Know	Multiply By	To Find	Symbol
inches	2.5400	centimeters	cm
feet	0.3048	meters	m
pounds	0.4535	kilograms	kg

Converting Temperature

deg. Celsius	$(^{\circ}\text{C} \times 1.8) + 32$	deg. Fahrenheit	$^{\circ}\text{F}$
deg. Fahrenheit	$(^{\circ}\text{F} - 32) \div 1.8$	deg. Celsius	$^{\circ}\text{C}$

FOR YOUR RECORDS

Please record the following information product serial number (located on right side of control box), be sure to **keep all receipts for proof of purchase**. Refer to this information when calling GTO for service or assistance with your automatic gate opener.

Serial Number: _____ Date of Purchase: _____

Place of Purchase: _____

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Please Read This First



Thank you for purchasing the Mighty Mule Diamond. When correctly installed and properly used, your LPA Diamond operators will give you many years of reliable service. Please read the following information to ensure you have the correct system for your particular needs. This manual will enable you to properly install your Diamond Automatic Gate Operators.

The Diamond operators are designed for installation on a pull-to-open dual leaf gates. The gates must not exceed 16 feet in length nor weigh more than 500 pounds* (please see Technical Specifications on page 1). The Diamond operators can be used on vinyl, aluminum, chain link, farm tube, and wrought iron gates. **Use on solid (wood) gates is not recommended. Solid surface gates have a high resistance to the wind. If the wind is strong enough, the operators will obstruct, stop, and blow fuses.**

The Diamond operators accommodates extra transmitters, digital keypads, solar panels, push buttons, automatic gate locks, and other access control products. **These optional accessories are noted with the ⊕ symbol.**

The Diamond can be installed on push-to-open gates with the addition of two (2) push-to-open brackets ⊕ [FM148].

The Diamond operators feature **adjustable stall force**. This safety feature makes the gate stop and reverse direction within two seconds when it comes in contact with an obstruction. The "MIN" setting means the gate will exert the minimum force on an obstruction before it stops and reverses direction.

The Diamond operators also have an **adjustable auto-close** feature. It can be set to remain open from 3 to 120 seconds before automatically closing. Pressing the transmitter button at any time after the gate fully opens will cause it to close immediately. "OFF" is the factory setting; meaning the gate will stay open until you press the transmitter button (or keypad, etc.) again.

Please call LPA at (800) 543-4283 for more information about our professional line of gate operators and accessories. Our Sales Department will be glad to give you the name and phone number of a Mighty Mule dealer near you.

BEFORE YOU BEGIN TO INSTALL YOUR AUTOMATIC GATE OPERATOR:

Read these instructions carefully and completely to become familiar with all parts and installation steps. You must read the installation manual for detailed instructions on gate operator safety and proper use of the gate operator.



24/7 Troubleshooting Wizard: <http://support.gtoinc.com>



GTO Accessories are noted with this symbol in this Installation Manual. Information about accessories can be found on page 28 and at www.mightymule.com.

IMPORTANT SAFETY INSTRUCTIONS



Because automatic gate operators can produce high levels of force, consumers need to know the potential hazards associated with improperly designed, installed, and maintained automated gate operator systems. *Keep in mind that the gate operator is just one component of the total gate operating system.* Each component must work in unison to provide the consumer with convenience, security, and safety.

This manual contains various safety precautions and warnings for the consumer. Because there are many possible applications of the gate operator, the safety precautions and warnings contained in this manual cannot be completely exhaustive in nature. They do, however, provide an overview of the safe design, installation, and use of this product. **CAREFULLY READ AND FOLLOW ALL SAFETY PRECAUTIONS, WARNINGS, AND INSTALLATION INSTRUCTIONS TO ENSURE THE SAFE SYSTEM DESIGN, INSTALLATION, AND USE OF THIS PRODUCT.**

Precautions and warnings in this manual are identified with this  warning symbol. The symbol identifies conditions that can result in damage to the operator or its components, serious injury, or death.

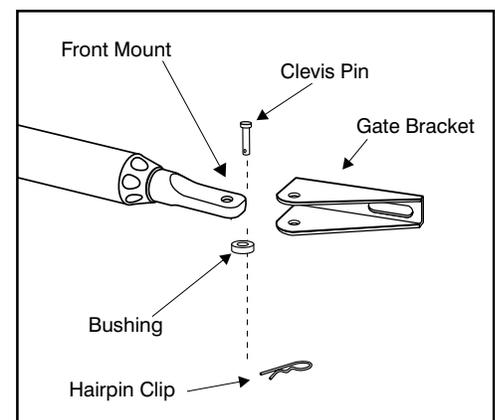
Because LPA automatic gate operators are only part of the total gate operating system, it is the responsibility of the installer/consumer to ensure that the total system is safe for its intended use.

How To Manually Open and Close the Gate:

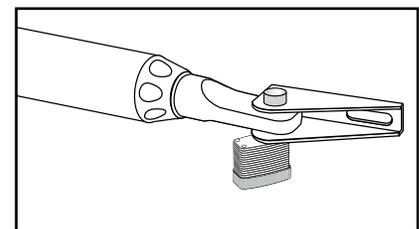
 **CAUTION:** The gate can be opened and closed manually when the operator is disconnected. **ONLY** disconnect the operator when the operator power switch is OFF and the gate is NOT moving.

Disconnecting the Operator

1. Turn operator power switch (Control Box) OFF.
2. Remove hairpin clip, clevis pin, and bushing from both the front and rear mounting points.
3. Remove the operator from the mount.



 **CAUTION:** Because the LPA gate operator is battery powered, disconnect the operator **ONLY** when the power switch on the control box is turned OFF. Unplugging the transformer does not turn power to the operator OFF.



NOTE: Substitute a Pin Lock  [FM133] for the clevis pin on the front mount of the gate operator to prevent unauthorized removal of the operator from the gate.



IMPORTANT SAFETY INSTRUCTIONS

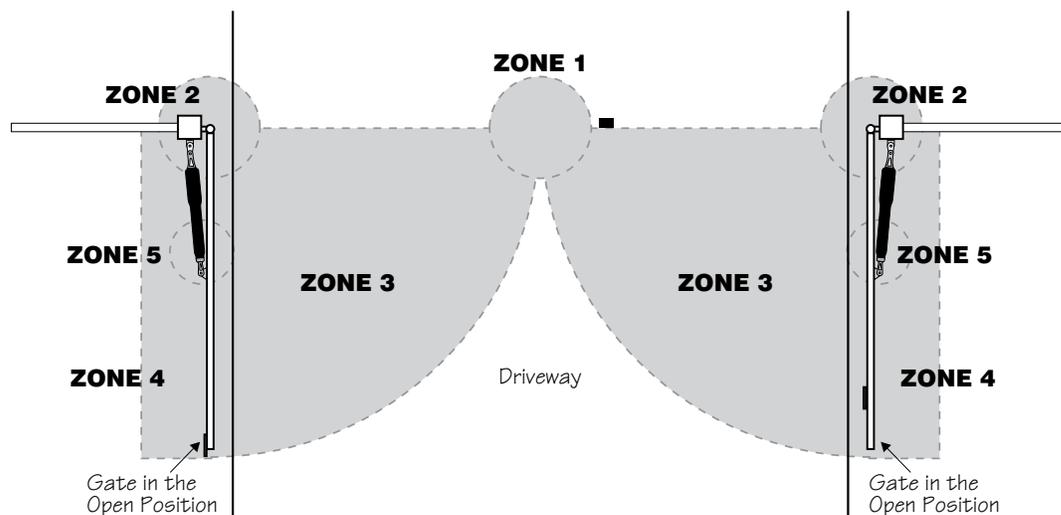
For The Consumer

⚠ WARNING: To reduce the risk of injury or death:

1. **READ AND FOLLOW ALL INSTRUCTIONS.** Failure to meet the requirements set forth in the instruction manual could cause severe injury or death, for which the manufacturer cannot be held responsible.
2. When designing a system that will be entered from a highway or main thoroughfare, make sure the system is placed far enough from the road to prevent traffic congestion.
3. The gate must be installed in a location that provides adequate clearance between it and adjacent structures when opening and closing to reduce the risk of entrapment. Swinging gates must not open into public access areas.
4. The gate and gate opener installation **must comply with any applicable local codes.**

I. Before Installation

1. Verify this opener is proper for the type and size of gate, its frequency of use, and the proper class rating.
2. Make sure the gate has been properly installed and swings freely in both directions. Repair or replace all worn or damaged gate hardware prior to installation. A freely moving gate will require less force to operate and will enhance the performance of the opener and safety devices used with the system.
3. Review the operation of the system to become familiar with its safety features. Understand how to disconnect the opener for manual gate operation (page iii).
4. This gate opener is intended for **VEHICULAR GATES ONLY**. A separate entrance or gate must be installed for pedestrian use (page vi).
5. Always keep people and objects away from the gate and its area of travel. **NO ONE SHOULD CROSS THE PATH OF A MOVING GATE.**
6. Pay close attention to the diagram below and be aware of these areas at all times.



Entrapment Zones for a proper Pull-To-Open installation:

Zone 1 – leading edge of the gates.

Zone 2 – between the gate and the gate post.

Zone 3 – the path of the gate.

Zone 4 – the space between the gate in the open position and any object such as a wall, fence, etc.

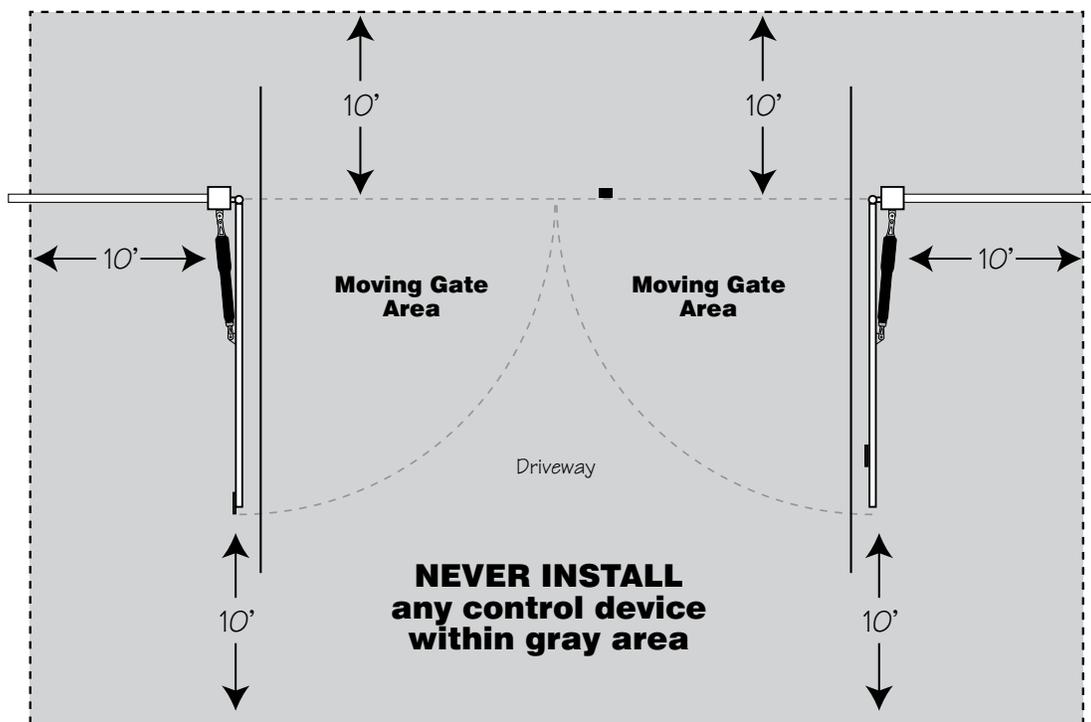
Zone 5 – pinch points between the opener and gate.

IMPORTANT SAFETY INSTRUCTIONS



II. During Installation

1. Install the gate opener on the inside of the property and fence line. **DO NOT** install an opener on the outside of the gate where the public has access to it.
2. Be careful with moving parts and avoid close proximity to areas where fingers or hands could be pinched.
3. **Devices such as contact sensors (safety edges) and non contact sensors (photo beams) provide additional protection against entrapment.**
4. If push buttons or keypads are installed, they should be within sight of the gate, yet located at least 10 feet from any moving part of the gate (see diagram below). **Never install any control device where a user will be tempted to reach through the gate to activate the gate opener.**
5. Do not activate your gate opener unless you can see it and can determine that its area of travel is clear of people, pets, or other obstructions. Watch the gate through its entire movement.
6. Secure outdoor or easily accessed gate opener controls in order to prohibit unauthorized use of the gate.



III. After Installation

1. Attach the **warning signs (included)** to each side of the gate to alert the public of automatic gate operation. It is **your responsibility** to post warning signs on both sides of your gate. If any of these signs or warning decals become damaged, illegible or missing, replace them immediately. Contact GTO for free replacements.
2. The gate is automatic and could move at any time, posing a serious risk of entrapment. No one should be in contact with an activated gate when it is moving or stationary.
3. Do not attempt to drive into the gate area while the gate is moving; wait until the gate comes to a complete stop.
4. Do not attempt to “beat the gate” (drive through) while the gate is closing. This is extremely dangerous.
5. Do not allow children or pets near your gate. **Never let children operate or play with gate controls.** Keep ALL gate controls away from children and unauthorized users; store controls where children and unauthorized users do not have access to them.
6. **KEEP GATE AND GATE OPENER PROPERLY MAINTAINED.** Always turn power to opener OFF before performing any maintenance. Regularly grease the gate hinges. Apply silicone spray to a soft, dry cloth and clean the push-pull tube at least once a month.



IMPORTANT SAFETY INSTRUCTIONS

7. To operate this equipment safely, YOU must know how to disconnect the operator for manual gate operation (page iii). If you have read the instructions and still do not understand how to disconnect the operator, contact the Mighty Mule Service Department.
8. Disconnect the operator **ONLY** when the power is **TURNED OFF** and the gate is **NOT** moving.
9. Make arrangements with local fire and law enforcement for emergency access.
10. Distribute and discuss copies of the **IMPORTANT SAFETY INSTRUCTIONS** section of this manual with all persons authorized to use your gate.
11. **IMPORTANT: Save these safety instructions. Make sure everyone who is using or will be around the gate and gate operator are aware of the dangers associated with automated gates. In the event you sell the property with the gate operator or sell the gate operator, provide a copy of these safety instructions to the new owner.**

Should you lose or misplace this manual, a copy can be obtained by downloading one from the Mighty Mule web site (www.mightymule.com), by contacting GTO Access Systems, LLC., at 3121 Hartsfield Road, Tallahassee, Florida 32303 or by calling 1-800-543-4283 and requesting a duplicate copy. One will be provided to you free of charge.

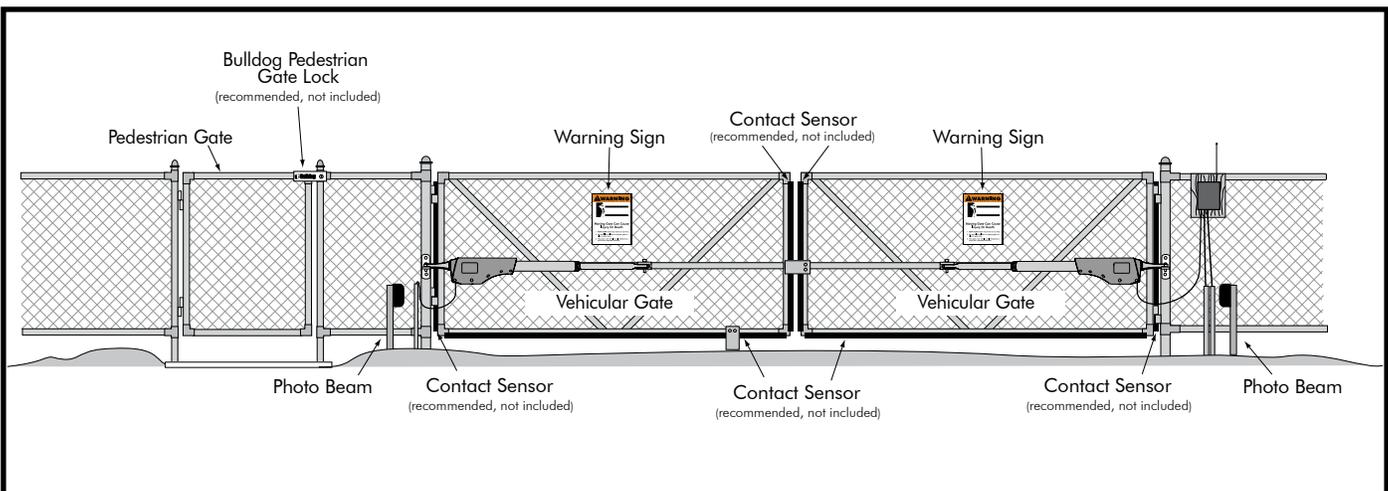
Required Safety Precautions for Gates

Install Warning Signs

Warning signs alert people of automatic gate operation and are **required** when installing the LPA Gate Operator. The Warning Signs included must be installed on both sides of each gate. Furthermore, a walk-through gate must be installed for pedestrian traffic. We recommend using the **GTO Bulldog Pedestrian Gate Lock** [FM145] for controlled access.

Entrapment Protection

The operator's inherent obstruction settings, even when properly adjusted, **may not be sensitive enough to prevent bodily injury in some circumstances**. For this reason, safety devices such as safety edge sensors (or photoelectric sensors), which stop and reverse gate direction upon sensing an obstruction, are suggested for enhanced protection against entrapment.



IMPORTANT SAFETY INSTRUCTIONS

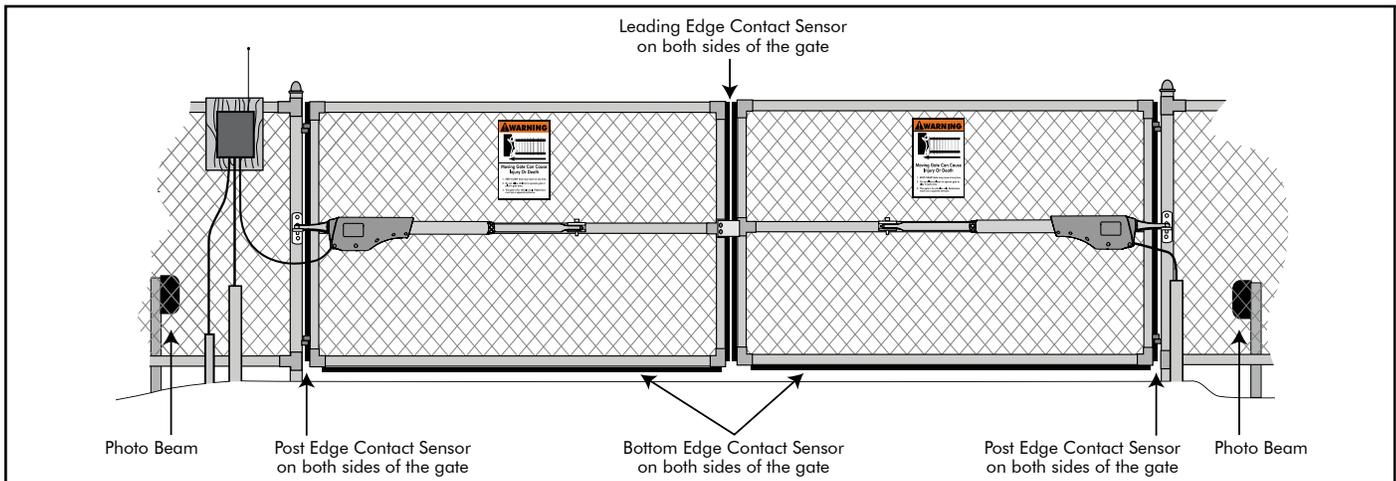


Secondary Means of Protection Against Entrapment

As specified by Gate Operator Safety Standard, UL 325 (30A.1.1), automatic gate operators shall have an inherent entrapment sensing system, and shall have *provisions for, or be supplied with*, at least one independent secondary means to protect against entrapment. The Diamond utilizes **Type A**, an inherent (i.e., built-in) entrapment sensing system as the **primary** type of entrapment protection. Also, the Diamond has *provisions for* the connection of **Type B1 or B2** protection to be used as the **secondary** type of entrapment protection, if desired.

1. For gate operators utilizing a non-contact sensor (e.g., photo-electric sensor– Type B1) in accordance with UL 325 (51.8.4 [h]):
 - A. Refer to the sensor manufacturer's instructions on the placement of non-contact sensors for each type of application.
 - B. Care shall be exercised to reduce the risk of nuisance tripping, such as when a vehicle trips the sensor while the gate is still moving.
 - C. One or more non-contact sensors shall be located where the risk of entrapment or obstruction exists, such as the perimeter reachable by a moving gate or barrier.
2. For gate operators utilizing a contact sensor (e.g., safety edge sensor– Type B2) in accordance with UL 325 (51.8.4 [i]):
 - A. One or more contact sensors shall be located at the leading edge, bottom edge, and post edge, both inside and outside of a vehicular swing gate system.
 - B. A hard wired contact sensor shall be located and its wiring arranged so that the communication between the sensor and the gate operator is not subjected to mechanical damage.
 - C. A wireless contact sensor such as one that transmits radio frequency (RF) signals to the gate operator for entrapment protection functions shall be located where the transmission of the signals are not obstructed or impeded by building structures, natural landscaping or similar obstruction. A wireless contact sensor shall function under the intended end-use conditions.

You may want to consider adding photo beams to your installation. GTO Photo Beams  [R4222] provide a “non contact” means of entrapment protection.



ENTRAPMENT ALARM (UL 325; 30A.1.1A)

The Diamond Gate Operator is designed to stop and reverse within 2 seconds when the gate comes in contact with an obstruction. Additionally, these operators are equipped with an **audio entrapment alarm** which will activate if the unit obstructs **twice** while opening or closing. This alarm will sound for a period of 5 minutes, or until the operator receives an intended signal from a hard wired entry/exit source (e.g. push button control or keypad) and the gate returns to a fully open or fully closed position. Turning the power switch on the control box OFF and back ON will also deactivate the alarm. Wireless controls such as transmitters and wireless keypads will not deactivate the alarm.



IMPORTANT SAFETY INSTRUCTIONS

WARNING

Moving Gate Can Cause Injury Or Death

1. **KEEP CLEAR!** Gate may move at any time.
2. Do not allow children to operate gate or play in gate area.
3. This gate is for vehicles only. Pedestrians must use a separate entrance.

Warning signs (2 enclosed) to be installed on each side of the gate (3–5 feet above the bottom of the gate).

WARNING

MOVING GATE!

CAN CAUSE INJURY OR DEATH

1. **KEEP CLEAR!** Gate may move at any time.
2. Do not allow children to operate gate or play in gate area.
3. This gate is for vehicles only. Pedestrians must use separate entrance.

Warning label (1) installed on control box.

DIAMOND

DUAL

AUTOMATIC GATE OPENER

MIGHTY MULE

1-800-543-GATE

| MIGHTYMULE.COM

MMDIA30D

Logo labels (4) installed on each side of operator housing.

2000XLS SERIES DC Swing Gate Operator
P/N MMDIA30D
 Conforms to UL STD 325
 Maximum Gate: 500 lb. (226.7 kg); 16 ft. (4.9 m)
 Voltage: 12 Vdc; Frequency: 0 Hz; Power: 30 W
 Class I & II Vehicular Swing Gate Operator.

9901178

Serial Number: **MMDIA30D-0000000**

TO MANUALLY OPEN AND CLOSE THE GATE:

1. Turn control box power switch OFF.
2. Disconnect front or rear mount from mounting bracket.
3. Pull operator away from mounting brackets and move gate.

Disconnect operator ONLY when the control box power switch is OFF and the gate is NOT moving.

MMDYY

GTO Access Systems, LLC - Tallahassee, Florida USA

Product identification and manual operation instruction label (1) installed on right hand side of battery box.

Technical Specifications

DIAMOND-DUAL AUTOMATIC GATE OPERATOR

DRIVE

- Low friction screw drive (linear actuator) rated for -5°F to +160°F (-21°C to +71°C). Use of GTO battery heater FM316 (Not solar compatible) is recommended in extreme cold temperatures
- Powered by a 12 V motor with integral case hardened steel gear reducer. Motor speed reduced to 395 rpm.
- Maximum opening arc of 110°. Approximate opening time (90°): 15-19 seconds, depending on weight of gate.

POWER

- The system is powered by a 12 Vdc, 7.0 Ah, sealed, rechargeable acid battery.
- Battery charge is maintained by a 120 Vac, 14 Vac output transformer.
NOTE: The transformer should not be directly connected to any battery. Do not replace fuses with higher ampere rated fuses; doing so will void your warranty and may damage your control board.
- One (1) blade style fuse is rated for 15 A.
- For optional solar charging see page 2.

CONTROL

- GTO microprocessor-based control board is set for pull-to-open gate installations. Jumper can be removed to accommodate an optional kit for push-to-open gates (see Accessory Catalog).
- A circuit on the control board regulates charging. "Sleep draw" is 15 mA; "active draw" is 2 to 5 A.
- Auto-memorization of digital transmitter code.
- GTO built-in RF receiver tuned to 318 MHz.
- Operator length with push-pull tube fully retracted is 33 3/4", mounting point to mounting point, arm stroke 15" max.
- Minimum gate length is 5 ft.
- Adjustable auto-close (3 to 120 seconds), and stall force potentiometers.
- Power terminal block accommodates a transformer or solar panels (not both).
- Accessory terminal block fully compatible with GTO push button controls, digital keypads, loops detectors, etc.
- Control board allows connection of safety edge sensors and photoelectric sensors.
- Audio entrapment alarm sounds if unit encounters an obstruction twice while opening or closing.
- Direct drive for automatic gate lock.

OPERATIONAL CAPACITY

- The Gate Capacity Chart shows approximate cycles, per day, you can expect from the Diamond Automatic Gate Operator when powered with a transformer. Actual cycles may vary slightly depending upon the type and condition of gate and installation.

Diamond Dual Gate Capacity Chart								
<i>Estimated number of daily cycles, based on use with a transformer and one(1) 12 Volt battery.</i>								
Gate Length	16 ft.	65	60	50	N/R	N/R	N/R	N/R
	14 ft.	70	65	55	50	40	N/R	N/R
	12 ft.	75	70	60	55	45	35	N/R
	5 to 10 ft.	80	75	65	60	50	40	30
		Gate Weight						
	50 lb.	100 lb.	150 lb.	200 lb.	300 lb.	400 lb.	500 lb.	

N/R - Not Recommended

NOTE: BALL BEARING HINGES SHOULD BE USED ON ALL GATES WEIGHING OVER 250 LB.

To determine the number of cycles the gate operator will perform using solar panels, please see the specifications listed on page 2.

* An operation cycle is one full opening and closing of the gate.

These specifications are subject to change without notice.

Before You Begin...

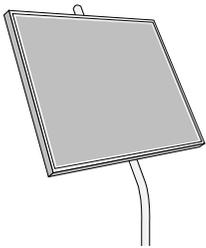
1. Determine Charging Option for Battery: Transformer OR Solar

**NEVER USE TRANSFORMER AND SOLAR PANEL(S) AT THE SAME TIME.
It will damage the control board.**

IMPORTANT:

- The opener's 12 volt battery must be charged by either connecting the transformer (included) or solar panel kit ⊕[FM123] to the control board.
- The transformer is designed for indoor use. If the transformer can be plugged only into an outside electrical outlet, a weatherproof cover/housing (available at local electrical supply stores) must be used.
- If your gate is more than 1000 ft. from an AC power source, you will need to use at least 10 watts solar charging power to charge the battery ⊕[FM123]. Refer to the Solar Panel and Gate Activity chart below.
- All low voltage wire used with the GTO Gate Operator must be 16 gauge dual conductor, stranded, direct burial wire ⊕[RB509]. **Do not** run more than 1000 ft. of wire.

Solar Panel and Gate Activity Chart

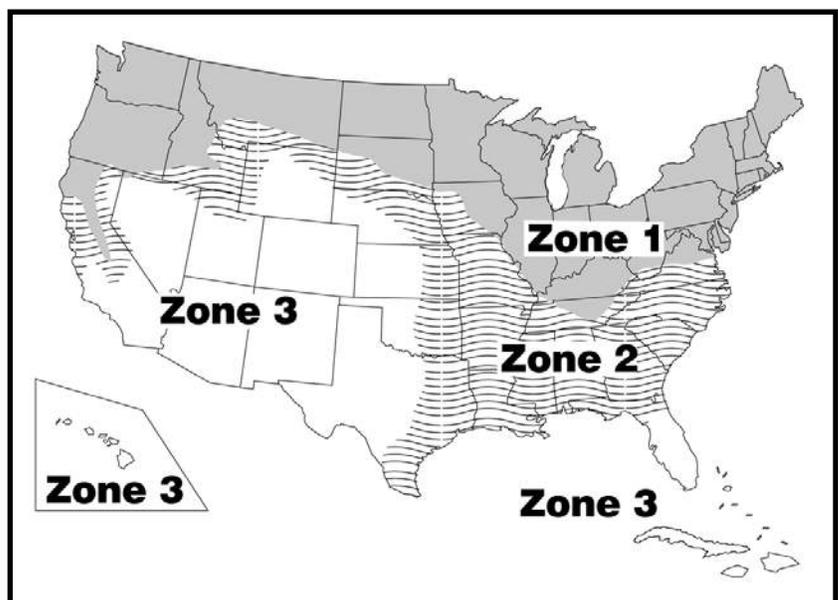


The table and map illustrate the maximum number of gate cycles to expect per day in a particular area when using from 10 to 20 watts of solar charging power. The figures shown are for winter (minimum sunlight).

Accessories connected to your system will draw additional power from the battery.

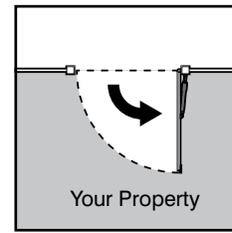
⊕ 10 Watt Solar Panel [FM123]

Winter Ratings for 12 V Single Gate	Zone 1	Zone 2	Zone 3
10 watts	8	16	26
15 watts	11	20	30
20 watts	14	28	38

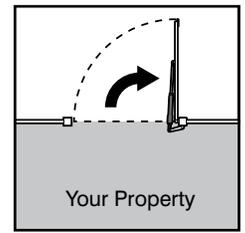


2. Check Direction of Gate Swing

The Diamond is designed for PULL-TO-OPEN installations. PUSH-TO-OPEN installations require a Push-To-Open Bracket [FM148]. Please refer to specific Push-To-Open Installation Information on page 20.



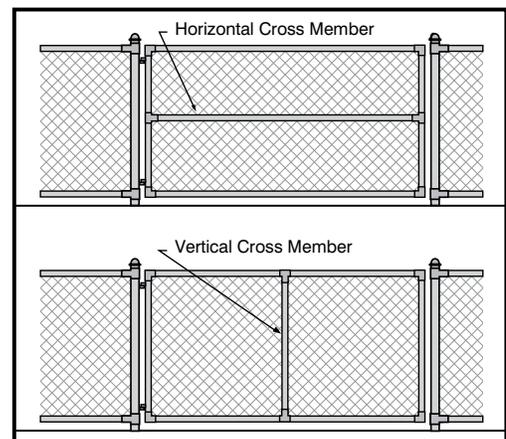
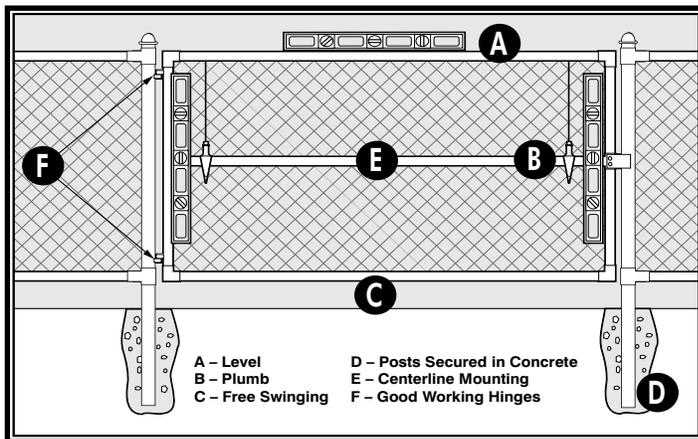
Pull-To-Open
(arm retracts to open)



Push-To-Open
(arm extends to open)

3. Prepare the Gate

- The gate must be plumb, level, and swing freely on its hinges.
- The gate must move throughout its arc without binding or dragging on the ground.
- Wheels must NOT be attached to the gate.
- Gates over 250 lb. should have ball bearing hinges with grease fittings.
- Post must be secured in the ground with concrete (minimizes twist/flex when the operator is activated).
- Make sure there is a stable area for mounting the gate bracket (this may require the addition of a horizontal or vertical cross member).
- We recommend you position the operator near the center-line of the gate to keep the gate from twisting and flexing, and to avoid back-splash from rain.



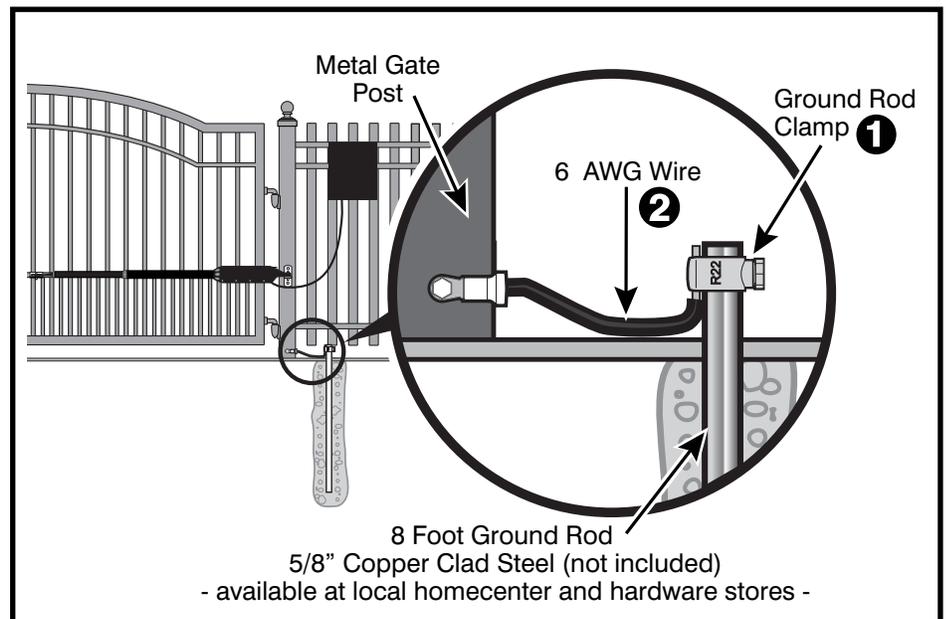
4. Gate Grounding

FOR INSTRUCTIONAL PURPOSES ONLY

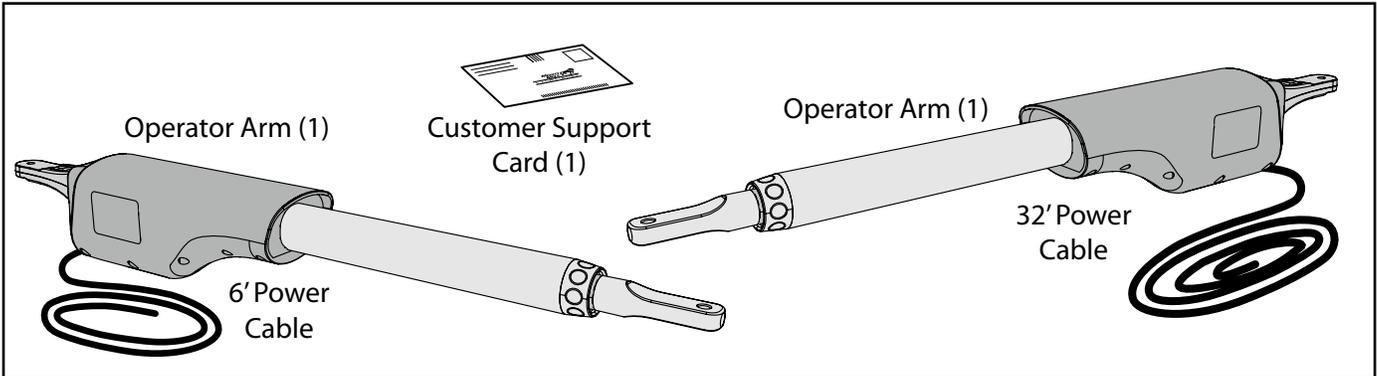
- Shorter cable is better, 1 to 2 feet recommended.
- Bolt ring terminal at end of cable 4 - 6 inches above ground level.

- ① Ground Rod Clamp
- ② 6 AWG Wire (3 feet)

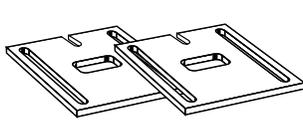
NOTE: No grounding system absolutely protects against lightning strikes. If installed correctly, a grounding system will help minimize damage to your gate opener.



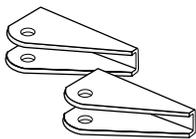
5. Diamond Parts List



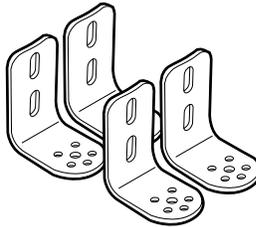
BRACKET BOX - HB100



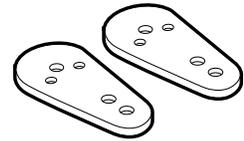
Closed Position Stop Plate (2)



Gate Bracket (2)



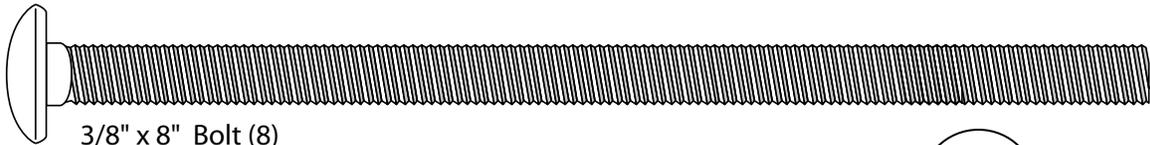
Post Bracket (4)



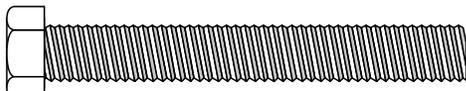
Post Pivot Bracket (2)

HARDWARE BAG - H101P

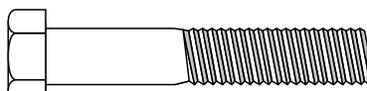
E



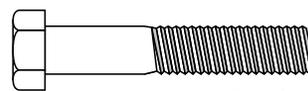
3/8" x 8" Bolt (8)



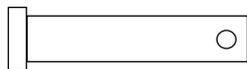
3/8" x 2-3/4" Bolt (4)



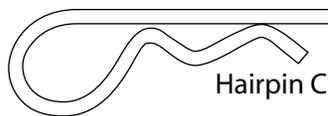
3/8" x 2" Bolt (2)



5/16" x 1-3/4" Bolt (2)



3/8" x 1-1/2" Clevis Pin (4)



Hairpin Clip (4)

3/8" Washer (18)

3/8" Lock Washer (14)

3/8" Nut (14)

5/16" Washer (2)

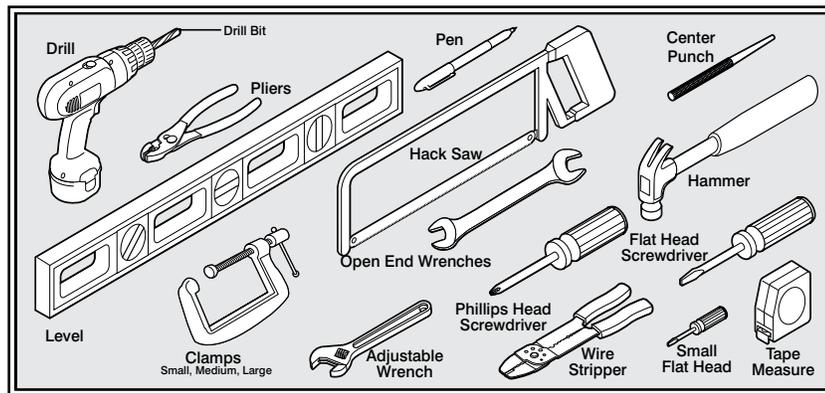
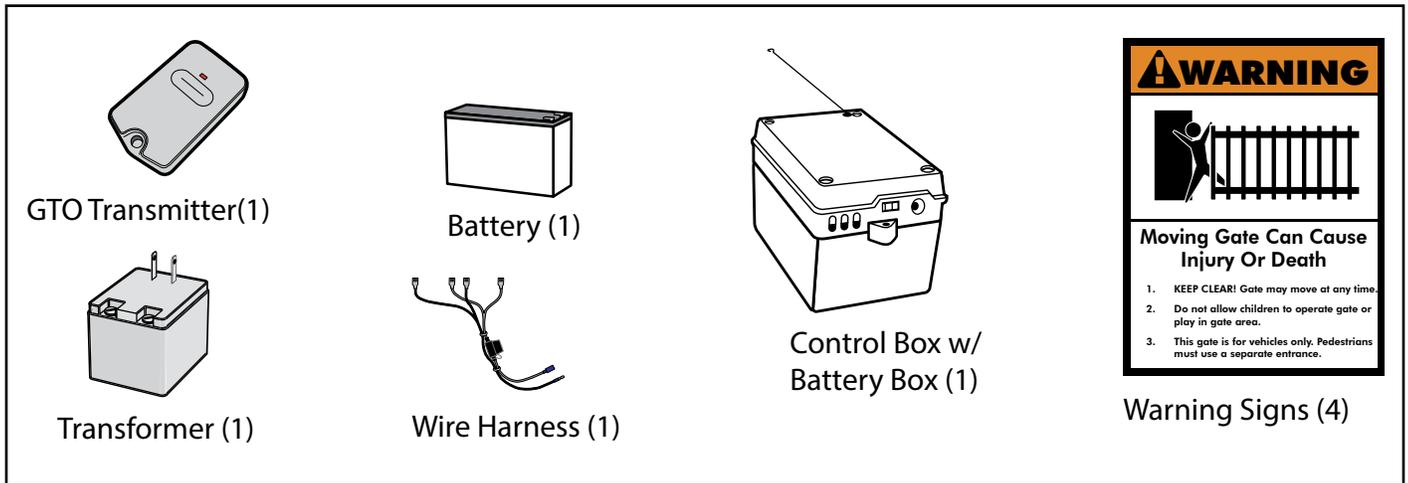
5/16" Nut (2)

3/8" x 3/16" Bushing (4)



2" Screw (10)

8" Nylon Cable Tie (28)



6. Tools Needed

- Power Drill
- Pliers
- Level
- Tape Measure
- Wire Strippers
- Center Punch
- Open End Wrenches: 9/16" and 1/2"
- Drill Bits: 3/8"
- Hacksaw or Heavy Duty Bolt Cutters
- Small (Flat Head) Screwdriver
- Phillips Screwdriver
- C-Clamps: small, medium, and large
- Adjustable Wrench
- Extra person will be helpful

7. Materials You may Need for the Installation:

Depending on the type of gate and post, you may need some additional materials/hardware.

- Low voltage wire Ⓢ[RB509]. Length depends upon the distance between the transformer power supply and the control box. (Page 15)
- If the gate is more than 1000' away from an AC power source you will need to use at least one 10 watt Solar Panel Ⓢ[FM123] to trickle charge the battery. (Page 2)
- PVC Conduit. (Page 6)
- The diameter of the post should be at least 6" in order to mount the post bracket. (Page 9)
- Depending upon the diameter of the post, you may need longer bolts than those provided. Bolts should be at least 1" longer than the diameter of the post. (Page 9)
- Metal plate for wooden posts. (Page 9)
- A horizontal or vertical cross member or mounting plate may be needed to mount the operator to the gate. (Page 3)
- Some types of installations require U-Bolts. (Page 11)
- Surge protection for transformer. (Page 17)
- Weatherproof cover for transformer if installed outside. (Page 17)
- For push-to-open applications you must have PTO Bracket Ⓢ[FM148]. (Page 20)

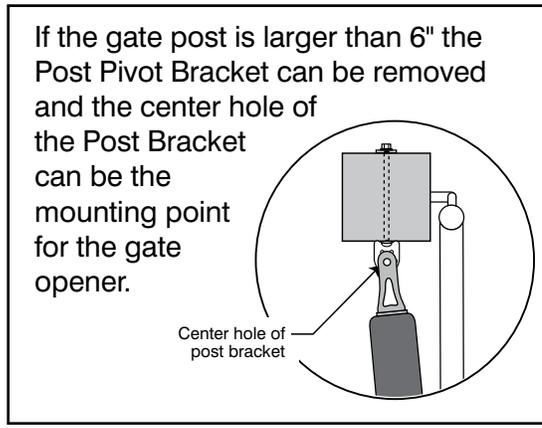
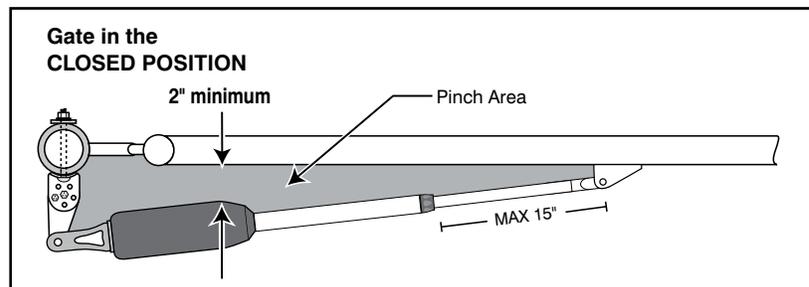
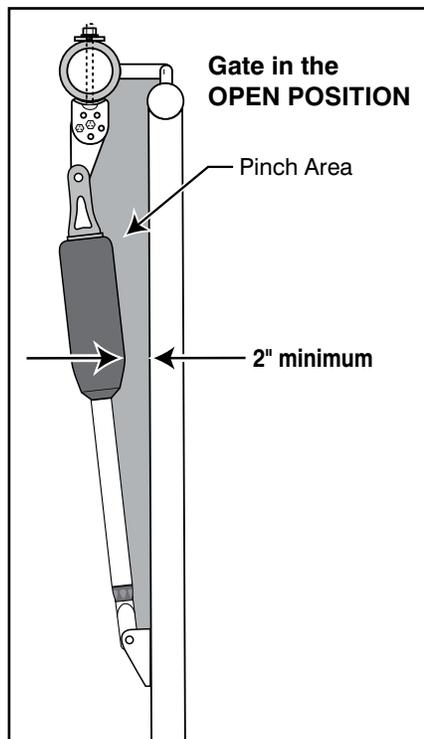
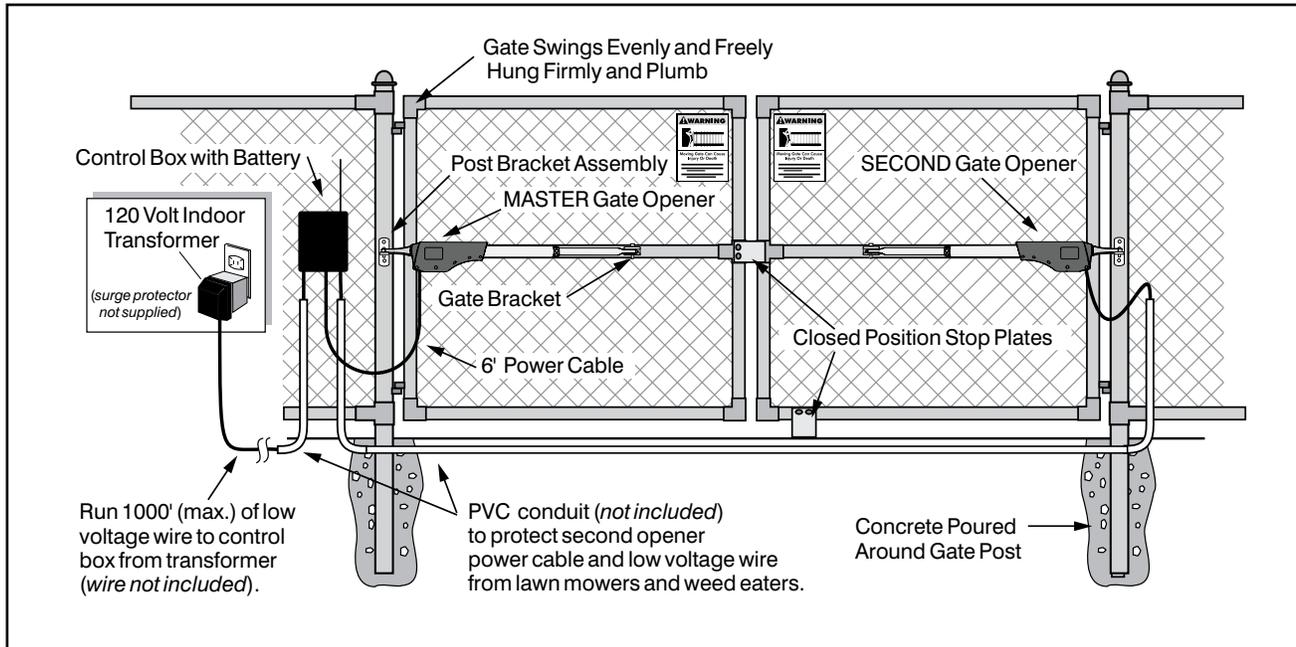
Installation Overview for Pull-To-Open Gate

PUSH-TO-OPEN installation instructions begin on page 20.

Example of an installation on a chain link fence:

IMPORTANT: To achieve the most efficient leverage for the gate opener and ensure long trouble free service, the gate opener needs to be installed within the following parameters.

The diagrams below show the optimum positions for the gate opener arm in relation to the gate in the open and closed positions. Be sure the position of the gate opener and brackets allows for 2" of clearance between the gate and the opener in both the open and closed positions.



We recommend you position the opener near the centerline of the gate to keep the gate from twisting and flexing and to avoid backsplash from rain water.

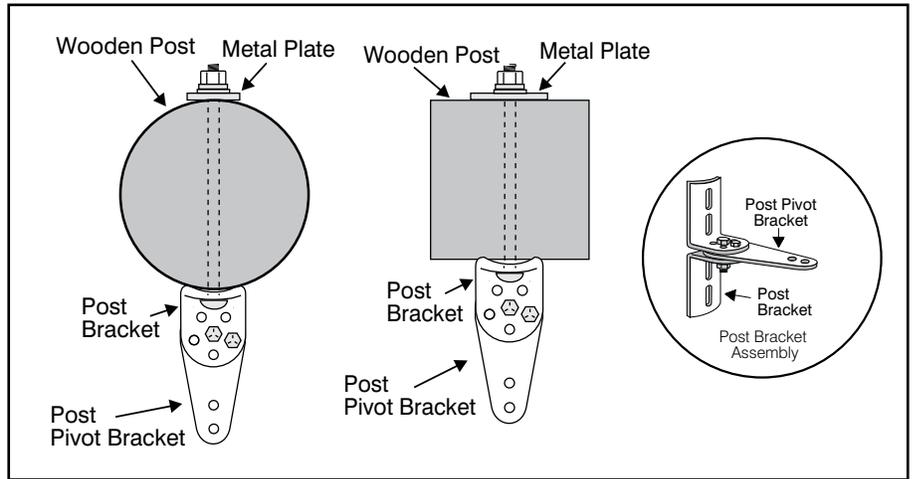
The Post Bracket Assembly

The position of the post bracket assembly determines the leverage and efficiency of the opener. The post bracket assembly position also sets the clearance between the opener and the gate in the open and closed positions.

The post bracket works well for installations on round and square fence posts. Because the post bracket carries the entire thrust of the active opener, bolts must completely penetrate the post.

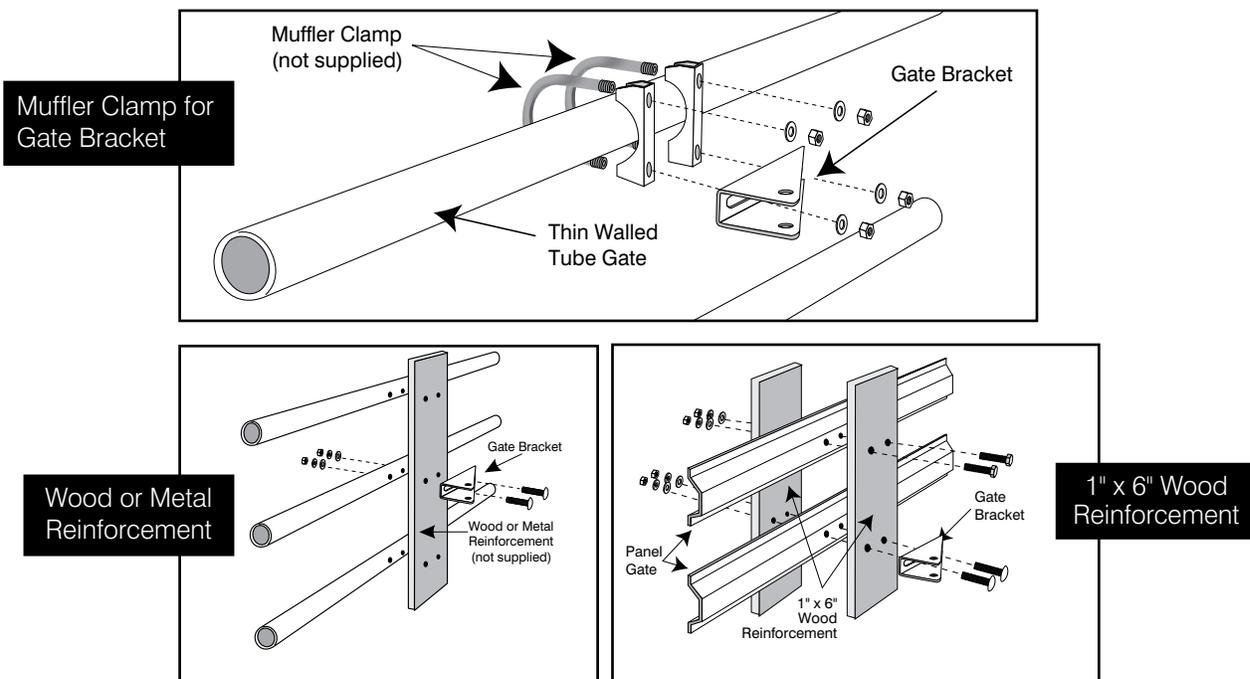
On wood posts, place a metal plate or washer (not supplied) between the nuts and the post to prevent the thrust of the opener from pulling the bolts and washers out of the wood.

The post pivot bracket may not be necessary on posts larger than 6" in diameter (see page 6). Fence posts smaller than 6" in diameter or 6" square should be made of metal instead of wood to remain stable while the opener is moving the gate.



Reinforcing Gates for the Gate Brackets

We recommend using a muffler clamp, wood, or metal, to reinforce thin-walled tube gates, or wood to reinforce panel gates as shown. These reinforcement methods will prevent damage to the opener and gate. Additional hardware may be needed depending on the installation.



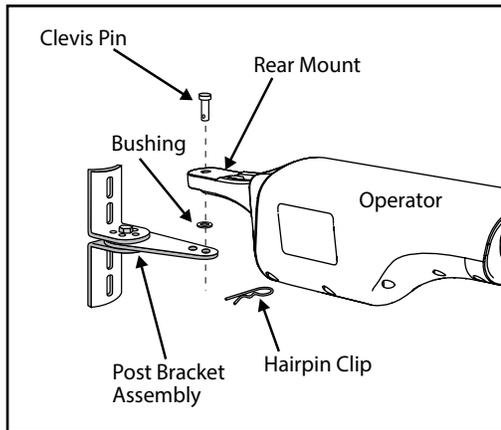
Install the Operator

Step 1

Insert the 3/8" x 2" bolt through the center hole of the post brackets and post pivot bracket as shown. Fasten a 3/8" lock washer, 3/8" washer and 3/8" nut on the end of the bolt. DO NOT overtighten the nut because the post pivot bracket will have to be adjusted later.

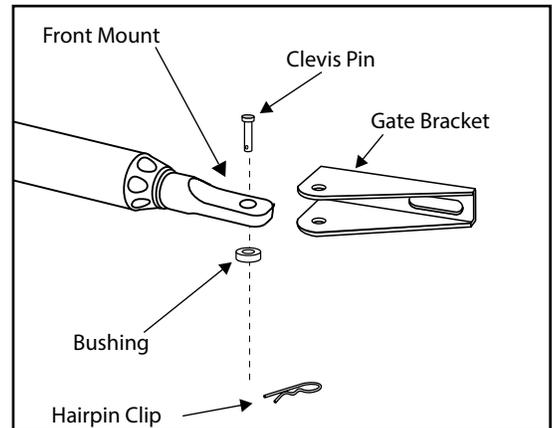
Step 2

Attach post bracket assembly to the rear mount of the opener with a clevis pin and a 3/8" washer. Secure the clevis pin with a hairpin clip.



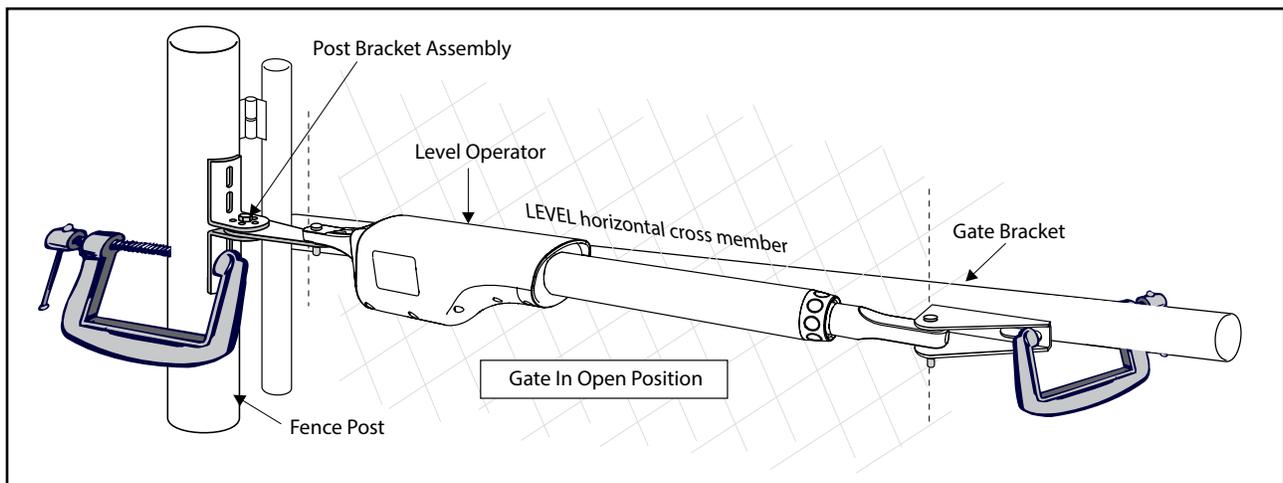
Step 3

Attach gate bracket to the front mount of the opener with a clevis pin and a 3/8" bushing. Secure the clevis pin with a hairpin clip.



Step 4

With the gate in the fully open position and the opener arm fully retracted, adjust the post bracket assembly and gate bracket until the opener is level. While holding the opener level, use C-clamps to temporarily secure the post bracket assembly and gate bracket to the post and gate.



Step 5

After verifying that you have the best position for the post pivot bracket in the open position, insert the 5/16" x 1-3/4" bolt through the aligned holes of the post bracket and post pivot bracket to hold it in place. Remove the clevis pin from the front mount and while supporting the gate opener, swing the gate and gate opener to the closed position.

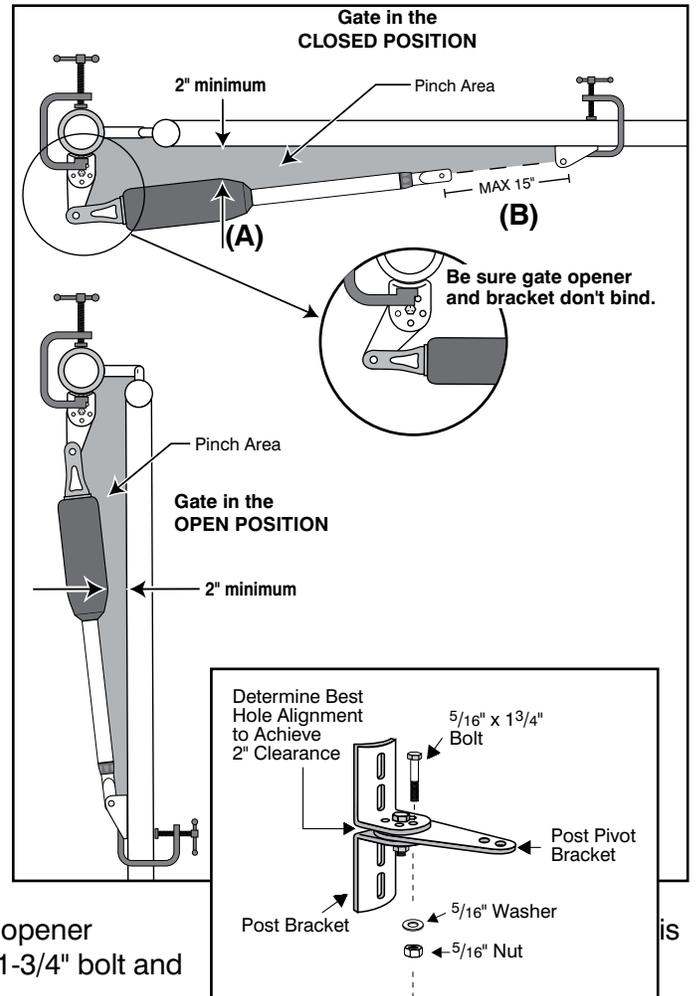
TIP: Turn the post pivot bracket over for more hole alignment options. You can also move the entire post bracket assembly to different positions on the post.

Step 6

Be sure the position of the gate opener and brackets allows for 2" of clearance between the gate and the opener in both the open and closed positions **(A)**, and maintaining a maximum distance of 15" from the clevis pin opening of the retracted opener arm to the gate bracket with the gate in the closed position. **(B)** see graphic to right. This mounting position will give the opener the most efficient leverage point for operation and provides the least possible pinch area.

Again, check the clearance and be sure that the gate opener is not binding at the post pivot bracket.

If you don't have the required clearance, or if the gate opener binding on the post pivot bracket, remove the 5/16" x 1-3/4" bolt and readjust the post pivot bracket.

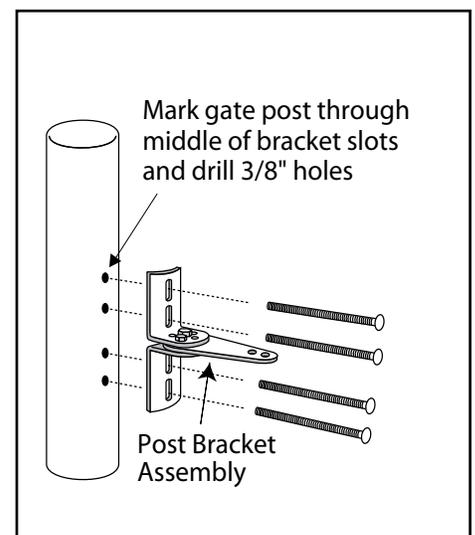
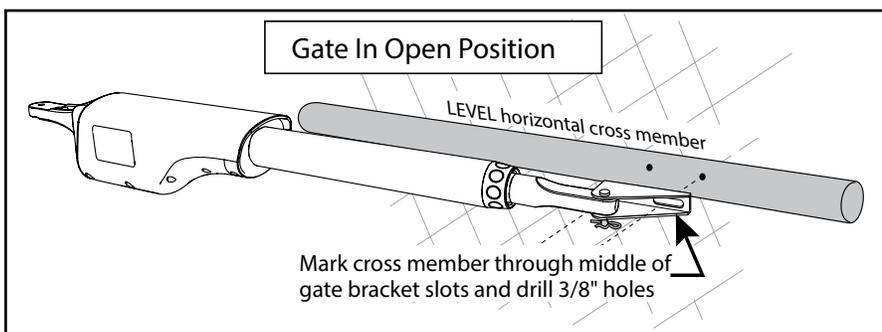


Step 7

When the post bracket assembly is in the optimum position for clearance and freedom of movement, reattach the opener to the gate bracket (gate in the open position); recheck the gate opener level; make sure the brackets are clamped securely. Secure the 5/16" x 1-3/4" bolt with a 5/16" washer and 5/16" nut.

Step 8

Mark reference points for bolt holes on the post through middle of post bracket assembly slots. Mark reference points for bolt holes on the gate cross member through middle of gate bracket slots. After marking your reference points, remove the opener and brackets from the fence and gate.



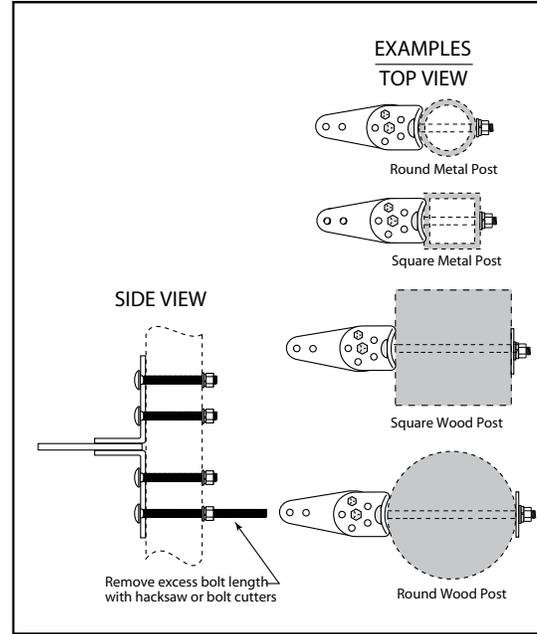
Step 9

Drill 3/8" holes through post as marked. Fasten post bracket assembly to the fence post using four 3/8" x 8" bolts, lock washers and nuts. You must use bolts that completely penetrate the post.

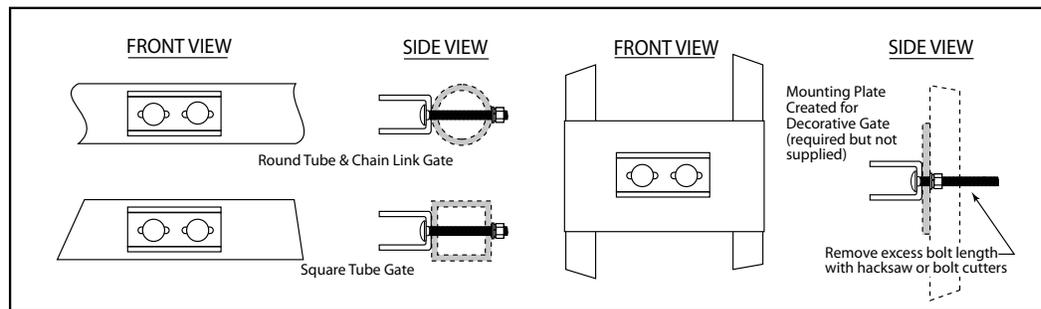
Step 10

Drill 3/8" holes through the gate cross member as marked. Mount gate bracket using two 3/8" x 2 3/4" bolts, lock washers, and nuts.

NOTE: After the gate opener installation is complete and operation of the opener system has been tested, you should remove excess bolt length extending beyond the tightened nuts with a hacksaw or bolt cutters.



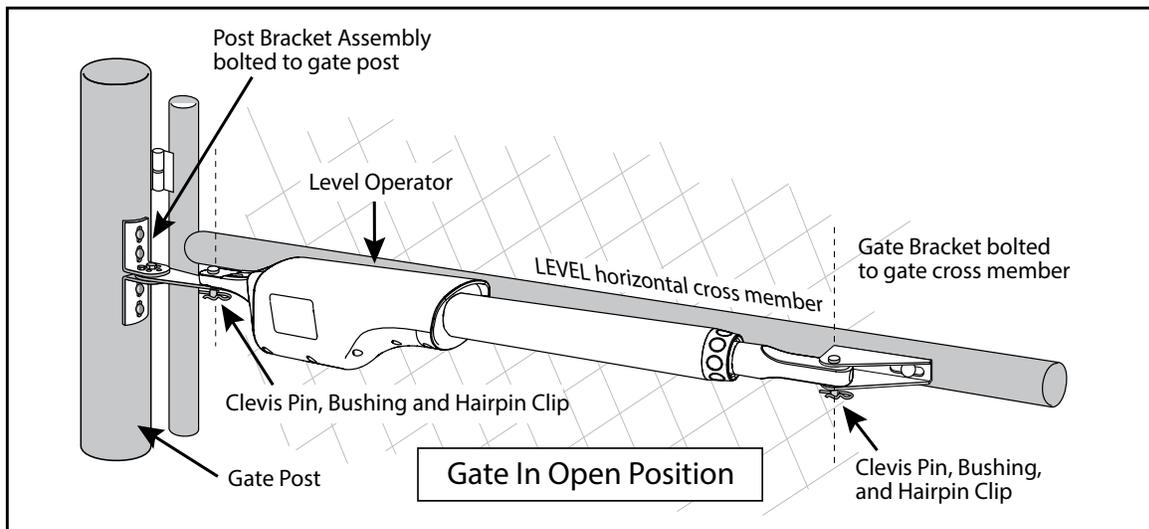
Gate Bracket Mounting Examples



Step 11

Attach Operator Arm

Attach the opener to the securely bolted post bracket assembly and gate bracket using clevis pins, bushings, and hairpin clips, or optional Pin Lock [FM133]. Verify that the opener is level and adjust the post bracket assembly, if necessary.



Step 12

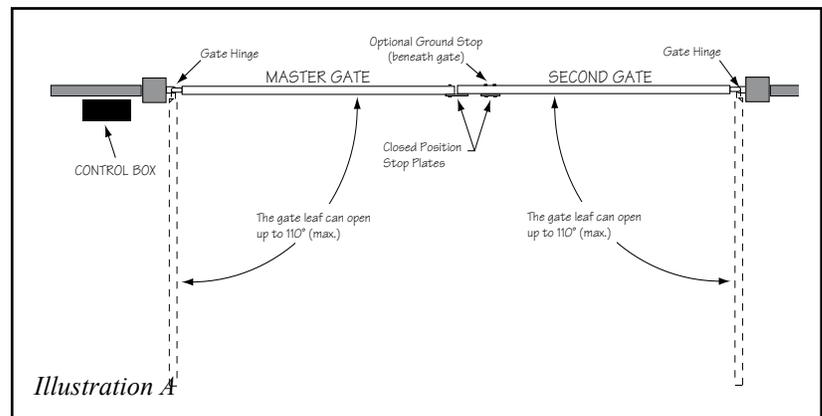
Installing the Second Arm

Install the second opener on the remaining gate leaf by repeating **Step 3** through **Step 11**, starting on page 8. After you have mounted the second opener, proceed to **Installing the Closed Position Stops** below.

Installation of Closed Position Stops

The Diamond Gate Operators firmly hold the gates in the closed position using positive stops. The positive stops help stabilize the gate leaves in the closed position. To further enhance stability and security, we strongly recommended using an optional **+** GTO Automatic Gate Lock (see Accessory Catalog) with your dual gate.

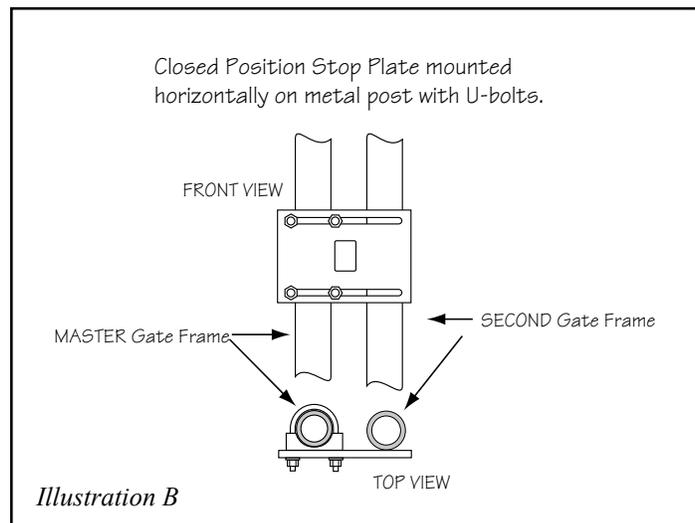
IMPORTANT: You need to determine which side of the driveway you will mount the control box. From this point on the gate and gate opener on the same side as the control box will be referred to as the **MASTER** gate and gate opener. The gate and gate opener on the opposite side of the driveway from the control box will be referred to as the **SECOND** gate and gate opener.



Step 1

Attach the horizontal closed position stop plate to the MASTER gate leaf.

Detach the gate operators from the gates and move the gates to their closed position (*Illustration A*). Using appropriate hardware for your type of gate (U-bolts for tube or chain link; screw or bolts for wood or metal) attach the *closed position stop plate (horizontally)* about mid height on the MASTER gate frame. **Do not** tighten it completely at this time. Slide the stop plate toward the frame of the SECOND gate leaf until they touch (*Illustration B*). Once you have moved the stop plate to the correct position, tighten its hardware completely.



NOTE: The optional ground stop post is used to provide a secure point for the SECOND gate to close against. If you will be using the GTO/PRO Horizontal Gate Lock accessory with your gate opener system, the closed position ground stop is **REQUIRED**, as shown in Steps 2 and 3 on the next page.

Step 2

Install a low profile ground stop (*not provided*) beneath the **SECOND** gate stop plate.

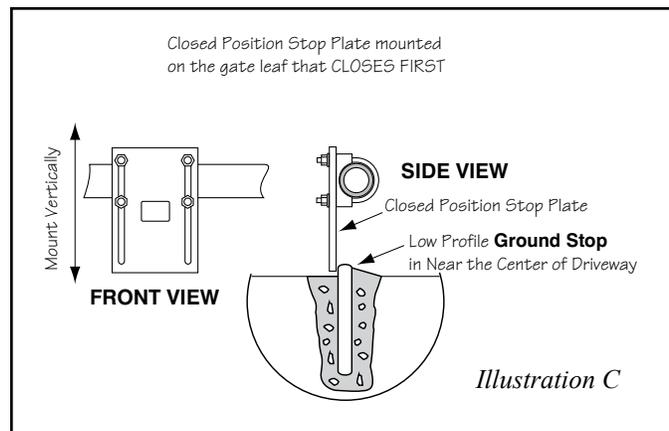
The ground stop needs to be positioned near the end of the gate as shown in *Illustration A* and may be made of metal or concrete and should be firmly secured in the ground (we recommend setting it in concrete).

Step 3

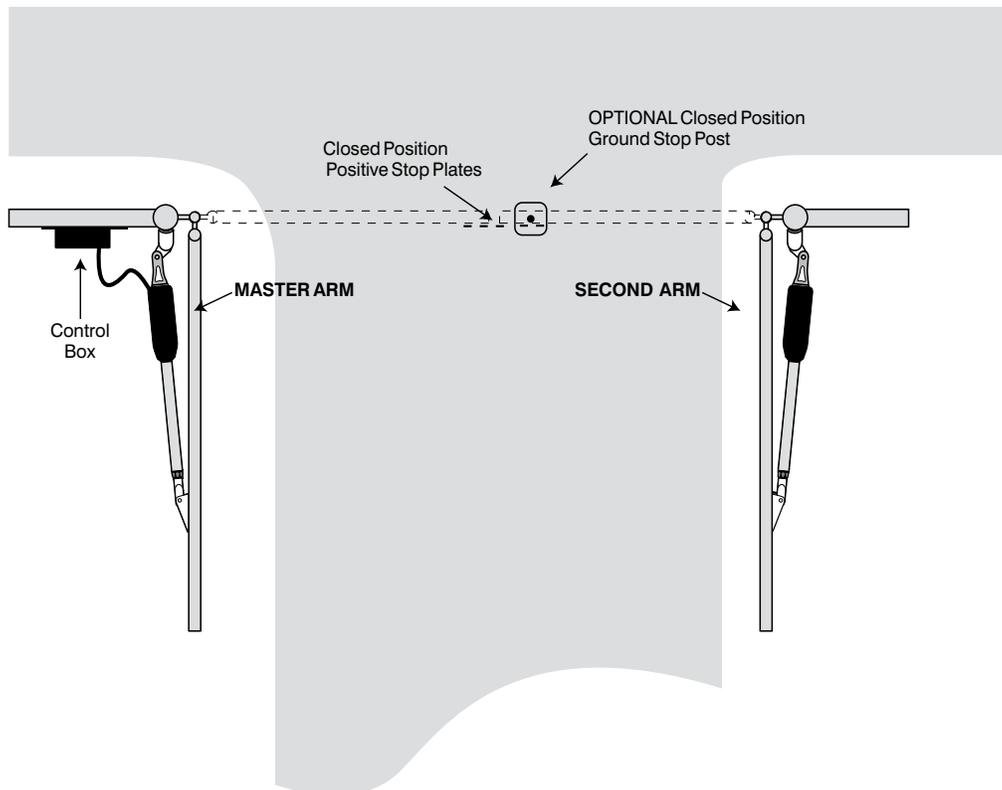
Attach a vertical closed position stop plate to the **SECOND** gate.

Using appropriate hardware for your type of gate attach the vertical *closed position stop plate* to the **SECOND** gate frame at the point where it will come in contact with the ground stop post.. **Do not** tighten it completely at this time. You must slide the closed position stop plate toward the *ground stop* until they touch (*Illustration C*). Once you have moved the stop plate to the correct position, tighten its hardware completely.

NOTE: For a push-to-open installation (gate opens *out* from the property) attach the closed position stop plate to the **outside** of the gate.



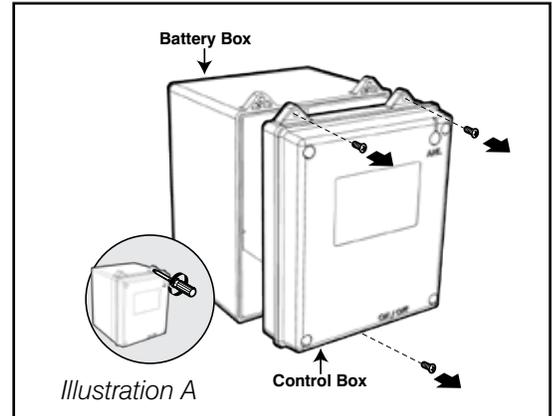
At this stage of the installation, the openers should be installed on the gate leaves and the open and closed position stops should be in place.



Mount the Battery Box / Control Box

Step 1

Remove the Control box from the Battery Box by removing the three screws as shown in Illustration A.

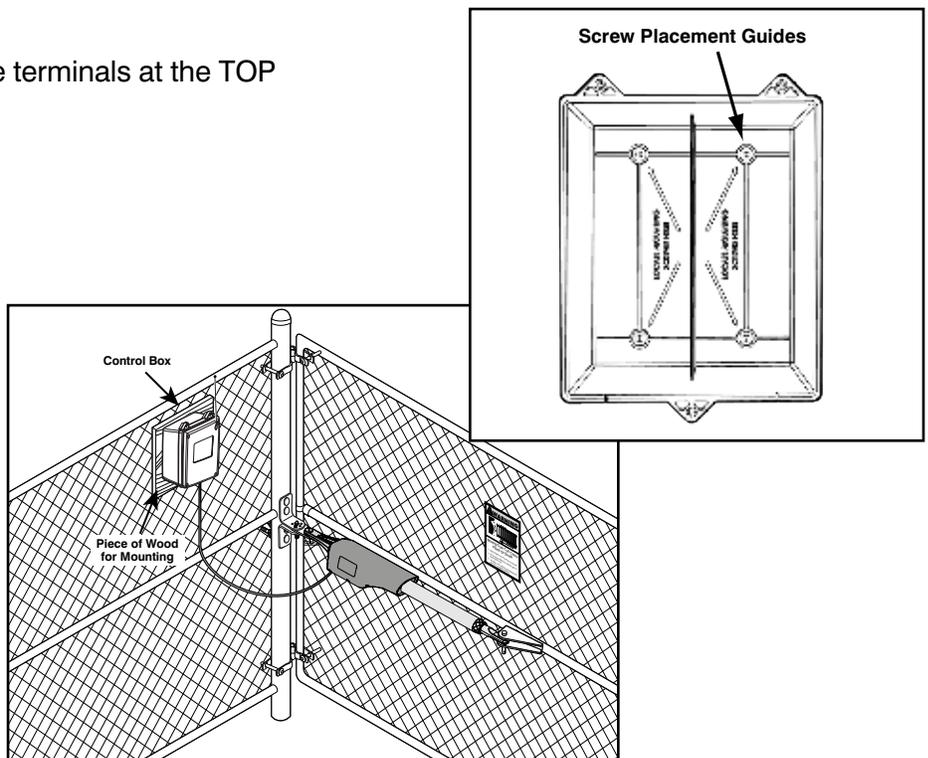
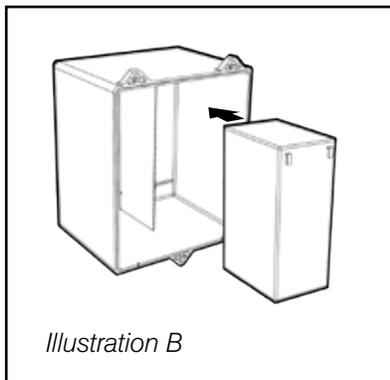


Step 2

Mount the Battery Box using the screws (provided) or another secure mounting method. The battery/control box must be mounted at least 3 feet above the ground to protect it from rain splash, snow, etc., and at least 3 feet from an AC power source to prevent electrical interference.

Step 3

Slide the battery into position with the terminals at the TOP as shown in Illustration B.



This device complies with FCC rules Part 15. Operation is subject to the following conditions:

1. This device may not cause harmful interference.
2. This device must accept an interference that may cause undesired operation.

Transmitter distance may vary due to circumstances beyond our control. NOTE: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment.

Connecting the Battery Box / Control Box

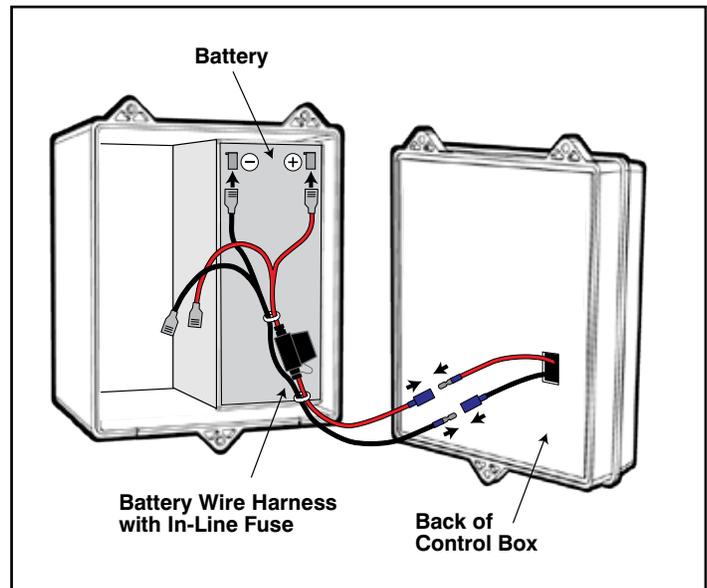
Step 4

Connecting the Battery

Verify that the ON/OFF switch is in the OFF position.

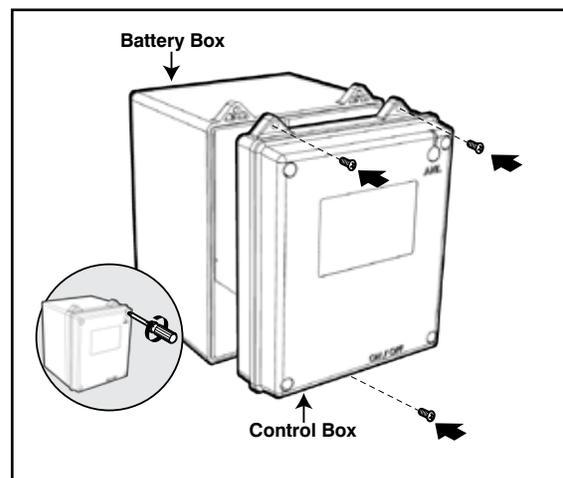
Connect the BATTERY WIRE HARNESS wires to the battery — RED wires to POSITIVE (+) battery terminal and BLACK wires to NEGATIVE (-) battery terminal.

The BATTERY WIRES from the CONTROL BOARD should extend through the KNOCK-OUT in the back of the CONTROL BOX. Plug the BATTERY HARNESS wires into the wires coming from the CONTROL BOX.



Step 5

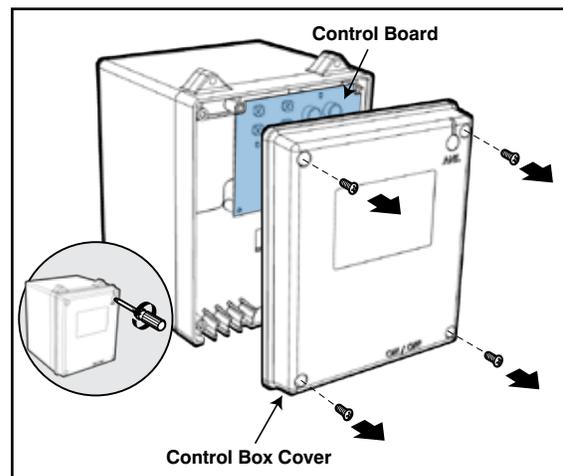
Tuck the excess battery leads into the battery box and reattach the CONTROL BOX to the BATTERY BOX.



Step 6

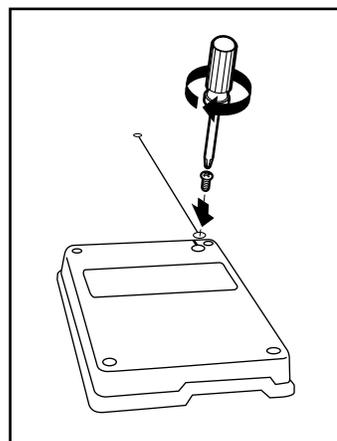
Remove the Control Box Cover

Remove the four (4) control box cover screws and remove the cover to access the CONTROL BOARD.



Step 7

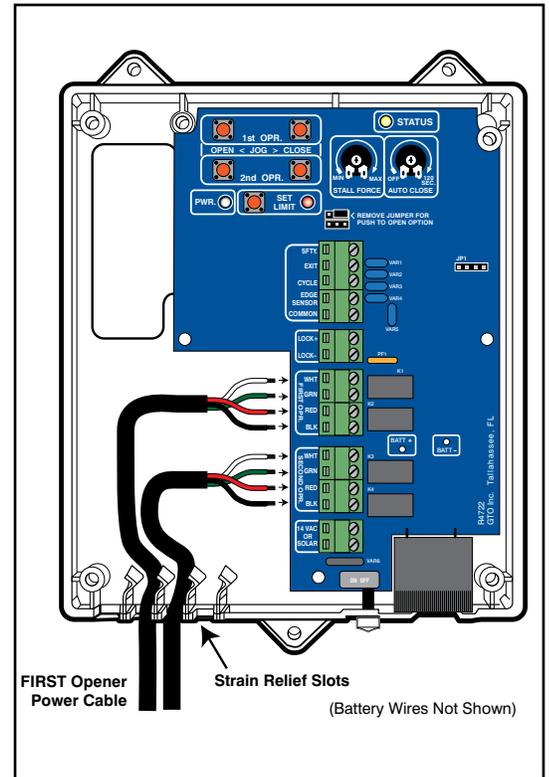
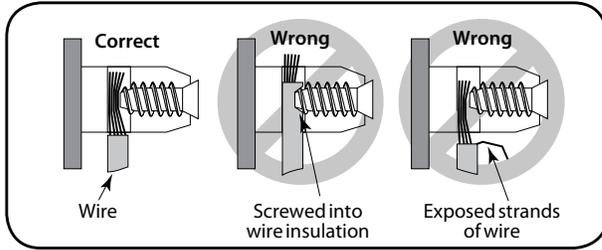
Attach antenna to control box cover. First, remove the Phillips screw (labeled ANT) from the control box cover. Place one end of the antenna coil over the antenna plug (antenna wire will fit into groove). Tighten the Phillips screw to secure antenna.



Connect Operator Power Cables

Bring FIRST and SECOND power cables into the control box through a strain relief slots, leaving enough wire to reach the FIRST OPR. and SECOND OPR. terminal blocks.

Insert the individual power cable wires into appropriate terminals on the FIRST OPR. terminal block (white to WHT; green to GRN; red to RED; black to BLK). Repeat process for SECOND OPR. wiring. Tighten the set screws.



Connect the Transformer (*Solar Instructions on Page 21)

NEVER USE TRANSFORMER AND SOLAR PANEL(S) AT THE SAME TIME!

IMPORTANT INFORMATION ABOUT LOW VOLTAGE WIRE:

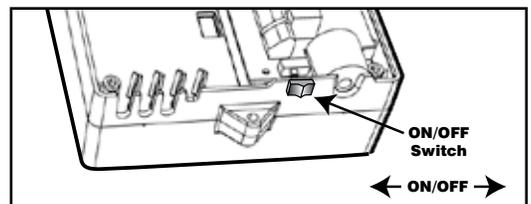
- The only wire acceptable for use with GTO products is 16 gauge stranded, low voltage, direct burial wire. This particular gauge enables the transformer to provide an adequate charge through the control board to the battery at distances up to 1000'.
- DO NOT use telephone wire or solid wire.
- NEVER SPLICE WIRES. Splicing permits corrosion and seriously degrades the wire's ability to carry an adequate current.

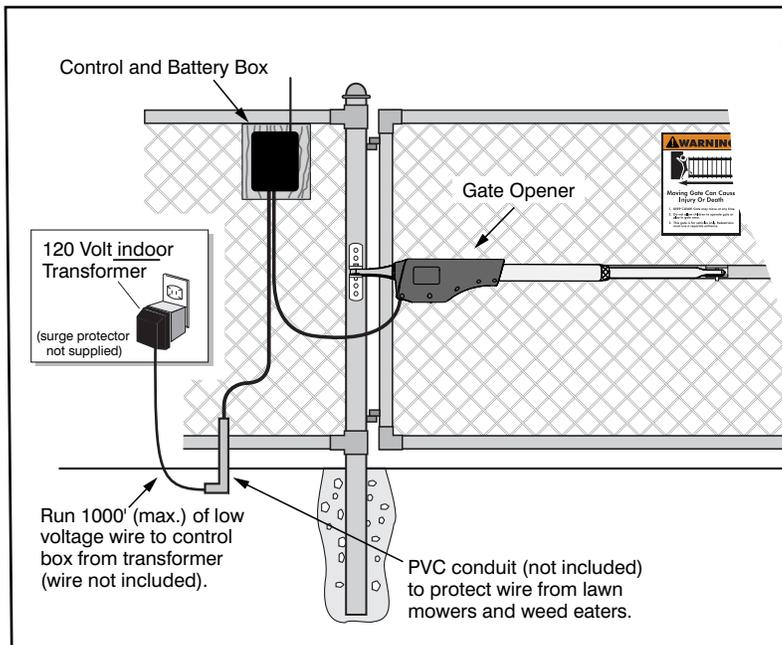
Step 1

Make sure the power switch is OFF.

Step 2

Select the electrical outlet where you will plug the transformer. Measure the distance from this outlet to the control box following the path where the wire will be laid. (Allow for an additional 6" to be pulled into the control box).





Step 3

Lay the low voltage wire in a trench following a path from the selected electrical outlet to the control box. Wires coming up from the ground should be run through PVC conduit to protect them from accidental damage. Be sure to bury the wire laid in the trench.

Step 4

Bring enough wire up through the PVC conduit to reach the control board.

Step 5

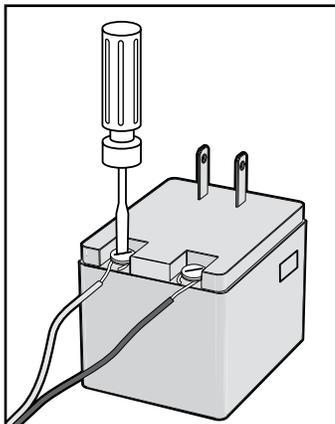
Strip 3/16" off the ends of the low voltage wire and twist tightly. Attach these ends to the 14VAC OR SOLAR terminals located on the terminal block. Be certain not to let the exposed wires touch each other!

Insert one transformer wire into a 14VAC OR SOLAR terminal. Insert the other transformer wire into the remaining 14VAC OR SOLAR terminal. The transformer wires can be connected to the 14VAC OR SOLAR terminals regardless of color/polarity.

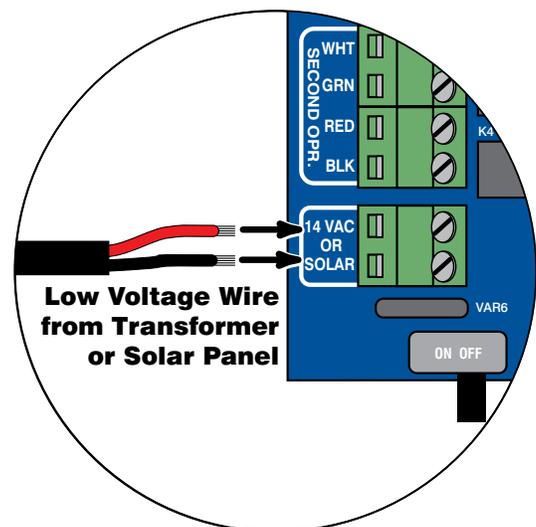
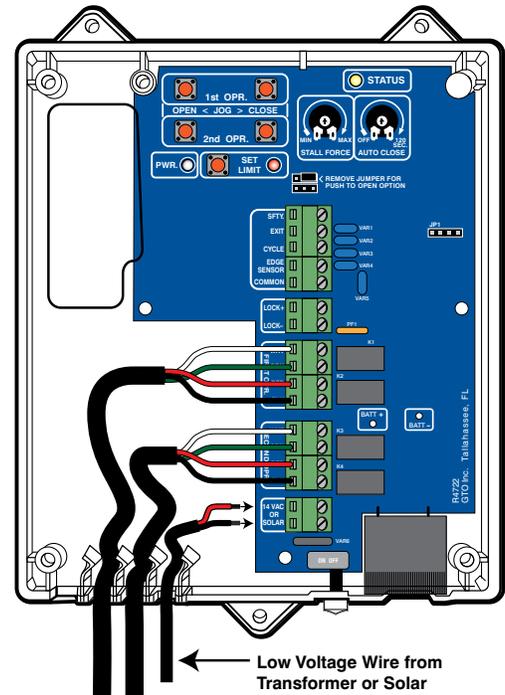
Tighten set screws against exposed end of wires.

Step 6

At the AC outlet, strip 1/2" of insulation from the ends of the low voltage wire. Attach these stripped ends to the transformer terminals.

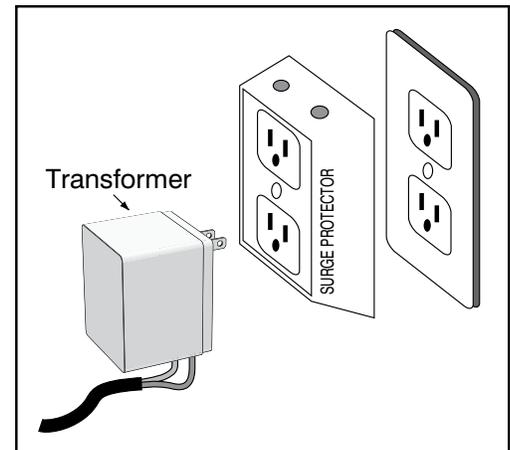


Make sure the exposed wires do not touch each other!



Step 7

Plug the transformer into the electrical outlet. Use of a surge protector with the transformer is **strongly** recommended. If electrical outlet is located outdoors, outlet and transformer should be protected by a weatherproof cover.



Set the CLOSED Position Limit for PULL-TO-OPEN Installation

Your transmitter must be able to operate the gate. If not, see "Personal Transmitter Setting" on page 19.

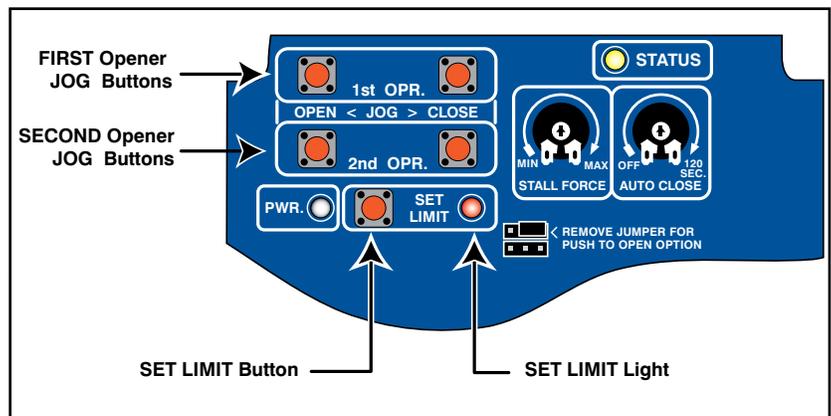
Note: The OPEN limit is when the openers are fully retracted and the gates are in the fully open position. The open limit setting can only be adjusted by moving the gate brackets. To achieve the optimum closed position, you must adjust the CLOSED limit setting:

Step 1

Make sure the Control Box is ON and that the gates are in the OPEN POSITION (arm fully retracted).

Step 2

Press and HOLD the Second Opener CLOSE button on the control board and be prepared to RELEASE the button when the gate reaches the desired closed position/limit. Use the JOG OPEN and CLOSE buttons to "fine tune" the gate position if necessary.



Step 3

Press and HOLD the First Opener CLOSE button on the control board and be prepared to RELEASE the button when the gate reaches the desired closed position/limit. Use the JOG OPEN and CLOSE buttons to "fine tune" the gate position if necessary.

Step 4

With the gates in in the desired closed positions PRESS and HOLD the SET LIMIT button until the alarm and RED Light come on. Then release the button.

NOTE: The opener must be extended more than 7 inches to set limits.

Step 5

NOTE: When the control box cover is removed the receiver range is reduced to less than 5 feet.

Press the transmitter button once (within 5 feet of the control board) and allow the gates to fully open. The alarm will beep once when the gates reach the OPEN LIMIT. This indicates the limits for the arms are programmed in memory.

Step 6

Press the transmitter button and allow the gates to fully close to verify that it stops at the desired positions. Repeat Steps 2-5 if correction is needed.

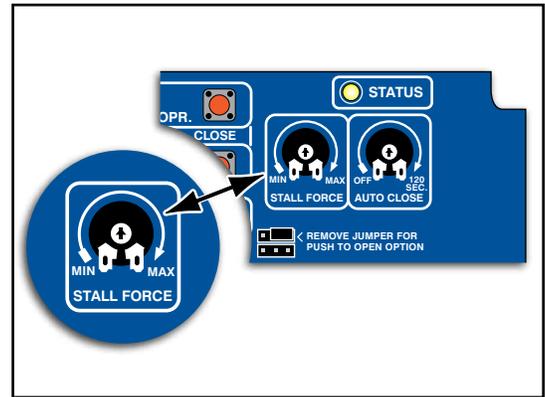
Adjust the Stall Force Setting

The Stall Force potentiometer controls the amount of force the opener will apply against an obstruction before it stops and reverses direction within two seconds.

IMPORTANT: The Stall Force setting **will need to be adjusted** to compensate for the weight and size of your gates. For safety reasons, use the lowest possible setting to operate the gate.

The Stall Force potentiometer on the control board operates like a volume control on a radio. Use a small flat blade screwdriver to turn the arrow in the center of the potentiometer. Adjust the sensitivity from the MINIMUM position just to the point where the gate operates smoothly without obstructing from its own weight or wind conditions.

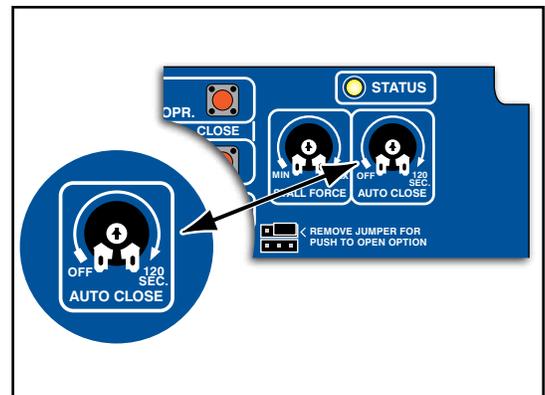
NOTE: You may need to increase the stall force in cold weather due to increased resistance from gate hinges.



Set Auto-Close Time

The Auto-Close determines how long the gate will remain open before it automatically closes. The factory setting is OFF. Use a small flat blade screwdriver, you can adjust the settings to OFF, or from 3 to 120 seconds.

NOTE: The Auto-Close timer will only function if the gates are in the fully open position.



Personal Transmitter Setting

All GTO transmitters have a standard setting and are ready to operate your Mighty Mule Gate Opener. For your safety and security, we strongly recommend that you replace the factory setting with your own personal setting.

NOTE: If you have multiple transmitters, you should adjust all of them at this time.

Step 1

Use a small phillips head screw driver to remove the transmitter cover.

Step 2

Set the transmitter DIP switches using a small screwdriver. There are nine (9) transmitter DIP switches; each can be placed in three different positions (+, 0, -). DO NOT set all the switches in the same position, such as all +, all 0, or all -. Once the DIP switches have been reset, replace and close the access cover.

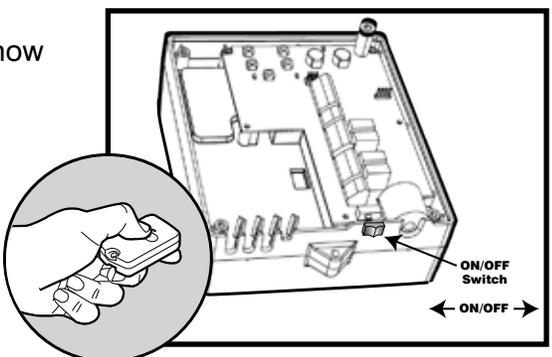
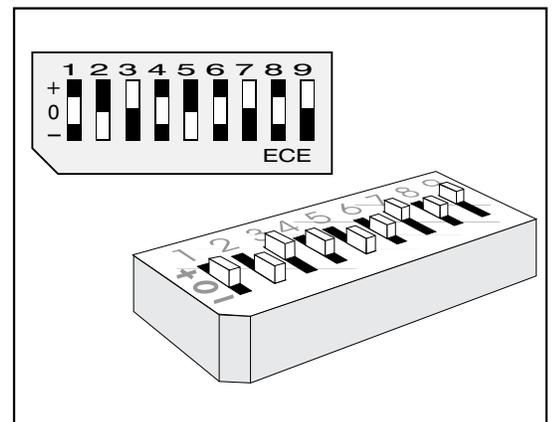
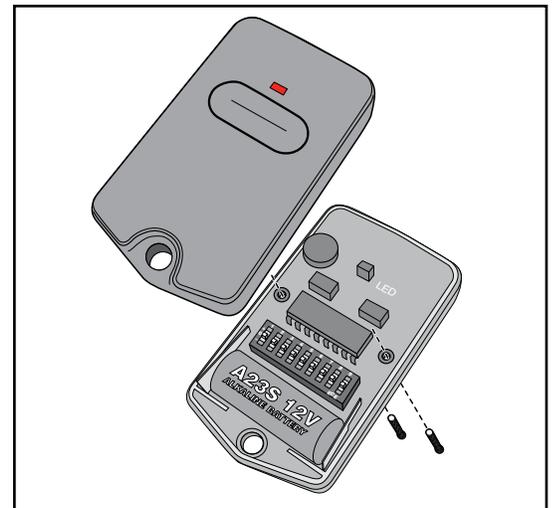
WARNING: No other adjustments should be made inside the transmitter.

Step 3

Program the new setting in the control board memory.

- A. Slide the control box ON/OFF switch to the OFF position.
- B. Press and hold the transmitter button while sliding the ON/OFF switch to the ON position.
- C. Continue to hold the transmitter button until the alarm sounds (3-5 seconds).
- D. Release the transmitter button. The new transmitter setting is now programmed.
- E. Verify that the transmitter operates the gate.

NOTE: It is NOT necessary to remove the cover of the control box to program the new transmitter code, but when the control box cover is removed the receiver range is reduced to less than 5 feet.



FCC WARNING: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. In accordance with FCC Part 15, Section 15.21, the manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could VOID the user authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. The external solid wire antenna was used during FCC testing. Substitutes should not be used.

However, there is no guarantee that interference will not occur in particular installations. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: • Increase the separation between the equipment and the receiver. • Connect the equipment into an outlet on a circuit different from that which the receiver is connected. • Consult the dealer or an experienced radio/TV technician for help.

Push-To-Open Installation Information

Swinging gates shall not open into public access areas!

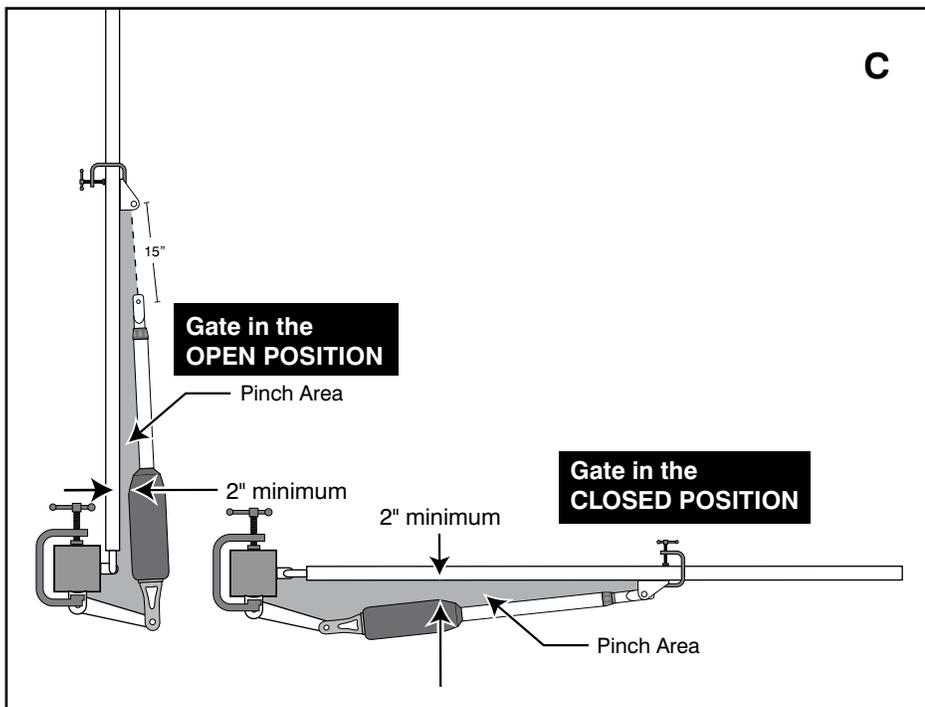
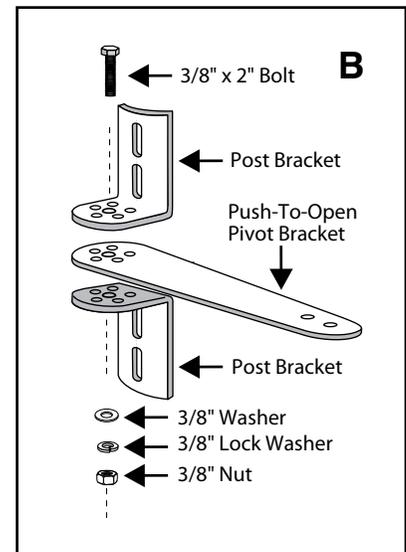
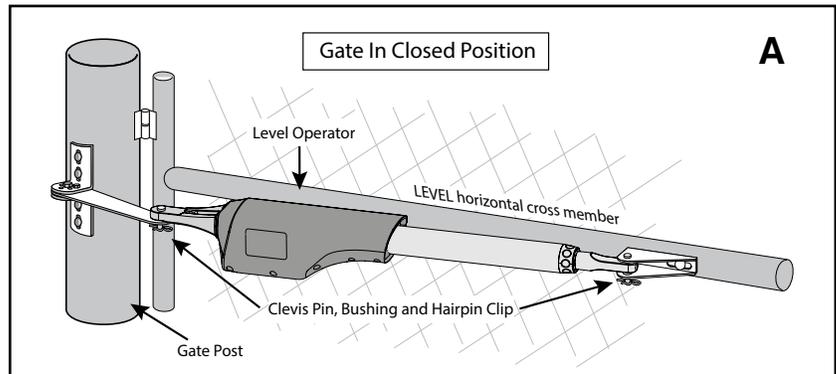
A "Push-to-Open" gate opens out from the property (operator arm extends to open the gate). A Push-To-Open installation requires the purchase of a Push-To-Open Bracket  [FM148].

In a Push-To-Open installation the operator is installed while the gate is in the **CLOSED POSITION**.

Install the Operator

Follow directions for installing the Diamond beginning on page 7. *The Push-To-Open installation differs from the Pull-To-Open installation in the following ways:*

1. In a Push-To-Open installation, the arm fully extends to open the gate, and it fully retracts to close the gate. **(C)**
2. You will install the operator while the gate is in the **CLOSED POSITION** (arm fully retracted). **(A)**
3. You must use the Push-to-Open Post Pivot Bracket  [FM148] in the Post Bracket assembly. **(B)**
4. **IMPORTANT:** While determining the mounting point for the post pivot bracket assembly be sure that the position allows for 2" clearance between the gate and the operator in both the open and closed positions (see diagram below). This clearance will give the operator the most efficient leverage point for opening and closing the gate and more importantly provides the least possible pinch area. **(C)**

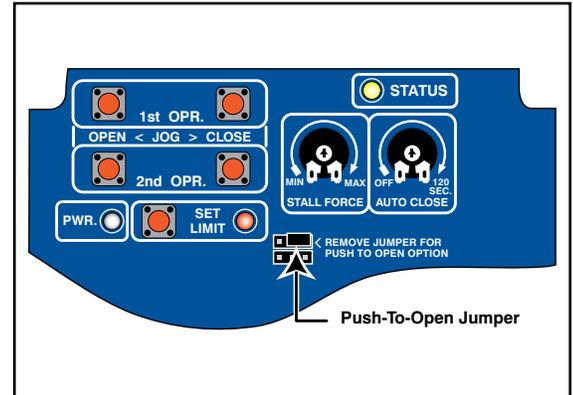


*The Troubleshooting Wizard has detailed information on Push-To-Open installations.

Setting the Open Position Limit

Step 1: Remove Push-To-Open Jumper

- A. Make sure the control box power switch is OFF.
- B. Use small pliers to remove the JUMPER for PUSH-TO-OPEN applications.
- C. Turn power switch ON. The control board is now configured to push the gates open. (Keep the jumper, as it is necessary if there is ever a need to convert the opener for Pull-To-Open.)

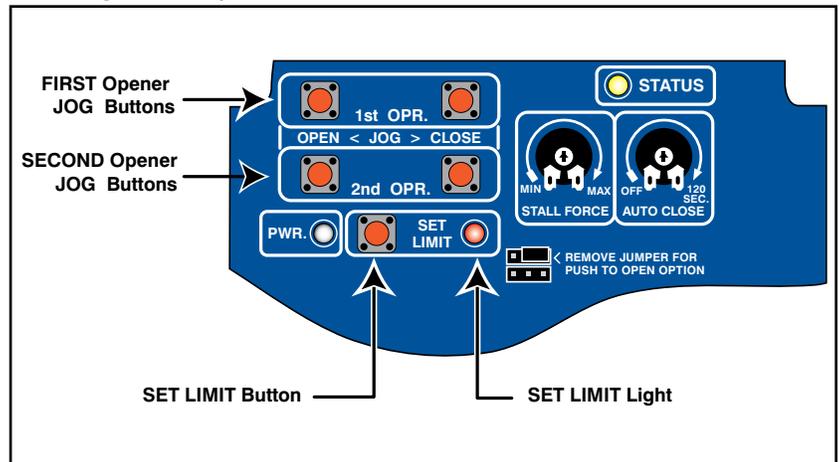


Step 2: Set the Open Position Limit (Push-to-Open)

The CLOSED limit is when the openers are fully retracted and the gates are in the closed position. The closed limit setting can only be adjusted by moving the gate brackets.

To achieve the optimum open position, you must adjust the OPEN Limit setting:

- A. If not already ON slide the ON/OFF switch on the Control Box to the ON position and make sure the arms are in the CLOSED POSITION (fully retracted).
- B. Press and HOLD the FIRST Opener OPEN button on the control board and be prepared to RELEASE the button when the gate reaches the desired open position/limit. Use the JOG OPEN and CLOSE buttons to "fine tune" the gate position if necessary.
- C. Press and HOLD the SECOND Opener OPEN button on the control board and be prepared to RELEASE the button when the gates reached the desired open position/limit. Use the JOG OPEN and CLOSE buttons to "fine tune" the gate position if necessary.
- D. NOTE: The opener arms must be extended more than 7 inches to set limits. With the gates in in the desired open positions PRESS and HOLD the SET LIMIT button until the alarm and RED Light come on. Then release the button.
- E. NOTE: When the control box cover is removed the receiver range is reduced to less than 5 feet. Press the transmitter button once and allow the gate to fully close. The alarm will beep once when the gates reach the CLOSED LIMIT. This indicates the LIMITS for both arms are learned and stored in memory.
- F. Press the transmitter button and allow the gates to fully open to verify that it stops at the desired positions. Repeat Steps B – E if correction is needed.



Note: Must have a transmitter that operates the gate. If not, see Personal Transmitter Setting on page 19.

Solar Panel Instructions

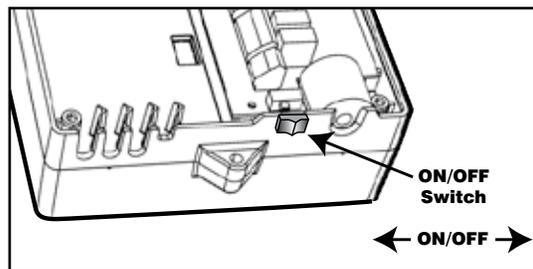
NEVER USE TRANSFORMER AND SOLAR PANEL(S) AT THE SAME TIME!
It will damage the control board!

IMPORTANT INFORMATION ABOUT LOW VOLTAGE WIRE:

- The only wire acceptable for use with GTO products is 16 gauge stranded, low voltage, PVC sheathed wire. This gauge enables the solar panel to provide an adequate charge through the control board to the battery at distances up to 250'.
- **DO NOT** use telephone wire or solid wire.

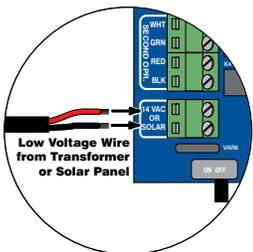
Step 1

Make sure the power switch is OFF.



Step 2

Strip 3/16" off the ends of the low voltage wire and twist tightly. Attach these ends to the 14VAC OR SOLAR terminals located on the terminal block. Be certain not to let the exposed wires touch each other!



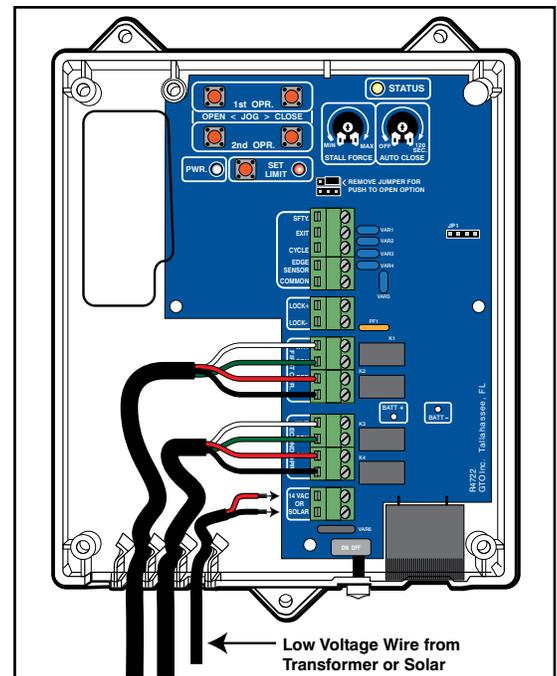
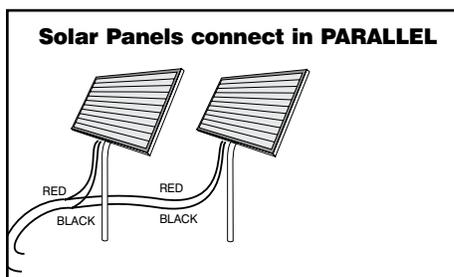
Step 3

Insert one solar panel wire into a 14VAC OR SOLAR terminal. Insert the other solar panel wire into the remaining 14VAC OR SOLAR terminal. The wires can be connected to the 14VAC OR SOLAR terminals regardless of color/polarity.

Step 4

Tighten set screws against exposed end of wires.

NOTE: For multiple panels, wire the panels in parallel as shown in this diagram.



24/7 Troubleshooting Wizard:
<http://support.gtoinc.com>

Connecting Accessories

Although GTO strongly recommends the use of additional safety devices, we do not endorse any specific brands. Only use products that are certified and listed to be in compliance with any applicable UL standards (Underwriters Laboratories) and national and regional safety codes.

Call GTO Sales at 1-850-575-0176 for information on compatible products for your specific application.

Step 1

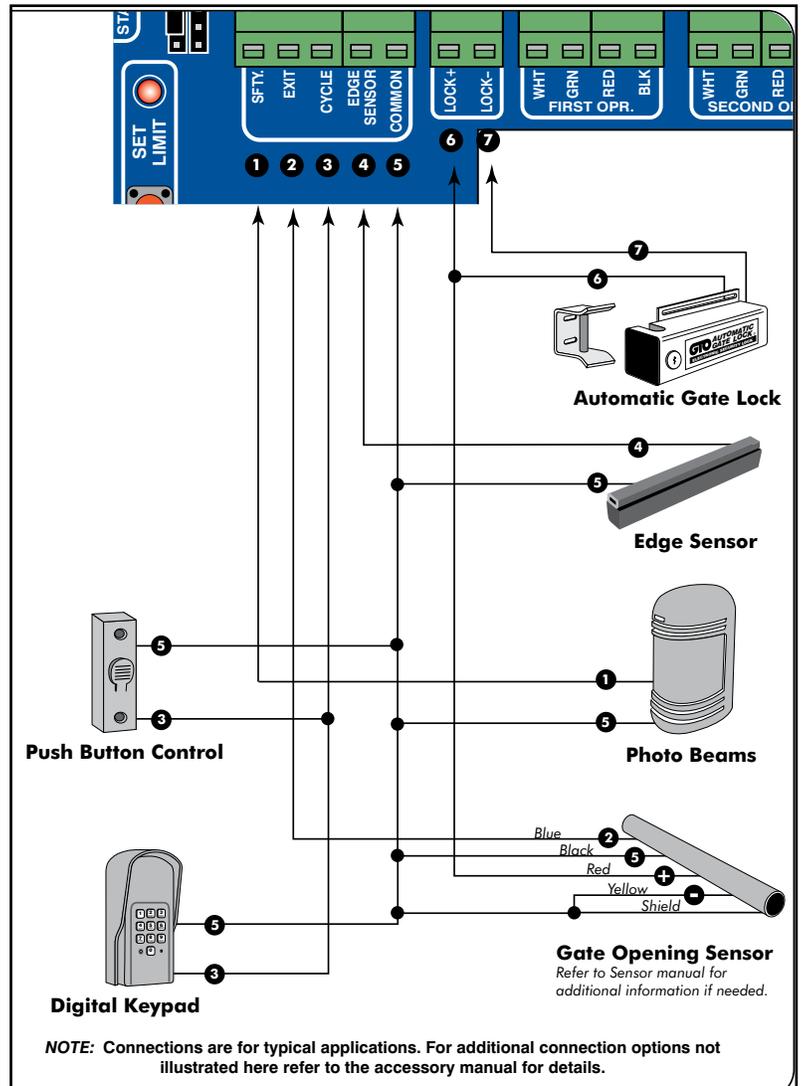
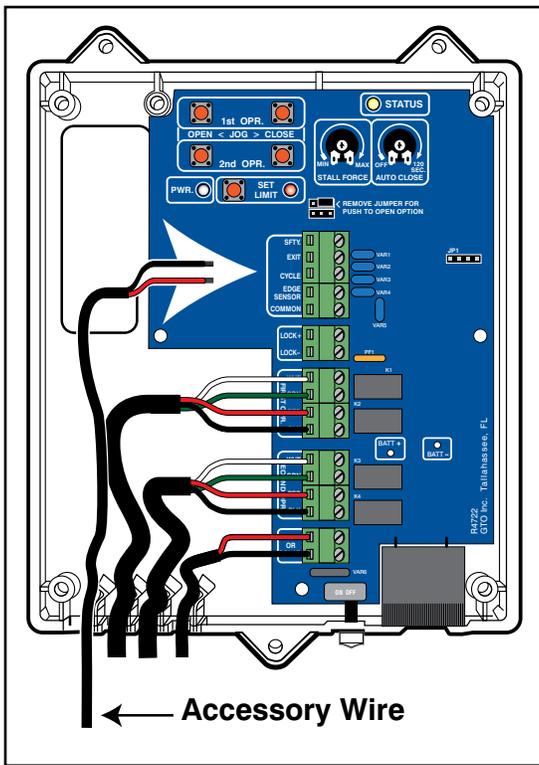
Turn control box OFF before connecting safety device wires to the control board. (Unplugging the transformer does not turn power to the opener OFF.)

Step 2

Run wires from safety devices and other accessories through the strain relief openings in the bottom of the control box.

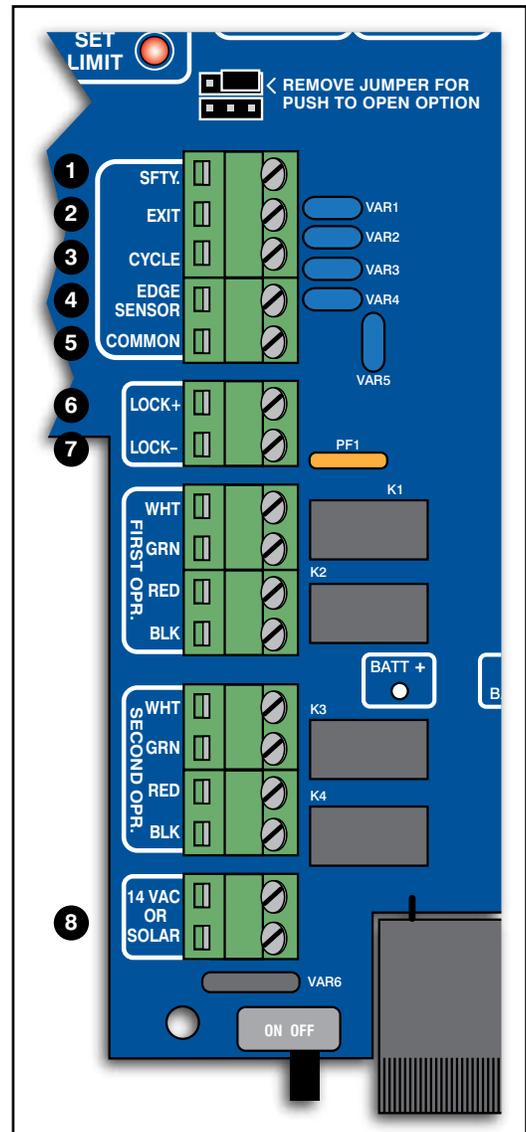
Step 3:

Follow directions in Accessory Installation Manuals.



Accessory Inputs

- 1 **SAFETY:** Typically for use with photo beam device, loop detector or other non-contact sensors
 - Activation of this input while the gate is closing will cause the gate to stop and return to the opened position.
 - Activation of this input while the gate is opening has no effect. (gate will continue to open)
 - Activation of this input while gate is idle will prevent gate from closing.
 - Activation of this input while at open limit will restart the auto close time (if enabled).
- 2 **EXIT:** Typically for use with exit loop or wand
 - Activation of this input will open the gate if it's not already at the open position.
 - Activation of this input while at open limit will restart the auto close time (if enabled).
 - Activation of this input while gate is open will prevent gate from closing.
- 3 **CYCLE:** Typically for use with doorbell button or hardwired keypad
 - Each activation at this input will cycle the operation as follows:
... OPEN STOP CLOSE STOP OPEN ...
- 4 **EDGE SENSOR:** Typically for use with contact edge sensor
 - Activation of this input while gate is moving will cause it to reverse direction for 2 seconds.
 - Activation of this input while idle will prevent gate from running.
- 5 **COMMON:** Common/Negative terminal for accessory devices.



12 Volt Power (Maximum Current: 100 mA)

- 5 **COM:** Common/Negative terminal for accessory power source.
- 6 **LOCK +:** Power source for GTO/Mighty Mule accessories, i.e. Gate Opening Sensor [FM139].

Lock Outputs

- 6 **LOCK +:** Positive terminal to connect Automatic Gate Lock [FM144].
- 7 **LOCK -:** Negative terminal to connect Automatic Gate Lock.

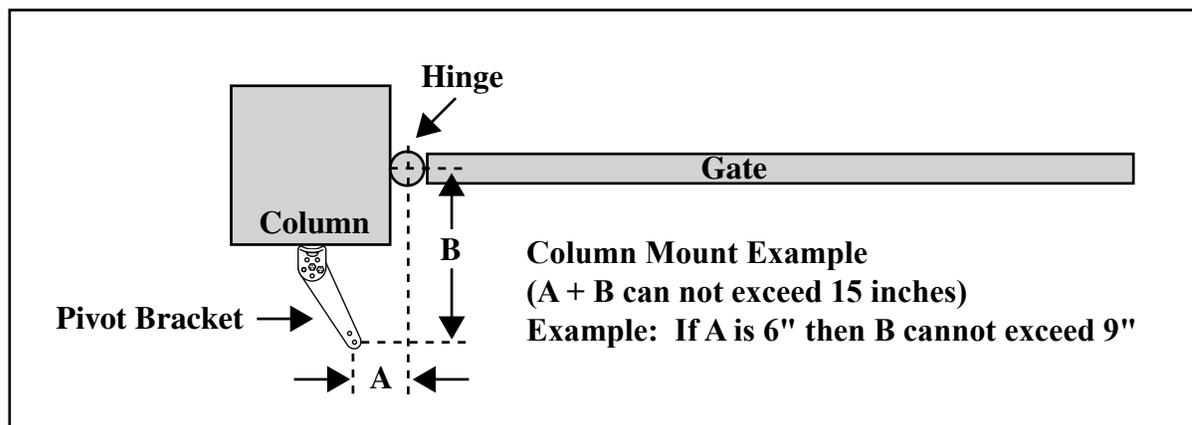
Charge Power Inputs

- 8 **14VAC or SOLAR:** Power Input Terminals:
 - Input terminals for transformer or solar panel.
 - Non-polarity sensitive.

Column Installation

If this operator will be used with gates that are mounted on masonry, brick, or rock (etc.) columns, read the following carefully before proceeding

- A. The simplest solution is to install the operator in a push-to-open configuration. The minimum clearance is easier to achieve and clearance is no longer a problem, since the operator will be pushing the gate away from the column instead of pulling it toward the column. It is recommended that you place a steel plate between the operator mounting brackets and masonry surface for additional strength.
- B. If a push-to-open installation is impossible due to traffic hazards, terrain, etc., another option is to re-hang the gate. You may hang it on a post, either in the center of the column or at the back corner, or move the gate to the back corner of the column.
- C. The most difficult solution is to cut a notch in the column to accommodate the operator and power cable. This job is NOT for the inexperienced!*



*The Troubleshooting Wizard has detailed information on column mounting.

Troubleshooting Guide



If your gate opener does not function properly, use this guide or use the online troubleshooter at <http://support.gtoinc.com> before calling the GTO Service Department.

VISUAL AND AUDIBLE DIAGNOSTIC INDICATORS

1. VISUAL INDICATORS:

a. Power LED (Green):

- ON: AC power or Solar power is present.
- OFF: There is no input power.

b. Status LED (Yellow): (while unit is running this LED will be OFF)

- Rapid blinking in random pattern: GTO's transmitter 318 MHz signal is detected.
- Continuously ON: Battery is in fast charge mode.
- 1 Blink every 2 seconds: Battery is in float charge mode (battery is fully charged)
- OFF: Switch is in the OFF position or there is no input power for at least 60 seconds.

2. AUDIBLE INDICATORS (ALARM/BUZZER):

a. Beeps upon power up:

- This is normal self test when the unit is turned on.

b. Continuous beep after power up:

- Unit has learned new transmitter code, releasing the transmitter button will shut off the alarm.

c. Rapid beeping:

- Unit has encountered two (2) obstructions without reaching either limit. (Power cycle to reset the alarm)
- Transmitter will not operate the gate.
- Alarm will automatically shut off after 5 minutes; gate will remain disabled until control box is restarted.

d. 1 beep every 20 seconds:

- Low battery is detected.

e. 1 beep every 2 second (first operator):

- Position sensor is open circuit. Call GTO Service department.

f. 3 beeps every 2 second (first operator):

- Position sensor is short circuit. Call GTO Service department.

g. 2 beeps every 2 second (second operator):

- Position sensor is open circuit. Call GTO Service department.

h. 4 beeps every 2 second (second operator):

- Position sensor is short circuit. Call GTO Service department.

i. 1 or more beeps when attempting to activate the opener:

- Blown fuse.
- Battery is extremely low or damaged.
- Loose connection from battery to circuit board.

3. IF THE GATE STOPS AND REVERSES DIRECTION

a. Check the gate for binding or hinge damage.

b. Adjust stall force if necessary.

c. Check the position of the mounting brackets and readjust or tighten if necessary.

VOLTAGE READINGS

14 Vac Transformer _____ 13.0 to 16.0 Vac

10 W Solar panel _____ 18.0 to 22.0 Vdc

Measure voltage at panel and control box w/ panel disconnected.

12 V Battery _____ 12.5 to 13.5 Vdc

Charging circuit _____ 13.8 to 14.8 Vdc

Measure voltage at battery terminals with battery disconnected.

Gate and Opener Maintenance:

1. Keep gates properly maintained. Grease hinges. Make sure gates remain level. Replace worn or damaged hardware. On gates over 250 lbs, grease ball bearing hinges at least 4 times annually (more if in a coastal area).
2. Service the gate opener regularly (make sure control box is OFF). Apply silicone spray to a soft, dry cloth and clean the push-pull tube at least once a month.

Repair Service

If your GTO Diamond Gate Operator is not operating properly, please follow the steps below:

1. First use the procedures found in the Troubleshooting Guide (see page 24).
2. Use the 24/7 Troubleshooting Wizard at <http://support.gtoinc.com>.
3. If you are unable to solve the problem, call the GTO Service Department at (800) 543-1236, or (850) 575-4144. Refer to the serial number (located on the right side of the battery box) and date of purchase when calling for assistance.
4. If repair or replacement of your gate operator is necessary, the Service Department will assign a Return Goods Authorization (RGA) number to you.
5. Once you have received your RGA# you are required to send in your original equipment for repair. Please refer to Manufactures' Limited Warranty for complete details. Securely pack the component(s) authorized for return to the factory. Include a copy of your sales receipt for the purchase of the product(s). Write the RGA number issued to you on the outside of the package in **LARGE BOLD PRINT**.

Ship the package(s) freight prepaid to: GTO, 3121 Hartsfield Road, Tallahassee, Florida, USA 32303.

NOTE: Products returned to GTO without a Return Goods Authorization (RGA) number in LARGE BOLD PRINT on the outside of the package WILL NOT be accepted. Also, items returned to GTO freight collect WILL NOT be accepted.

GTO Technical Service

8:00am–7:00pm • Monday–Friday (EST)



3121 Hartsfield Road • Tallahassee, Florida, USA 32303

800-543-4283 • Fax (850) 575-8912

Web site www.mightymule.com

24/7 Troubleshooting Wizard: <http://support.gtoinc.com>



Accessories for Diamond

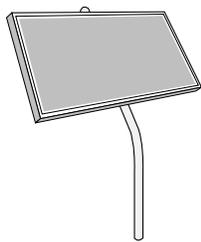
Please visit www.gtoaccess.com for photos and detailed descriptions of Mighty Mule Accessories. Or call 1-800-543-4283.

POWERING ACCESSORIES



Low Voltage Wire [RB509]

The 16 gauge, stranded, dual conductor low voltage Wire is for connecting the AC powered transformer, solar panel or wired accessories to the system's control board. This specially designed wire is UV treated, PVC coated, and ready for direct burial.



Solar Panel Kits [FM123]

If your gate operator is more than 1000 ft. away from an AC power outlet, you can choose to maintain the battery charge with the GTO Solar Panel Kit.

- 10 Watt Solar Panel Charging Kit [FM123]



Additional/Replacement Battery [FM150]

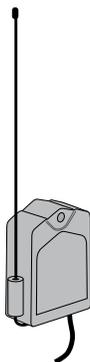
For additional battery power or replacement.

“FROM VEHICLE” ENTRY AND EXIT ACCESSORIES

Transmitters [FM135/FM134]

Purchase an additional transmitter for each vehicle in your family. The Two-Button Transmitter can be programmed to operate both your gate operator and a garage door opener using the Universal Receiver. Or it can be programmed to open two gate operator systems.

- Single Button Transmitter [FM135]
- Dual Button Transmitter [FM134]



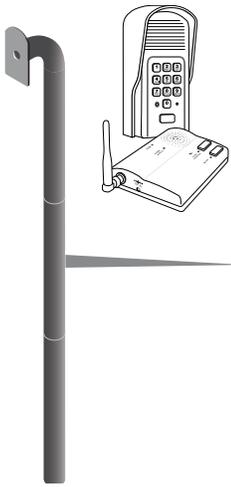
Universal Receiver [RB709U-NB]

The Universal Antenna Receiver gives you the ability to use one remote to activate your gate operator and your garage door opener. Connects to any brand garage door opener. Up to 100 ft. range.



Digital Keypad [FM137]

Allow friends access to your property using an entry code that you provide. Program up to 25 entry codes for added security. Powered by three “AA” batteries (not included).

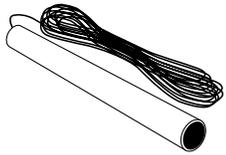


Residential Wireless Entry Intercom [FM136]

Designed for added security to your automated gate with the ability to “speak to” and “screen” visitors safely from inside your home. Ideal for securing gate entrances while providing controlled access.

Gooseneck Pedestal [FM100]

Designed to mount digital keypads, wireless intercom systems, and other access control devices for your gate automation system. Available for in-ground or surface installations.

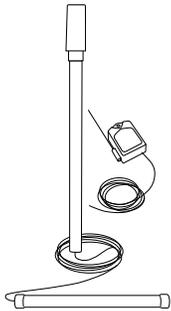


“HANDS FREE” ENTRY & EXIT ACCESSORIES

Driveway Vehicle Sensor [FM138]

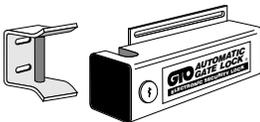
Automatically activates gate operator “Hands-Free” when a vehicle exits the property. Electromagnetic sensor detects vehicles in motion.

- 50 ft. [FM138]
- 100 ft. [FM140]
- 150 ft. [FM141]



Wireless Vehicle Sensor [FM130]

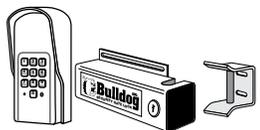
Automatically activates gate operator “Hands-Free” when a vehicle exits the property. 100 ft. range between transmitter and receiver. Easy installation.



LOCKING & SECURITY ACCESSORIES

Automatic Gate Lock [FM143]

The #1 Accessory For Swing Gate Operators! Designed for added security in conjunction with GTO Automatic Gate Operators. The gate lock unlocks and locks automatically when the gate opens and closes. The perfect solution for high wind conditions.



Bulldog Pedestrian Gate Lock [FM145]

Designed to mount on horizontal swing “walk through” wood, chain link, and metal pedestrian gates opening in or out. Ideal for securing pools, condominiums, schools and any pedestrian gate.

Wireless Driveway Alarm [FM231].

This device alerts you of vehicles entering your driveway (with or without an automated gate). The indoor base station signals you with a door chime when a vehicle passes the driveway sensor.



ADDITIONAL ACCESSORIES

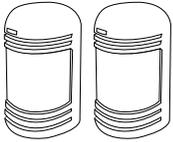
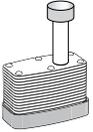


Photo Beams [R4222]

Primary “through beam” photo beam device. Provides “non-contact” entrapment protection.

Pin Lock [FM133]

Use as a substitute for the clevis pin at the front mount of the Diamond to prevent theft of the operator.



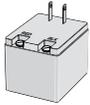
Push Button Control [FM132]

Wire this unlit push button directly to your gate operator for simple open/close/stop operation from up to 1000 ft. away. Use 16 gauge low-voltage wire.



Replacement Transformer [RB502]

Standard 14 volt, 1430 mA AC transformer included with the Diamond to maintain battery charge.



HARDWARE ACCESSORIES



Push To Open Brackets [FM148]

Required when the Diamond must push a gate open (arm extends to open), such as away from a sloping driveway or where space prevents gate from opening into the property (pull to open). Order two brackets for a dual swing gate installation.



ACCESS SYSTEMS, LLC

3121 Hartsfield Road • Tallahassee, Florida, USA 32303

800-543-4283 • Fax (850) 575-8912

Web site www.mightymule.com

24/7 Troubleshooting Wizard: <http://support.gtoinc.com>

