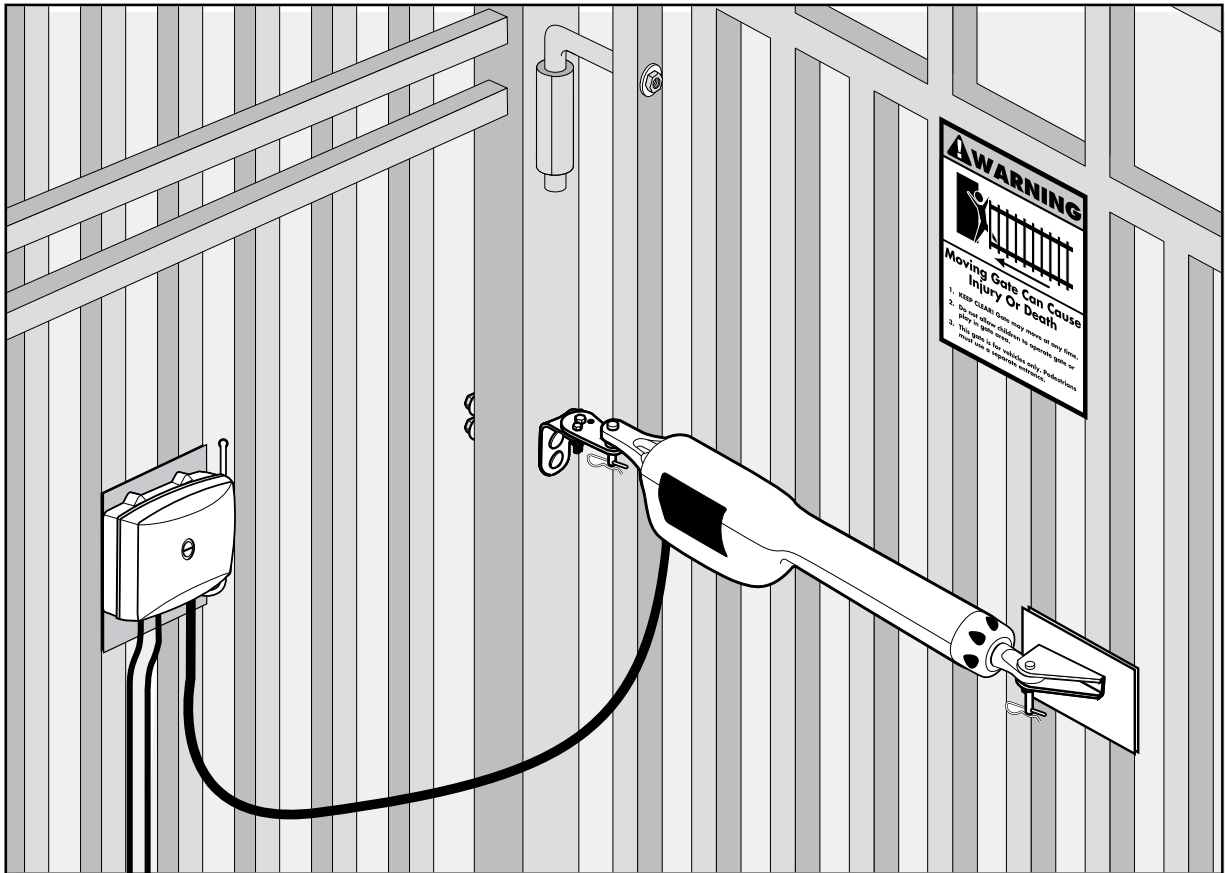


Installation Manual



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 Mighty Mule's full line of Automatic Gate Openers and Access Controls visit our website at www.mightymule.com

GTO Sales: 800-543-4283 • Fax 850-575-8912

GTO Technical Service 800-453-1236

For 24 hour/day, 7 day/week Technical Service visit <http://support.gtoinc.com>

For more information on Mighty Mule's full line of Automatic Gate Openers and Access Controls visit www.mightymule.com

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 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 opener. This gate opener produces a high level of force. Stay clear of the unit while it is operating and exercise caution at all times.

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

Mighty Mule Gate Operators are 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 Opener Class Categories

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

Commercial/General Access Vehicular Gate Opener-Class II: A vehicular gate opener (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 Opener-Class III: A vehicular gate opener (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 Opener-Class IV: A vehicular gate opener (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.

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PLEASE READ THIS FIRST

Thank you for purchasing a Mighty Mule Gate Opener—GTO's "do-it-yourself" automatic gate opener! When correctly installed and properly used, your Mighty Mule Gate Opener will give you many years of reliable service. Please read the following information and watch the enclosed DVD video to ensure you have the correct system for your particular needs. Furthermore, this manual and the DVD video will enable you to properly install your Mighty Mule Gate Opener.

The Mighty Mule Gate Opener is designed for installation on a pull-to-open single leaf gate (gates that open into the property). The gate must not exceed 12 feet in length and weigh more than 300 pounds (please see Technical Specifications on page x). The Mighty Mule Gate Opener 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 opener will obstruct and stop.

The Mighty Mule Gate Opener accommodates extra transmitters, digital keypads, solar panels, push buttons, automatic gate locks, and other access control products. These optional accessories (see the enclosed Mighty Mule Accessory Catalog) are available at most stores. Your store should be able to special order any accessory not in stock. If your store cannot special order accessories, please call the GTO Sales Department (800-543-GATE).

The Mighty Mule Gate Opener features adjustable obstruction sensing. This safety feature makes the gate

stop and reverse direction within 2 seconds when it comes in contact with an obstruction. MIN is the factory setting; meaning the gate will exert the minimum force on an obstruction before it stops and reverses direction.

The Mighty Mule Gate Opener also has an adjustable auto-close feature. After the gate reaches the fully open position, it can be set to remain open up to 120 seconds before automatically closing. Pressing the transmitter button at any time after the gate opens fully will cause it to close immediately. OFF is the factory setting; meaning the gate will stay open until you press the transmitter (or keypad, etc.) again.

PLEASE NOTE—This operator is not for the following:

- Push to Open
- Column Mounting
- Swing gates longer than 12 feet or weighing more than 300 lbs.
- Slide gates

Go to www.gtoinc.com for a dealer or retailer near you or call GTO at (800) 543-GATE [4283] or (850) 575-0176 for information about our GTO Access Systems line of gate openers and accessories. Our Sales Department will be glad to give you the name and phone number of a GTO Access Systems dealer near you.

BEFORE YOU BEGIN TO INSTALL YOUR AUTOMATIC GATE OPENER:
watch the enclosed DVD video and read these instructions carefully and completely to become familiar with all parts and installation steps. The DVD video is only designed as an overview of the installation procedure. You must read the installation manual for detailed instructions on gate opener safety and proper use of the gate opener.




IMPORTANT SAFETY INSTRUCTIONS

Because automatic gate openers produce high levels of force, consumers need to know the potential hazards associated with improperly designed, installed, and maintained automated gate opener systems. ***Keep in mind that the gate opener 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 opener, 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 opener or its components, serious injury, or death.

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

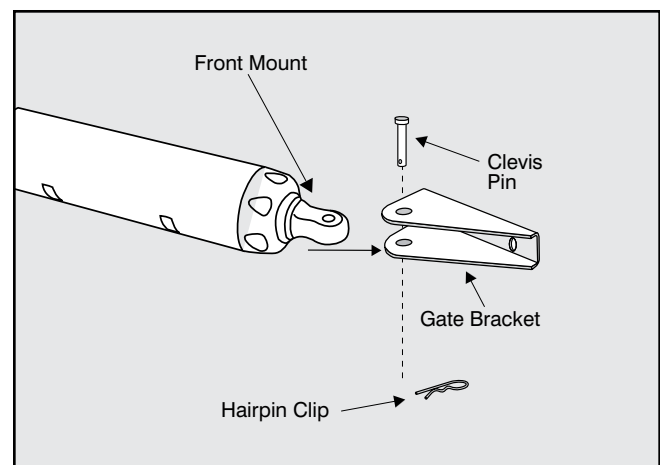
Manually Opening and Closing Gate

 **CAUTION:** The gate will move freely and uncontrolled when the gate opener is removed from the gate. **ONLY** disconnect the opener when the control box power switch is OFF and the gate is **NOT** moving.

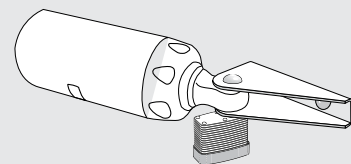
Disconnecting the Opener

1. Turn control box power switch OFF.
2. Remove hairpin clip, clevis pin, and bushing from both the front or rear mounting points.
3. Remove the opener from the mounts.

The gate can be opened and closed manually when the opener is disconnected.



NOTE: Substitute a **Pin Lock (FM133)** for the clevis pin on the front mount of the gate opener to prevent unauthorized removal of the opener from the gate (see *accessory catalog*).





IMPORTANT SAFETY INSTRUCTIONS



For the Consumer

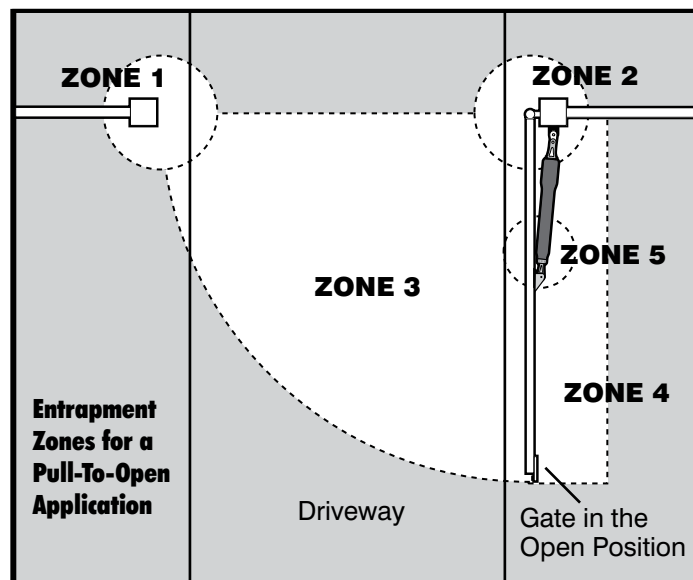
WARNING: To reduce the risk of injury or death:

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.**
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 operations (*see page iii*).
4. This gate opener is intended for **vehicular gates ONLY**. A separate entrance or gate must be installed for pedestrian use (*see page viii*).
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.**

I. Before Installation

1. Verify this opener is proper for the type and size of gate, its frequency of use and proper class rating.

6. Pay close attention to the diagram below and be aware of these areas at all times.





IMPORTANT SAFETY INSTRUCTIONS



For the Consumer

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

Zone 1 – leading edge of the gate and the fence post.

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, tree, etc.

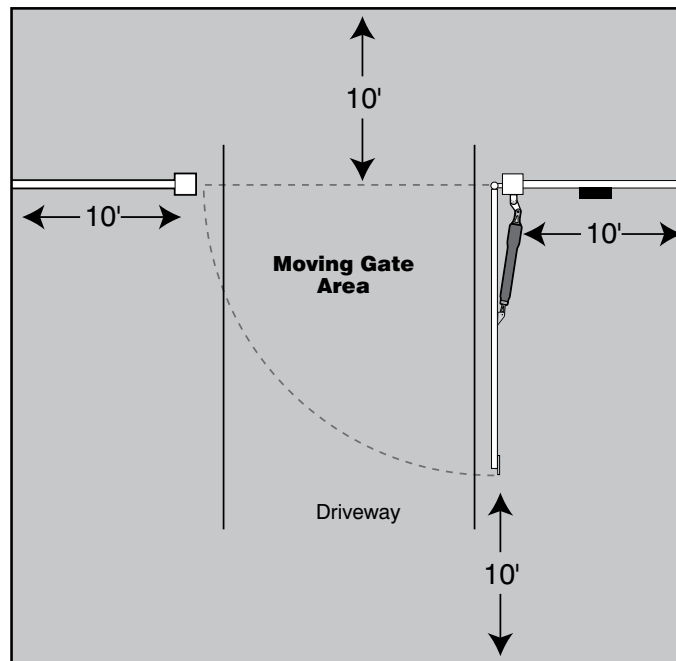
Zone 5 – pinch points between the opener and gate.

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 key switches 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).
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.

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

**NEVER install
any control device
within gray area**





IMPORTANT SAFETY INSTRUCTIONS



For the Consumer

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 becomes damaged, illegible, or missing, replace them immediately. Contact GTO for free replacements.
2. The gate is automatic and could move at any time, posing serious risk of entrapment. No one should be in contact with the 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 the remote control 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.
7. To operate this equipment safely, YOU must know how to disconnect the operator for manual gate operation (see page iii). If you have read the instructions and still do not understand how to disconnect the operator, contact the GTO 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 INFORMATION 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 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.



IMPORTANT SAFETY INSTRUCTIONS

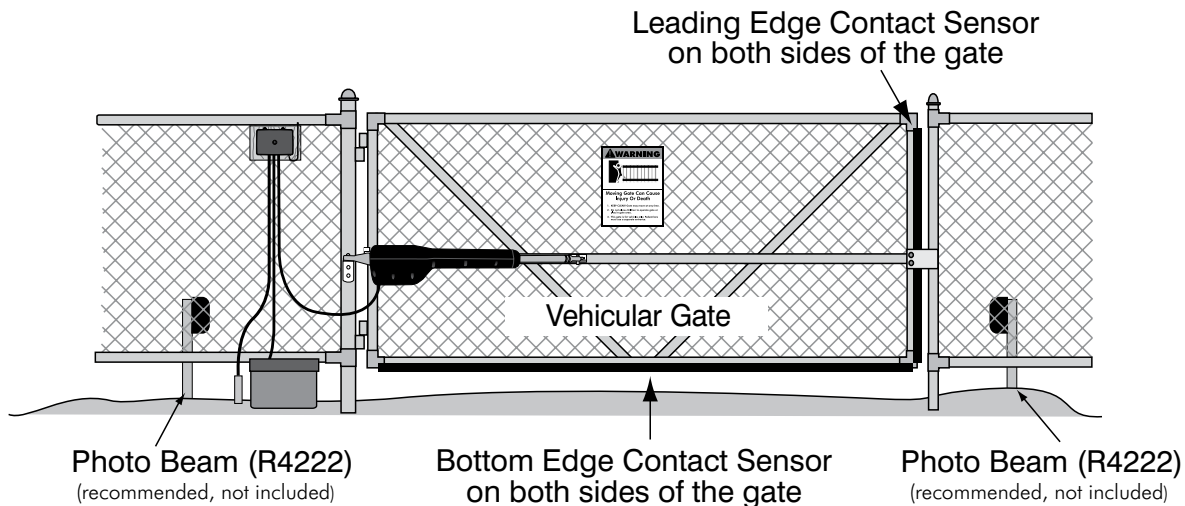


Secondary Means of Protection Against Entrapment

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 Mighty Mule 200 utilizes **Type A**, an inherent (i.e., built-in) entrapment sensing system as the **primary** type of entrapment protection. Also, the Mighty Mule 200 has **provisions for** the connection of **Type B2** protection to be used as the **secondary** type of entrapment protection, and is recommended.

1. 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 is not obstructed or impeded by building structures, natural landscaping or similar obstruction. A wireless contact sensor shall function under the intended end-use conditions.



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

The Mighty Mule 200 Automatic 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 hardwired 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.



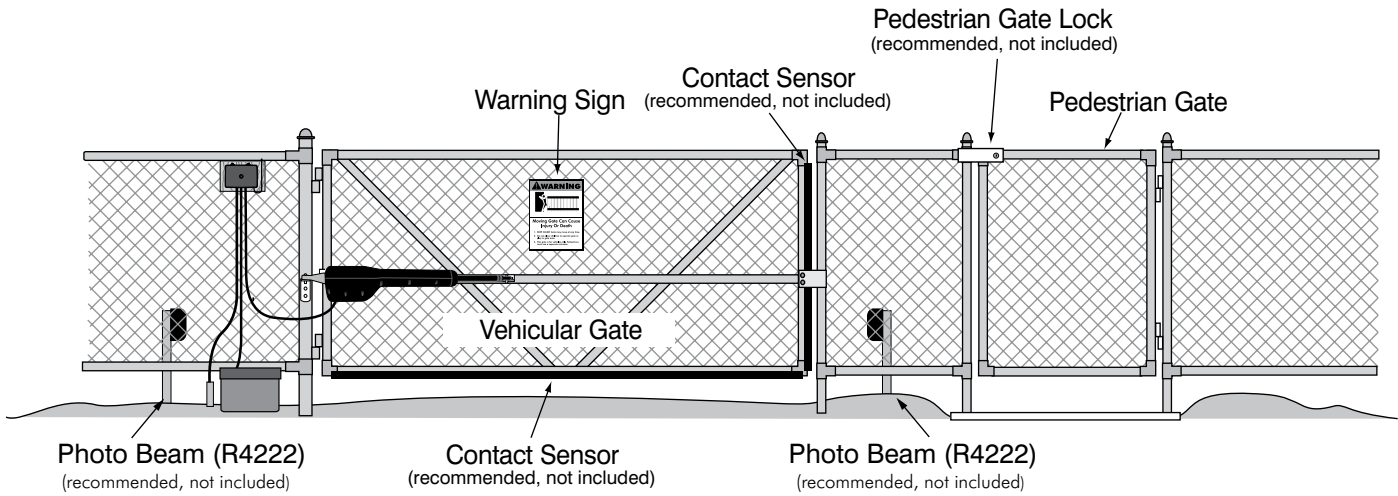
IMPORTANT SAFETY INFORMATION



Required Safety Precautions for Gates

Install Warning Signs

Warning signs alert people of automatic gate operation and are **required** when installing the Mighty Mule 200 Automatic Gate Operator. Furthermore, a walk-through gate must be installed if pedestrian traffic is expected near the vehicular gate. We recommend using a **Pedestrian Gate Lock**. *Call the GTO Sales Department at 800-543-4283* for controlled access.





IMPORTANT SAFETY INFORMATION



Required Safety Precautions for Gates

! 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.**



GTO DC SWING SERIES
Conforms to UL325
5th Edition Standards

Serial No.
MM200-000000

9901178
XXXXXX

GTO Access Systems, LLC - Tallahassee, Florida USA

Product identification label (1)
installed under rear mount on arm.

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



TO MANUALLY OPEN AND CLOSE THE GATE

1. Turn opener power switch OFF.
2. Disconnect front or rear mount from mounting bracket.
3. Pull opener away from mounting bracket and move gate. Disconnect opener ONLY when the power switch is OFF and the gate is not moving.

Control box label (1) installed on front of control box



1-800-543-GATE (4283) • www.mightymule.com

! 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.**

Maximum Gate: 300 lbs. (249.4 kg); 12 ft. (4.9 m) • Voltage: 12 Vdc;
Frequency: 0Hz; Power: 25W • Class I Vehicular Swing Gate Operator

Logo and warning labels (2) installed on each side of
opener housing

Technical Specifications

Mighty Mule 200 Gate Opener

DRIVE

- Low friction screw drive (linear actuator) rated for -5 °F to +160 °F (-20 °C to +71 °C).
- Powered by a 12 V motor with integral gear reducer. Motor speed reduced to 260 rpm.
- Maximum opening arc of 110°. Approximate opening time (90°): 18 seconds, depending on weight of gate.

POWER

- The system is powered by a 12 Vdc automotive or marine battery.
- Battery charge is maintained by GTO transformer or optional GTO Solar Panels.
IMPORTANT: Never use both transformer and solar panel - this will damage the battery and control board.
- One (1) blade-style fuse is rated for 15 A.

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.

CONTROL

- GTO microprocessor-based control board for single leaf, pull-to-open gate installations.
- 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 RF receiver tuned to 318 MHz.
- Opener length with push-pull tube fully retracted is 26³/₈", mounting point to mounting point. Maximum stroke is 13".
- Adjustable auto-close timer (OFF, 3 to 120 seconds), and obstruction sensitivity.
- Power terminal block accommodates a transformer or solar panels.
- Accessory terminal block fully compatible with all Mighty Mule access controls.
- 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.

OPERATIONAL CAPACITY

- The Gate Capacity Chart shows approximate cycles, per day, you can expect from the Mighty Mule 200 Automatic Gate Opener when powered with a transformer. Actual cycles may vary slightly depending upon the type and condition of gate and installation.

Mighty Mule 200 Gate Capacity /Cycle Chart					
<i>Estimated number of daily cycles, based on use with a transformer.</i>					
Number of Cycles Per Day					
Gate Weight	300 lbs.	77	72	67	62
	150 lbs.	82	77	72	67
	100 lbs.	87	82	77	72
	50 lbs.	92	87	82	77
		5' - 6'	8'	10'	12'
Gate Length					

* These specifications are subject to change without notice.

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

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

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

Before You Begin

POWERING OPTIONS

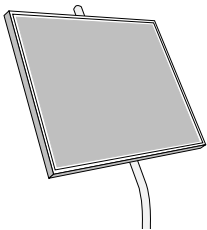
1. Determine Charging Option for Battery: Transformer OR Solar

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

IMPORTANT:

- The Mighty Mule 200 is designed and intended for use with a 12 Volt automotive or marine type battery. The battery must be placed inside a weatherproof case and located within 6 feet of the opener arm. The 8 foot harness supplied connects the battery to the opener arm.
- 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 5 watts solar charging power to charge the battery [FM121]. 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.

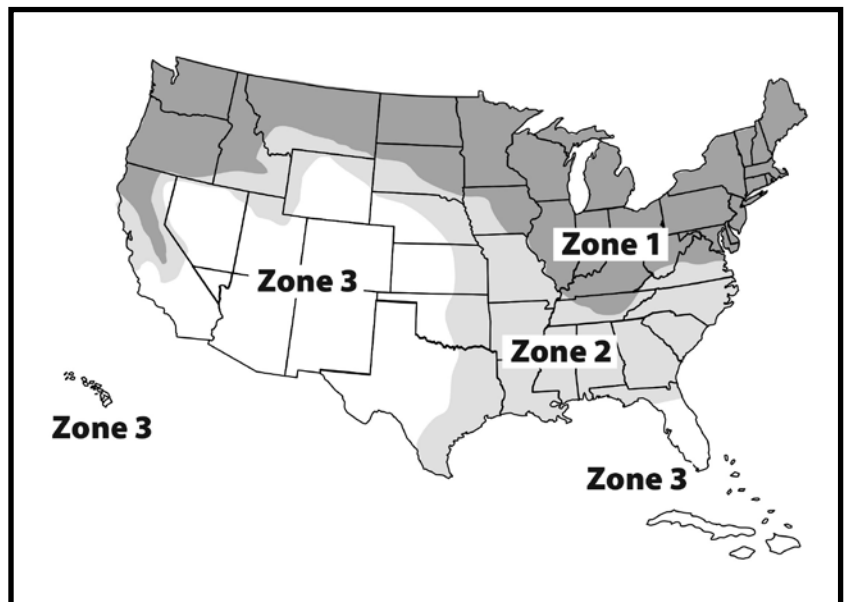
SOLAR PANEL AND GATE ACTIVITY CHART



(minimum sunlight). Accessories connected to your system will draw additional power from the battery.

The table and map illustrate the maximum number of gate cycles to expect per day in a particular area when using from 5 to 30 watts of solar charging power. The figures shown are for winter

Single Gate Winter Ratings	Zone 1	Zone 2	Zone 3
12 v single gate (5 watts) solar charger	4	8	13
12 v single gate (10 watts) solar charger	8	16	26
12 v single gate (15 watts) solar charger	11	20	30
12 v single gate (20 watts) solar charger	14	28	38
12 v single gate (25 watts) solar charger	17	36	46
12 v single gate (30 watts) solar charger	20	44	54



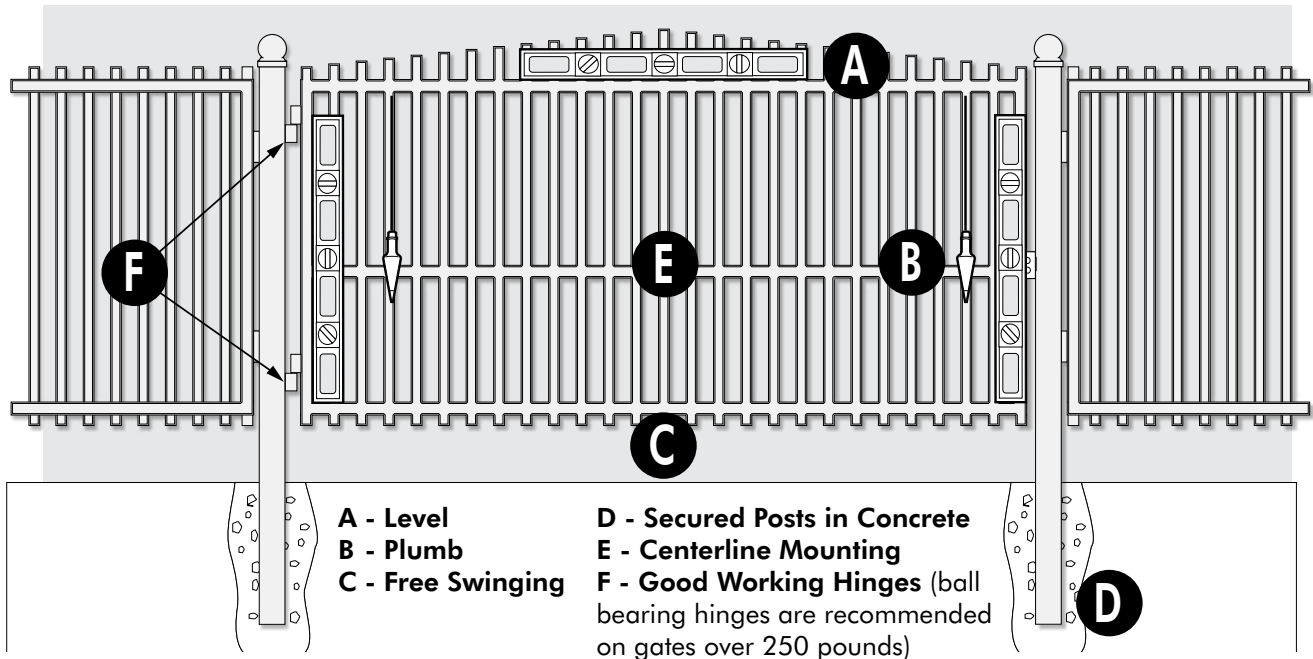
Before You Begin

Check Existing Gate Size and Material

- **Gate size:** Up to 12 feet or up to 300 lbs—See chart on **page x**.
- **Type of gate material:** Vinyl, aluminum, chain link, farm tube, wrought iron, wood (not recommended for solid surface gates).

IMPORTANT: Check for Proper Gate Installation

- 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.



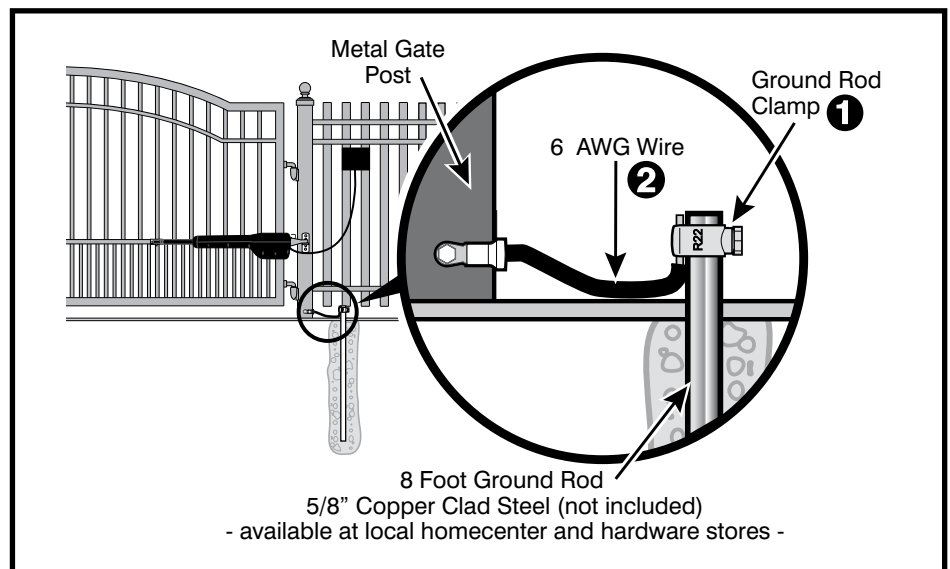
Gate Grounding

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

R4196 Kit Includes:

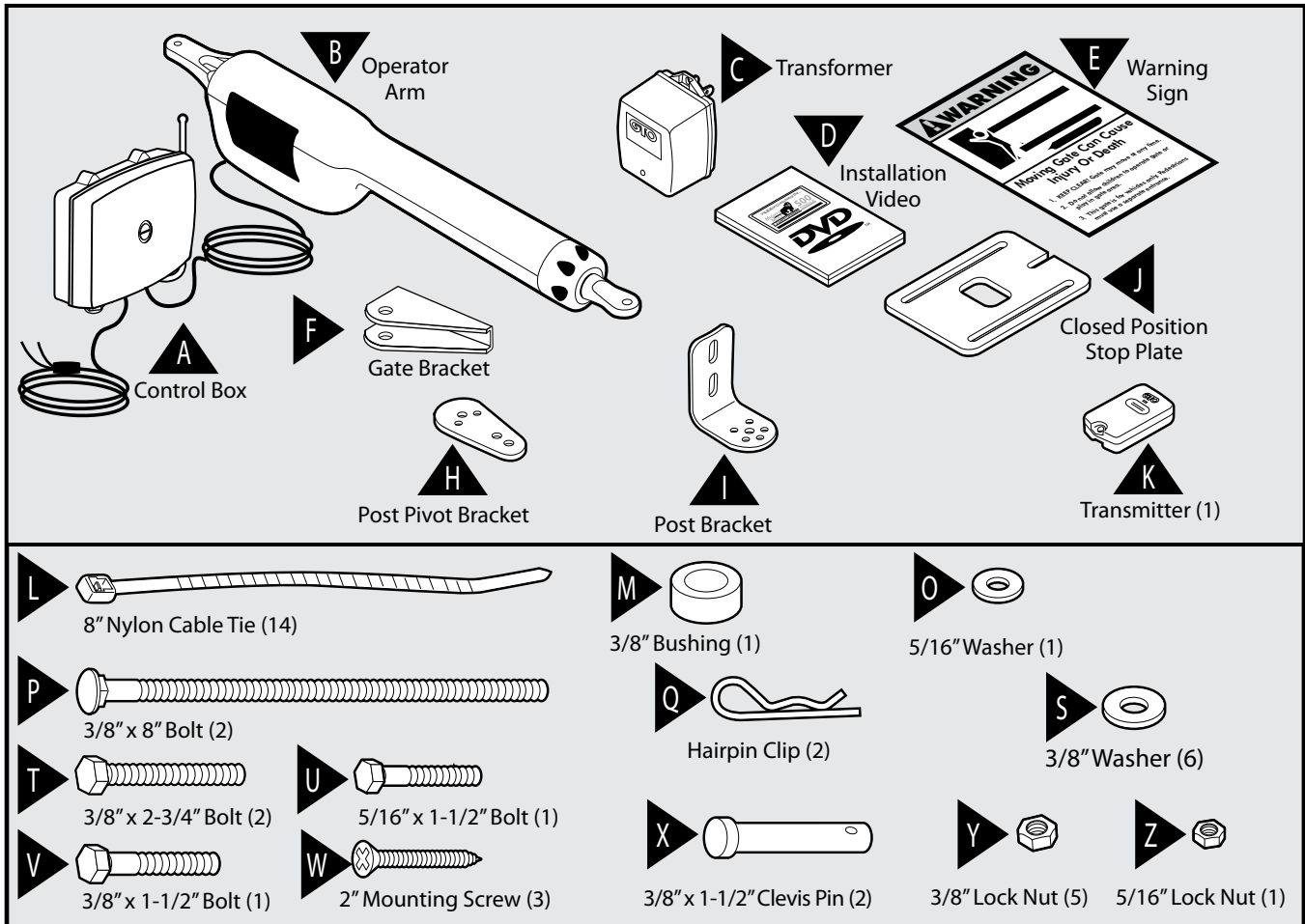
- Ground Rod Clamp
- 6 AWG Wire (3 feet)

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



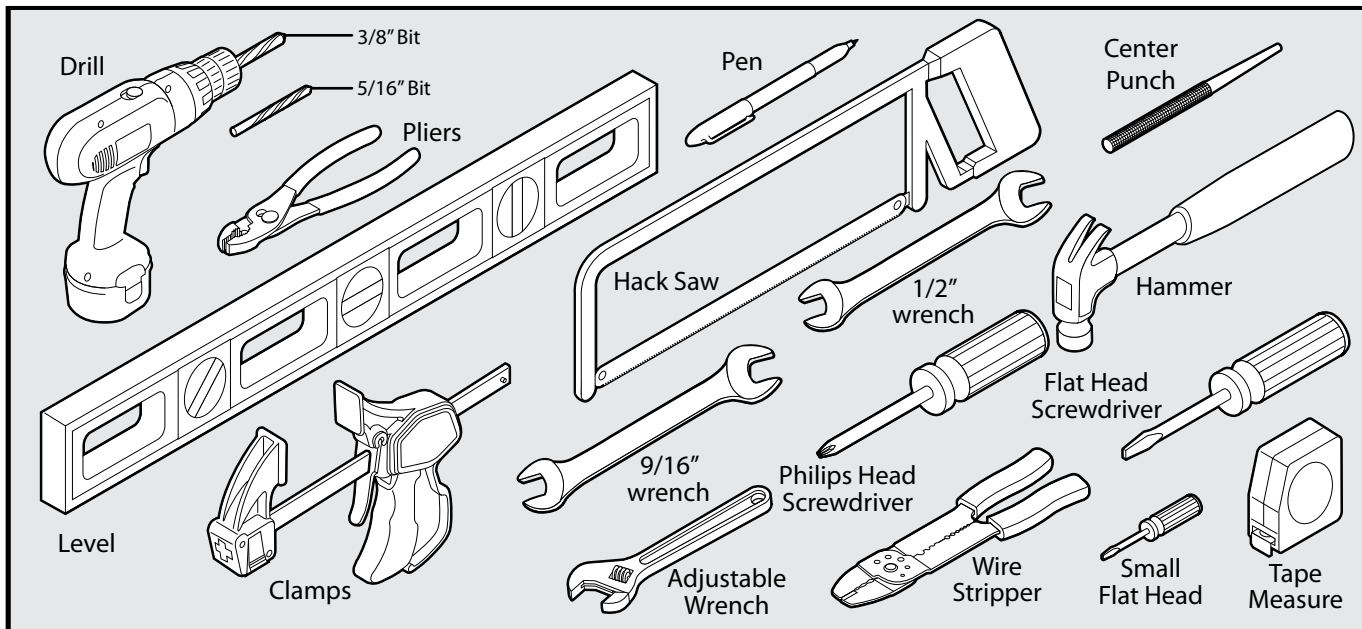
Before You Begin

Items Included



Before You Begin

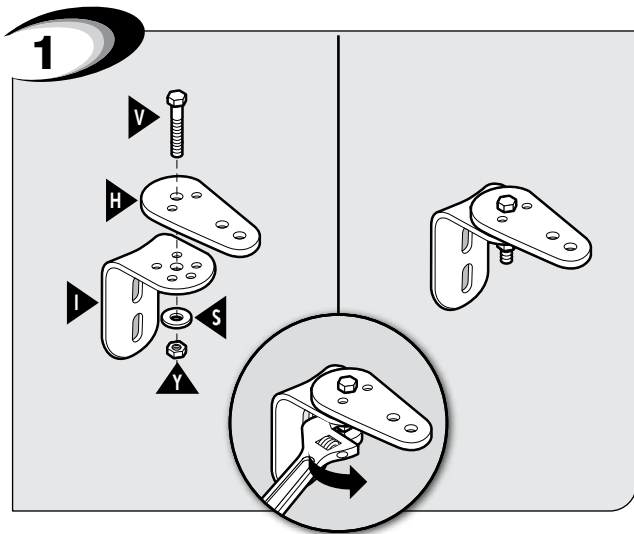
Tools Needed



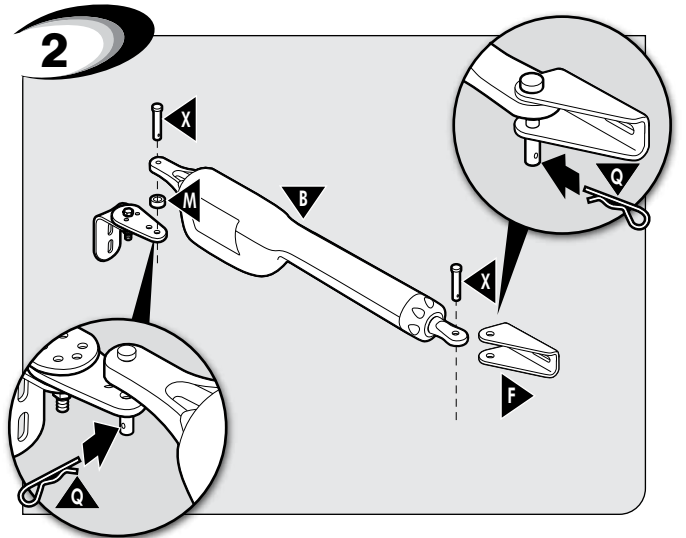
Items Not Included

- 12 Volt automotive or marine battery and a weather proof case.
- Low voltage wire will be needed to run from the transformer to the control box; length depends upon the distance between the transformer power supply and the control box. See Transformer Wiring Installation on page 5, and the accessory catalog.
- PVC conduit.
- If your gate is more than 1000' away from an ac power source you will need to use at least one Mighty Mule 5 watt solar panel to trickle charge the battery. See the accessory catalog (Do not use both transformer and solar).
- Depending on the type of gate, a horizontal cross member or mounting plate may be needed to mount the front of the opener and gate bracket to the gate. See Gate Bracket Mounting Examples after Step 3 of "Gate Operator Installation."
- Surge protection for transformer.
- Some types of installations require u-bolts.
- Additional washers or a metal plate may be needed for wooden post.
- Weatherproof cover for outdoor outlet.
- If post is more than 6", bolts longer than 8" are needed.

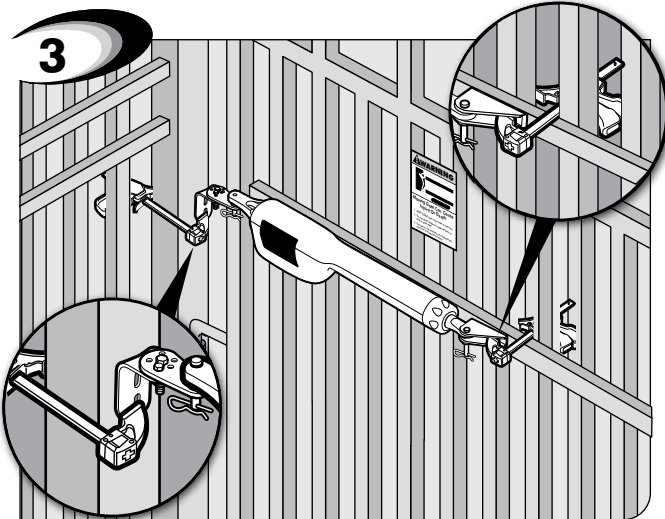
GATE OPERATOR INSTALLATION



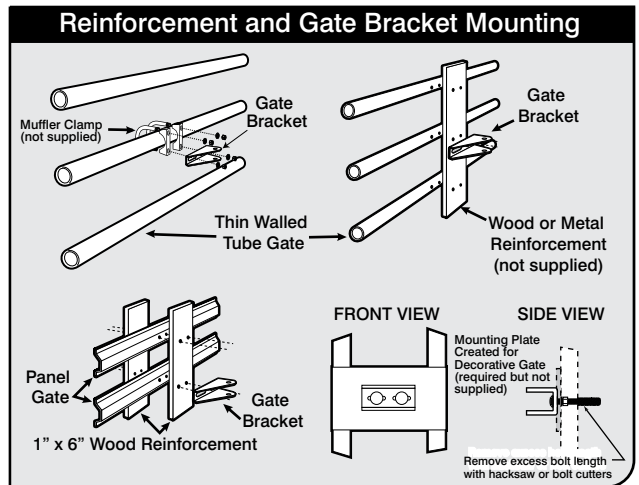
Assemble post bracket parts.



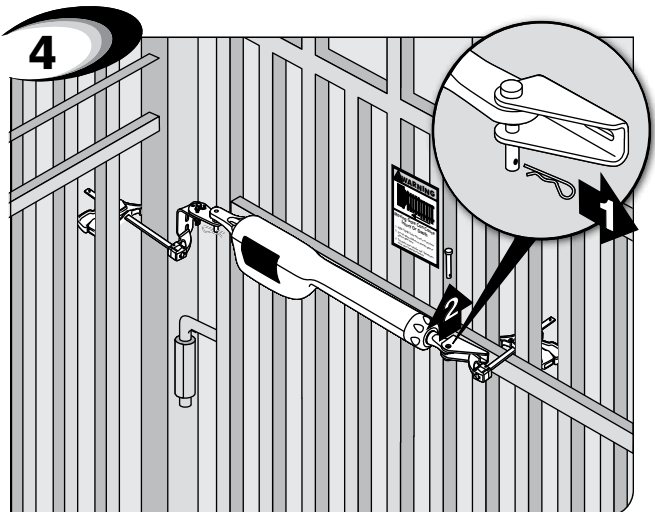
Attach opener to gate and post bracket and secure with required hardware.



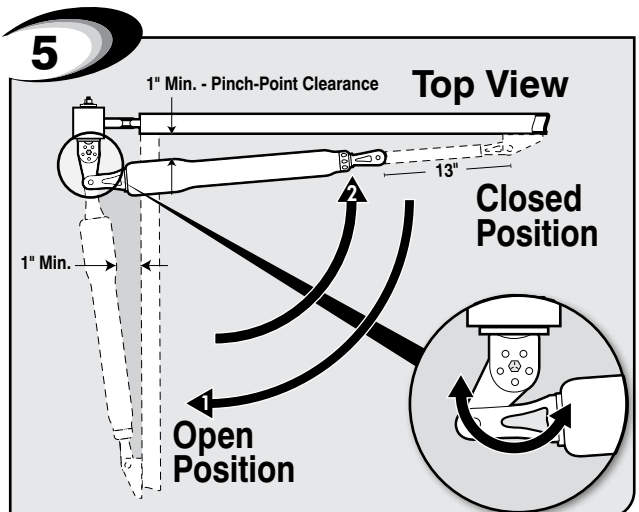
With Gate in OPEN position, using clamps, secure opener to gate post and center cross member of gate.



Recommended reinforcement and gate bracket mounting examples.

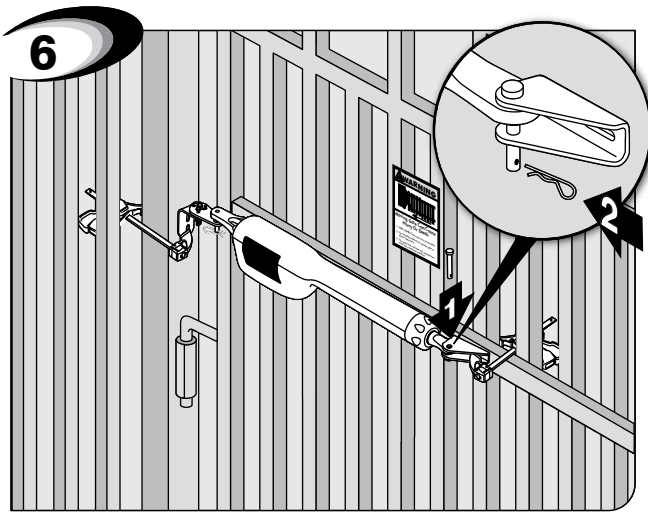


Remove clevis pin from the gate bracket and support loose opener.

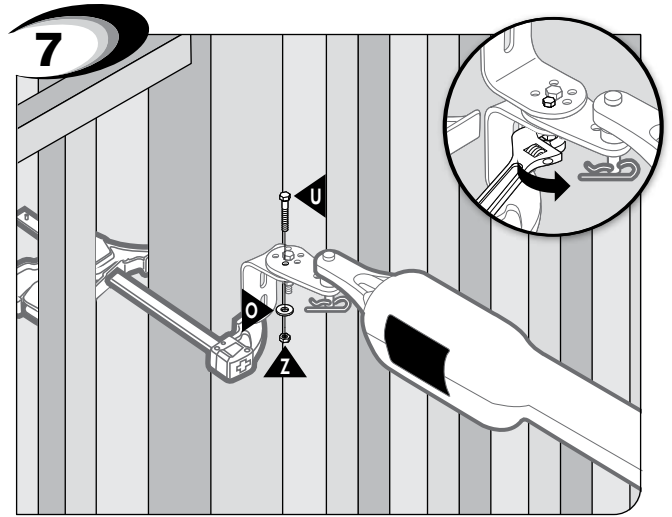


Swing gate to CLOSED position-check clearance/binding by inspecting alignment. Arm stroke should be minimum of 7" and 13" Max. TIP: Turning the pivot bracket over gives more hole alignment options for the post pivot bracket assembly.

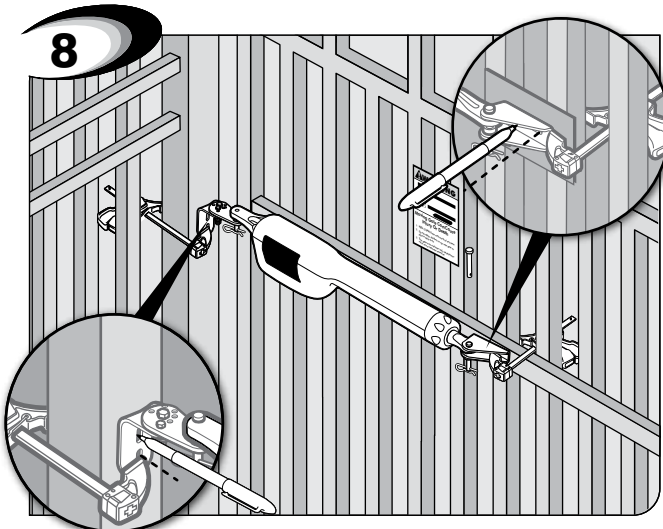
GATE OPERATOR INSTALLATION



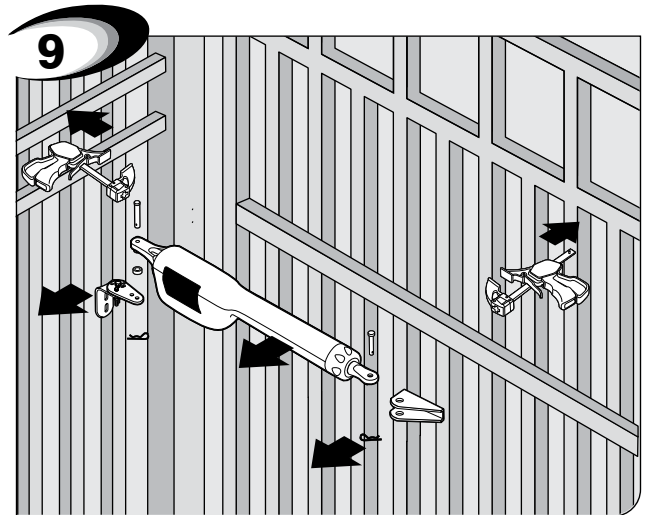
6 OPEN gate and reattach opener with clevis pin. Check for level. Clamp securely.



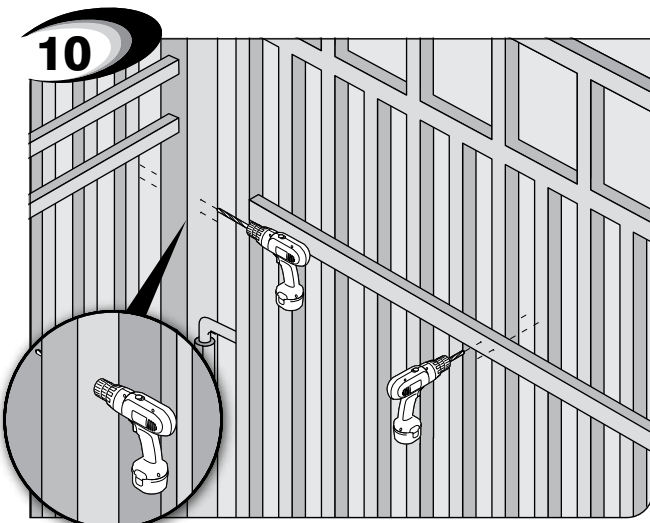
7 Secure post pivot bracket to post bracket when clearance is OK (Step 5) in both open and closed positions.



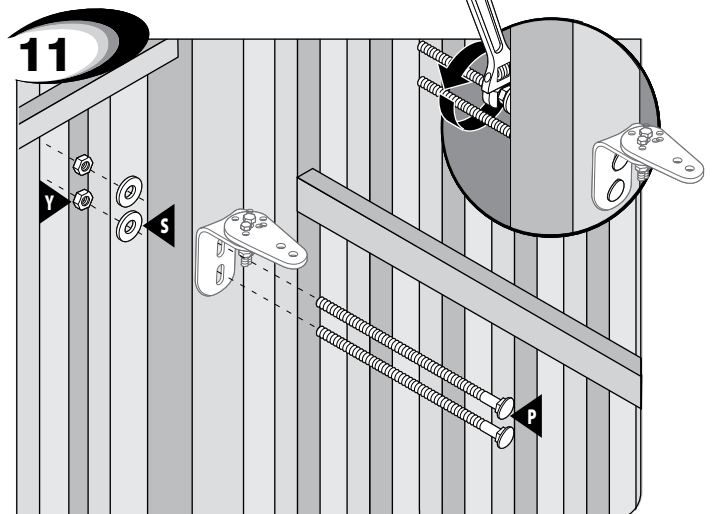
8 Mark middle of post bracket slots on fence post. Mark middle of gate bracket slots on gate cross support.



9 Remove clamps, post bracket, gate bracket, and opener. Then use a hammer and center punch to mark hole positions.

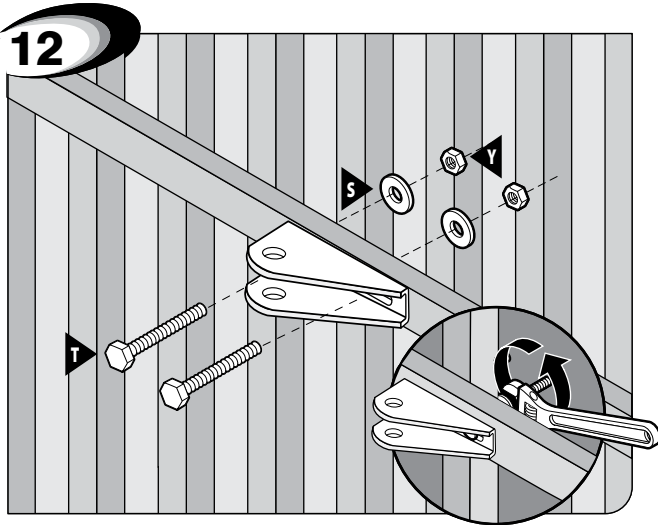


10 Drill holes completely through gate post and gate cross support.

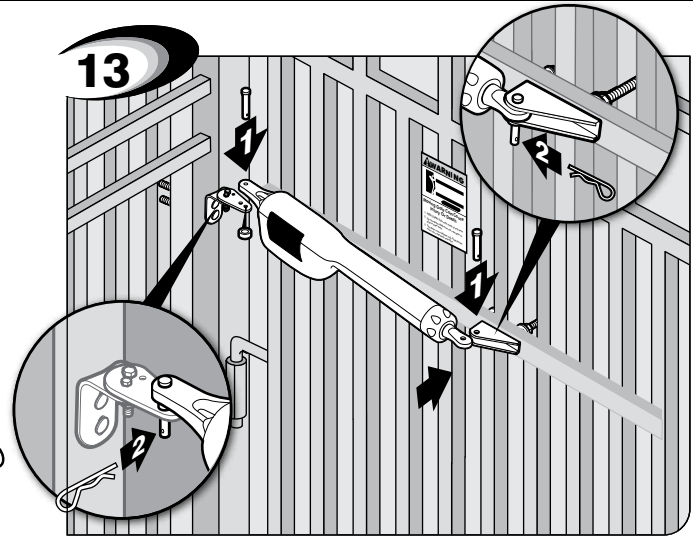


11 Attach post bracket assembly to fence post. *NOTE: Must be through bolted.*

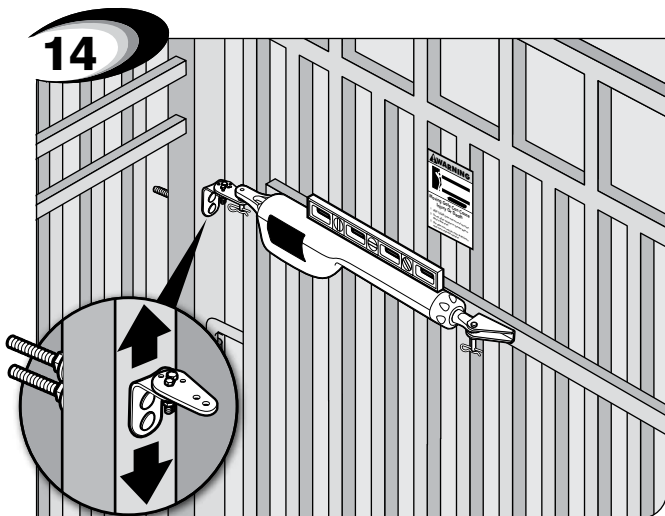
GATE OPERATOR INSTALLATION



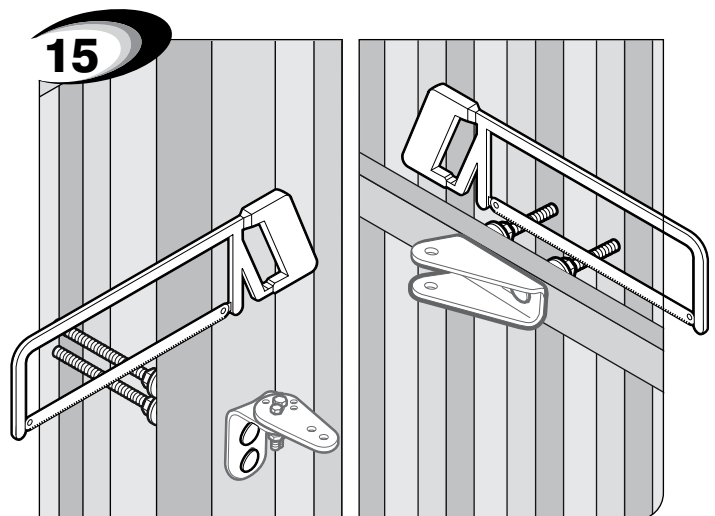
Attach gate bracket assembly to gate cross support.



Attach and secure opener assembly to brackets.

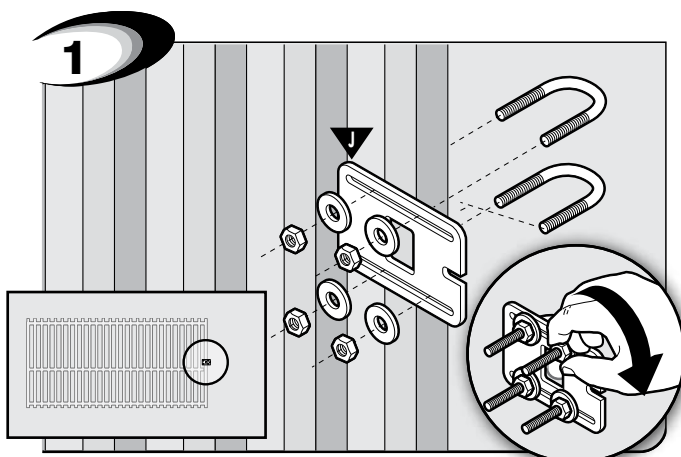


Check for level. Adjust post bracket if necessary.



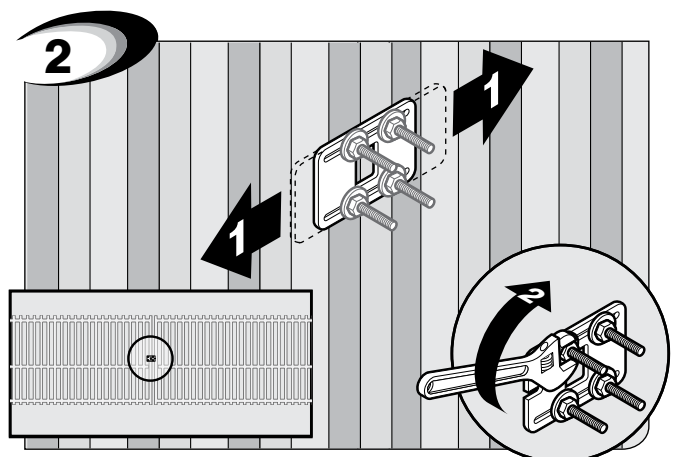
Tighten all bolts and remove excess length on post and gate bracket bolts with hacksaw.

CLOSED POSITION STOP PLATE INSTALLATION



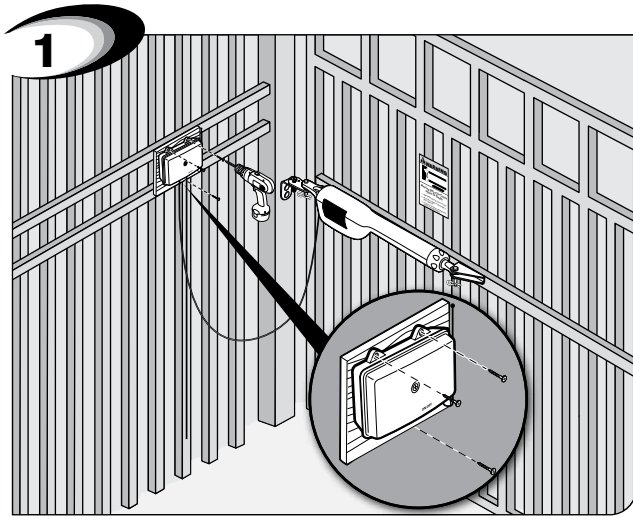
Fully open gate. Attach gate stop with one of the following:

- U-bolts—tube and chain link gates (Not included)
- Wood/lag screws—flat aluminum/wood supports (Not included). Do not tighten.

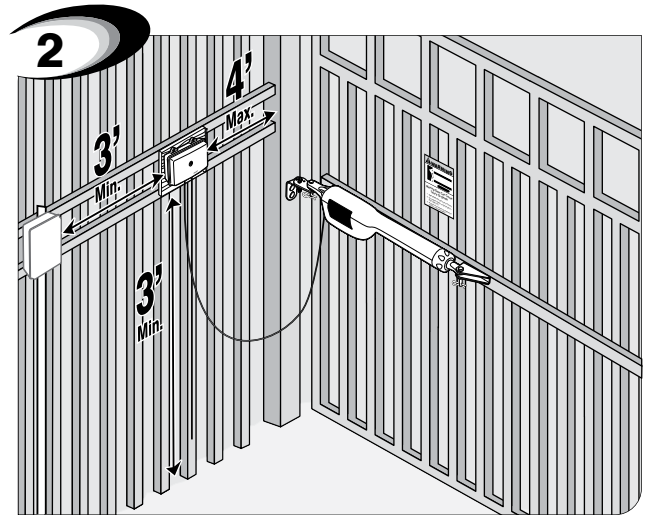


Position gate stop with gate CLOSED to fence post. Tighten fasteners. Cut off excess bolt length.

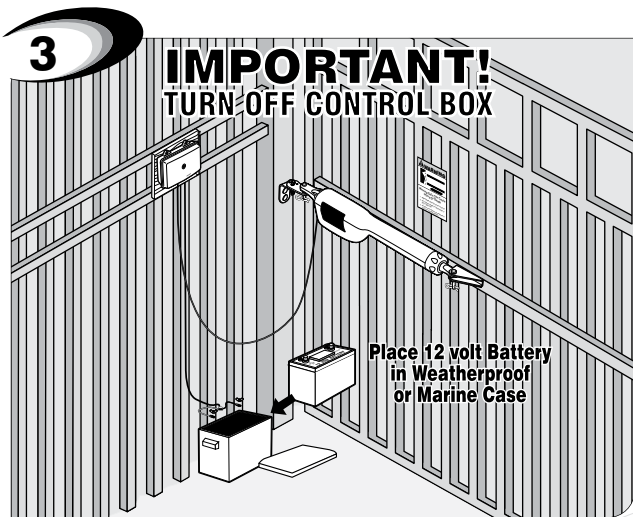
CONTROL BOX & BATTERY INSTALLATION



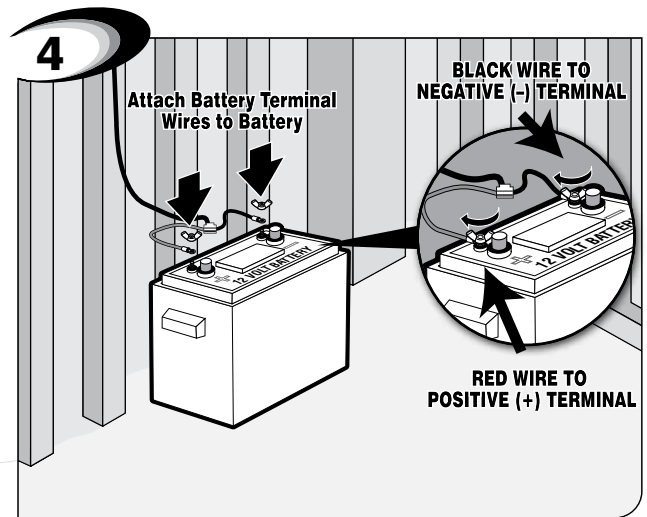
1 Mount control box on piece of treated plywood then attach it to post or fence using screws.



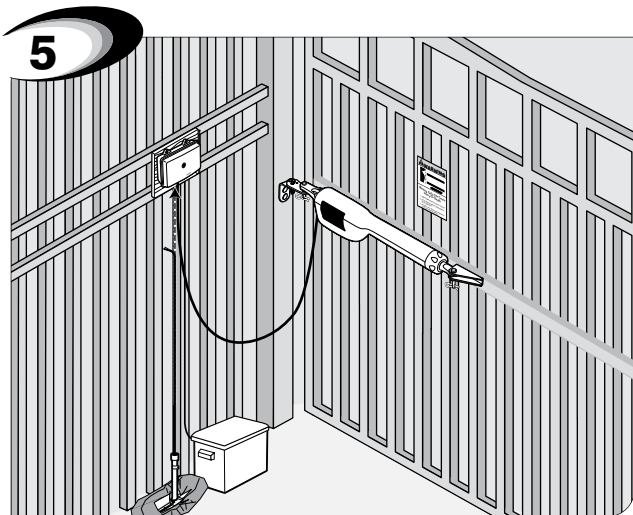
2 Locate control box mounting area. **IMPORTANT:** Be sure to mount box at least 3 feet from AC power and 3 feet off the ground.



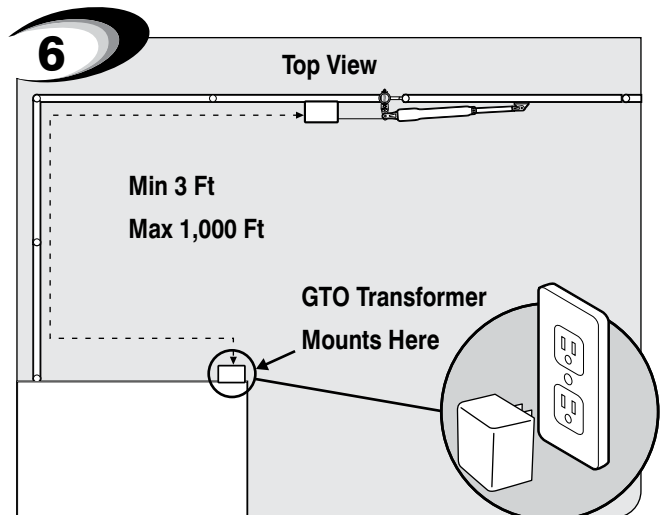
3 **IMPORTANT!** TURN-OFF CONTROL BOX
Place 12 volt Battery in Weatherproof or Marine Case
Turn control box OFF. Place 12 Volt battery and weatherproof battery box within 6 feet of the control box Attach the battery harness wires from the control box to the battery terminals.



4 Attach Battery Terminal Wires to Battery
BLACK WIRE TO NEGATIVE (-) TERMINAL
RED WIRE TO POSITIVE (+) TERMINAL
Tighten the bolts, washers, and nuts and place the cover on the weatherproof box. **IMPORTANT:** Do not connect the transformer or solar panel directly to the battery.

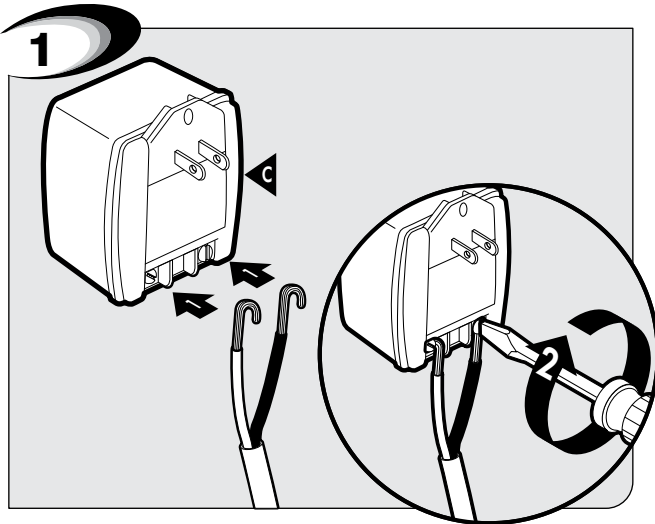


5 Use PVC conduit from ground up to control box.

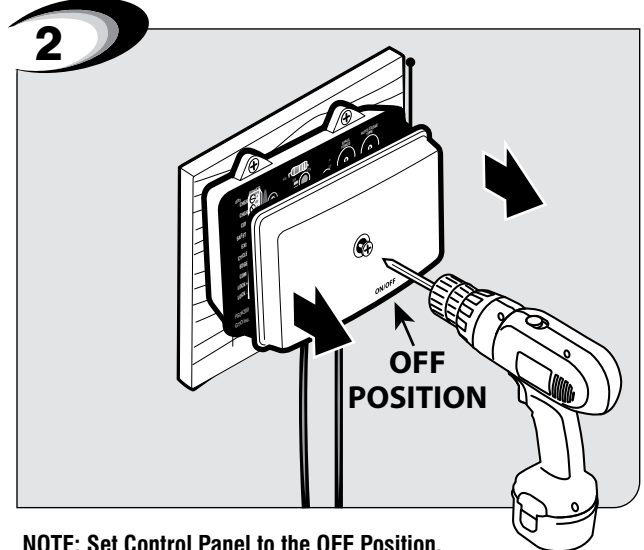


6 Top View
Min 3 Ft
Max 1,000 Ft
GTO Transformer Mounts Here
Locate power outlet and identify wire path to control box.
NOTE: If OUTLET is OUTSIDE use weatherproof cover.

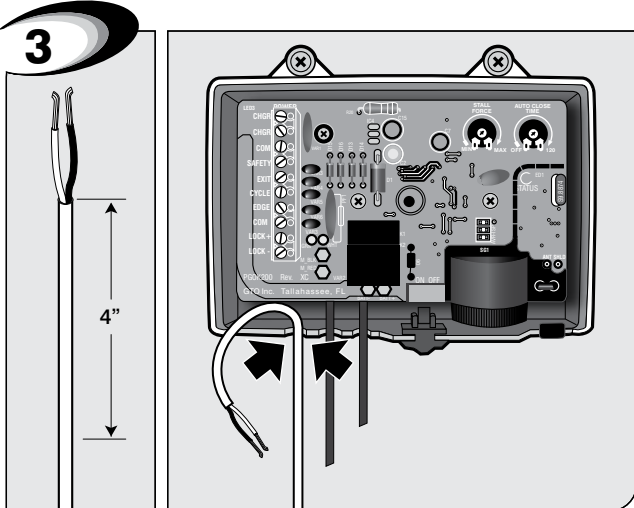
TRANSFORMER WIRING INSTALLATION



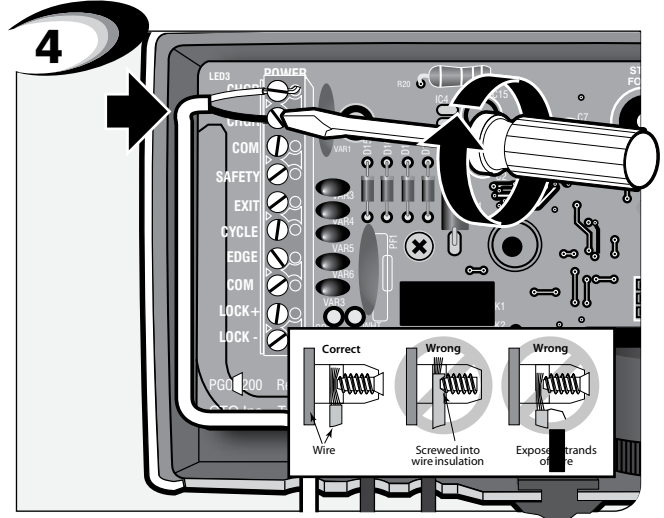
Strip 1/2" off 2 wires and twist ends. Attach wires to transformer screw terminals.



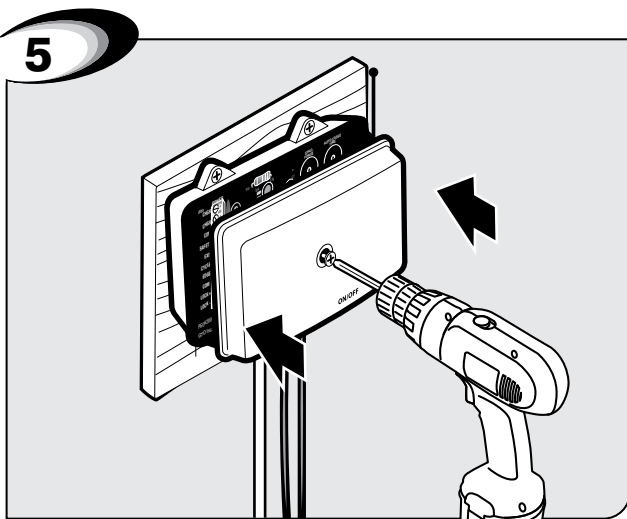
NOTE: Set Control Panel to the OFF Position. Remove control panel cover by unscrewing center cover fastener.



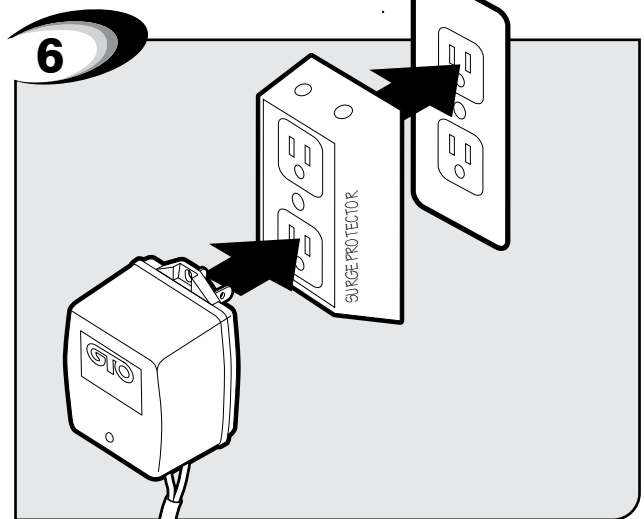
Feed 4" of low voltage wire through strain relief into box with battery wire harness.



Insert RED and BLACK wires into CHGR terminals interchangeably as shown. Do Not Overtighten Screws.

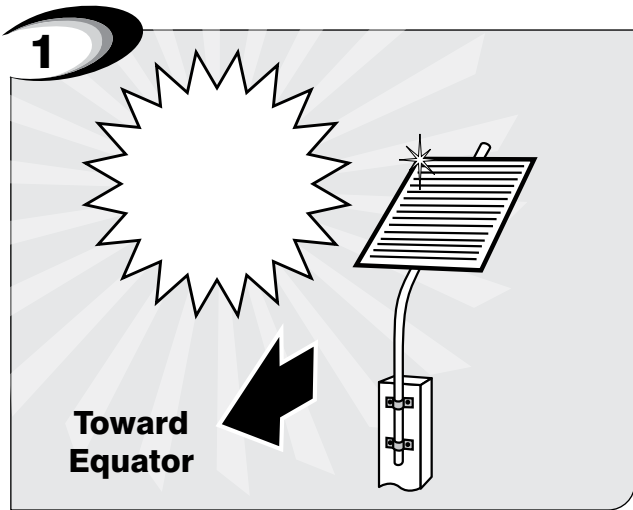


Attach cover back onto the control box.

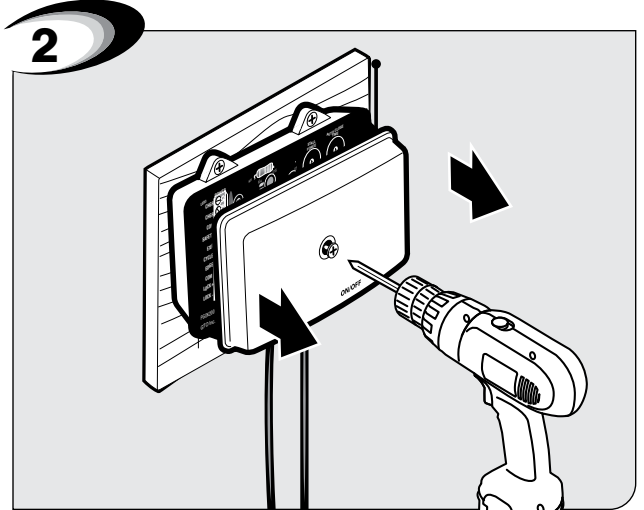


Plug in transformer to power outlet. (Use of a surge protector is highly recommended. If outdoors use weatherproof box.)

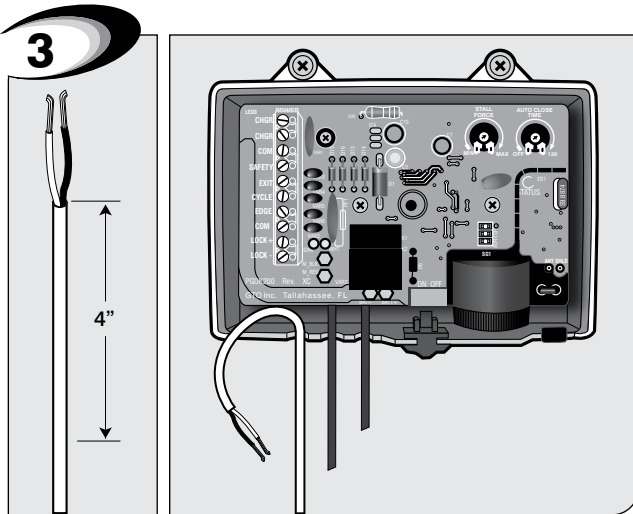
SOLAR PANEL INSTALLATION



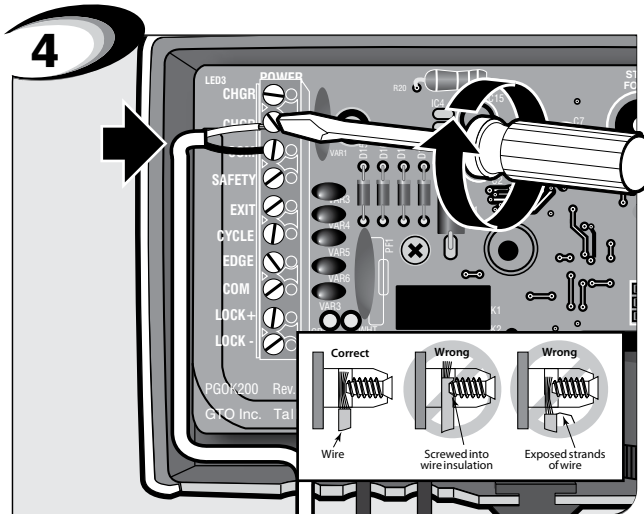
Position solar panel facing sun and in a non-shaded open area that allows 8 hours of direct sunlight for a full charge.



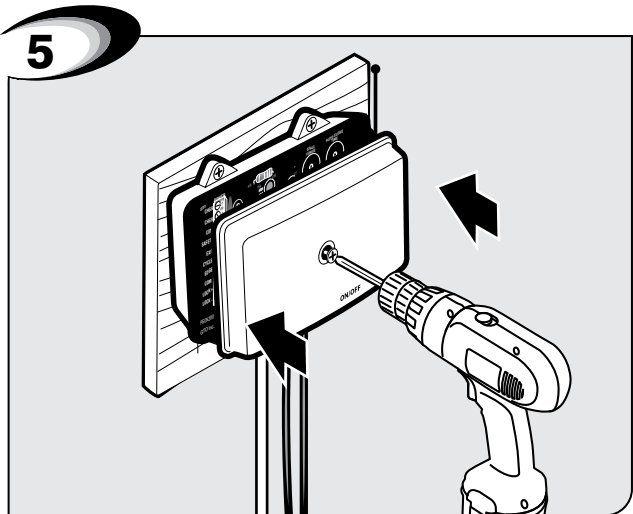
NOTE: Set Control Panel to the OFF Position. Remove control panel cover by unscrewing center cover fastener.



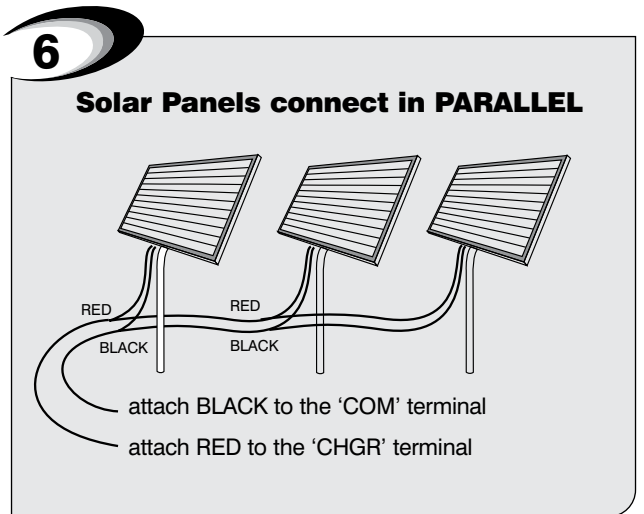
Feed 4" of the solar panel wire through strain relief into control box.



Insert red (+) wire into CHGR terminal and the black (-) wire into the COM terminal. Do Not Overtighten Screws.



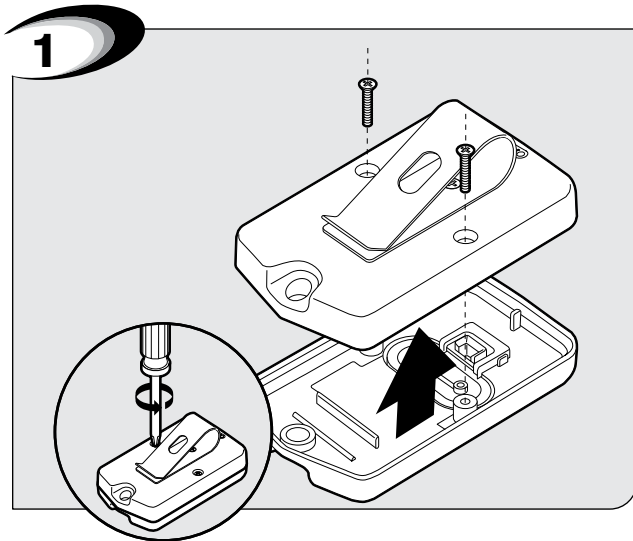
Reattach cover. Turn power on.



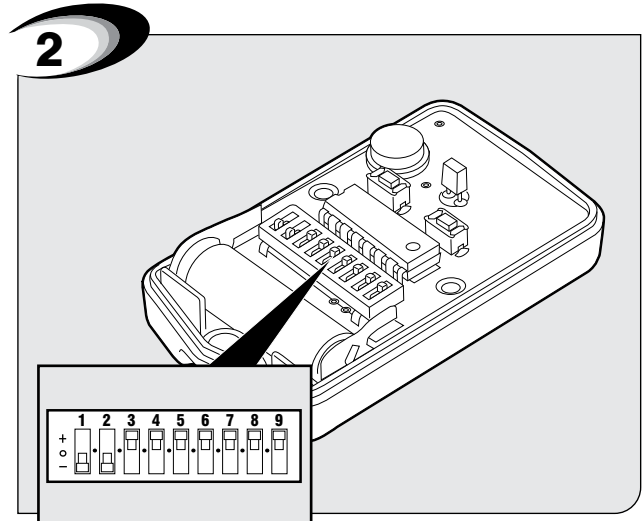
For multiple solar panels, wire the panels in parallel as shown.

SETTING PERSONAL TRANSMITTER CODE

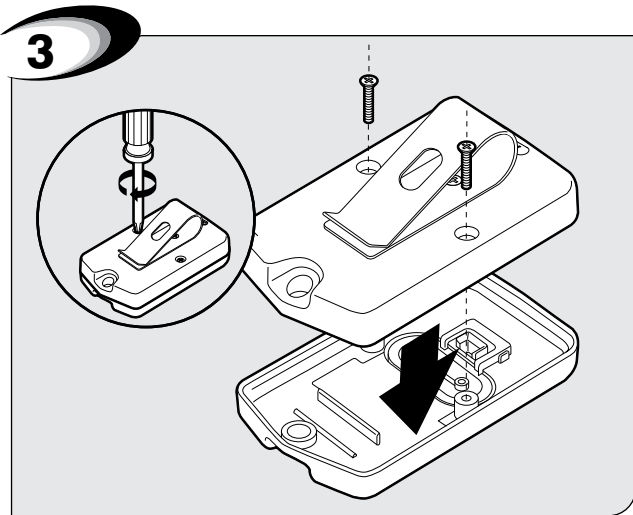
All GTO transmitters are set to a standard code at the factory and are ready to operate your gate opener. For your safety and security, however, we strongly recommend that you replace the factory setting with your own personal code. Follow the directions below:



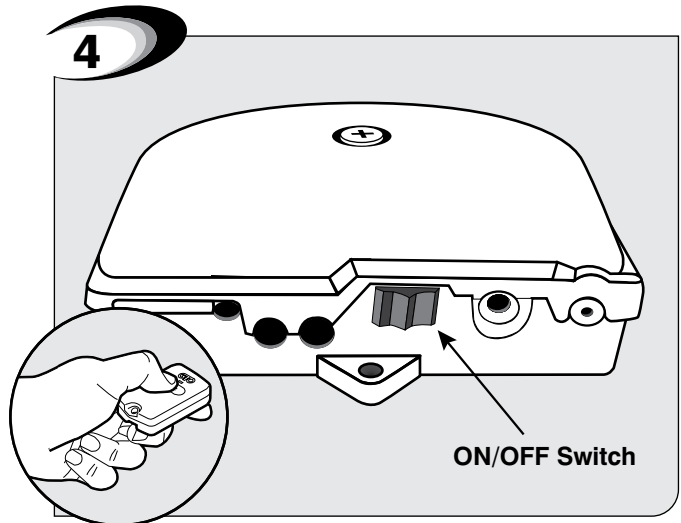
Remove back cover of the transmitter.



Flip transmitter over. Use small screwdriver to move switches to random positions. If you have more than one transmitter, now is a good time to set them all with the same code.



Replace back cover of the transmitter.



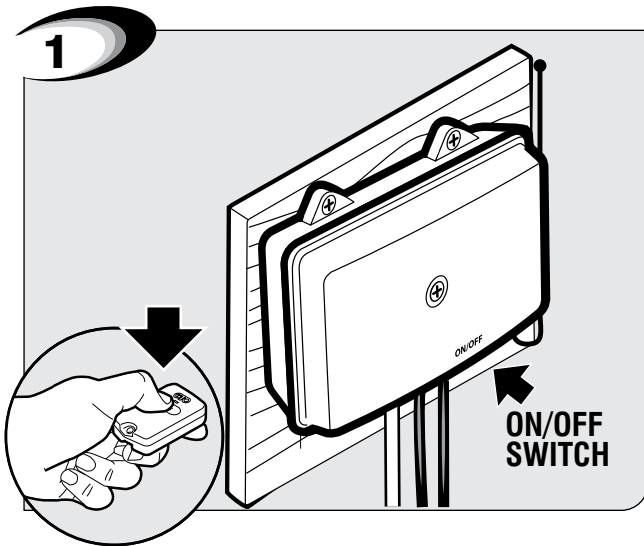
Turn off control box. Press and hold transmitter button while sliding the ON/OFF switch to the ON position. Continue to hold transmitter button for 8 - 10 seconds or until the alarm sounds. Release transmitter's button. Personal code is now programmed.

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

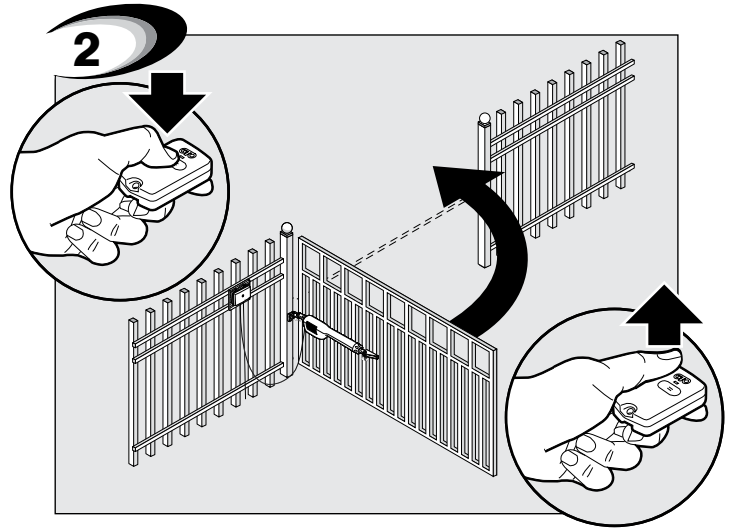
1. This device may not cause harmful interference.
2. This device must accept an interference that may cause undesired operation.

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.

SETTING CLOSED LIMIT POSITION

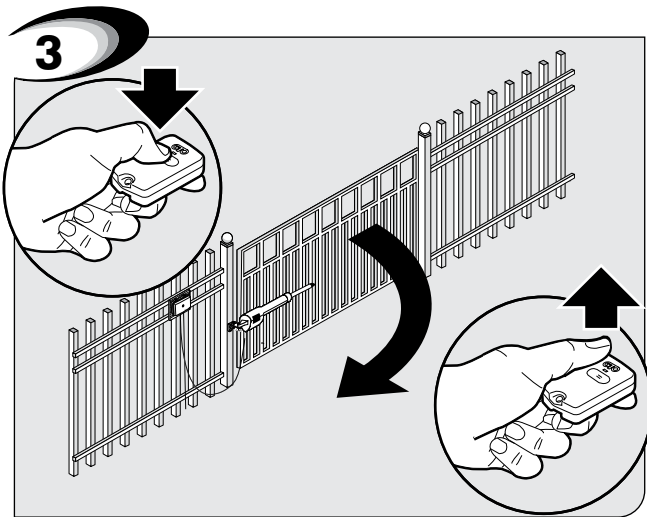


With gate in **OPEN** position, (arm retracted) turn control box **ON/OFF** switch to the **OFF** position. Press and hold the transmitter while sliding the **ON/OFF** switch to **ON** position for 8 - 10 seconds or until the alarm sounds.

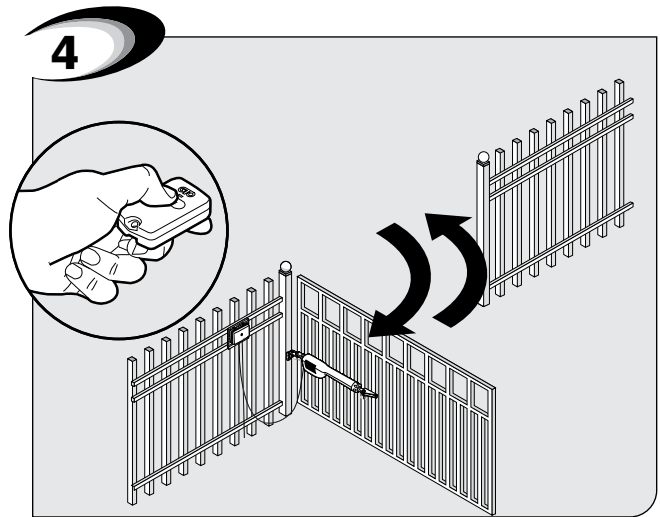


Press and hold transmitter; gate should start closing. Release transmitter button when gate reaches desired **CLOSED** position.

NOTE: If your gate stops and reverses before it fully closes, you may need to increase the stall force. (See page 9)



Press and hold transmitter again; gate should start opening. Release transmitter button when single audible alarm sounds indicating that gate has reached **OPEN** position.

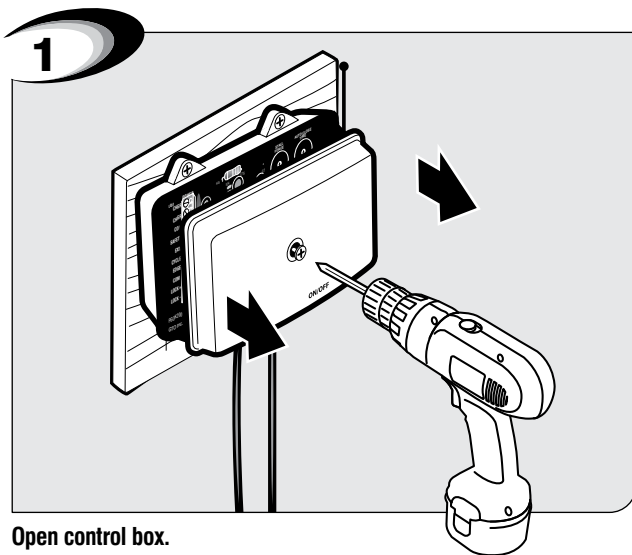


Gate operator's closed position is now set. Press and release transmitter to close gate for normal operation.

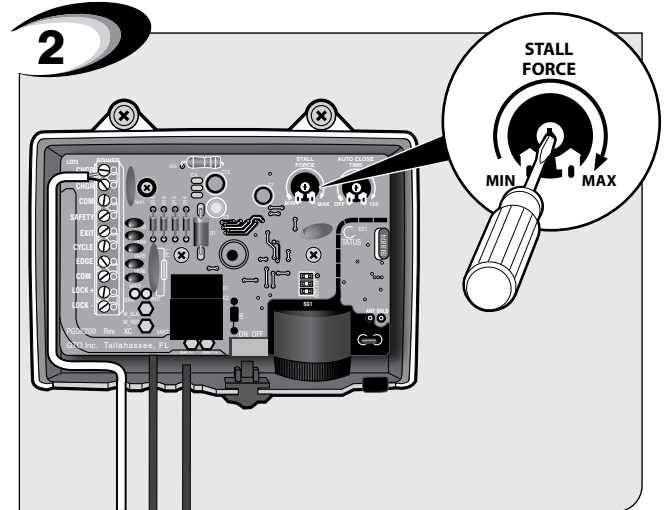
SETTING STALL FORCE & AUTO CLOSE TIME

IMPORTANT: For safety reasons the obstructions setting or Stall Force on the Mighty Mule control board comes from the factory set at MIN (minimum). In many installations this setting will need to be adjusted to overcome the weight and size of the gate.

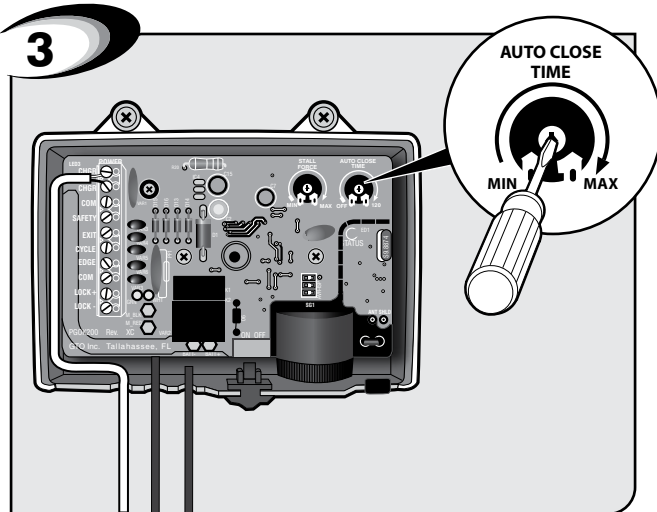
ALWAYS KEEP SAFETY AT THE TOP OF YOUR LIST WHEN ADJUSTING OR SERVICING YOUR AUTOMATIC GATE OPENER



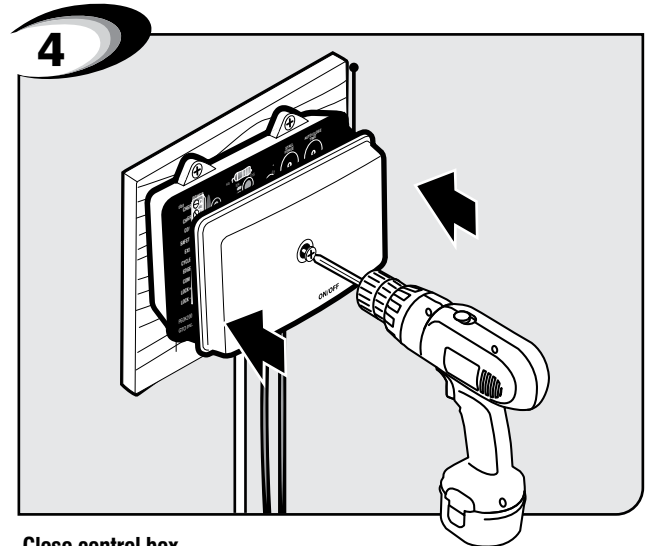
Open control box.



Turn the "STALL FORCE" arrow in the center of the potentiometer with small flat head screwdriver. Adjust the sensitivity from the MINIMUM position up to the point where the gate operates without obstructing from its own weight or the wind conditions in your area.



Turn the "AUTO CLOSE TIME" arrow in the center of the potentiometer with small flat head screwdriver to determine how long the gate will remain open before it automatically closes. The limits are OFF and 3 - 120 seconds. The factory setting is OFF.



Close control box.

CONNECTING SAFETY DEVICES

Although GTO strongly recommends the use of additional safety devices, we do not endorse any specific brand names. 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 1-800-543-4283 for information on compatible products for your specific application.

⚠ Make sure the power to the opener is turned off before connecting safety device wiring to the terminal blocks. Unplugging the transformer does not turn power to the opener OFF. ⚠

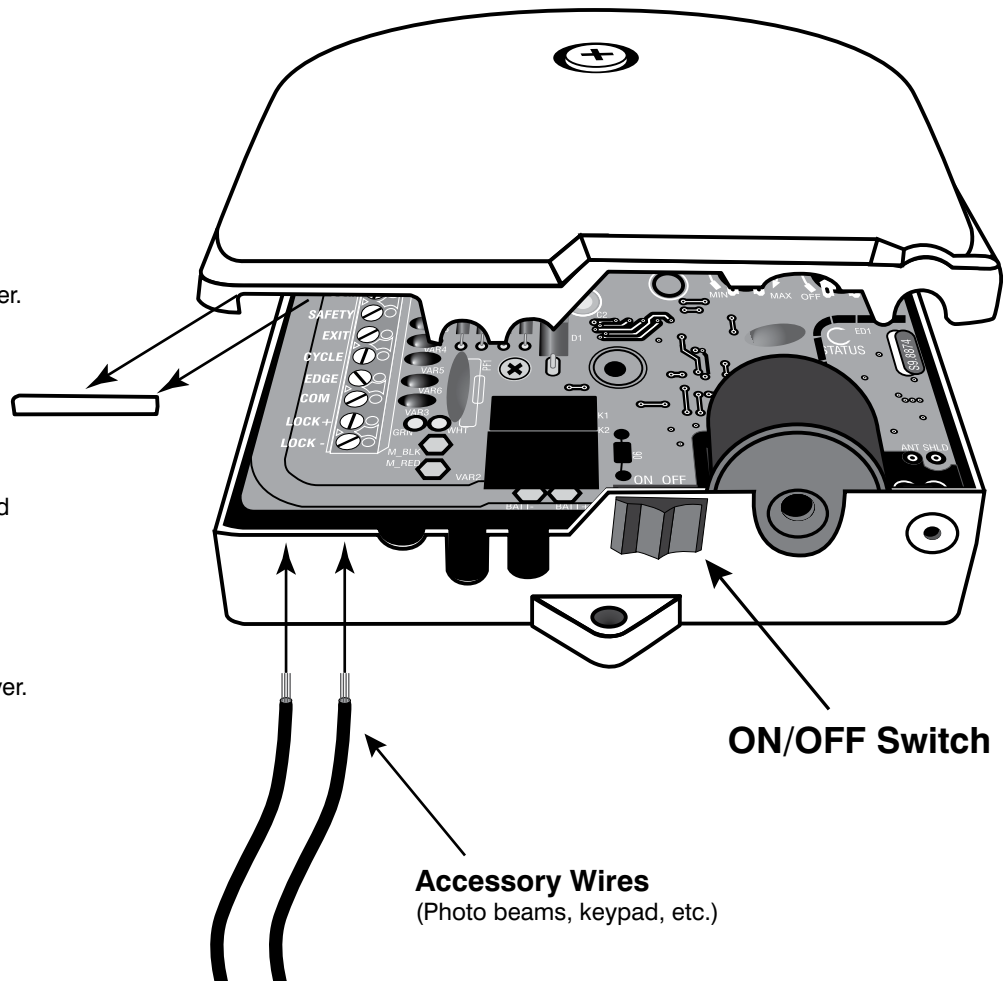
Wiring Accessories through Control Board Wiring Knockout

Remove control box cover.

Carefully remove wiring knockout (on cover) to insert accessory wires.

Insert accessory wires through the knockout and route to the accessory input terminals on the control board.
(See pg. 12)

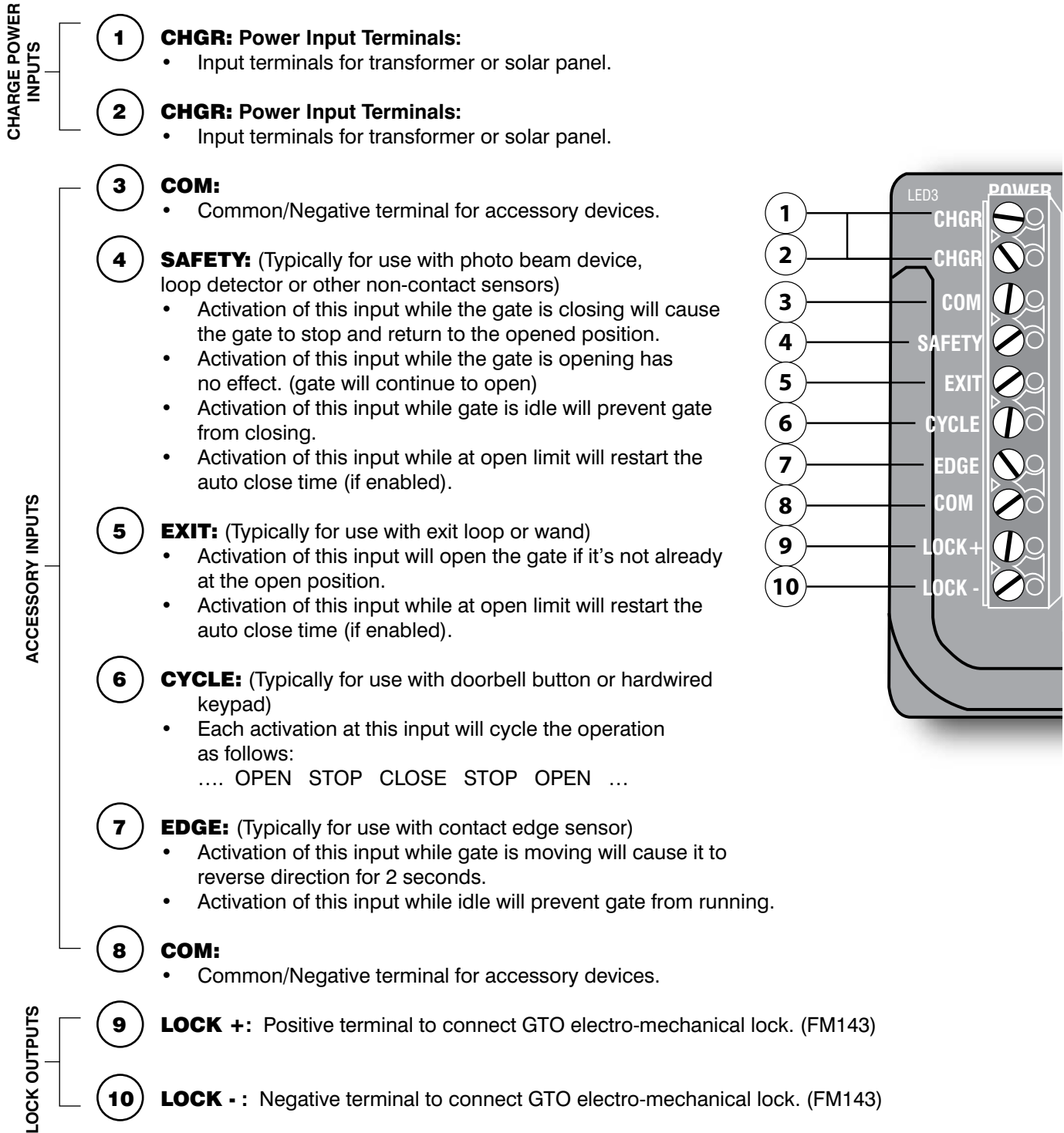
Reattach control box cover.



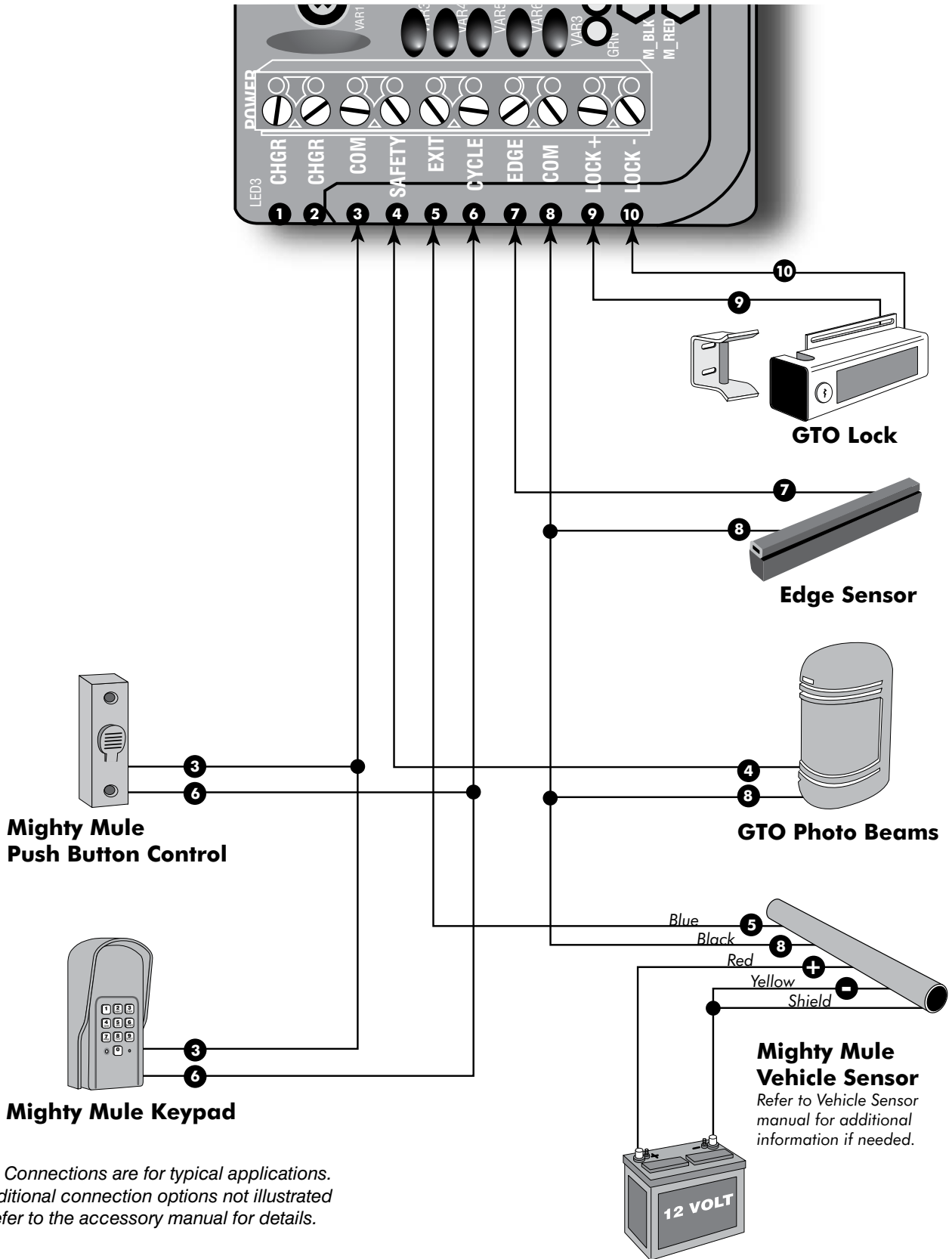
CONTROL BOARD CONNECTIONS

NOTE:

- All accessory inputs are dry-contact, normally open, inputs. DO NOT apply external voltage sources to these inputs.
- All accessory inputs are connected with respect to **COMMON** terminal.



CONNECTING ACCESSORIES



NOTE: Connections are for typical applications. For additional connection options not illustrated here refer to the accessory manual for details.

MAINTENANCE

- On all gates weighing 250 lb. or more, routinely grease the ball bearing hinges at least 4 times a year; more frequently if the gates are near a coastal area.
- Apply silicone spray to a soft, dry cloth and clean the push/pull tube at least once a month.

TROUBLESHOOTING GUIDE

If your gate opener does not function properly after it is installed, use this guide before calling the GTO Service Department.

Audible Feedback

Symptom	Diagnosis	Check:
1 or more short beeps upon power up	Circuit Board Powered Up & Ready	<ul style="list-style-type: none"> • Normal Operation
Continuous beep after power-up	<p>Unit has learned new transmitter code, releasing the transmitter button will shut off alarm.</p> <p>Unit has entered "LEARN LIMIT" mode. Releasing the transmitter will turn off alarm.</p>	<ul style="list-style-type: none"> • Normal Operation
Rapid beeping	Circuit Board Senses an Obstruction	<ul style="list-style-type: none"> • Path of Gate • Gate for Level and Plumb • Stall Force Adjustment • Disconnect Safety Devices
1 beep with 20 seconds off	Low Battery Condition	<ul style="list-style-type: none"> • Transformer or Solar Panel Voltage • Battery Harness Connections • Battery Under Load
2 beeps every 2 seconds	Position sensor is short circuit.	<ul style="list-style-type: none"> • Arm Power Cable for Damage
1 beep with 2 seconds off	Arm Limit Switch Error	<ul style="list-style-type: none"> • Connections to Inputs • Arm Power Cable for Damage
1 beep when attempting to run the gate	<p>Blown fuse</p> <p>Battery is low or damaged</p> <p>Loose Connection</p>	<ul style="list-style-type: none"> • Check and replace fuse • Test battery voltage • Check all connections

Additional information can be found online 24 hours 7 days a week at the
GTO Tech Wizard (support.gtoinc.com/Support/TroubleShooter.aspx)

Visual Feedback

Symptom	Diagnosis	Check:
Power (green) ON	AC or Solar Power Present	Normal Operation
Power (green) OFF	No AC or Solar Power	<p>Transformer:</p> <ul style="list-style-type: none"> • Breaker or GFI • Power at AC outlet. • Output of Transformer. • Voltage on wire at 18 VAC Input <p>Solar:</p> <ul style="list-style-type: none"> • Solar Panel Wires Reversed • Weather • Solar Panel Placement • Output of Solar Panel • Voltage on wire at Solar Input

REPAIR SERVICE

If your Mighty Mule Gate Opener is not operating properly, please follow the steps below:

1. First use the procedures found in the Maintenance & Troubleshooting Guide (see page 13).
2. For 24 hour 7 days a week trouble shooting and support online go to our TECH WIZARD site at... support.gtoinc.com/Support/TroubleShooter.aspx
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 rear of control arm) and date of purchase when calling for assistance.
4. If repair or replacement of your gate opener is necessary, the Service Department will assign a **Return Goods Authorization (RGA) number** to you to track return of equipment.
5. Include a copy of your receipt and securely pack the component(s) authorized for return to the factory. 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 Access Systems, LLC • 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. Items returned to GTO freight collect WILL NOT be accepted. Items returned without proof of purchase will not be repaired under warranty.



For 24 hour 7 days a week trouble shooting and support online go to our TECH WIZARD site at... support.gtoinc.com/Support/TroubleShooter.aspx

For out of warranty service and repair call the Mighty Mule National Repair Center at... **1-800-543-1236**

The GTO Access Systems, LLC Technical Service Department is open
Monday – Friday 8:00 A.M. – 7:00 P.M. (Eastern Time)

Telephone (800) 543-1236

Fax (850) 575-8950 • Web site: www.mightymule.com

Conversion Chart

VOLTAGE READINGS

18 Vac Transformer _____ 18.0 to 22.0 Vac

5 W Solar panel (single) _____ 18.0 to 22.0 Vdc
measure voltage at panel and control box.

12 V Battery _____ 12.0 to 13.5 Vdc

Charging circuit _____ 12.0 to 14.8 Vdc
measure voltage with battery connected

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 product serial number (located on the right hand side of the control box), and the date and place of purchase in the spaces provided below. Refer to this information when calling GTO for service or assistance with your automatic gate opener.

Serial Number _____ Date of Purchase _____

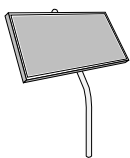
Place of Purchase _____

Remember to keep all receipts for proof of purchase.



ACCESSORIES

Accessories are Available From Your Retail Store



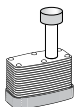
Solar Panel (FM121)

The Solar Panel is a 5 watt solar powered battery charger for use with the Mighty Mule 200 gate operator systems. Particularly suited for remote installations, each Solar Panel comes with tubular steel support, mounting clips, wire connectors, and 10 ft. of low voltage wire (see Low Voltage Wire for additional wire). The Mighty Mule control board has clearly labeled terminal connections for easy installation of the Solar Panel. Installation in some regions of the world will require multiple solar panels for adequate charging power.



Push Button Control (FM132)

Unlit doorbell button for remote entry or exit control. Wires directly to the control board and uses 16 gauge stranded, dual conductor low voltage wire (sold separately).



Pin Lock (FM133)

The Pin Lock substitutes for the clevis pin at the front end of the Mighty Mule gate openers. Helps prevent theft of the operator from the gate, while allowing quick release of the operator.



Key Chain Two Button Transmitter (FM134)

The Key Chain Transmitter is a dual button version of the Mighty Mule single button entry transmitter and has the same adjustable code settings. Used for 2 gates or 1 gate and garage door. (battery is included)



Single Button Transmitter (FM135)

The Mighty Mule entry transmitter, with adjustable code settings, is standard equipment with all Mighty Mule systems. (battery is included)



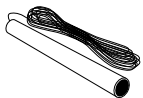
Digital Keypad (FM137)

Allow friends access to your property using an identification code that you provide. Keypad can be programmed to use up to 25 different personal identification number (PIN) codes. Each code is face programmable with additional security features built in. Wired installations require 16 gauge, low voltage, stranded, dual conductor, direct burial wire (sold separately). Requires three AA batteries (not included).



Mounting Post (FM100) - In Ground

This black powder coated pedestal is designed to provide convenient access to your keypad, wireless intercom, or other access control device from your vehicle. With its break down design it is easy to install and works well in most standard applications. Surface Mount Flanges (F102) and Extensions (F103) for added height are available.



Mighty Mule Vehicle Sensor (FM138)

The Gate Opening Sensor is designed for residential and agricultural applications and is compatible with most Mighty Mule automatic gate opener models. The Sensor is an electromagnetic sensor, which offers 'hands free' operation of the Mighty Mule Gate Operator with a 12 ft. radius of detection of vehicles in motion.



Automatic Gate Lock Pull-to-Open (FM143)

A MUST for added security. Solenoid driven, with a steel housing. Used with Mighty Mule DC swing gate operating systems for maximum stability and security. Comes with a keyed manual release.

Accessories are Available From Your Retail Store (con't)



Wireless Entry Intercom / Keypad (FM136)

Allows owner to screen guest at the gate before allowing access to the property. Keypad also allows owner to give up to 25 programmable entry codes to family, friends or approved delivery personnel. Codes can be permanent or temporary. Up to 500 feet reception.

Additional base stations available (F3101MBC).



Low Voltage Wire (RB509)

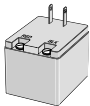
The 16 gauge, stranded, dual conductor **Low Voltage Wire** is for connecting the AC powered transformer, or the **Solar Panel** to the control board. Also used for the connection of accessories, such as locks, keypads, push buttons and other wired control devices. This specially designed wire is UV treated, PVC coated and ready for direct burial.

Available in 1000' rolls or special lengths.



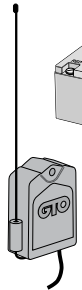
Column Mount Lock Receiver (433IH)

For mounting the **Automatic Gate Lock** on brick columns, walls, or for other applications with limited space between gate and post.



Replacement Transformer (RB570)

Standard 18 volt, 2200 mA, AC transformer for maintaining the battery with the **Mighty Mule** gate operator.



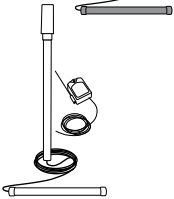
Garage Door Receiver (RB709U-NB)

The **Garage Door Receiver** allows you to use the same 2 button **Mighty Mule** entry transmitter to operate your gate operator and your garage door operator. Compatible with most garage door operators.



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.



Wireless Driveway Vehicle Sensor (FM130)

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

**If you have a question about any special order item,
just call 1-800-543-4283!**

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