



Installation and Maintenance Manual



Slide Gate Operator

Model SL500-11

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General Information

Supplied Parts

Inspect the operator for any possible shipping damage and any shortage of parts. Please note that if accessories were ordered with this unit, some may be packed separately.



Part Description	QTY.
Roller Chain	1
Chain Bracket	2
Chain Stud	2
Master Link	2
Chain Guard	2
Battery	1
3/8 Flat Washer	4
5/16 Lock Washer	4
5/16 – 16 Hex Nut	4
1/4 - 20 Bolt	4
1/4 - Lock Washer	4
Gate Caution Sign (*)	2
Safety Instructions	1
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Table 1

* Install **Gate Caution** signs on both sides of the gate where they can be easily seen.

Cycle Rate

Frequency of Use - Cycles Per Hour (cycle equals 1 full open and 1 full close)						
Gate opening in feet	Cycles per hour					
	22	16	13	11	9	8
12	✓					
16	✓					
20	✓					

Table 2



NOTE: These figures are maximum and should not be exceeded. When at all possible, try to keep the cycles per hour at 75% of these figures.

Specifications

MODEL	GATE SPEED	MOTOR WATTAGE FULL LOAD	MOTOR CURRENT FULL LOAD	MAXIMUM GATE OPENING	MAXIMUM GATE WEIGHT
SL500-11	9" per sec.	150 w.	12.4 amp	20 ft	400 lbs

Table 2

Dimensional Outline

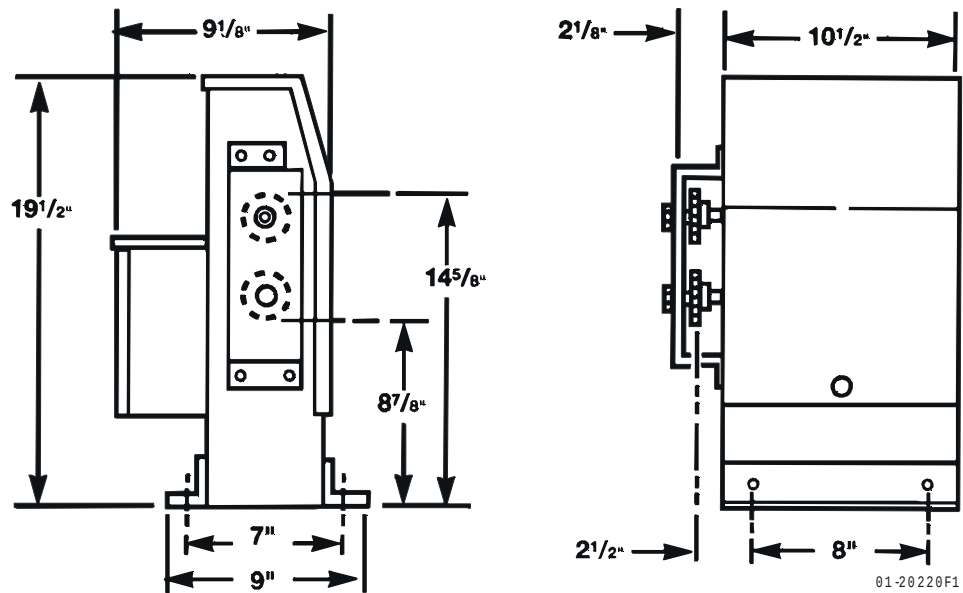


Figure 1

Safety Information

Vehicular gate systems provide convenience and security. Gate systems are comprised of many component parts. The gate operator is only one component. Each gate system is specifically designed for an individual application.

Gate operating system designers, installers and users must take into account the possible hazards associated with each individual application. Improperly designed, installed or maintained systems can create risks for the user as well as the bystander. Gate systems design and installation must reduce public exposure to potential hazards.

A gate operator can create high levels of force, in its function as a component part of a gate system. Therefore, safety features must be incorporated into every design. Specific safety features include:

- Gate Edges
- Enclosed Track
- Vertical Posts
- Guards for exposed rollers
- Photo-electric Sensors
- Instructional and Precautionary Signage
- Screen Mesh

Important instructions follow. These instructions are intended to highlight certain safety related issues. These instructions are not intended to be comprehensive. Because each application is unique, it is the responsibility of the purchaser, designer, installer and end user to ensure that the total gate system is safe for its intended use.

Safety Instructions



Select instructions are highlighted with this precautionary symbol (see left margin). Failure to follow these selected instructions can result in serious injury or death.

STEP 1: BEFORE INSTALLATION



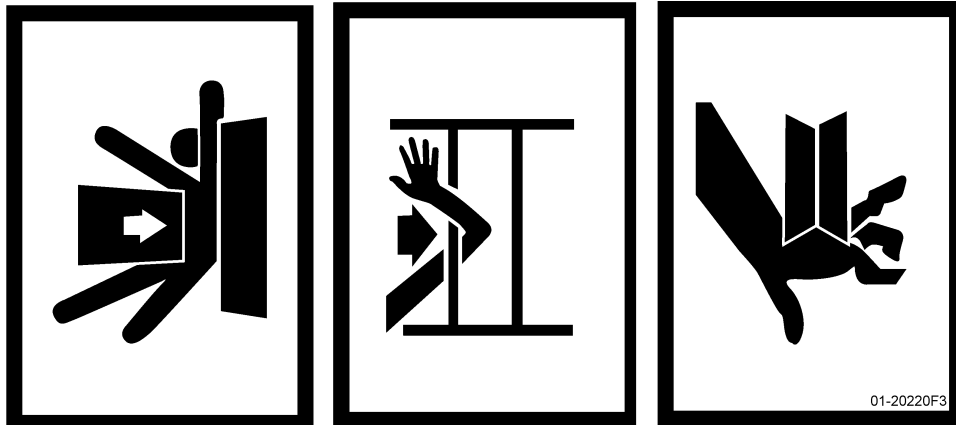
- 1 Confirm gate operator model is specified by Installation and Maintenance Manual for application type, gate size and frequency or use.
- 2 Confirm ALL appropriate safety features, such as gate edges, photo-electric sensors, vertical posts and enclosed tracks, are specified.
- 3 Confirm gate system design reduces pinch points and protects against entrapment.
- 4 Confirm gate system design has pedestrian access separate from vehicular entrance.
- 5 Confirm gate system design reduces traffic backup.
- 6 Confirm warning signage is included in design.
- 7 Confirm gate moves freely before installation of operator
- 8 Repair or service worn or damaged gate hardware before installation of operator.
- 9 To avoid installation hazards, review the gate system operation and installation procedures, such as manual disconnect mechanism procedure.
- 10 Confirm control design prohibits unauthorized use.

STEP 2: DURING INSTALLATION

-  1 Disconnect power at service panel before making any electrical connection.
-  2 Avoid pinch points, be aware of all moving parts.
-  3 Adjust clutch or load sensing device to minimum force setting.
-  4 Do not over-tighten clutch or adjust force setting above minimum.
-  5 Install controls where user cannot touch gate while operating controls.
- 6 Install controls where user has full view of gate operation.
- 7 Install two or more warning signs on the gate to alert persons in the area of automatic gate operation. Warning signs must be conspicuous.
- 8 Install operator inside fence line. DO NOT install operator on public side of fence line.
- 9 Secure gate operator cover.

STEP 3: AFTER INSTALLATION

-  1 Test all safety features.
- 2 Train end user about basic functions and safety features of gate system.
- 3 Leave Installation and Maintenance Manual and Safety Instructions with end user.





Safety Precautions for Open-Roller Gates and Ornamental “Grill Type” Gates



OPEN-ROLLER GATES

Injuries occur when people get their or feet caught between the top or bottom of the gate and the gate roller. This potential pinch-point should be guarded against at all times. Enclosed style gate tracks are available for refitting of these rollers from many fence suppliers. Also, roller guards are available for installing over the rollers.

One or more contact sensors shall be located at the leading edge, trailing edge, and post-mounted both inside and outside of a vehicular horizontal slide gate.

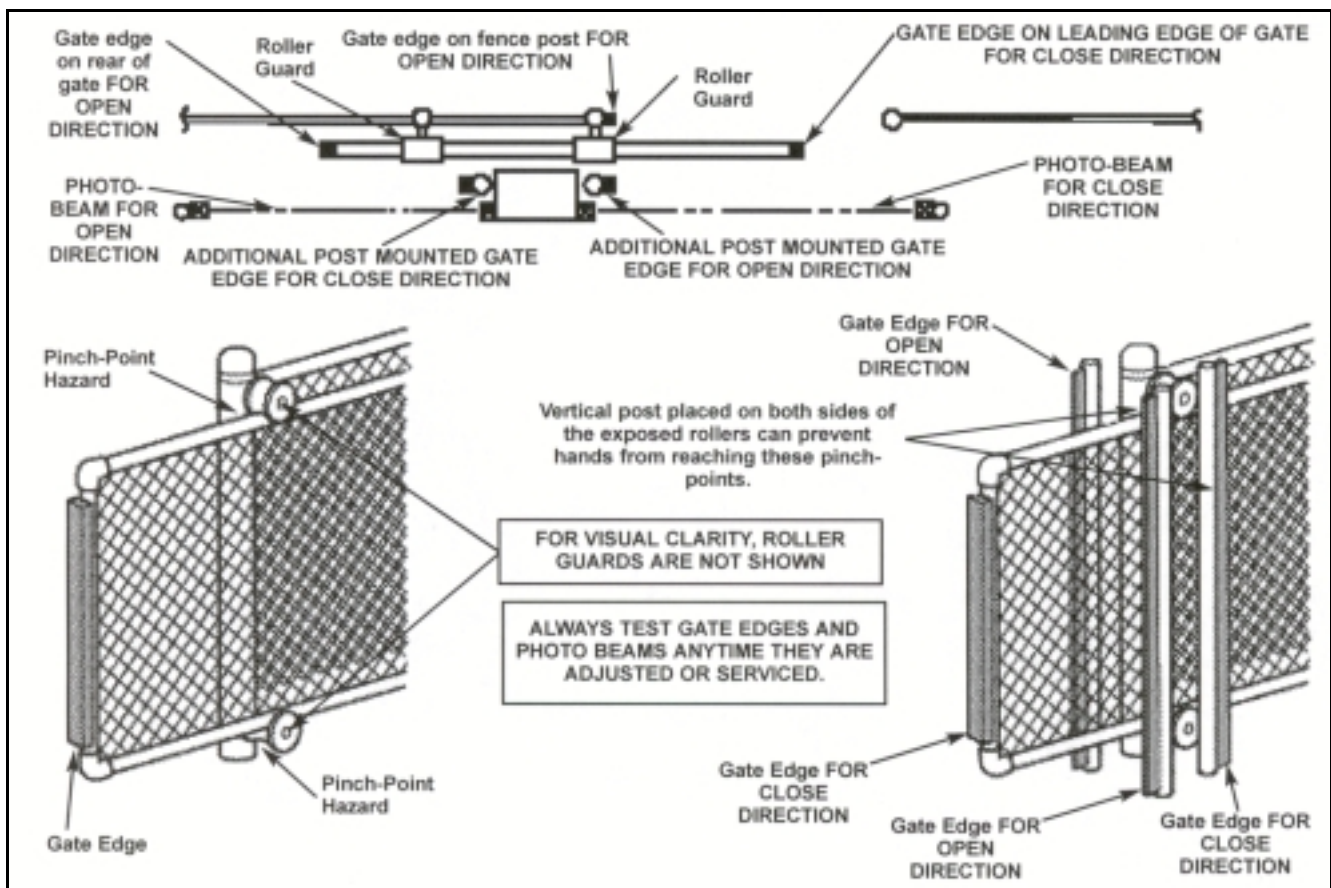
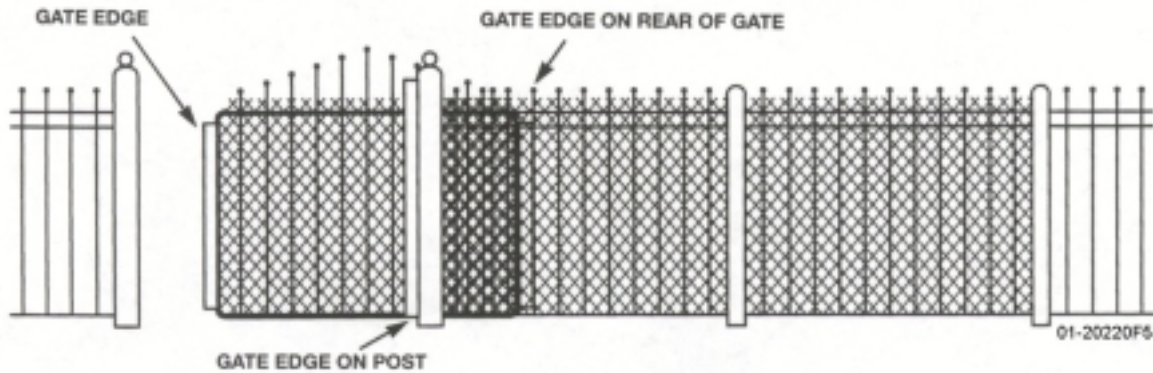


Figure 2

ORNAMENTAL “GRILL TYPE” GATES

Injuries occur when people put their hands and arms through openings in the grill and the gate is operated. They cannot retract their arms and it gets caught between the moving gate grill and the stationary fence post or fence. This potential hazard can be averted by placing a screen mesh on the gate to prevent access through openings anywhere the gate may travel.

**Figure 3**

Preparing the Installation

Pre-installation Check List

- ✓ Check the gate. It **MUST** operate smoothly and freely. If necessary, lubricate, adjust or repair the gate prior to operator installation. The gate **MUST** be level and plumb.
- ✓ Some gates may only be as wide as the gate opening. They may require a backframe to be constructed to allow for chain attachments. See Figure 4.
- ✓ Double check the size and weight of the gate to make sure that this operator is proper for this application.
- ✓ If wiring has already been installed, check to make sure it meets the following specifications and requirements.

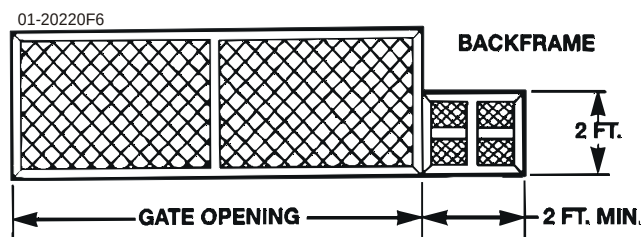


Figure 4

Wiring Specifications

- A. The distances shown are measured in feet from the operator to the power source.
- B. These calculations are based on the National Electrical Code and allows for a 5% voltage drop.
- C. Supply voltage must be within 10% of the operator's rating under load conditions.
- D. These calculations are based on stranded copper wire.
- E. It is highly recommended that only 90% of the distances shown be used; this will allow for a 10% safety factor.
- F. For dual units, the distance shown should be cut in half.
- G. When wire larger than 12 gauge is used, a separate junction box will be required for operator power connections. Not supplied.
- H. All local codes must be strictly adhered to.
- I. Do not run control wires in the same conduit with power wires.
- J. Do not run or parallel conductor cable for controls.

POWER WIRING		CONTROL WIRING	
Single Phase – 120 Vac. – 60 HZ.			
One Way Distance	Wire Gauge	One Way Distance	Wire Gauge
90 ft.	16	800 ft.	18
145ft.	14	1200 ft.	16
225 ft.	12	2000 ft.	14
360 ft.	10		
602 ft.	8		

Table 3

**DO NOT RUN OPERATOR UNTIL INSTRUCTED!
OPERATOR MUST BE PROGRAMMED BEFORE OPERATION.**

Operator Features

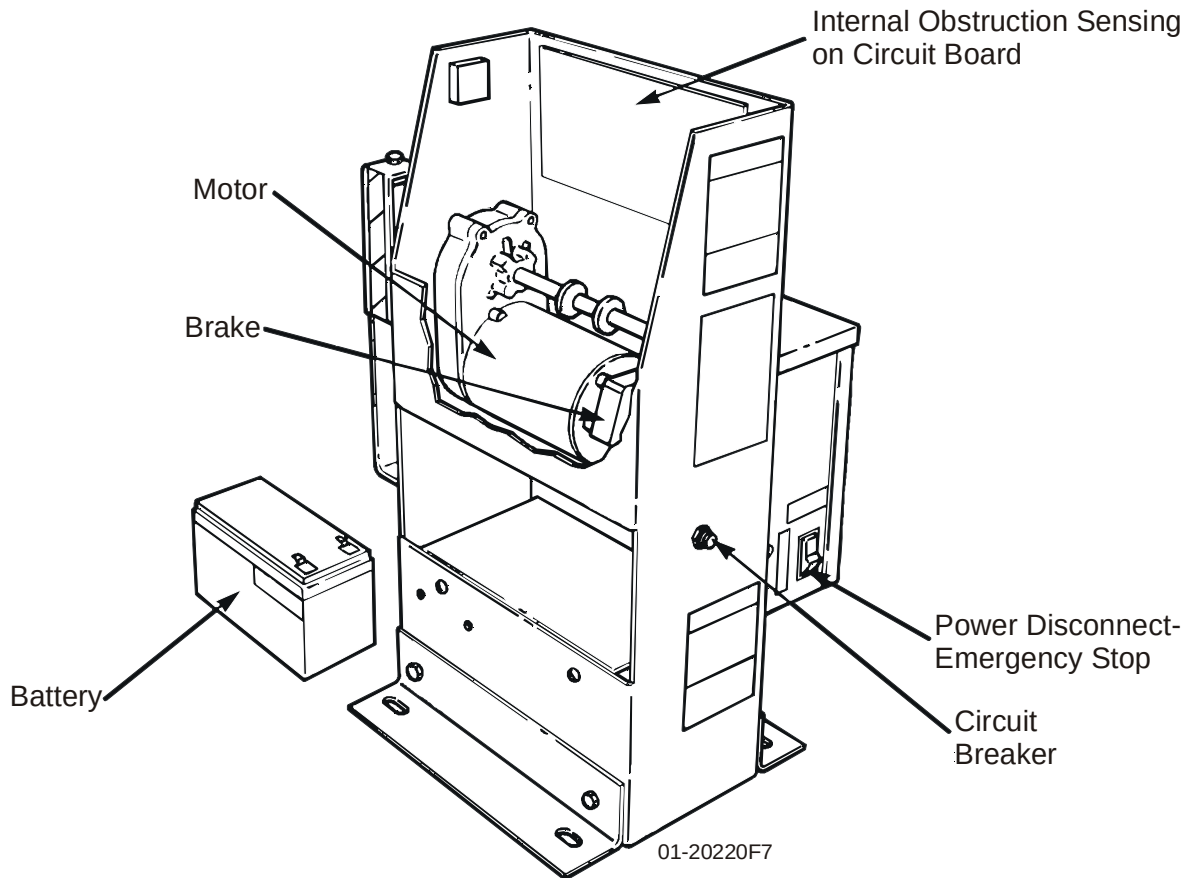


Figure 5

BATTERY BACK-UP

Should there be a power failure, the model SL500-11 will automatically switch over to battery back up to run the gate. If battery is fully charged, it should be able to run a standard size gate many complete cycles, (cycle = one full open and one full close). The number may vary depending on idle time and weather conditions.

Battery specifications – Type = Sealed lead acid. Amp hours = 6.5 Max. charging volt. = 13.7 BATTERY PRECAUTIONS:

- NEVER place battery near or in fire.
- NEVER short the terminals.
- NEVER disassemble the battery.
- If dilute sulfuric acid contacts skin or clothes, wash immediately with water and contact a doctor.



INTERNAL OBSTRUCTION SENSING

Built-in motor current monitor. Will automatically “Learn” the current that the motor is using to open and close the gate. During gate operation, should the current rise above the learned setting (because of gate obstruction), the model SL500-11 will react. See program settings for more details.



POWER DISCONNECT SWITCH/EMERGENCY STOP

This switch will turn power (120 vac.) off at the operator. Will also act as an emergency stop. When turned off, the operator will immediately stop if it was running.

SPRING APPLIED, ELECTRICALLY RELEASED BRAKE

The purpose of the brake is to minimize overtravel caused by gate coasting. An added feature of the brake is to assist in preventing backdriving of the gate. The brake is spring applied whenever the motor is not running. Anytime the motor is running, 12 v.d.c. is sent to the brake to electrically release it.

MOTOR (12 V.D.C. / 150 WATTS)

The motor used in the model SL500-11 is a PMDC (permanent magnet direct current) gearmotor. The nominal characteristics of the motor are – 1/8 horsepower, 19:1 gear ratio (with all steel gears), no load r.p.m. = 111, full load r.p.m. = 75, no load amps = 2.2, full load amps = 12.4, full load torque = 75 lb. in., starting torque = 90 lb. in., and it is rated for intermediate duty.

CIRCUIT BREAKER

15 amp. circuit breaker, with manual reset. Protects the secondary circuit (d.c. side) of the operator.



NOTE: If the power disconnect/emergency stop switch is turned off while the unit is operating from the batter, and then turned back on, the unit will NOT work. It will only work when 120 volts are re-applied.



MAXIMUM RUN SHUT OFF CIRCUIT

This is a self learning circuit. It will take the average amount of time between the opening cycle and the closing cycle and add 5 seconds to it. If this time should be reached during operation, then this circuit will shut of the operator.

REVERSAL DELALY CIRCUIT

Will not allow the operator to instantly reverse the gate, there will be a 1-1/2 second delay prior to operator reversing direction.



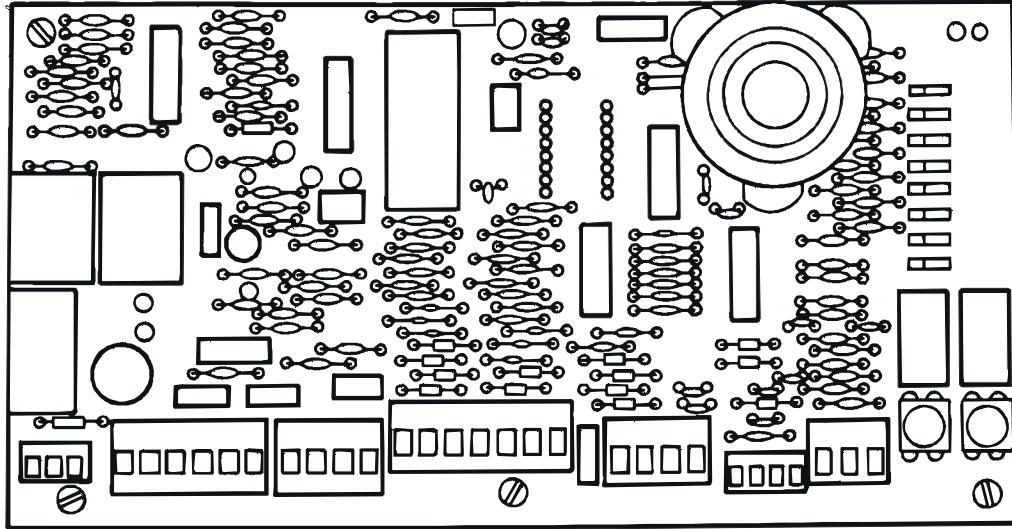
AUDIBLE WARNING

Built in sounder will activate four seconds prior to and during gate movement. Sound level is adjustable.

DIGITAL MICROPROCESSOR CONTROL BOARD

This circuit board contains all the logic, inputs and outputs for the system. It contains all the L.E.D.'s the programming button and displays. All input and output

wire connections are made to it. It is protected from voltage spikes and surges by a “State-of –the-art” voltage clamping circuitry (See Figure 6).



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Figure 6

MID OPEN CIRCUIT

When a control device is wired into this circuit, it will open the gate to position slightly greater than $\frac{1}{2}$ way from the full closed position or if gate is less than $\frac{1}{2}$ open. If the gate should be more than $\frac{1}{2}$ way open, then the control device will open the gate to the full open position. If the time delay to close is enabled, the operator will automatically close from the “mid-open” position.

VEHICLE REVERSE CIRCUIT

If this circuit is energized while gate is closing, gate will stop and reverse to full open position. If energized while gate is at full open or stopped between limits, it will not allow the gate to be closed.

VEHICLE OPEN CIRCUIT

A device connected to this circuit will only open the gate. If gate is closing, it will cause the gate to stop and reverse to the full open position.



EXTERNAL WARNING CIRCUIT

An external signaling system can be connected to this circuit that will activate anytime the sounder in the operator is active, (4 seconds prior to and during gate movement).

THREE BUTTON CONTROL CIRCUIT

Sequence of operation is, open/stop/close. Stop will override all other functions. If closing, open will cause operator to stop and reverse to full open. If opening, close will cause operator to stop and reverse to full open. If opening, close will cause operator to stop and reverse to full close position.

ONE BUTTON CONTROL CIRCUIT

Sequence of operation is – open, stop, close, stop. If power has been interrupted, will always open with first activation.

Programmable Features

PROG.1

(R.H./L.H.): Will automatically set up motor rotation, limit switch functions and directional logic for the operator.

PROG. 2

(MASTER/SLAVE): Will set up two (2) operators to act as one, using common controls.



PROG. 3

(CURRENT SENSOR): This program will set the current sensor for different sensitivities of obstruction force required to make the system react.



PROG. 4

(OBSTRUCTION SENSING CLOSE): Will determine the response the operator will make when the gate meets an obstruction while closing.



PROG. 5

(OBSTRUCTION SENSING OPEN): Will determine the response the operator will make when the gate meets an obstruction while opening.



PROG. 6

(EXTERNAL REVERSE DEVICE): Will program the system to accept either a normally open or normally closed contact type external obstruction sensing device.

PROG. 7 & 8

(TIME DELAY TO CLOSE): These two independent programs will allow the gate to automatically close from the full open or mid open position after a programmed amount of time.

PROG. 9

(GATE LOCK): This program will allow the use of different types of gate locks to be used with the system.

Led Descriptions

Color	Name	Description
Green	Program	"On when in program mode, "OFF" when in operational mode
Red	External Reverse	"ON" when an external reverse device was activated, "OFF" with next input
Red	Maximum Run	"ON" when maximum run circuit shut operator off, "OFF" with next input
Red	Current Sensor	"ON" when current sensor circuit caused an operator reaction, "OFF" with next input
Red	Right Hand/Left Hand	"ON" when operator is programmed R.H., "OFF" when operator is programmed L.H., "BLINKS" when operator has not been programmed for either
Red	Gate Closing	"ON" anytime sounder is activated prior to and during closing
Red	Gate Closing	"ON" anytime sounder is activated prior to and during opening
Red	Power	"ON" when operator electrical power is on. "OFF" when the operator has no power. "BLINKS" when the control voltage of the operator drops below 10.5 VAC. See not below.

Table 4



NOTE:

PROGRAM 2 (MASTER/SLAVE)

When setting up a master/slave system, both operators **MUST** be programmed independently.

IMPORTANT: The following is for a standard master/slave system.

IMPORTANT: The following is for a standard master/slave system.

- **Program 1:** One operator will be set to #1 the other will be set to #2.
- **Program 2:** One operator will be set to #1 the other will be set to #2.
- **Program 3:** Set each operator as required.
- **Program 4 through 9:** Both operators will have the same settings..



NOTE: When the battery is fully charged, the red power L.E.D. will "flicker".

Installation

Please note that there are two basic types of power unit mounting shown here. Mounting, using the operators two mounting legs on a concrete pad or pedestal post mounting (pedestal post is an optional item). The installation shown here is for right hand units (when looking outside, unit is right side). For left hand units everything is the same, just opposite.

If there is existing concrete at the area of power unit mounting, use dimensioning procedure called out. It is suggested that $\frac{1}{2}$ " threaded anchors (not supplied), be used to secure the unit. If needed, shim the unit to **ensure that it is level and parallel with the gate!**

Step 1: Mounting Legs

- 1 Layout concrete pad as detailed. *See Figure 7.*
- 2 Locate electrical conduit, as required, prior to pouring concrete.
- 3 Pour concrete, ensuring that pad is level and above the ground line.
- 4 Locate four (4) $\frac{1}{2}$ " threaded anchors (not supplied) as detailed. **IMPORTANT:** Anchors must be positioned accurately and secure in concrete.
- 5 Allow concrete to set for at least two days before installing power unit.

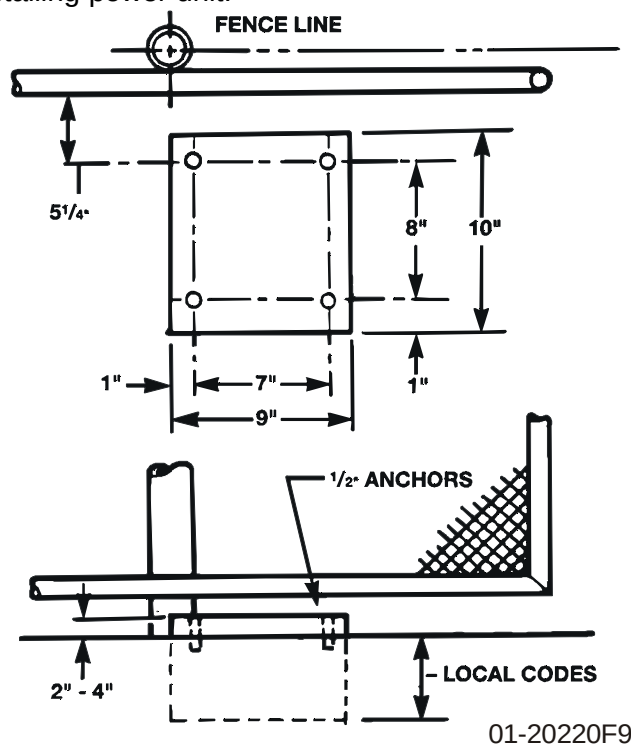


Figure 7: Typical Mounting

Step 2: Pedestal Post (Optional)

- 1 Layout concrete pad as detailed.
- 2 Locate electrical conduit, as required, prior to pouring concrete.
- 3 Pour concrete, ensuring that pad is level and above the ground line.
- 4 Locate four (4) ½" threaded anchors (not supplied) as detailed.
- 5 Allow concrete to set at least two days before installing pedestal post and power unit.

See Figure 8.

IMPORTANT: Anchors must be positioned accurately and secure in concrete.

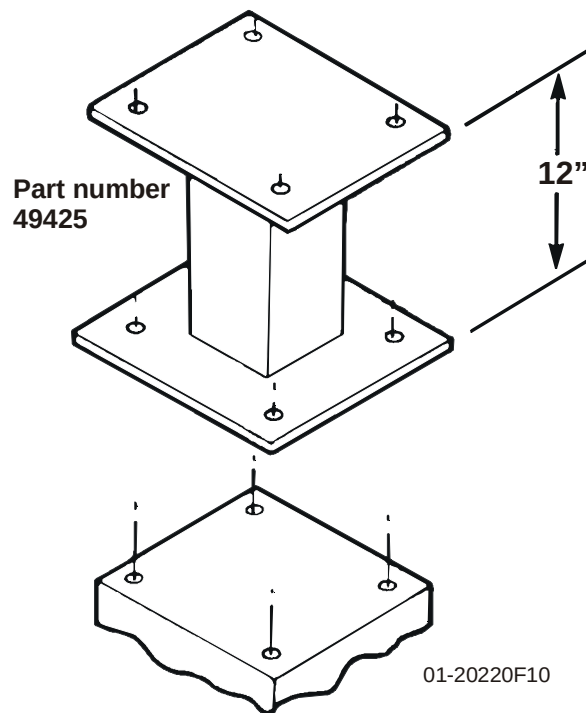


Figure 8: Pedestal Post (Optional)



NOTE

Figure 7 and Figure 8 display two possible ways of mounting the unit; there are others which you may prefer. **IMPORTANT:** It is extremely important that you double check the distance from the mounting leg to the lowest chain point.

You **must** insure that the gate itself is low enough at the bottom to reach this chain dimension.

Step 3: Mounting

STEP 3A: MOUNTING TO PAD

Carefully secure the power unit to the concrete pad with the drive and idler sprockets facing the gate. It is **very important** that the unit is level and parallel to the gate.

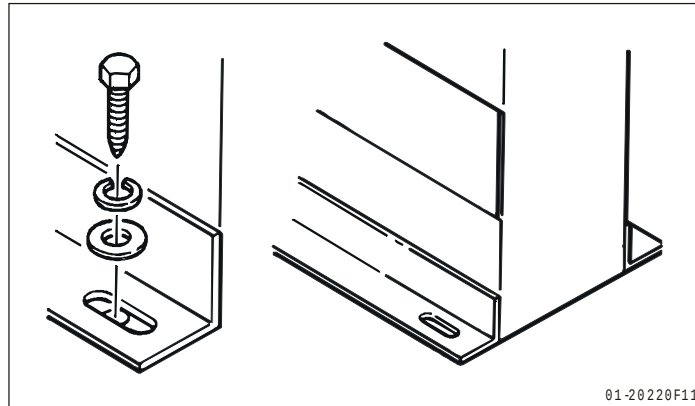


Figure 9

STEP 3B: MOUNTING TO POST

Carefully secure the power unit to the pedestal with the drive and idler sprocket facing the gate. It is **very important** that the unit is level and parallel to the gate.

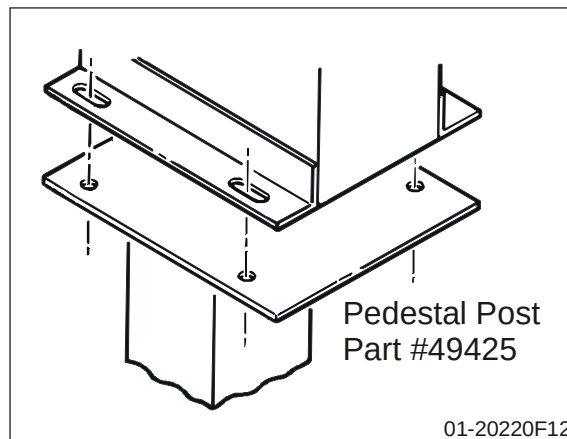


Figure 10

Step 4: Gate Brackets

Secure gate bracket to the vertical front and rear posts of the gate.



NOTE

If a back frame was added, then secure rear gate bracket to the back frame.

IMPORTANT: The large slotted holes in gate brackets **must** be level with the top of the drive sprocket and with the bottom of the idler sprocket. Slide the gate to the full open and full closed positions to check alignments.

Step 5: Drive Chain

Before proceeding, it is suggested that the gate be positioned at the half way point.

- 1 Using a master link assembly, connect one of the threaded eye bolts to each end of the drive chain. Then attach this eyebolt to one of the gate brackets. *See Figure 11.*
- 2 Thread chain around drive and idler sprockets.
- 3 If required, cut chain to proper length, then attach the remaining eyebolt to the chain.

Attach this eyebolt to the remaining gate bracket and take out the chain slack, using both eyebolts evenly. The suggested amount of chain slack is no more than 1 inch of slack for every 10 feet of chain length. **Do not over-tighten chain!**

- 4 Double check alignments of chain and brackets. It is suggested that after chain is installed and adjusted, the gate brackets be welded to the gate.

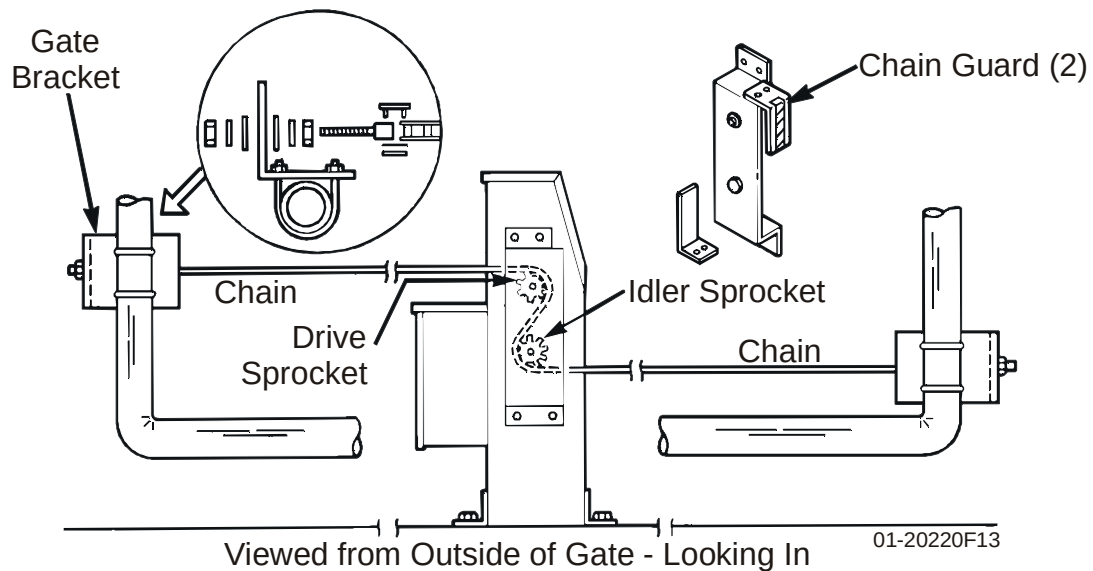


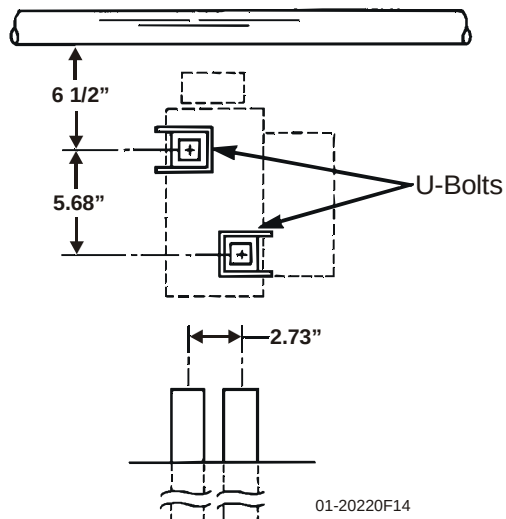
Figure 11

Step 6: Chain Guards

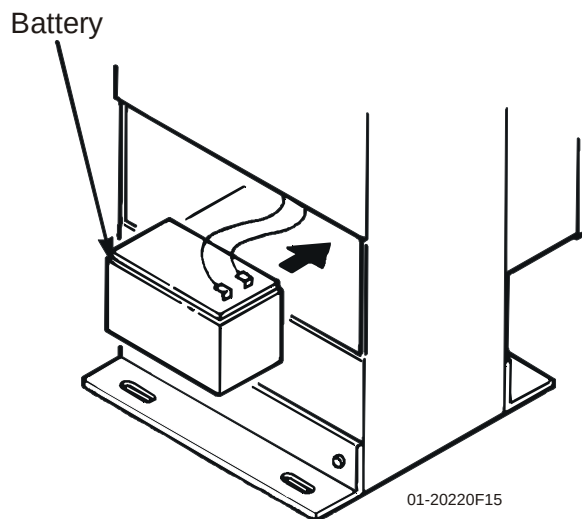
Using $\frac{1}{4}$ " bolts and lock washers, attach both chain guards to the sprocket shield (see Figure 11).

OPTIONAL POST MOUNTING

If necessary, the model SL500-11 can be post mounted. Requirements are (2) two 2" x 2" posts and mounting hardware. You will need to remove the battery bracket and the tow mounting legs to install the posts and u-bolts. After installing, replace batter bracket.

**Figure 12****Step 7: Battery Install**

Locate the two battery wires and connect them to the battery. **IMPORTANT:** The red wire **MUST** go to the (+) positive terminal and black wire **MUST** go to the (-) negative terminal. Install battery into unit.

**Figure 13**

NOTE: It is highly suggested that the battery be charged before using operator. Due to stocking inventory, installation date and weather conditions, we cannot guarantee that the battery will be completely charged.

Step 8: Electrical Power Connections

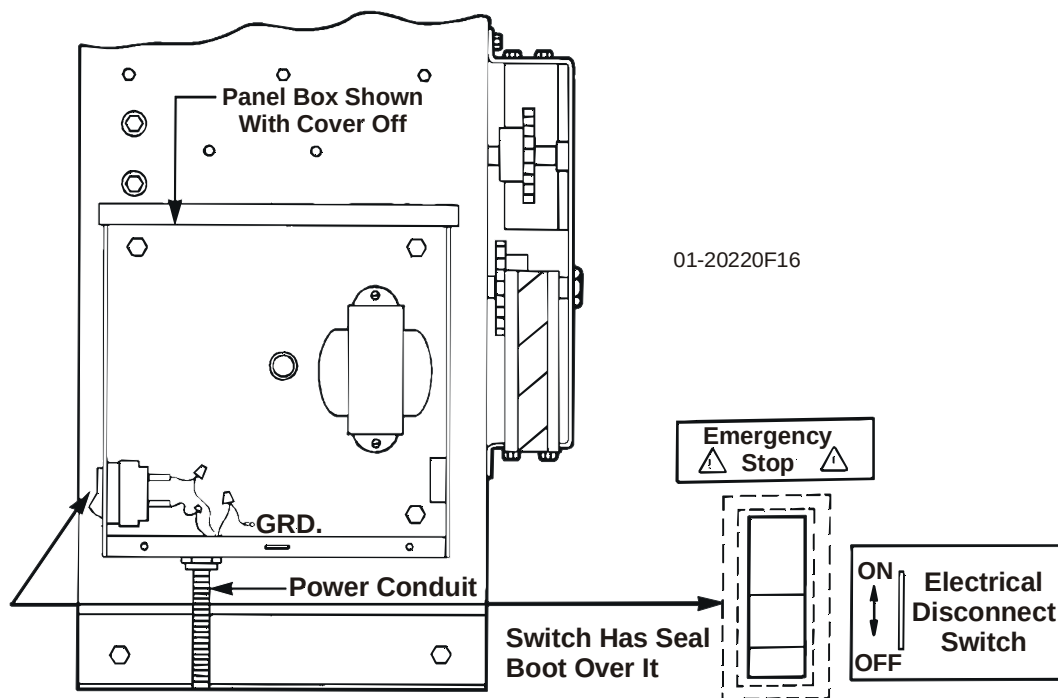


Figure 14



CAUTION

Make sure power is disconnected at the main power source and at the operator's electrical disconnect switch before proceeding!

Secure the electrical power connection inside panel box. Use electrical diagram supplied with operator. The 120 vac., single phase, 60 hz. will have – L1 (neutral), L2 (hot) and a ground lead.



The disconnect switch can also be used as an emergency stop switch, if needed. By turning this switch “OFF”, the gate and operator will stop if they are opening or closing.

Step 9: Programming

This gate controller has (9) nine programmable options which must be set prior to gate operation. To program the controller, press and hold the "FUNCTION" select pushbutton for 2 seconds. When the board enters the program mode, the green program LED will turn on and the two display panels will become active.

When the controller enters the program mode and the program LED turns on, the "FUNCTION" display panel will display "0" (zero) and the "OPTION" display panel will display "0" (zero). To exit the program mode, at any time, press and hold the "FUNCTION" select pushbutton for 2 seconds. The program LED will turn off, indicating that you are out of the program mode. The board will reset as if first powered on.

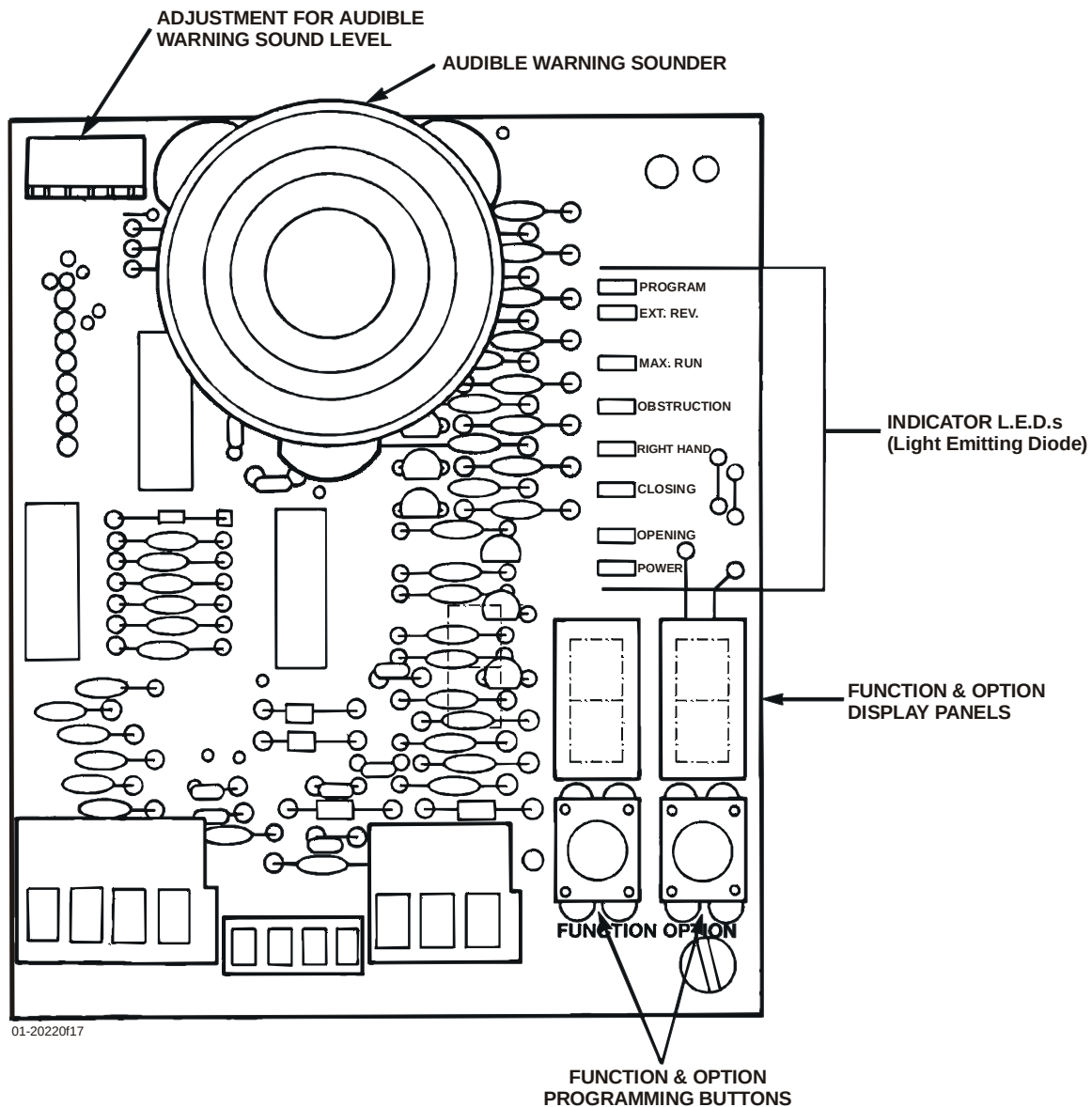


Figure 15

PROGRAM 1 – RIGHT HAND/LEFT HAND OPERATION

Program 1 determines whether the operator is “right handed” or “left handed”. To determine which type your gate controller needs to be set to, observe the installation from the operator side of the gate.

0 = NOT SELECTED – OPERATOR WILL NOT FUNCTION IN THIS MODE

1 = RIGHT HANDED – OPERATOR WILL MOVE GATE FROM LEFT TO RIGHT TO OPEN

2 = LEFT HANDED – OPERATOR WILL MOVE GATE FROM RIGHT TO LEFT TO OPEN

 If the operator is on the right side of the opening, the operator is “right handed”.

 If the operator is on the left side of the opening, it is “left handed”.

- 1 Press the FUNCTION select button to set the function to “1”. *The option display will show a “0”, “1” or “2”.*
 Option “0” is the factory setting and does not allow gate movement. *This option must be changed to either a “1” for right hand or “2” for left hand.*
- 2 Pressing the “OPTION” button will change the option between “1” and “2”.
 When the correct option for your application is indicated, press the “FUNCTION” select button to save this selected option and to step to the next program.

PROGRAM 2 – MASTER/SLAVE OPERATION

Program 2 selects whether the installation is a single operator or dual operators with common controls.

0 = SINGLE GATE OPERATOR INSTALLATION

1 = MASTER GATE OPERATOR

2 = SLAVE GATE OPERATOR

- 1 If the “FUNCTION” display shows “2”, proceed on as follows. *If it does not show “2” then press the “FUNCTION” select button to set the display to “2”.*
- 2 The “OPTION” display will indicate a “0”, “1” or “2”. The “0” option is the factory setting and is for single operator gates. *The “0” option can be changed to “1” or “2” for dual gate operators.*
- 3 Press the “OPTION” select button to change the option between “0”, “1” or “2”, where option “1” is for master operation.

IMPORTANT: Once all programming is completed for the master operator, you must then program all features for the slave operator. All nine (9) programs should be the same except for – Program 1 (R.H./L.H.). In most cases one unit will be right handed and the other will be left hand. Program 3 (Gate obstruction sensitivity). In some cases the two gates will require different settings.



NOTE – MASTER/SLAVE OPERATION: The two operators must have the 3 interconnection wires in place between the two operators for the master/slave system to work. Reference the wiring diagram supplied with units.



PROGRAM 3 – GATE OBSTRUCTION SENSITIVITY SELECT

Program 3 selects the force required to make the internal speed sensor react.

0 = MINIMUM FORCE SETTING

1 = MODERATE FORCE SETTING

2 = MEDIUM FORCE SETTING

3 = MAXIMUM FORCE SETTING

- 1 If the “FUNCTION” display shows “3”, proceed on as follows.
The “OPTION” display indicates a “0”, “1”, “2” or “3”. The “0” option is the factory setting.
- 2 Press the “OPTION” select button to change this setting to either “1”, “2” or “3”.
Option “0” is the most sensitive setting. It will only take a small amount of force to make the sensor react.
Option “3” is the least sensitive setting, in this setting. It will take the most force at the gate to make the sensor react.

If it does not show “3” then press the “FUNCTION” select button to set the display to “3”.

IMPORTANT: Always select the lowest option number that will function properly with your gate application.



NOTE: After you have completed all programming and are testing out the system, you may have to come back to this program and make some refinements for proper gate operation. Press the “FUNCTION” select button to save this selected option and to step to the next program.



PROGRAM 4 – REVERSE WHEN CLOSING

Program 4 determines the response of the gate operator to an obstruction from either the internal sensor or an external obstruction signal while closing.

0 = REVERSE FOR 2 SECONDS THEN STOP

1 = REVERSE TO FULL OPEN POSITION

With “FUNCTION” display showing “4”, press the “OPTION” select button to select either “0” or “1”. The factory setting is “1”.

PROGRAM 5 - REVERSE WHEN OPENING

Program 5 determines the response of the gate operator to an obstruction from either the internal sensor or the external obstruction circuit, (#6 on wiring diagram), while opening.

0 = REVERSE FOR 2 SECONDS THEN STOP

1 = STOP

With "FUNCTION" display showing "5", press the "OPTION" select button to choose either "0" or "1". The factory setting is "1".

IMPORTANT: Programs 4 and 5 are only for the internal sensor and for the external obstruction device (adaption #6 on wiring diagram). Note that adaption #5, shown on wiring diagram (vehicle reverse device), will always stop and reverse a closing gate to the full open position. Adaption # 7 will only react in the closing direction.



PROGRAM 6 – EXTERNAL REVERSE DEVICE SELECT

This program determines which polarity of signal on the external obstruction device will cause the gate operator to react.

0 = EXTERNAL REVERSE DEVICE WITH NORMALLY CLOSED CONTACTS

1 = EXTERNAL REVERSE DEVICE WITH NORMALLY OPEN CONTACTS

If a device with normally open contacts is used, then this option should be set to "1". If a device with normally closed contacts then this option should be set to "0". The factory setting is "1".

When the correct option is displayed, press the "FUNCTION" select button to save the choice and to step to the next program.

PROGRAM 7 – TIME DELAY TO CLOSE ENABLE/DISABLE

This program enables or disables the automatic time delay to close option.

0 = TIME DELAY TO CLOSE "OFF"

1 = TIME DELAY TO CLOSE "ON"

When the correct option is displayed, press the "FUNCTION" select button to save the choice and to step to the next program.



NOTE: If the timer to close option is set to disable, you will not need to do program 8. By pressing the "FUNCTION" select button twice you will go to program 9.

PROGRAM 8 – TIME DELAY TO CLOSE “TIME”

This program sets the time from when the gate is fully open to the time when it will automatically begin to close.

- 0 = 2 seconds*
- 1 = 15 seconds*
- 2 = 30 seconds*
- 3 = 60 seconds (1min.)*
- 4 = 90 seconds (1- ½ min.)*
- 5 = 120 seconds (2 min.)*
- 6 = 180 seconds (3 min.)*
- 7 = 240 seconds (4 min.)*

- 1 By pressing the “OPTION” select button, choose the time that will be required for this gate application.
- 2 Once the selection has been made, press the “FUNCTION” select button to save this selection and to step to the next program.

PROGRAM 9 – GATE LOCK TYPE SELECT

If gate lock is to be used with the operator, this program determines the state of the built-in lock relay contacts and how they will turn on and off.

- 0 = LOCK OUTPUT NORMALLY “OFF”*
- 1 = LOCK OUTPUT NORMALLY “ON”*

By pressing the “OPTION select button, choose either option “0” or “1”.

Option “0” would normally be selected if you are using a solenoid activated type lock system. The built-in lock relay’s contacts will be open when gate is closed. They will close for one second before the gate begins to open, and open up two seconds after the gate has begun moving.

Option “1” would normally be selected if you are using a magnetic type lock system. The built-in lock relay’s contacts will be closed while the gate is closed. They will open up one second before the gate begins to open and remain open. With either selection the contacts will be closed when the gate begins to close.

**NOTE:**

For wiring information see electrical diagram supplied with operator. If no lock system is to be used, it does not matter which option is shown in the display.

This was the last programming option. To exit program mode, press and hold the “FUNCTION” select button for 2 seconds. The green program LED will turn off.

Step 10: Limit Switch Adjustments

IMPORTANT: Operator must be programmed before operation!

- 1 Remove operator top cover and locate limit switch assembly.
- 2 Attach activation device such as a three button station to control terminal strip.
- 3 With power on and gate at the mid way point, activate operator to open.

Reference wiring diagram or control wiring section further on in this manual.

Note direction of limit nuts.

After unit shuts off, press detent down and adjust open limit nut until full open position is obtained.

Repeat this procedure for the full close direction.

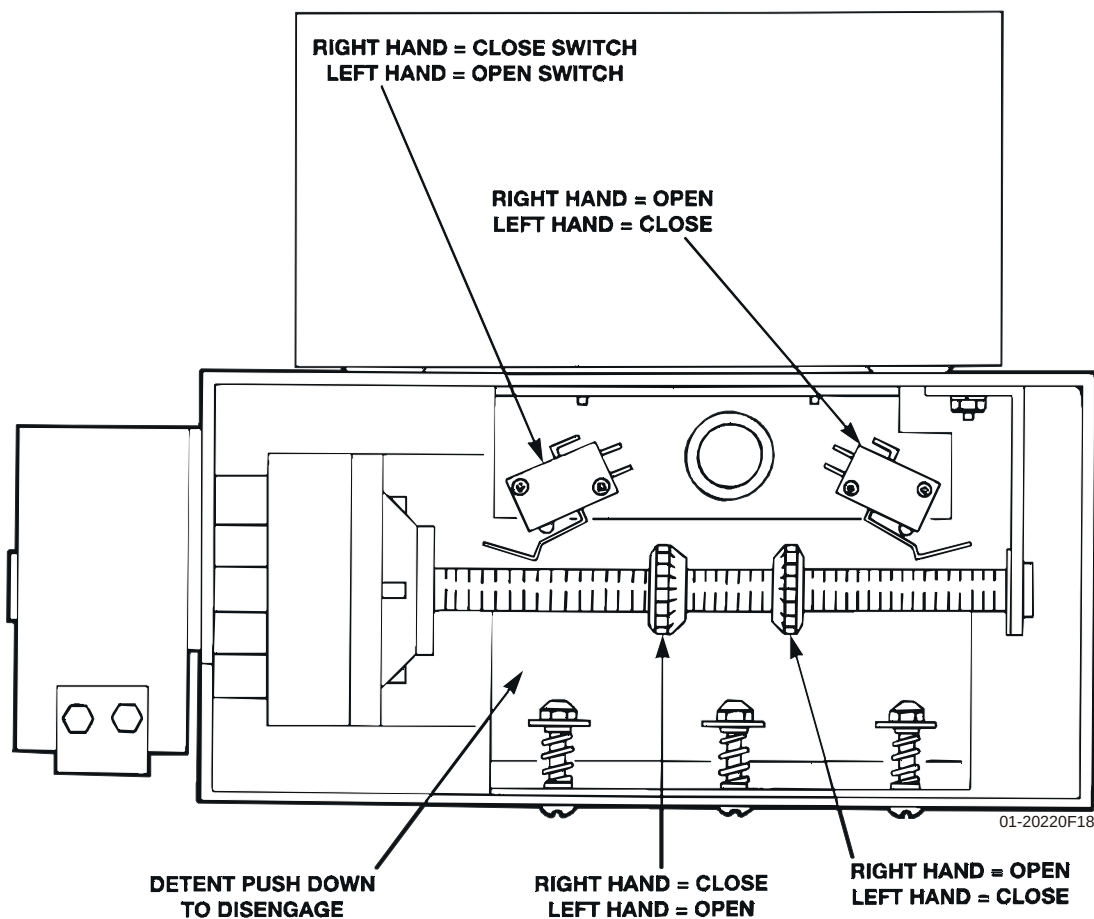


Figure 16

Step 11: Preliminary System Check-Out

Before adding any options, accessories or adaptations, it is highly recommended that you check out the system and its programs. If you have not already done so, ...

- ✓ Temporarily connect a 3 button station to the control terminal strip, see next page or wiring diagram supplied with operator.
- ✓ Test for proper open, stop and closing of gate.
- ✓ Test the internal sensor system.
- ✓ Test for proper operation of all programs that were programmed into the system.
- ✓ Once everything checks out okay, then proceed to adding on the accessory items for this job site.



NOTE: We recommend that, if more than one accessory item is used, after each one is attached check it for proper operation before adding the next.

Step 12: Accessory Installation

See Figure 17 for more information.

Refer to **Wiring Specifications** on p. 10 for wiring distance and wire gauge information.



WARNING

Make sure that the two (2) gate caution signs are secured to the gate: one on the inside and one on the outside. They must be easily visible. If exterior controls such as keyswitch, card reader or pushbutton station are to be incorporated into this system, make sure the controls are installed where the user cannot touch the gate while operating controls. Install the controls where the user has full view of gate operation.

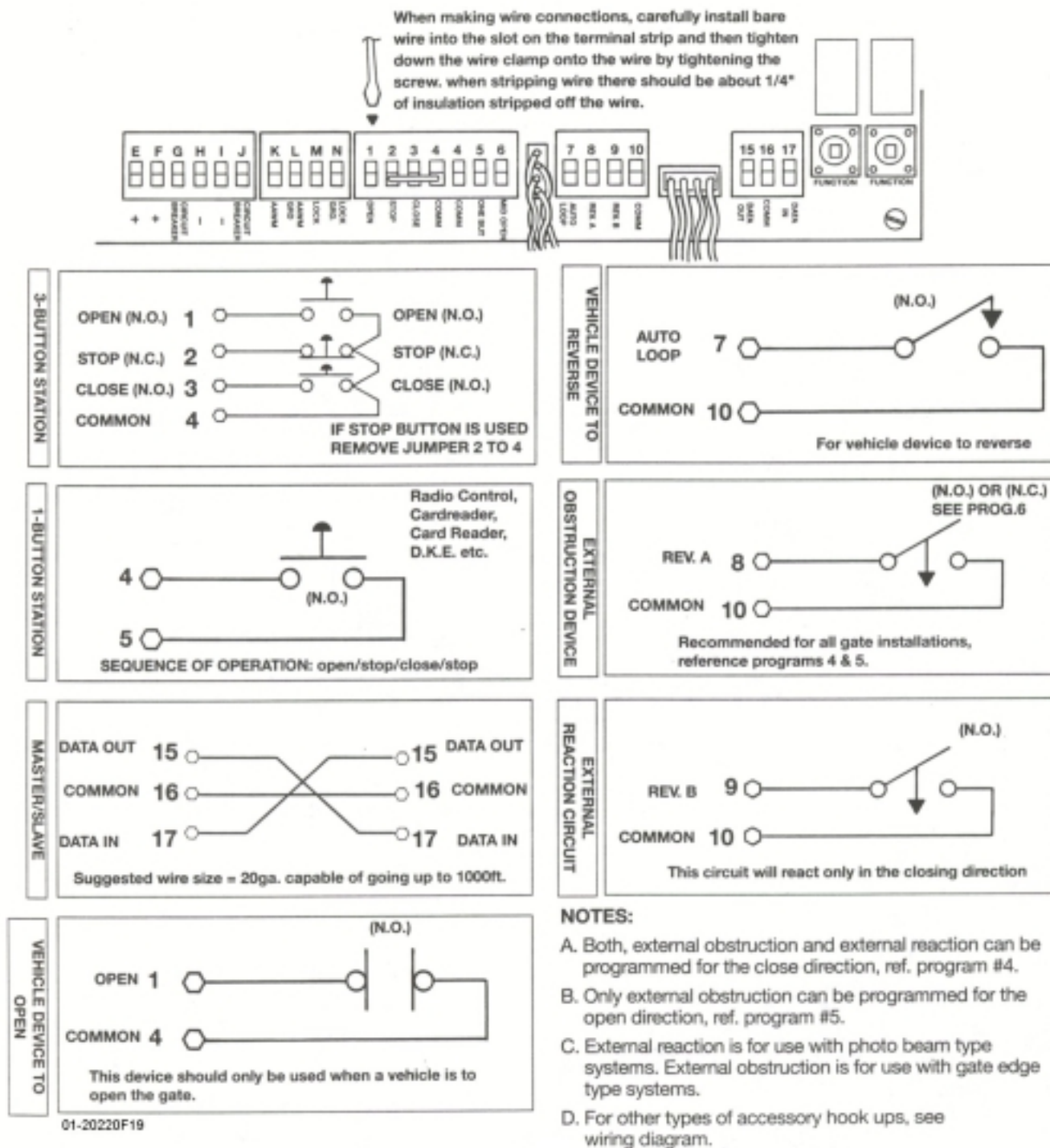


Figure 17

Required Maintenance

Normal Usage

		Check at least once every			
MONTH INTERVALS		1	3	6	12
   Complete Check Out	Internal sensor	Check for proper operation	✓		
	External safety systems	Check for proper operation	✓		
	Gate caution signs	Make sure they are present	✓		
	Brake system	Check for proper operation		✓	
	Drive chain (D) (E)	Check for excessive slack & lubricate			✓
	Drive sprockets	Check for set screw tightness			✓
	Battery back-up	Disconnect power and test battery		✓	
	Gate	Inspect for wear or damage			✓
	Accessories	Check all for proper operation			✓
	Electrical	Inspect all wire connections			✓
	Frame bolts	Check for tightness			✓
	Total unit	Inspect for wear or damage			

Table 5

NOTES



-  A. **CAUTION** - When servicing, always disconnect operator from electrical power supply.
- B. Severe or high cycle usage will require more frequent maintenance checks.
- C. Inspection and service should always be performed anytime a malfunction is observed or suspected.
- D. Limit switches may have to be reset after any major drive chain adjustments.
- E. If lubricating chain, use only a proper chain lube spray or a lightweight motor oil. Never use grease or silicone spray.
- F. When servicing, please do some “house cleaning” of the operator and the area around the operator. Pick up any debris in the area. Clean the operator if needed.
- G. It is suggested that while you are at the site, you take some voltage readings of the operator. Using a VOM, double check the incoming voltage to the operator to make sure it is within ten percent of the operator's rating.
- H. While you are at the site, now would be a good time to let the owner or manager know about any new items available or any safety items that could and should be added to the site.
- I. **IMPORTANT:** Please leave this manual at the job site, preferably with the end user or facility manager.

Troubleshooting

When troubleshooting, one of the first things to do is try to isolate the problem area. The four (4) main areas to check out are:

- [POWER](#)
- [ACCESSORIES](#)
- [PROGRAMMING](#)
- [OPERATOR](#)



1. Power

Always use extreme caution! Some possible symptoms of power problems include:

- ✓ The obvious one – the operator will not run.
- ✓ The operator runs slow.
- ✓ Circuit breakers or fuses keep tripping.
- ✓ Operator starts but then stops.

1A.

Using a V.O.M. take a voltage reading at the control transformer's primary terminals. You should get a reading as follows:

Nominal volt.	Min.	Max.
120v	108	132

If you get a reading that does not fall into the minimum/maximum area, then check out your main power supply. Check the wire run from the power supply to the operator. Double check the gauge of the wire versus the distance.

1B.

If the voltage reading is O.K. from 1 a, then take the same voltage reading with the operator running. If voltage drops below the minimum with this reading, then there could be an excessive current draw somewhere.

1C.

In some cases, power drops can occur at only specific times during the day or night. This can be caused by increased power demands in a general area at a specific time.

2. Accessories

Add-on accessories can create many of the problems that are credited to the operator. Many applications have more than one accessory item attached to the operator and some of these items even draw their power from the operator. So, before we start blaming the operator, let's take a look at all the add-on's first.

Some of the symptoms that can show up because of accessories include:

- ✓ The operator won't close.
- ✓ The operator won't open.
- ✓ The operator will not run.
- ✓ The operator begins to run then stops or reverses.

2A.

Whenever the problem is thought to be an accessory and there are more than one connected to the operator, always disconnect one accessory at a time and then test the system. This will hopefully isolate which item is causing the problem.

2B.

If an accessory item is being used as an access control device (used to open or close), fails in the closed position or sends out a continuous signal. The operator will hold the gate in one position until the signal from the accessory is removed.

2C.

In some applications, the gate may begin to move then either stop or stop and reverse within a couple of seconds. This can be caused by an external obstruction device that has failed.



3. Programs/Features

In many cases, unawareness of the programs and their functions can make it look like there is a problem when in actuality it is just missed or wrong program mode setting. Before you start tearing things apart, please review pages 8, 12, 13 & 14.

Always use the LE.D.'s that are on the circuit board. They will normally lead you to the particular area to check out.

3A.

PROGRAM 1 .R.HJLH.: If not programmed for either one, the operator will not work. Check LE.D.

3B.

PROGRAM 2- MASTER/SLAVE: If you have a single unit and have the program set for master, the operator will not work. It MUST be set to #0. When programming for master/slave, both operators MUST be programmed individually.

3C.

PROGRAM 3- CURRENT SENSOR: A damaged or poorly working gate can trip the sensor and cause what is called, "phantom reversal or stopping". Also, excessive wind loads can cause the sensor to react. Double check the sensor settings.

3D.

PROGRAMS 4 & 5- OBSTRUCTION REACTION SETTINGS: Please review these programs.

3E.

PROGRAMS 6- EXTERNAL REVERSE DEVICE: If this program is set the opposite from what the device is, the gate will not move.

3F.

PROGRAMS 7, 8 & 9: Please review these programs.

3G.

When in the program mode (green LE.D. on), the operator will not work.

3H.

The operator will automatically exit the program mode if no button (function or option) is pressed within five minutes.

3I.

MAXIMUM RUN SHUT OF CIRCUIT: This is a built in self learning circuit. It will automatically shut off the operator after the amount of time to open plus 5 seconds. LED will indicate activation.

3J.

Mid open circuit. If terminals #4 and #6 are activated, operator will only open to approximately the 1/2 way position.

4. Operator

4A.

The transformer is: 120 vac,. input /1 2vac. output / 100 Va. If the transformer is suspected, check for proper voltages.

4B.

If the motor sounds like it's running but the gate is not moving, there is a possibility that there is a broken gear tooth inside the gear box. To test for this, carefully while the motor is running, try pushing the gate. If it starts to move then there might be a broken tooth or two.

4C.

To check the brake. First take a V.O.M. reading at the terminals where the two brake leads are connected at the circuit board. You should get 12 vdc. there when the motor is running. If not, then the circuit board should be replaced. Second, with gate either opened or closed, try manually moving the gate. It should be very hard to move. If it is very easy to move then the brake has mostly likely failed and the entire gear motor should be replaced.

4D.

If unit will not run, double check the circuit breaker on side of operator. Push button on circuit breaker.

4E.

If unit does not run from the battery. First check the battery for voltage and current. Second, remove the two wires from the battery and using V.O.M. take a voltage reading from the two wires. When 120 vac. is active you should see 12 vdc. at these two wires.

4F.

The two limit switches used are S.RD.T. (single pole double throw). Each has two wires attached to it, one on the common and one on the normally open side (N.O.). The limit switch designations are LS-1 and LS-2. LS-1 is the open switch when the operator is programmed for "right hand" and LS-2 is the closed switch. The two switches are opposite when the unit is programmed for "left hand".

4G.

If a three button station or a normally closed (N.C.) stop button is not used, there MUST be a jumper placed between terminals #2 and #4 (stop & common). If a three button station or stop button is used, then this jumper MUST be removed. If wire is not there when it should be, the operator will not work. If it is there when it should not be, the operator will not stop when the stop button is pressed.

4H.

ALWAYS double check the wire connections at the terminal strips. Make sure that the wire itself, not the insulation of the wire is being clamped down on. Also check for a loose wire connection.

General Reference Information

THE GATE

Double check the gate and its related hardware. Does the gate move freely? If it does not, this can and will affect the unit's internal obstruction sensor.

WIRING DIAGRAM

Always reference the wiring diagram for this operator. Note that some accessory items may have their own wiring diagram.

COMPONENT DESCRIPTIONS

- A. GEAR MOTOR WITH BRAKE -12 v.d.c. permanent magnet, rated horsepower 1/8, no load r.p.m. = 111, no load amps = 2.2, full load r.p.m. = 75, full load amps = 12.4, gearbox ratio = 19 to 1, duty cycle = intermittent, brake is spring activated 12 v.d.c. to release.
- B. POWER DISCONNECT SWITCH - Rocker style, triple pole single throw (T.P.S.T.), contact ratings = 15 amp. © 125 v.a.c./10 amp. ©
- C. TRANSFORMER - Primary voltage = 120 v.a.c., secondary voltage ~ = 12 v.a.c., 100 v.a., class B insulation, built in thermal overload.
- D. LIMIT SWITCH - Single pole double throw (S.R.D.T.), 15 amp. @250 vac.
- E. CIRCUIT BREAKER - 15 amp. © 125 v.a.c./50 v.d.c. with manual reset.
- F. BRIDGE RECTIFIER - Full wave, 12 v.a.c. to 12 v.d.c., reverse voltage = 50 volt. mm., rectified current = 25 amp. mm.
- G. BATTERY - Type = sealed lead acid, amp. hour = 6.5, maximum charging volts = 13.7, battery storage info = 6 months c~ 68 degrees F = 80% voltage, 12 months © 68 c~rees F = 63% voltage. Amp hours = Battery will supply 1 amp, for 6 1/2 hours, or 1/2 amp. for 13 hours, etc.



NOTE

No attempt at service or repair should be made on the battery!

Warranty

LIMITED ONE-YEAR WARRANTY

LiftMaster gate operators are warranted against deficiencies in material and workmanship for a period of one (1) year from date of purchase, providing recommended installation, and maintenance procedures are followed. This warranty is in lieu of all other warranties expressed or implied (some states do not allow limitations on how long an Implied warranty lasts, so this limitation may not apply to you) and shall be considered void if damage was due to improper installation or use, connection to improper power source, or if damage was caused by fire, flood or lightning. The manufacturer will not be responsible for any labor charges incurred in the removal or replacement of deficient parts.

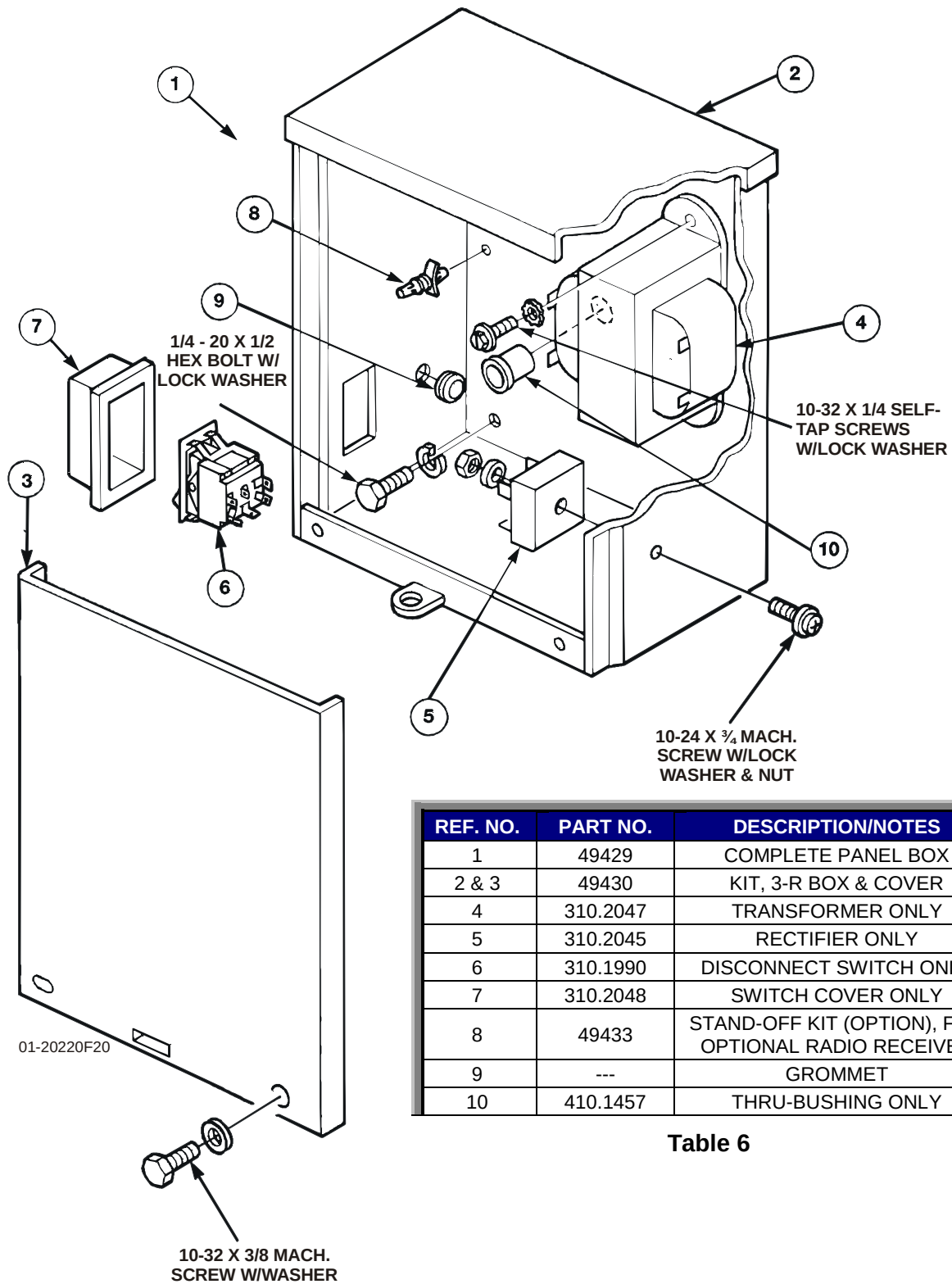
In case of failure due to deficiencies in material or workmanship during the warranty period, the complete gate operator will be repaired or replaced at the manufacturers option. New or factory rebuilt replacements will be used. Replacement parts are warranted for the remaining portion of the original warrant period. LiftMaster will pay freight on our return of repaired or replaced items in warranty.

This warranty give you specific rights, and you may also have other rights which vary from state to state.

FCC Radio Usage Limitations

CAUTION: The gate operator and all accessory equipment has been designed to Federal Communications Standards for part 15 radio devices. Operation of this device is subject to the following conditions: (1) This device may not cause harmful interference; (2) This device must accept any interference that may be received, including interference that may cause undesired operation; (3) Changes or modifications not expressly approved by LiftMaster could void the authority of users to operate this equipment.

Parts List



REF. NO.	PART NO.	DESCRIPTION/NOTES
1	49429	COMPLETE PANEL BOX
2 & 3	49430	KIT, 3-R BOX & COVER
4	310.2047	TRANSFORMER ONLY
5	310.2045	RECTIFIER ONLY
6	310.1990	DISCONNECT SWITCH ONLY
7	310.2048	SWITCH COVER ONLY
8	49433	STAND-OFF KIT (OPTION), FOR OPTIONAL RADIO RECEIVER
9	---	GROMMET
10	410.1457	THRU-BUSHING ONLY

Table 6

Figure 18

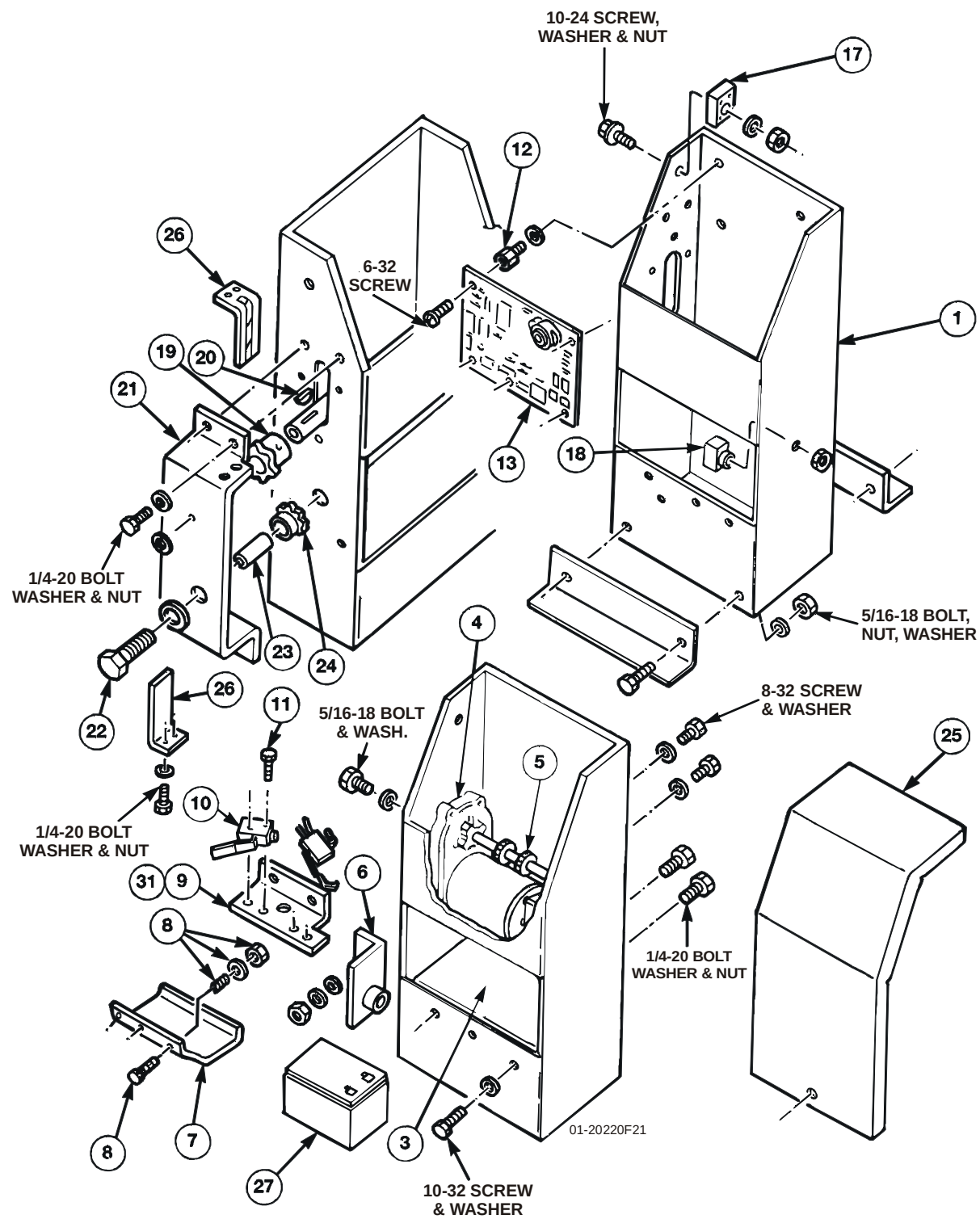


Figure 19

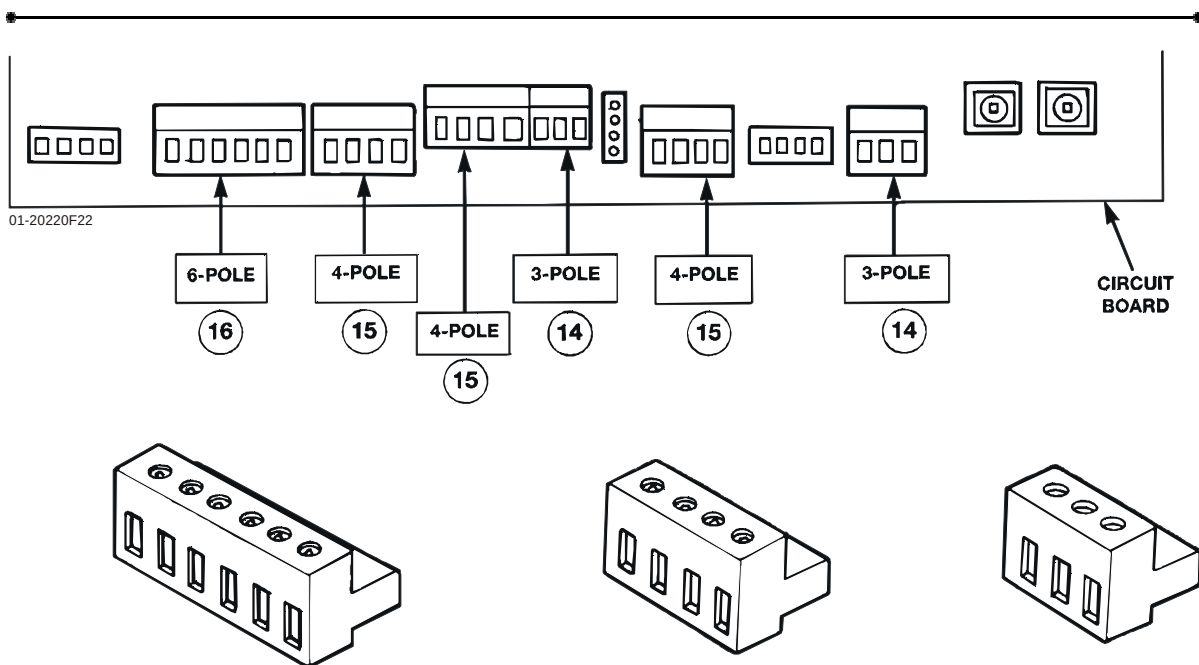


Figure 20

Ref. No.	Part No.	Descriptions/Notes	Ref. No.	Part No.	Description/Notes
1	510.1021-T	Housing	17	310.2045	Rectifier
2	510.1022	Mounting Angle	18	310.2046	Circuit Breaker
3	510.1023	Battery Bracket	19	49431	Drive Sprkt
4	510.1024	Motor/Gearbox	20	645.0002	Woodruff Key
5	310.1113	Limit Nut	21	520.0870	Sprocket Shield Assy - Incl: Shield & Bearing
6	520.0868	Bearing Plate Assy.	22	625.0058	Idler Bolt
7	510.1027	Detent Plate	23	510.1032	Support Tube
8	49426	Spring Kit - Incl: Scr's, Washers, Nuts	24	520.0871	Idler Sprocket Assy - Incl: Sprk~ & Bearing
9	510.1029	Limit Switch Bracket	25	510.1036-T	Cover Kit. Incl: Cover W/Labels
10	23-10041	Limit Sw	26	520.0874-T	Chain Guard Assy - Incl: Guard W/Caution Tape
11	49427	Limit Sw. Scr. Kit - Incl: (2) Scr's.	27	49056	Battery
12	49428	Stand-Off Kit - Incl: (5)	28	410.1322	Chain Bracket Not Shown
13	204001	Circuit Bd.	29	310.0241	Chain Stud Not Shown
14	310.2042	Circuit Bd. Connector -3 Pole	30	49425	Pedestal Not Shown
15	310.2043	Circuit Bd. Connector -4 Pole	31	410.1457	Bushing (For Limit Brkt)
16	310.2044	Circuit Bd. Connector -6 Pole			

Table 7



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FOR TECHNICAL SUPPORT

Call our toll free numbers:

(800) 323-2276

(800) 998-9197

Installation and service information is
available six days a week.

TO ORDER REPAIR PARTS

Call our toll free numbers:

(800) 528-2806

(800) 998-9197

Prepare to provide the following
information when ordering repair parts:

- **Part Number**
 - **Part Name**
 - **Model Number**
-
-