

Warning, DON'T CONNECT WIRES COLOR TO COLOR INSIDE THE MOTOR

Read All Directions Prior To Installation!

Use of other wiring directions could result in damage to your GEM unit and/or the motor

We have 23 years of experience. We recommend that you read and use the Step by Step Wiring Procedures before starting the installation. It could save you time and money.

Step by Step Wiring Procedures:

To ensure proper installation of your GEM Controller, use GEM's directions in lieu of all others.

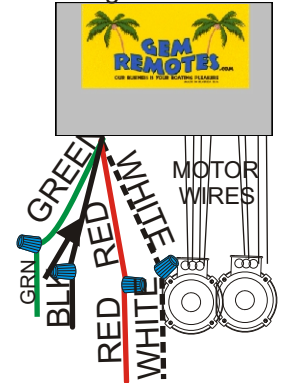
Tools: **Philip's** screwdriver #two, wire strippers, **volt meter** and wire crimpers.

1. Remove four screws on cover, CAREFULLY remove cover, a fragile membrane switch tail might be connected to the receiver board. Pull on black housing to remove tail and remove the motor inspection cover you will have to move wires inside the motor even if the motor worked with a hand drum switch.
2. Cut off the drum switch, GEM units are not designed to be used in conjunction with a hand switch. Strip main feed and motor wires inside the GEM unit. If your drum switch had a corded GFI, you can wire as the main feed wires.
3. Hook up your unit at 115VAC wiring use **figure 1B**. At 115 vac the **GEM main feed White and GEM Red wires** should be connected together with the white main feed wire. Check to see that you have 110-125 VAC between incoming white and black wires. If your unit is a special order 230VAC, you will not have white wires. Overload and GFI protection is not provided inside the Gem box. Use type 3 conduit hubs Only. **Caution:** Bonding (grounding) between conduits is not automatic, it must be provided upon installation. The **GEM unit is wired for 115VAC or 230VAC**(3 wires + ground= neutral). No modifications to the GEM transformer are needed as long as you have a neutral(115VAC). GEM recommends that excessively long electrical runs be wired at 230VAC. If wired at 230VAC then rewire inside the motor for 230VAC. Most motors come from the factory wired at 115VAC. See the next page for confirmation of motor wire configurations. The transformer is wired to the GEM white wire (neutral 115VAC). If you don't have a neutral you will have to rewire the transformer for 230vac. Green or bare wires must only be used as a ground. **It is unsafe to use a ground as a neutral.** If you use the wrong size wire, you could damage your motor and/or the GEM unit. If you get a grinding or a chattering sound in the contactor during use then you have a voltage drop greater than 5% rewire for 230vac or increase wire size.
4. **Turn off power at the circuit breaker.** Use properly sized circuit breakers. If breaker trips check wire size vs. run lengths do not increase recommended breaker size.
5. Connect motor wires color to color inside the GEM box. Not color to color inside the motor!
6. Attach the membrane switch tail to the electronic receiver board it plugs on upper left. Pin 1 on left side, replace the 4 screw.
7. If wiring the motor and the GEM unit at 230VAC: Cap off the GEM motor white. This white wire is not used at 230VAC.
8. To confirm and/or change motor wiring, open motor cover and configure motor wires as shown in the diagrams on the next page. **Inspect wires inside the motor to ensure proper wire connection.** Failure to do so could damage your motors. **You may have to move wires inside the motor even though the drum switch worked.** To reverse motor starting direction, swap wires **inside motor!** Some motors have circuit protection and output wires from these might have different color wires. Also, some motor manufacturers pre-wired their motors with wires that don't have 5 matching wires to the GEM unit. Some use blue and/or yellow wires as a substitute for green ground or orange wires. **Note: A.O Smith motors with drum wiring might have the orange wire might be pre-wired to Motor Blk*. The GEM orange wire needs to go to the motor orange wire and inside the motor it needs to be attached to Pin 2 or motor wire yellow (T4).**
9. This unit is not an Auto-Stop unit even though the switch on the front say Auto-Stop.
10. **Turn off unit when not in use. Test the GFI** (if equipped) once every month and or before each use.
11. This unit has a 3 second delay before switching directions this is to ensure that the motor turns in the correct direction.
12. A replacement 3 button transmitter 7230 or a spare can be bought online, loss of range or unit hiccup check battery, 2: 3volt, CR2032. Old 2 button transmitters 6230 will not work with this unit.

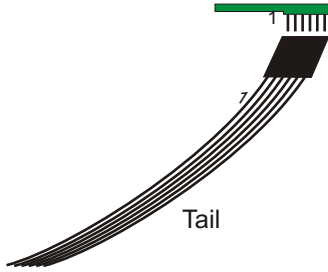
# of Motors	Motor HP	115 Volt AC Main Feed							230 Volt AC Main Feed						
		Amps to run	Breaker Size	50 Feet	100 Feet	200 Feet	300 Feet	400 Feet	Amps to run	Breaker Size	50 Feet	100 Feet	200 Feet	300 Feet	400 Feet
1	1/2	8.8	10 Amps	14	12	8	6	6	4.4	5 Amps	14	14	12	12	10
1	3/4	10.8	15	14	10	8	6		5.4	10	14	14	12	12	10
1	1	12.8	15	12	10	6			6.4	10	14	14	12	12	10
1	1 1/2	17.0	20	12	8	6			8.5	10	14	14	10	10	8

Breakers size is our recommendation. Please use motor label for proper size and code compliance.

230VAC WIRING
 Figure 1A



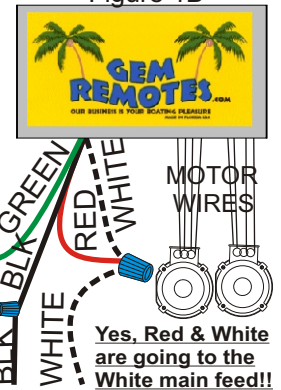
When turned on this led flashes a few times.
 Power up LED



Plug tail in to board pin 1 on left hand side.

Inside the motor you will have numbered wires, colored wires or terminals
 Use 1 of the three diagrams below these 3 will cover 90% of all motors.
 If you have an A.O Smith motor and it has terminals use the third drawing on the right.

Main Feed Wire Connections
115 VAC WIRING
 Figure 1B



Yes, Red & White are going to the White main feed!!!

Standard "T#" or # Wires Wired at 115 VAC.
wire inside the motor!!!!
 A.O. Smith, Baldor, Dayton, GE Electorgear, Emerson, Leeson, Lincon, Marathon, SMC and other "T#" Number motor wires.

*To change motor direction, switch T5 & T8 motor wires.

To change from 115 to 230VAC:
 1. Cap GEM White wire (not used).
 2. Attach 3 motor wires together T3, T5* and T2.
 3. FYI: GEM Blk to T1(P1), GEM Org to T4, GEM Red to T8(6)*.

Standard "T#" or # Wires Wired at 230 VAC.
 A.O. Smith, Baldor, Dayton, GE Electorgear, Emerson, Leeson, Lincon, Marathon, SMC and other "T#" Motor wires

*To change motor direction, switch T5 & T8 motor wires inside the motor!!!!

Standard Colored Motor Wired at 115 VAC.
wire inside the motor!!!!
 A.O. Smith, Baldor, Dayton, Electorgear, Emerson, Leeson, Lincon, Marathon and other Colored Motor wires.

*To change motor direction, switch Motor Red and Motor Black wires.

To change from 115 to 230VAC:
 1. Cap GEM White wire (not used).
 2. Attach 3 motor wires together M Org, M Blk* and M White.
 3. FYI: GEM Black to Motor Blue, GEM Orange to Motor Yellow, GEM Red to Motor Red*.

Standard Colored Motor Wired at 230 VAC.
 A.O. Smith, Baldor, Dayton, Electorgear, Emerson, Leeson, Lincon, Marathon and other Colored Motor wires.

*To change motor direction, switch Motor Red and Motor Black wires inside the motor!!!!

A.O. SMITH 115/230VAC Wired at 115 VAC.
 Note: drum switch Org might be pre-wired to Motor Black*. GEM Orange needs to be on pin 2. Also move White wires. See below.

Wiring From GEM Unit
 *To change motor direction, switch Motor Black & Motor Red wires.

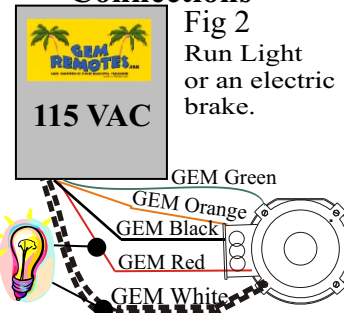
To change from 115 to 230VAC:
 1. Cap GEM White wire (not used).
 2. Place Motor Black on pin 4.
 3. Move Motor Blue jumper from pin 4 to pin 5.
 4. **GEM Orange is on pin 2!!!!!!**
 5. Move Motor White from pin 1 to 3.

AO SMITH Wired at 230VAC.
 Note: Drum switch Org might be pre-wired to Motor Black*. GEM Orange needs to be on pin 2. Also move Motor White and Motor Black wires to pin 4 and 3.

*To change motor direction, switch Motor Black & Motor Red wires.

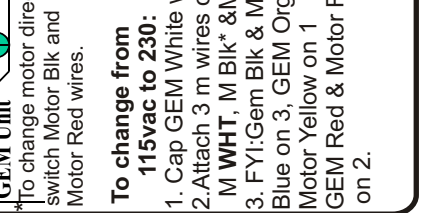
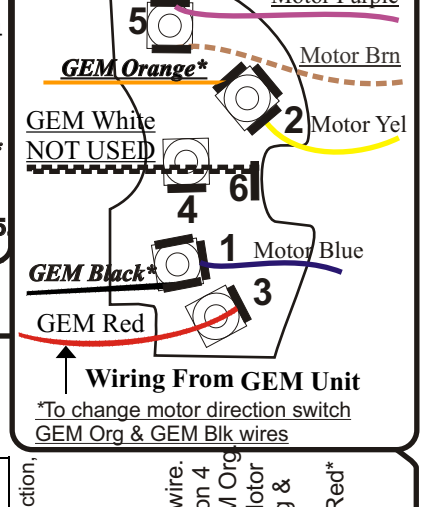
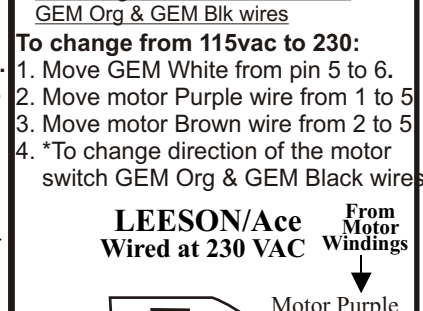
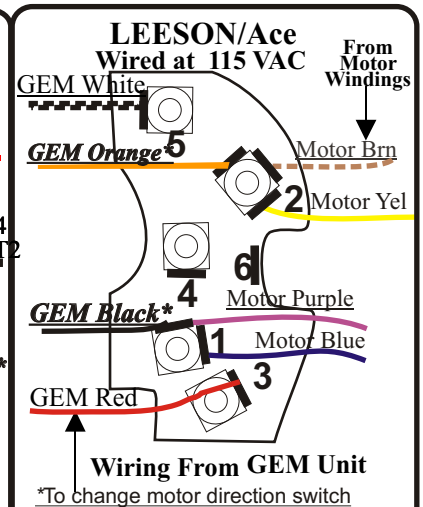
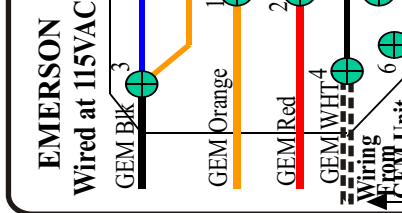
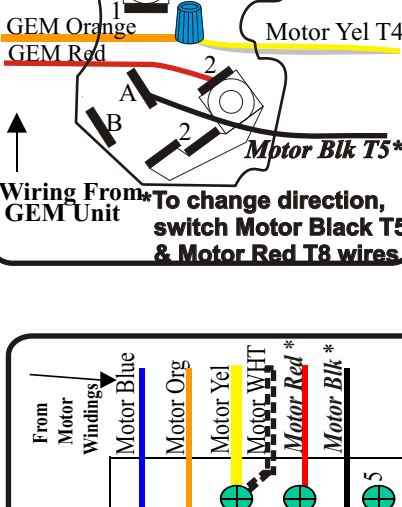
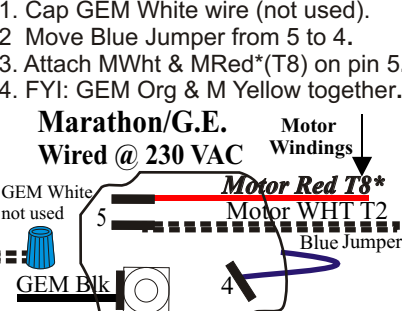
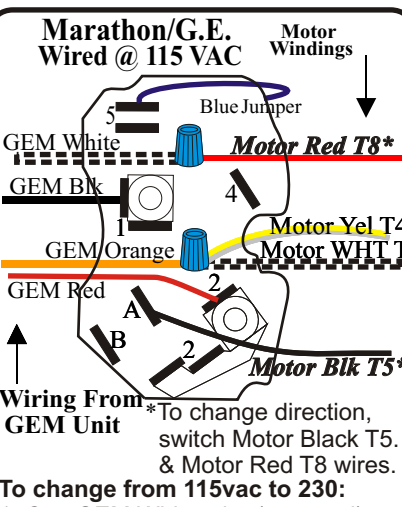
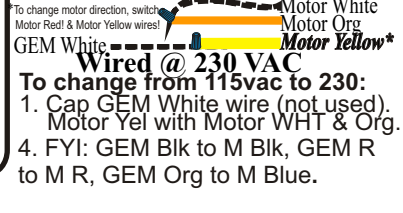
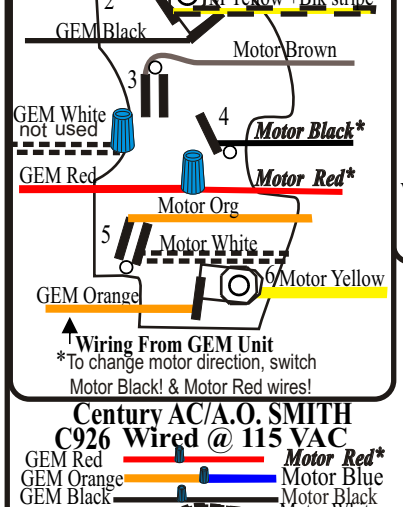
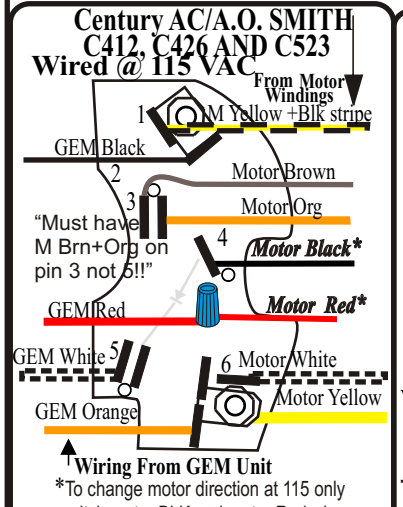
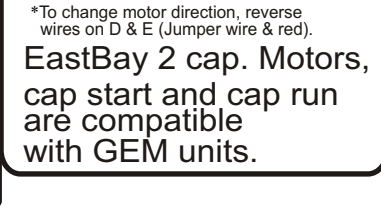
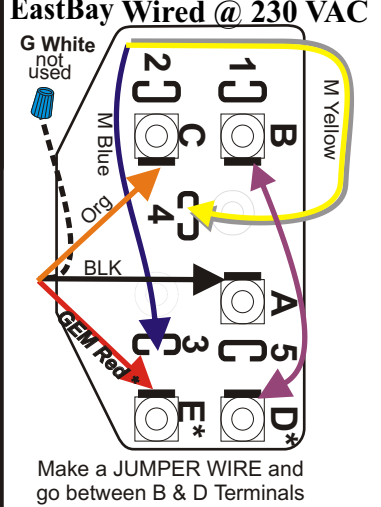
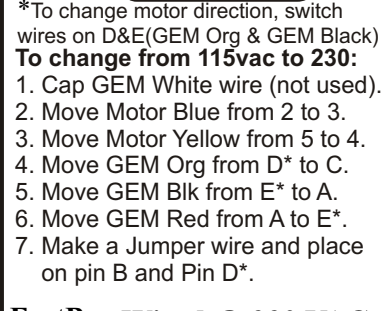
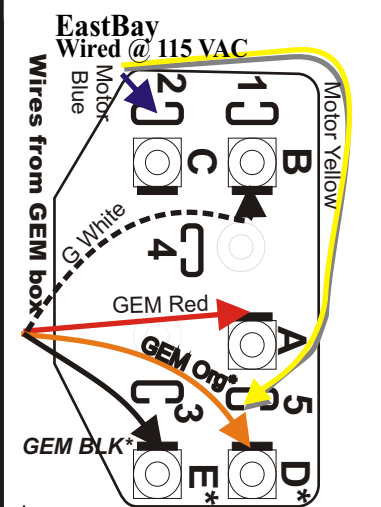
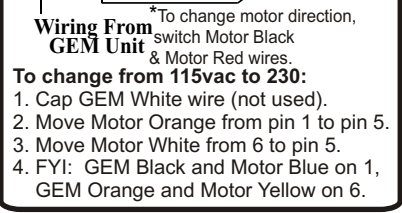
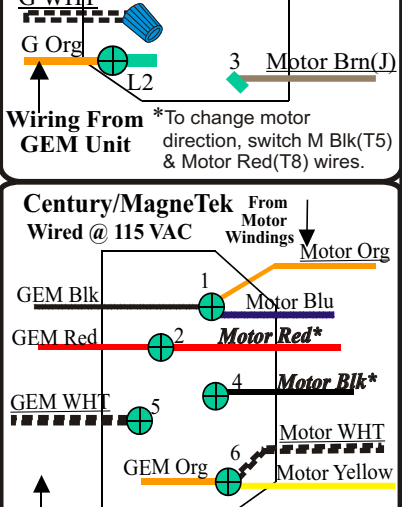
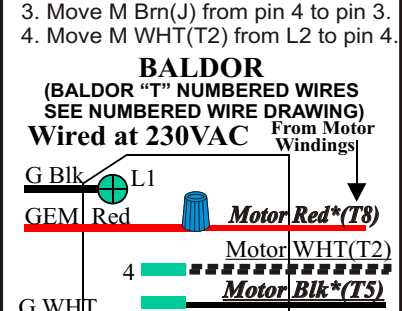
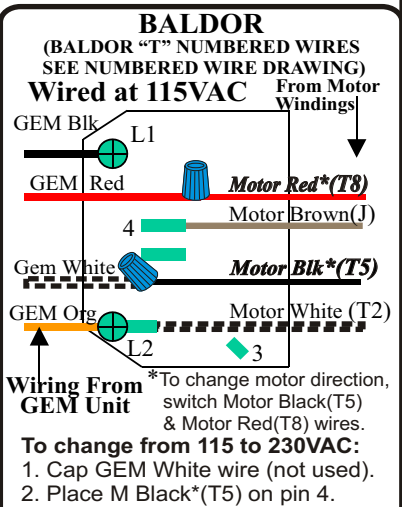
Wiring From GEM Unit

Run Light or Brake Connections
 Fig 2



Attach the run light onto the GEM Red & GEM White for 115VAC or 230VAC system that has 115VAC neutral.

To run a 115VAC brake attach wires to GEM Orange and GEM Black when main feed is at 115VAC. If 230VAC brake is used, use GEM Orange and GEM Black.
 If you have 230VAC system and you only have a 115VAC brake then you must use GEM White & GEM Red. (The GEM white wire will be used at 230VAC).



This exploded view is inside the inspection panel of an **A.O. SMITH** motor wired at 115VAC to a **GEM GR2A**. ***GEM ORANGE WIRE IS ON PIN 2***

See previous pages for more motor wire diagrams.

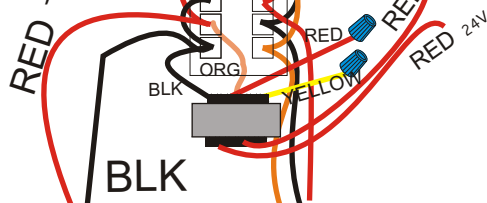
**MAIN FEED
POWER 230VAC
(3wires+ground)
Wired to GEM
at 115VAC**

Fig: 1A

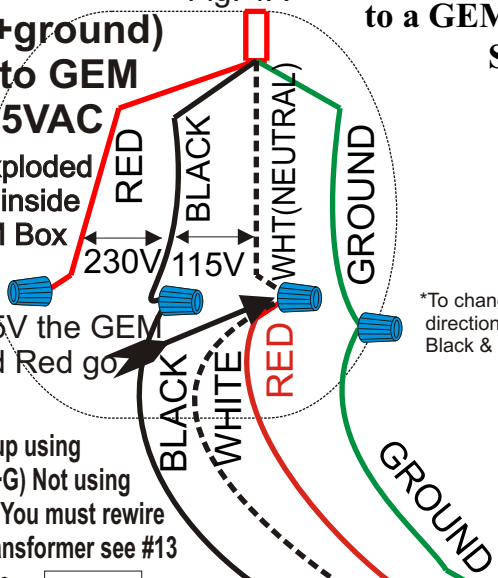
These 3 exploded views are inside the GEM Box

Yes @115V the GEM White and Red go to Neutral

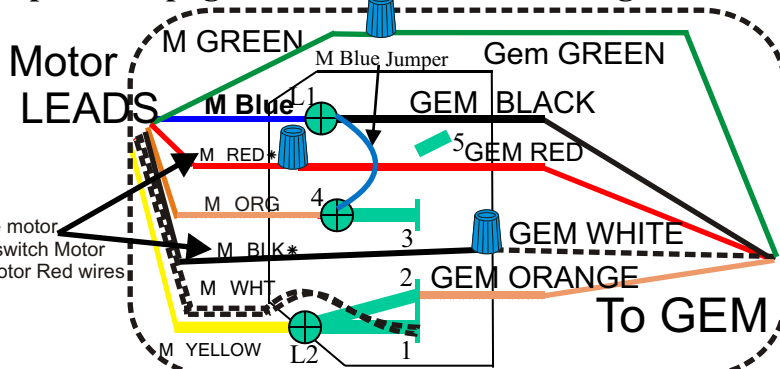
240 Volt hook up using only 3 wires(2+G) Not using Neutral(White) You must rewire the Multitap transformer see #13 below. Can't be done to a GEM GFI (needs 115vac to work).



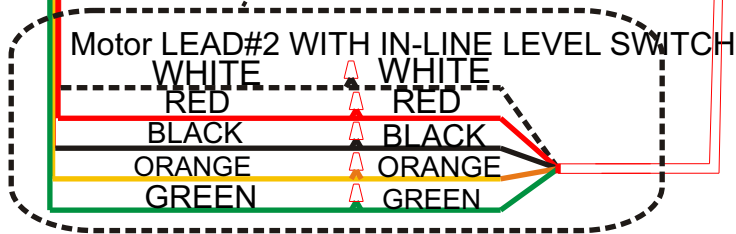
Only use this diagram when you don't have a neutral.



*To change motor direction, switch Motor Black & Motor Red wires



To MOTOR#1



TROUBLESHOOTING:

2. You must **Cut off drum the switch**: motor worked, but the GEM unit only works in 1 direction; You need to rewire inside motor, Note GEM Org wire.
3. **Motor turns in the wrong direction**: Switch **motor wires**, wire inside the motor BLK*(T5) with Red*(T8) see motor diagram pages.
4. **Chatter or grumble in the contactor**: Check for low voltage, when system is running (override by pushing in contactor). Check wire size vs run length all the way from the motor to the breaker at the house.
5. **Motor not working**: Color to Color wiring inside the motor is incorrect. You must use GEM's motor wire diagrams. **A.O. Smith motors move GEM Orange wire to pin 2** GEM units works with 115/230VAC 1 phase, cap. start, **induction run motors**. Three phase motors require special order. 1 1/2 horsepower motors and larger can have a cap. start and a cap. run. The run cap. might not reverse or the run cap. can explode. It must be removed, this will increase the run amps that the motor will draw by 3 amps(Eastbay motors, 2 cap systems are compatible).
6. A transmitter **does not work** 3 second delay when switching direction, or check that LED on transmitter lights and check learn button LED lights when receiving from the transmitter. Relearn the transmitter, press the learn button 1 time and then push the Stop button the Learn LED should flash.
7. **Short range or lift hiccups**: If the red LED on the transmitter flickers, **replace the batteries 2: 3Volt CR2032**. Do not change the length of the antenna wire this will not help the range. Metal will hurt the range, you should have line of sight for the unit to have a 300 foot range (2007 units).
8. If the GEM unit does nothing check inside GEM box see if the LED Flashes when powered up. If no LED then check main power also press in the middle of the bottom contactor if the lift runs you have power but your 24 VAC transformer is not working.
9. **Clearing the memory**: Press and hold the Learn/Clear button (LED will light) for 7 seconds then the LED will flash stop pressing and all transmitter will be cleared. Then press the learn button the LED will light up, press the Stop button on the transmitter the Learn LED will flash 2 times.
10. **TROUBLESHOOTING: Wiring at 110VAC-120VAC**: If motors (A.O. Smith) does not work rewire GEM Org inside the motor to pin #2.
 1. 115 VAC motor system problems: **Motor Hum**: Connect red and white GEM main feed wire together. See figure 1A.
 2. Over sizing the circuit breaker can damage your lift, motors and/or the boat. Use the correct size circuit and wire size. Use wire chart.
13. **TROUBLESHOOTING: Wiring at 220VAC-240VAC**: 4 motor or special order **230V only** do not have a White main feed unless a GFI unit.
 1. **Unless the GEM unit is specifically ordered for 230VAC, a 4 wire main feed is required. If you do not have 3 wires + ground then you will need to rewire the system for 230VAC only (2 wire+Ground)**. Read the label, on top of the transformer BLK-ORG = 240 VAC Cut yellow transformer wire and cap it off. Find ORG wire it should be hiding around the base of the contactor it has a red wire taped to it. Attach the Org wire to the main feed red on screw L2. The red wire taped to this wire is used for 208 connections.
14. **TROUBLESHOOTING: Wiring at 208VAC**: Rewire the transformer. Read Label BLK-RED = 208 Cut Yellow transformer wire and cap it off. Attach Red to main feed Red.

Need more help? Call 239-642-0873 M-F 8:30-4:00 EST. The web page also has more information for after hours help.