# Bowl-Tronics Enterprises Incorporated

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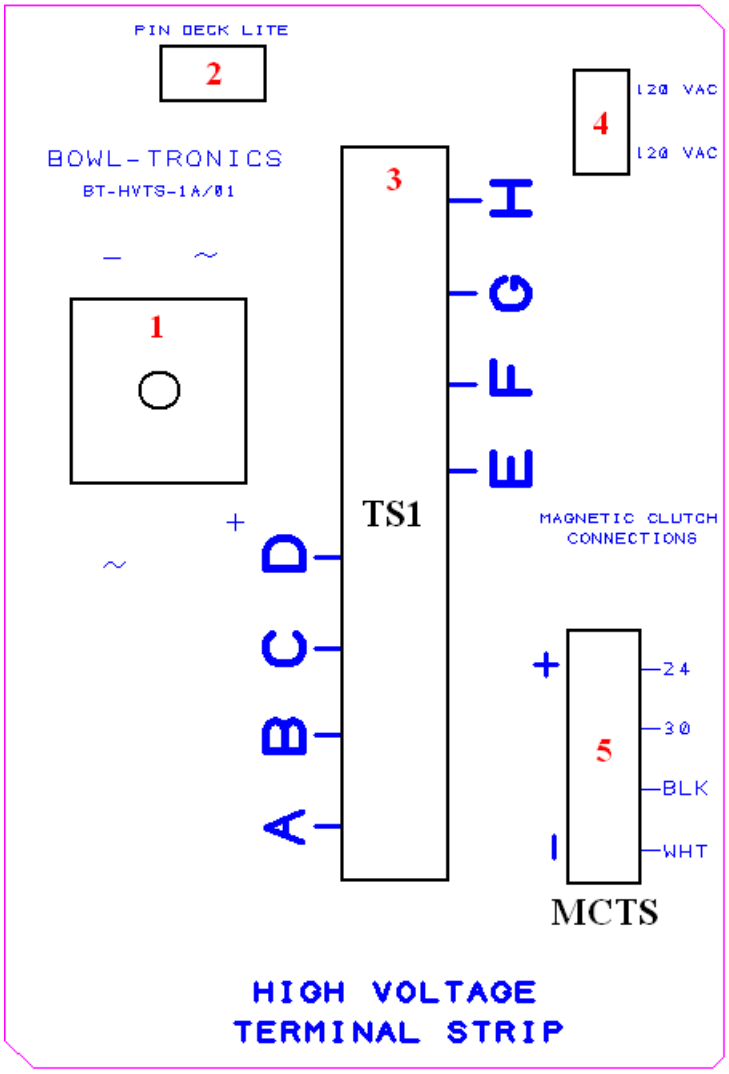
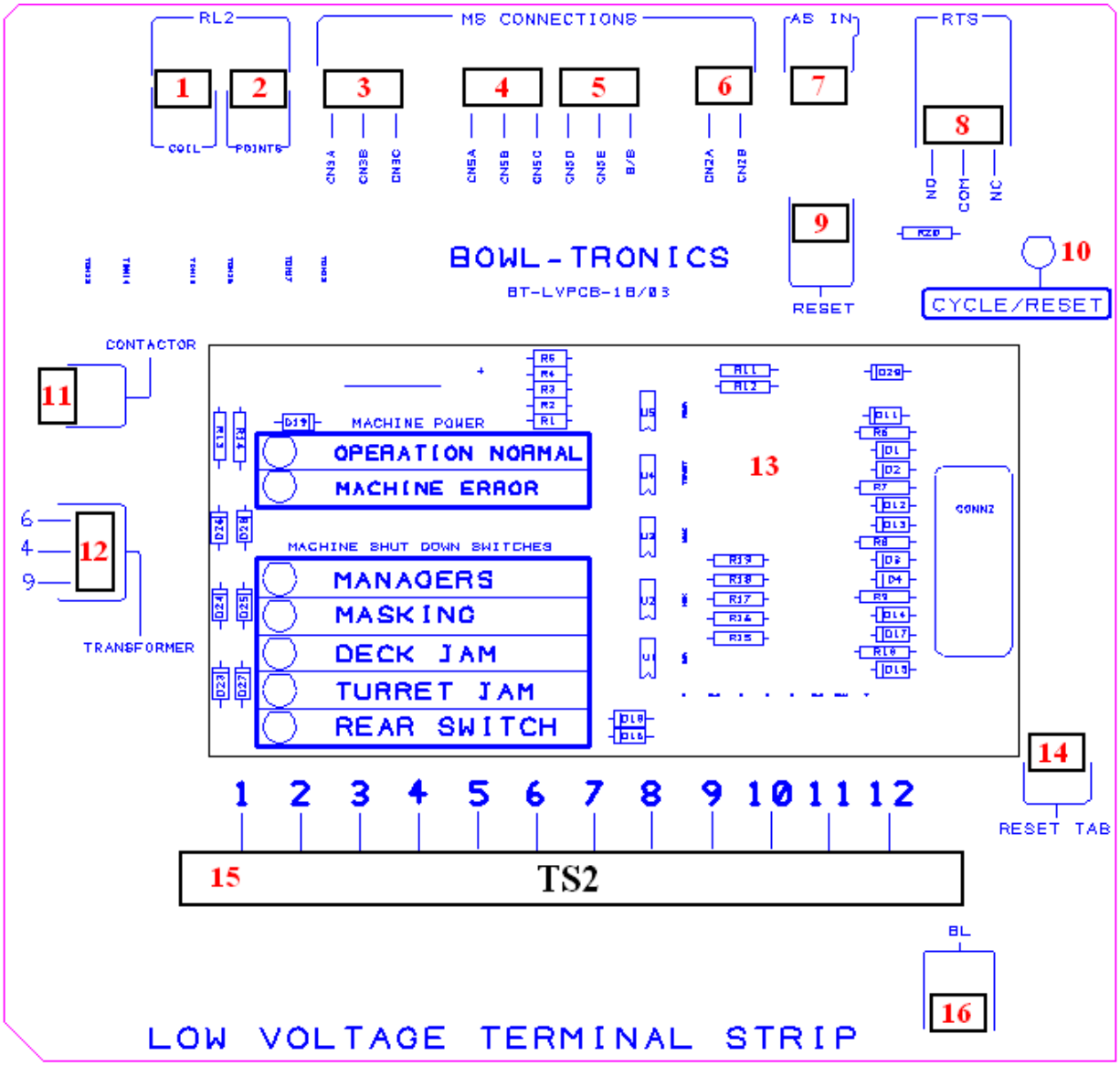
## ♦Bowl-Tronics Brunswick Machine Electrical Chassis♦




## PC Board Layout Description Table:

1. **35 AMP bridge rectifier**
2. **Pin deck lite terminal connector**
3. **High voltage terminal strip**
4. **High voltage transformer connector**
5. **Magnetic clutch and cross conveyer switch terminal strip**




# PC Board Layout Description Table:

1. **RL-1 coil terminal connector**
2. **RL-1 points terminal connector (Connects TS-2 (1) to TS-2 (9) )**
3. **Cannon plug CN3A, CN3B, CN3C terminal connector**
4. **Cannon plug CN5A, CN5B, CN5C terminal connector**
5. **Cannon plug CN5D, CN5E, B/B terminal connector**
6. **Cannon plug CN2A, CN2B terminal connector**
7. **Autoscore managers bypass input (allows scoring to turn machine on and off)**
8. **Rake trigger switch terminal connector**
9. **Machine reset terminal connector (electronic triggering input)**
10. **Cycle/Reset LED ( LED will be lit when machine is reset)**
11. **Main contactor coil terminal connector**
12. **Low voltage transformer terminal connector**
13. **LED diagnostic display (View BTDDM-1 manual on Pg. 11 for further info.)**
14. **Mechanics reset button terminal connector**
15. **Low voltage terminal strip**
16. **Accelerator/Ball lift 24 VAC terminal connector**

# Installation Instructions

***Before Performing Any Installation Make Sure That Power Is Removed From the Machine By Unplugging The Power Cord From The Electrical Chassis!!***

**The Bowl-Tronics chassis is a replacement for the Brunswick "A-2" chassis. The low voltage installation connections are identical for either unit. The high voltage connections are slightly different and can be found in the following wiring diagrams. *While removing the old chassis, marking each wire that is removed is an easy way to avoid the confusion of trying to trace where each wire has come from*. Nearly all of the connections are pre-wired internally in the Chassis. The only connections that must be made during the installation process are the wires coming from the channel. **When installing on a pinsetter with a motor that has no thermal overload it is necessary to use some type of breaker that is rated at 15 Amps.* Take time to be sure all of the connections are correct before restoring power to the chassis. The connections below can also be found in easy to follow electrical schematics in the following pages. The connections are as follows:**

| Function | Wires from channel | | Connection to Chassis |
|---|---|---|---|
| | | | *** (*USING A 15 AMP BREAKER*)** |
| **TLR-4** | **Wire #23** | ⇒ | **TS1-D** |
| **(Motor receptacle)** | **Wire #72** | ⇒ | **TS1-A** |
| | **Wire #26** | ⇒ | **ground** |
| **TLR-3** | **Wire #59** | ⇒ | **TD1 #20** |
| **(Cycle solenoid)** | **Wire #27** | ⇒ | **ground** |
| | **Wire #11** | ⇒ | **TS1-C** |
| **TLR-5** | **Wire #24** | ⇒ | **MCTS - 24** |
| **(Magnetic clutch)** | **Wire #30** | ⇒ | **MCTS - 30** |
| **SW1** | **Wire #19** | ⇒ | **TS2-6** |
| **(Rear switch)** | **Wire #20** | ⇒ | **TS2-5** |
| **SW2** | **Black wire** | ⇒ | **TS2-5** |
| **(Turret jam switch)** | **White wire** | ⇒ | **TS2-3** |
| **SW3** | **Black wire** | ⇒ | **TS2-3** |
| **(Deck jam switch)** | **White wire** | ⇒ | **TS2-2** |
| **SW4** | **Black wire** | ⇒ | **TS2-10** |
| **(Counter switch)** | **White wire** | ⇒ | **TS2-9** |
| **SW5** | **Black wire** | ⇒ | **MCTS - BLACK** |
| **(Cross conveyer sw.)** | **White wire** | ⇒ | **MCTS - WHITE** |
| **SW6** | **Green wire** | ⇒ | **TS2-4** |
| **(1&2 ball light)** | **Black wire** | ⇒ | **TS2-7** |
| | **White wire** | ⇒ | **TS2-8** |
| **SW8** | **Wire #47** | ⇒ | **TS2-12** |
| **(Cycle button mech.)** | **Wire #60** | ⇒ | **reset tab** |

| | | | |
|---|---|---|---|
| **Wire #23** | ⇒ | **breaker** |
| **Breaker** | ⇒ | **TS1-D** |
| **Wire #72** | ⇒ | **TS1-A** |
| **Wire #26** | ⇒ | **ground** |

## CHASSIS FEATURES

**Diagnostic LED's**

**Your BOWL-TRONICS CHASSIS is equipped with a diagnostic display module which will assist the mechanic in diagnosing a machines blackout. These LED's are clearly labeled on the circuit board and will be lit in the event of a machine error.** ***View BTDDM-1 diagram on page 11 for more information.***

**Bowl-Tronics TDM-X**

**The Time Delay Module Extreme included with your chassis is an improvement over existing TDM's. Besides being a direct replacement it offers improved functionality and added features.** ***View TDM-X diagram on page 11 for more information***

***Automatic block out*: Disables the reset buttons while the machine is in cycle mode reducing deck jams.**

***Diagnostic LED's*: LED's indicate second ball, power, and reset/trigger input.**

**40 AMP Contactor**

**The heavy duty contactor has twice the current handling capabilities as the original.**

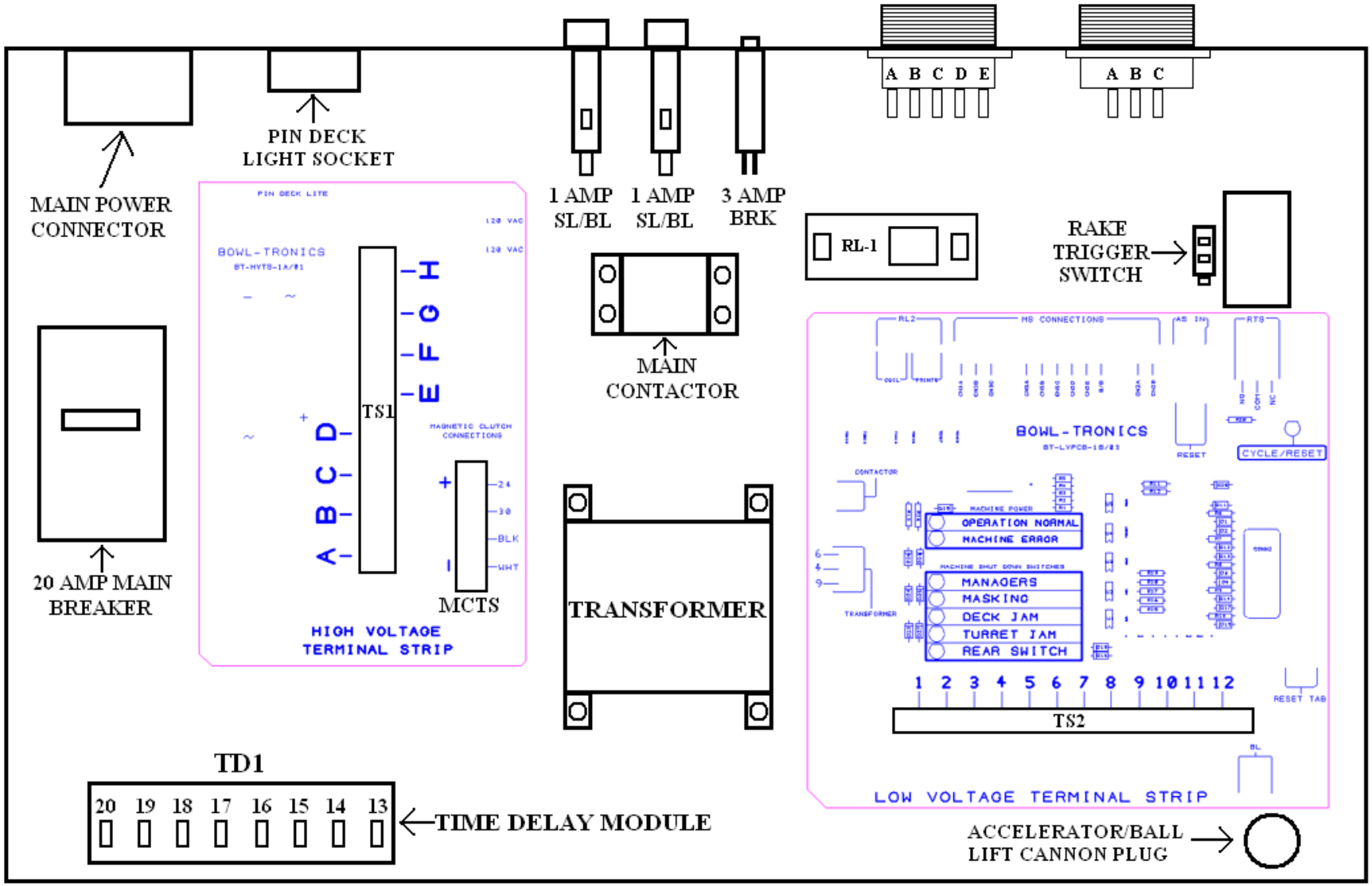
**PCB Connections**

**No more wires to get tangled or loose. Most internal connections are done on the circuit boards with extra thick traces to allow for voltage spikes and unintentional short circuits.**

**For repair visit: www.bowl-tronics.com/service**

**Fill out our service request form and ship to the address that is shown.**

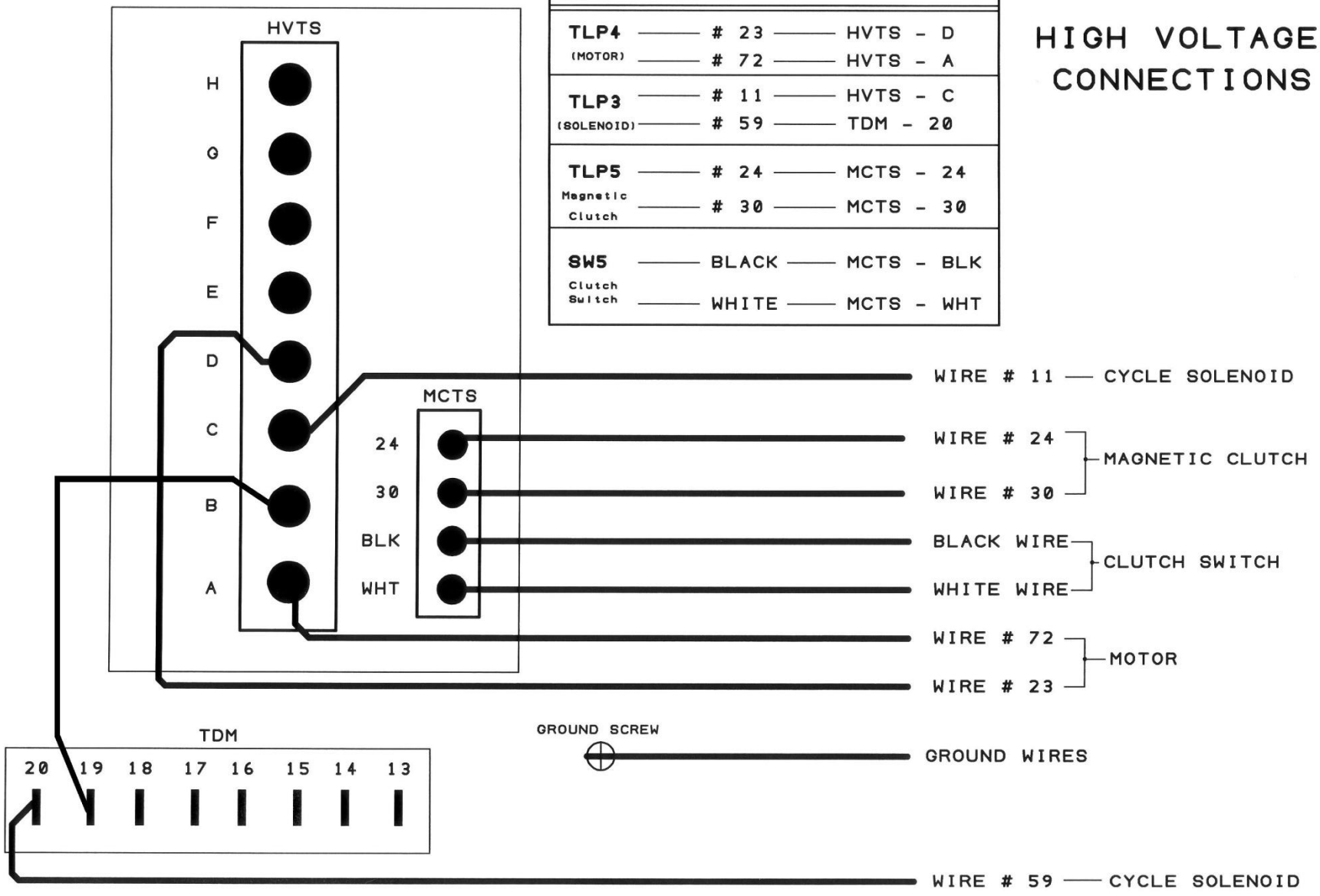
**Notes:**

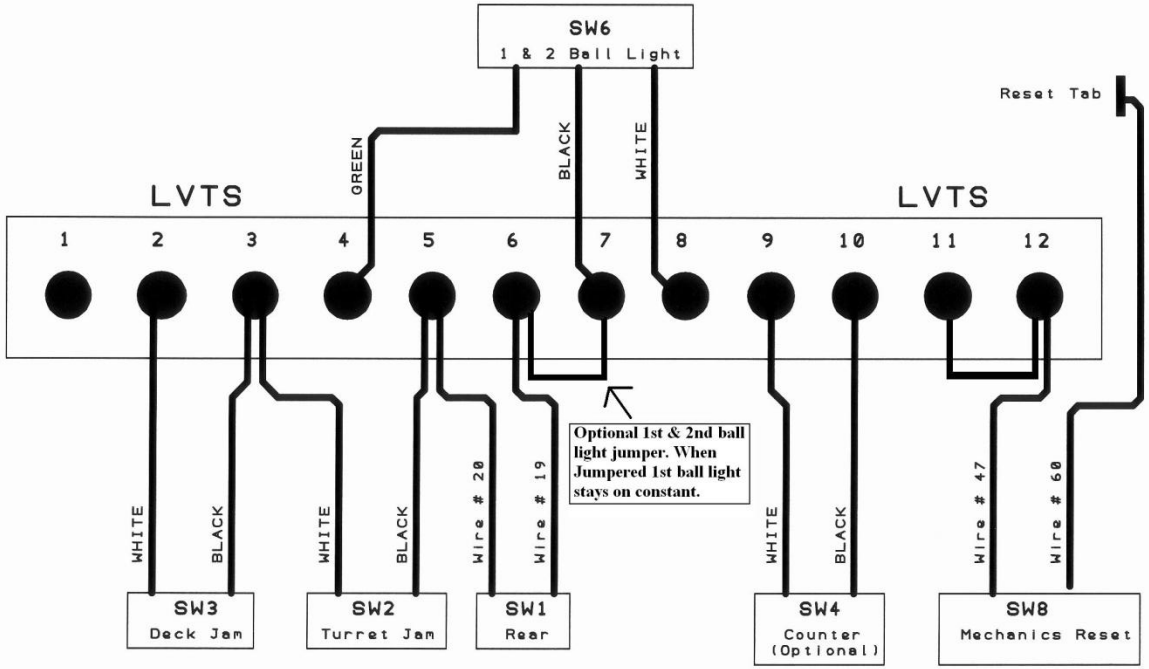



# BOWL-TRONICS CHASSIS LAY-OUT

# HIGH VOLTAGE CONNECTIONS

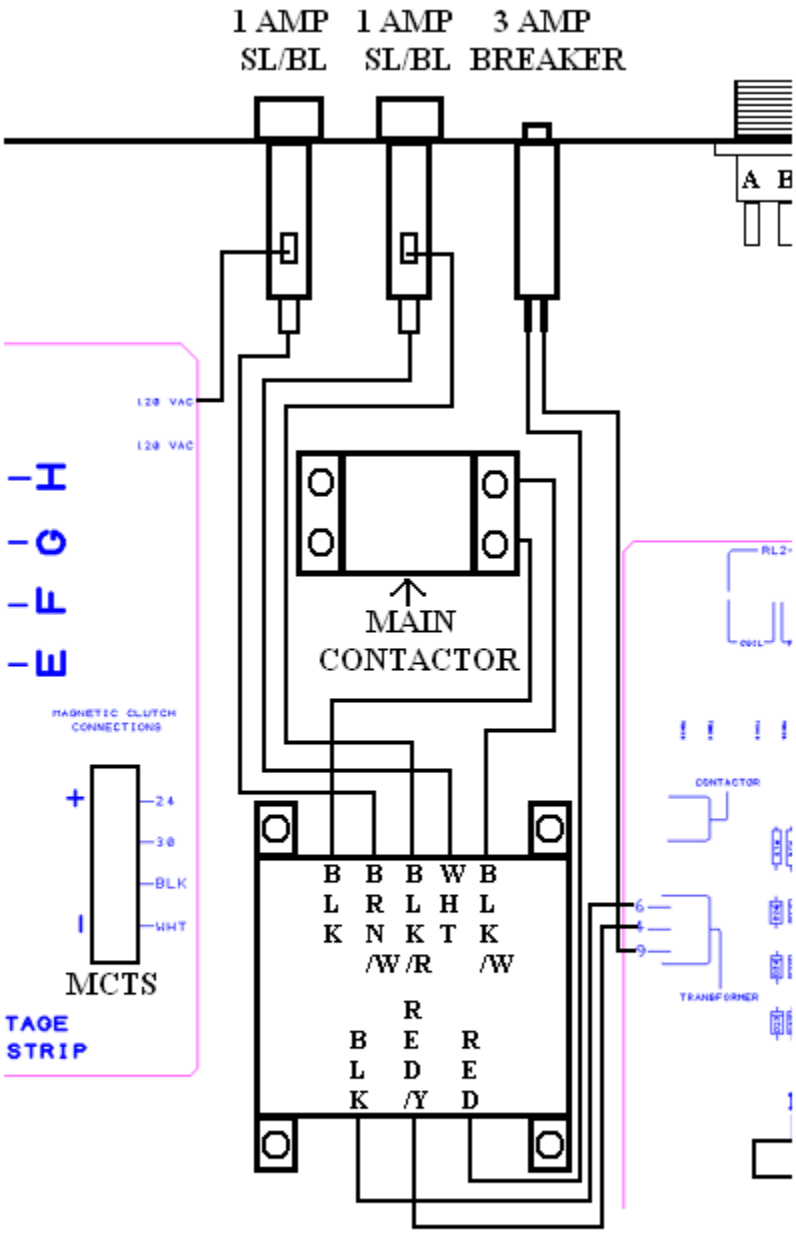
| PLUG | WIRE # | CONNECTION |
|---|---|---|
| TLP4 (MOTOR) | # 23 | HVTS - D |
| | # 72 | HVTS - A |
| TLP3 (SOLENOID) | # 11 | HVTS - C |
| | # 59 | TDM - 20 |
| TLP5 Magnetic Clutch | # 24 | MCTS - 24 |
| | # 30 | MCTS - 30 |
| SW5 Clutch Switch | BLACK | MCTS - BLK |
| | WHITE | MCTS - WHT |



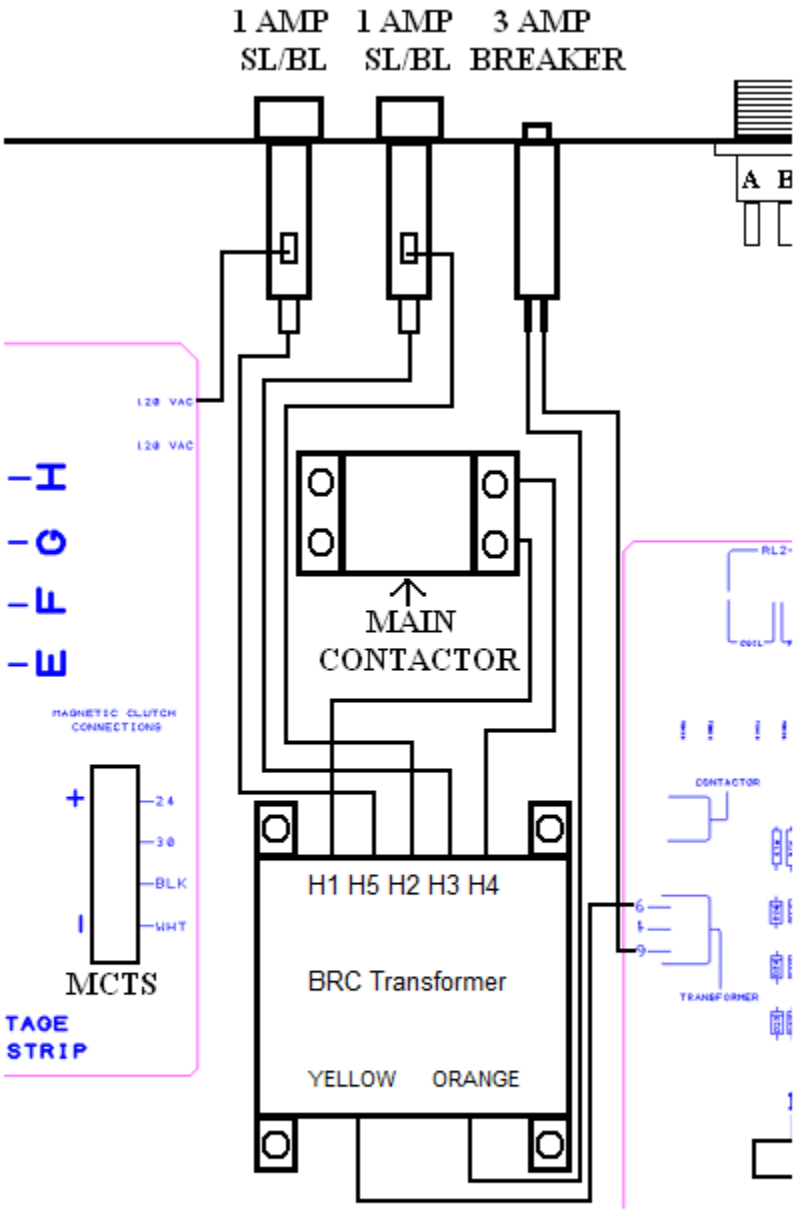



| SWITCH | WIRE # / COLOR | CONNECTION |
|---|---|---|
| SW1 Rear on/off | # 19 | LVTS - 6 |
| | # 20 | LVTS - 5 |
| SW2 Turret Jam | WHITE | LVTS - 3 |
| | BLACK | LVTS - 5 |
| SW3 Deck Jam | WHITE | LVTS - 2 |
| | BLACK | LVTS - 3 |
| SW4 Counter | WHITE | LVTS - 9 |
| | BLACK | LVTS - 10 |
| SW6 1 & 2 Ball light | GREEN | LVTS - 4 |
| | BLACK | LVTS - 7 |
| | WHITE | LVTS - 8 |
| SW8 Mechanics Cycle | # 47 | LVTS - 12 |
| | # 60 | Reset Tab |

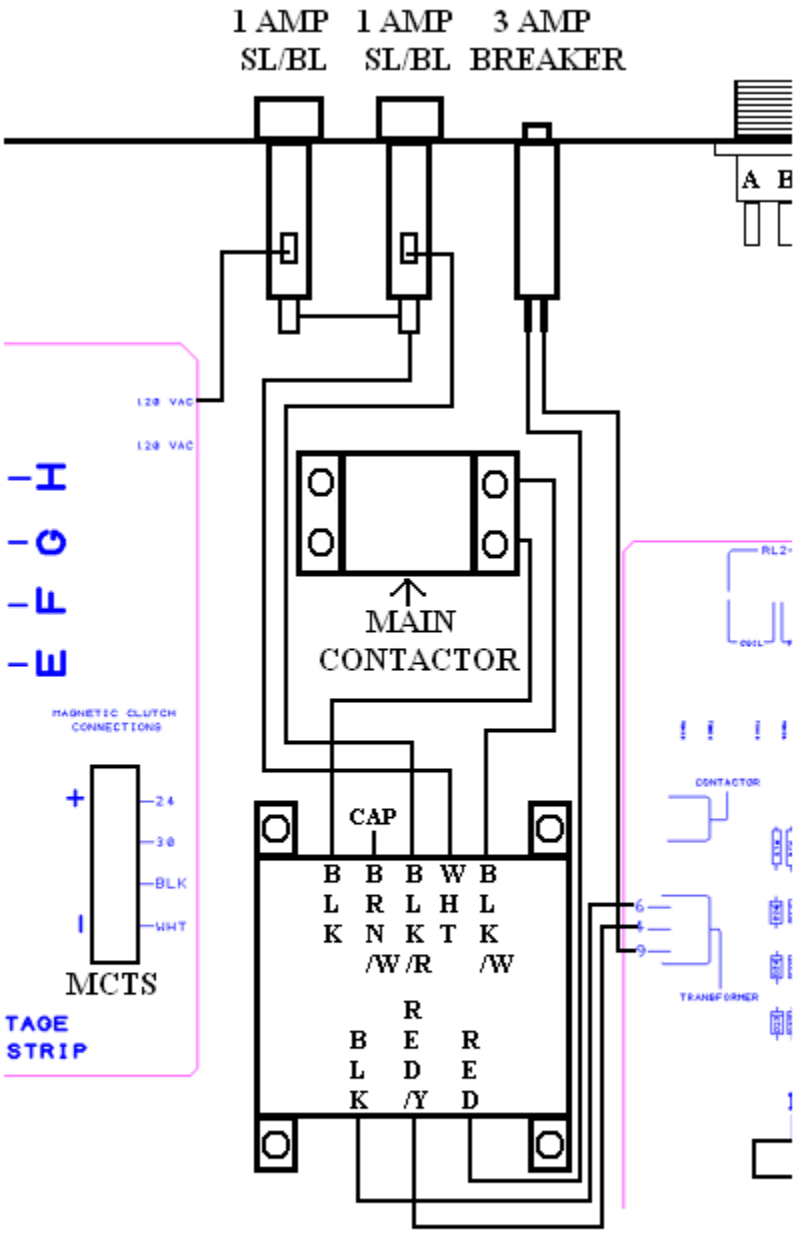
LOW VOLTAGE CONNECTIONS



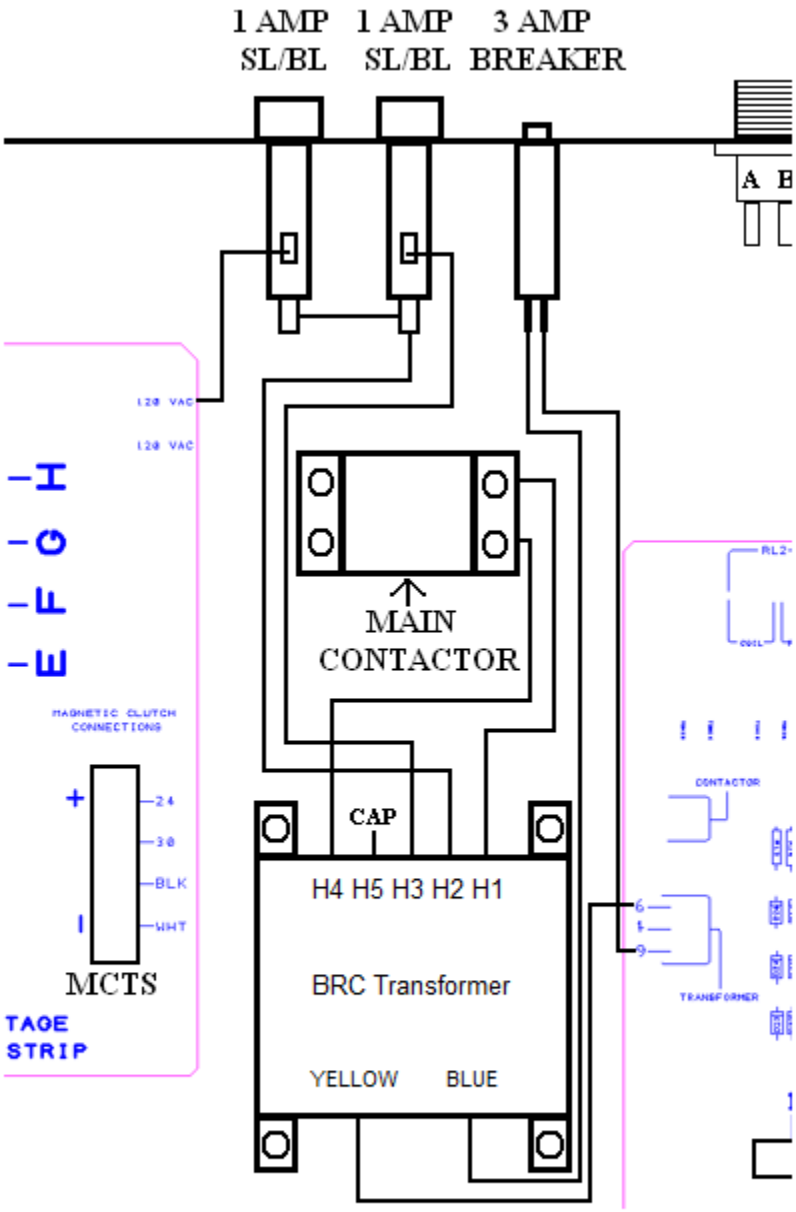

**TRANSFORMER HOOK UP 208VAC**



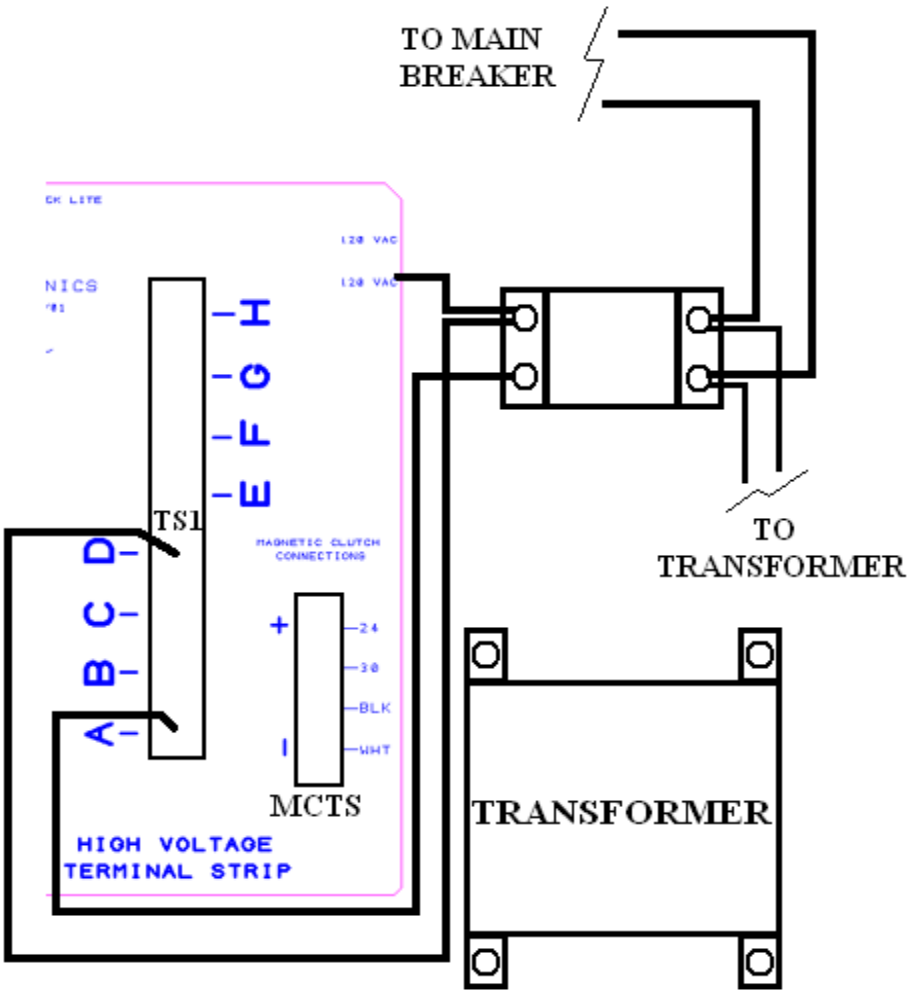

**TRANSFORMER HOOK UP 208VAC**



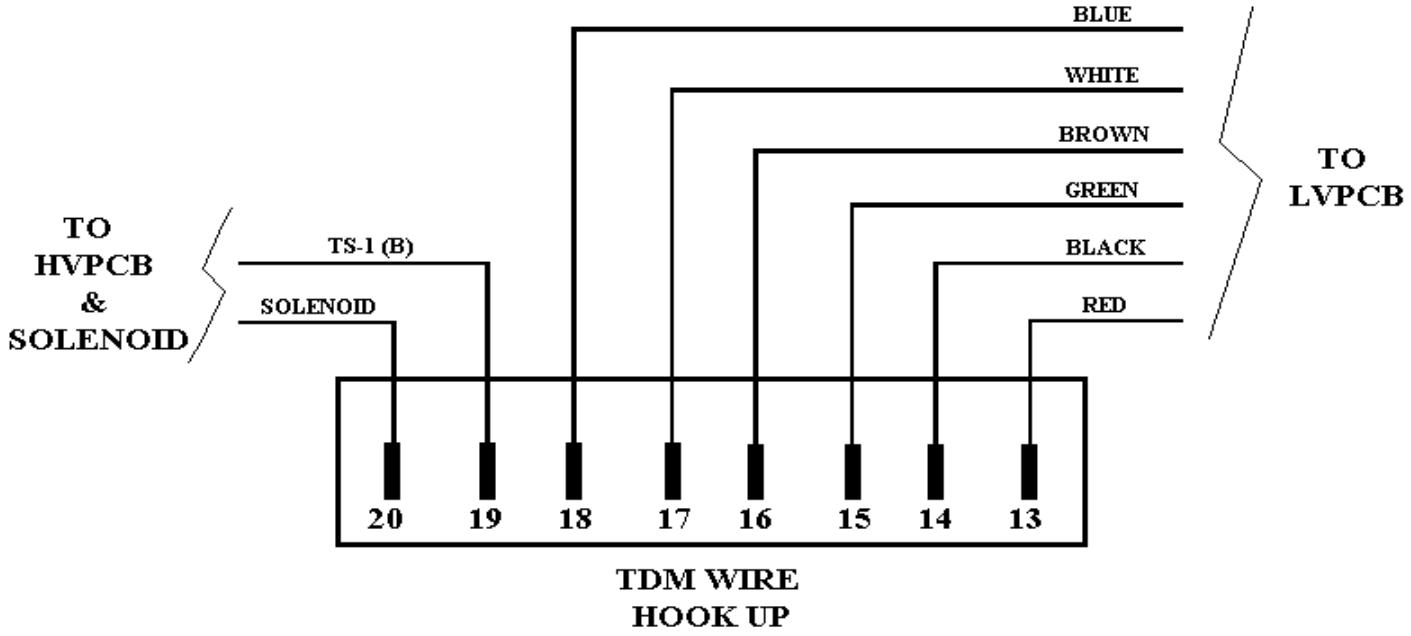

**TRANSFORMER HOOK UP 230VAC**



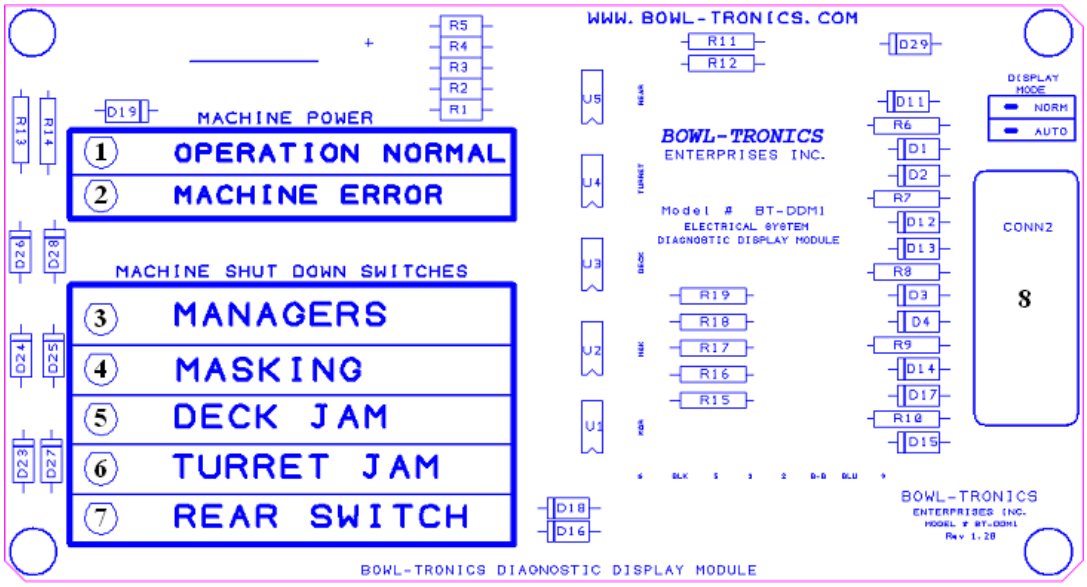

**TRANSFORMER HOOK UP 230VAC**




MAIN
CONTACTOR
WIRING




# Diagnostic Display Module (BT-DDM1)




## PC Board Layout Description Table:

1. **Operation Normal LED (LED will be lit if the machine is running normal)**
2. **Machine Error LED (LED will be lit if the machine is in a blackout mode)**
3. **Managers LED (LED will be lit if the managers switch is open)**
4. **Masking LED (LED will be lit if the masking switch is open)**
5. **Deck Jam LED (LED will be lit if the deck jam switch is open)**
6. **Turret Jam LED (LED will be lit if the turret jam switch is open)**
7. **Rear Switch LED (LED will be lit if the rear switch is open)**
8. **DB-9 Sub Connector (D-Sub connector for remote mounting location of BTDDM-1)**