

The Un-Official

# RCMC & RailSounds LITE Guide

Covers basic wiring information about the RCMC and LITE boards.

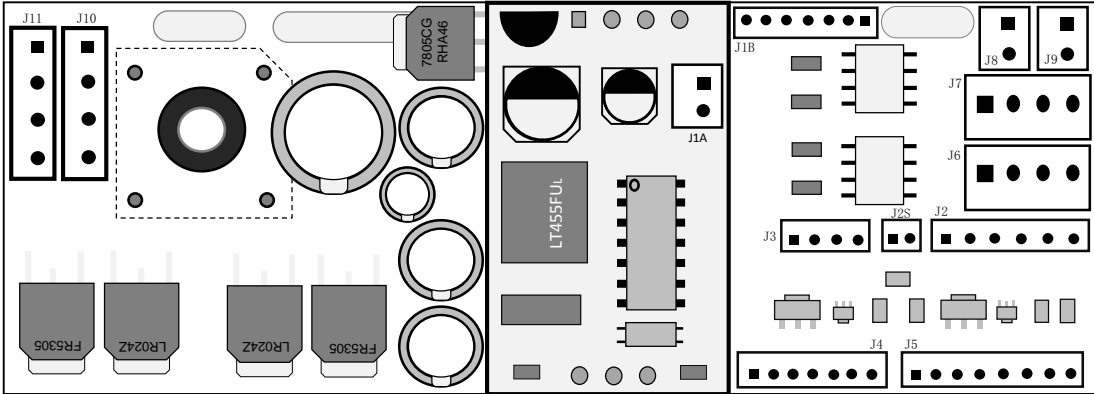
# Info & Discretion

- The wiring diagrams were created from inspecting 15+ current products of my own, that were produced at different time periods from Lionel® ranging from diesel to steam locomotives that have this type of electronic package.
- I spent my own time creating these documents to help myself and the repair/service station community.
- If your engine is equipped with Lit number boards, they are powered off track power not the RCMC board.
- There is no documentation in this detail currently about this generation of LEGACY® Electronics.
- As of 2016 there are 7 revisions of the RCMC. Current one has Thermal resistors “Thermistor” inside the smoke units to measure the temperature. An extra pin was added to each smoke unit harness for this.
- Electro-coupler plugs on the board have 1 extra pin now too. It is unknown to me why they were added.
- The RailSounds (RS) switch is almost not used anymore on any models.
- LED’s are Polarity Sensitive. If installed backwards they will not work.

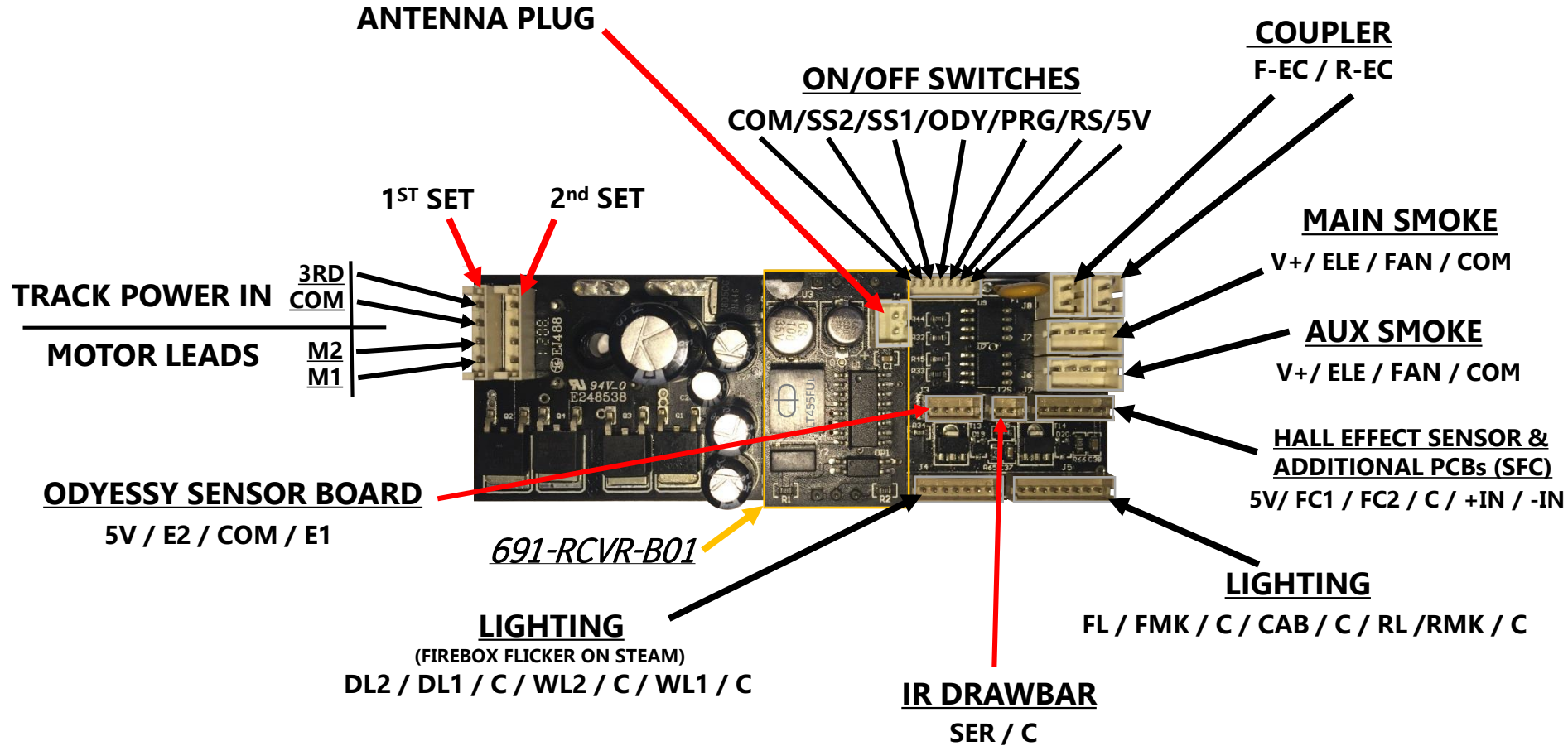
# Info & Discretion

- Covers basic pin out and wiring information about the RCMC and LITE boards.
- This does not cover technical troubleshooting. (My advice is too send it back)
- This has not been looked at by Lionel. It is unclear how accurate the wiring diagrams are. I warn you to always trace your wires. Some wiring will vary from model to model.
- Colors of wires will vary model to model. Colors shown are not 100% accurate.
- Lighting outputs will vary from model to model.
- **NOT ALL “common” outputs on the RCMC is common to the chassis ground.** You will damage the board if grounded to chassis. Please use a Test meter to confirm your pinout.
- I’m still not 100% Clear on all the abbreviations for the pin outs. Educated guess mostly.
- Plug “J2” on the RCMC is not typically used. I’ve seen it used on the Legacy controlled dummy units with smoke units and electro-couplers. A Hall effect sensor is installed to trigger the cab lights offs and kick the RPM up on the smoke units fan motor when it starts to move.
- It is also used in the VL Big Boy for the smoke stack to turn off one of the stack fans when the deflector is placed on the top. It also is used to connect external PCBs such as the (SFC) and Coil Drive board for the swinging bell. On the Centipedes its used to run the overhead fans. I’ve only seen it used mainly in the Vision Line engines. A more detailed diagram of this will be made in future updates. (If I can get my hands on a VL Big Boy)

# RCMC



# RCMC PLUG BREAK DOWN



| RCMC PIN BREAK DOWN |                           |
|---------------------|---------------------------|
| ABRV                | TERM                      |
| 3RD                 | HOT (CENTER RAIL PICK UP) |
| COM                 | COMMON GROUND             |
| M1                  | MOTOR LEAD 1              |
| M2                  | MOTOR LEAD 2              |
| SS1                 | SMOKE SWITCH 1            |
| SS2                 | SMOKE SWITCH 2            |
| ODY                 | ODYSSEY SWITCH            |
| PRG                 | PROGRAM/RUN SWITCH        |
| RS                  | RAIL/SIGNAL SOUNDS SWITCH |
| 5V                  | 5 VOLTS +                 |
| F-EC                | FRONT ELECTRO COUPLER     |
| R-EC                | REAR ELECTRO COUPLER      |
| V+                  | POSITIVE OUTPUT VOLTAGE   |
| ELE                 | HEATING ELEMENT           |
| FAN                 | SMOKE FAN MOTOR           |
| FC1                 | ?                         |
| FC2                 | ?                         |
| FL                  | FRONT LIGHT               |
| FMK                 | FRONT MARKER LIGHTS       |
| RMK                 | REAR MARKER LIGHTS        |
| CAB                 | CAB LIGHT                 |
| RL                  | REAR LIGHT                |
| SER                 | SERIAL DATA LINE          |
| DL1                 | DITCH LIGHT 1             |
| DL2                 | DITCH LIGHT 2             |
| WL1                 | WORK/GROUND LIGHT 1       |
| WL2                 | WORK/GROUND LIGHT 2       |
| C                   | COMMON GROUND             |
| +IN                 | ?                         |
| -IN                 | ?                         |
| E1                  | ?                         |
| E2                  | ?                         |

**NOTE:**

Each RCMC board is programmed for the specific product it came from. Make sure when ordering a new RCMC board, it has the correct part number for the item you are repairing.

Diagram Perfected By:  
**Bruk Bannister** with help from **Lionel LLC.**

Revised January, 2017

**NOTES:**

- (C)= COMMON GROUND TO BOARD NOT CHASSIS GROUND
- THIS VERSION HAS NO THERMISITORS IN THE SMOKE UNITS

# RCMC Wiring Diagram (Steam)

WIRE COLOR WILL VARY

Diagram 1

**NOTE:**  
LED's are Polarity Sensitive.  
If installed backwards they will not work.

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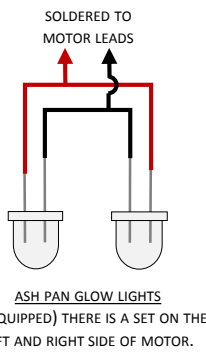
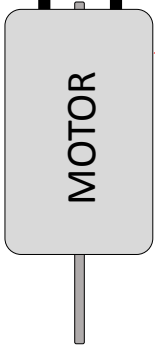
A FEW STEAM MODELS WILL HAVE TWO MOTORS. BUT TYPICALLY ONE IS USED. CONSULT DIESEL DIAGRAM FOR WIRING TWO MOTORS.

(Hot) Center Rail Pick Up

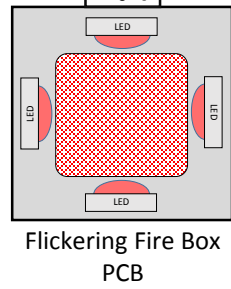
TRACK CHASSIS GROUND

(TYPICALLY) GRAY

MOTOR LEAD 2  
MOTOR LEAD 1



Motor Sensor Board

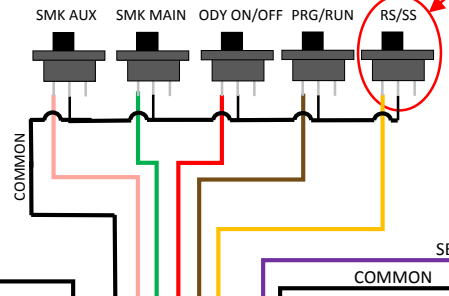
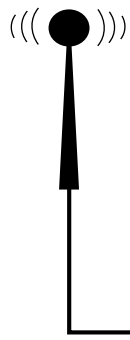


Ground Light 1  
Ground Light 2

Front Headlight  
Front Marker Light  
Front Marker Light  
Cab Light

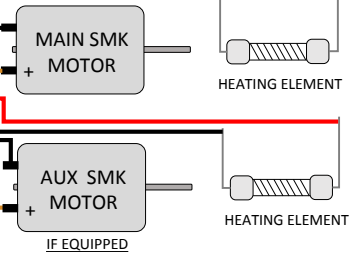
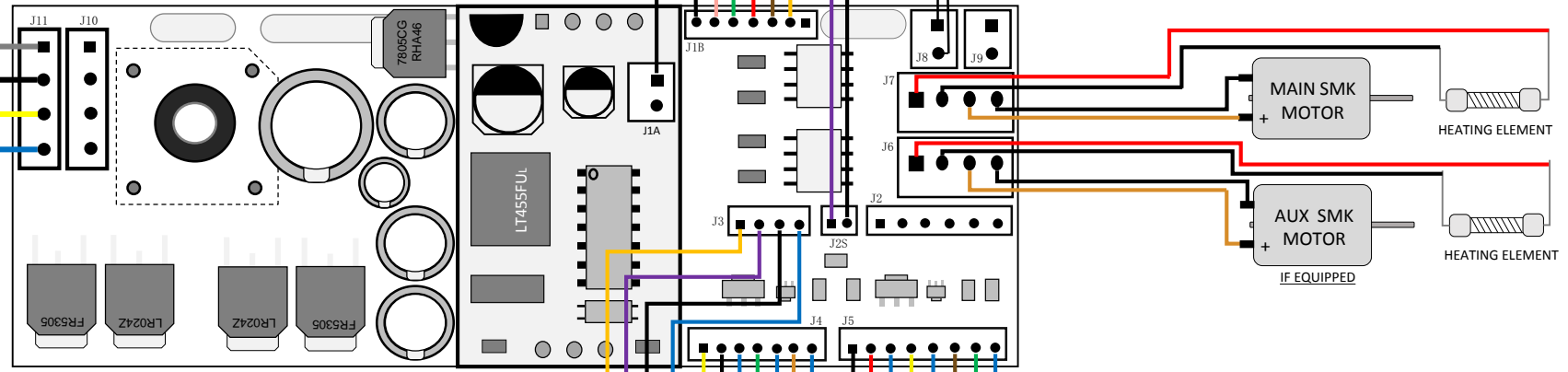
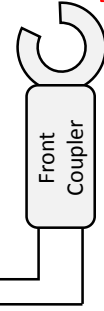
Rear Headlight  
Rear Marker Light  
Rear Marker Light  
(IF EQUIPPED)

WIRE COLOR WILL VARY



TYPICALLY NOT USED IN STEAM LOCOMOTIVES

IR Drawbar Transmitter



**"Special" Lighting**  
Output location may vary per model for certain lighting features such as:

- MARS Lights
- Strobe Lights
- Emergency Lights
- Warning Lights
- Flashing Beacons
- Ground Lights
- Work Lights
- Number Boards
- Lit Gauges

IT IS RECOMMEND TO TRACE THE WIRES FROM THE LED TO THE PIN OUTS ON THE BOARD

# RCMC Wiring Diagram (Steam)

WIRE COLOR WILL VARY

Diagram 2

**NOTE:**  
The "PCB female Plug end" is used for a visual reference only, the wire location on PCB might vary. Always test pin outs with a meter to avoid damage to both the RCMC board and RS-LITE board.

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TYPICALLY NOT USED IN STEAM LOCOMOTIVES

(Hot) Center Rail Pick Up

TRACK CHASSIS GROUND

(TYPICALLY) GRAY

ANNTENA

PCB FEMALE PLUG END

SERIAL

COMMON

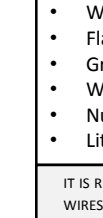
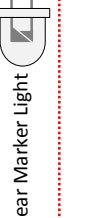
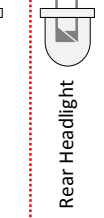
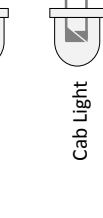
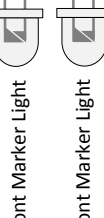
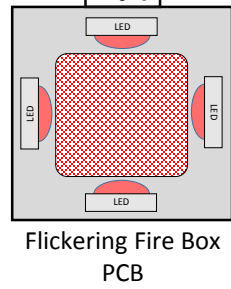
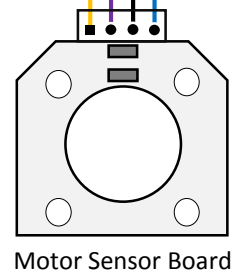
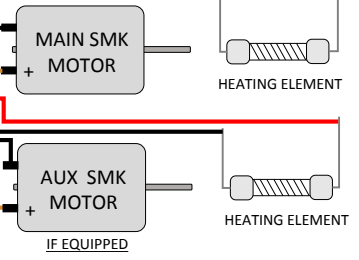
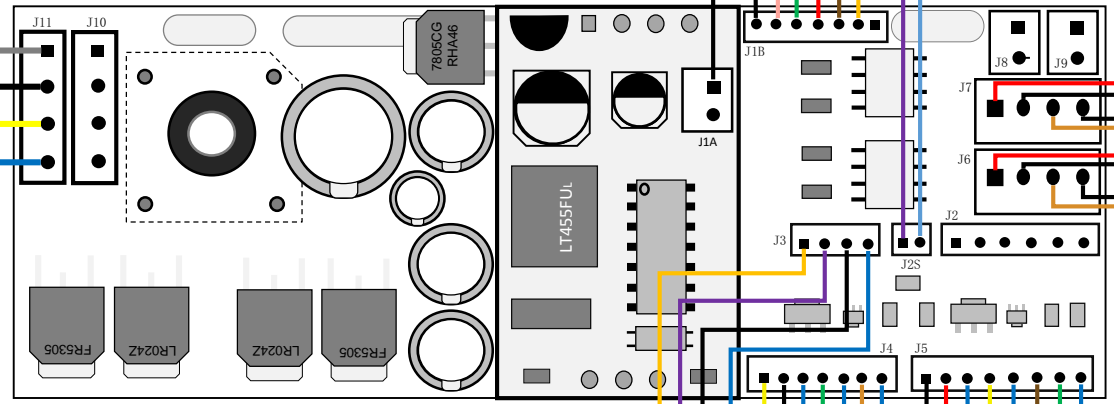
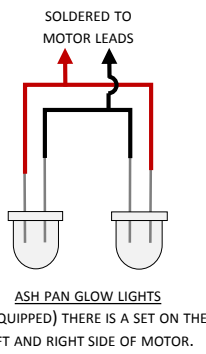
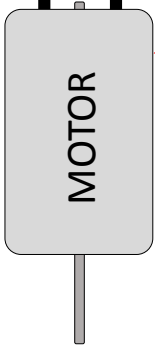
TRACK CHASSIS GROUND

(Hot) Center Rail Pick Up

SEE (Diagram 11) FOR CONNECTION TO RS-LITE BOARD

A FEW STEAM MODELS WILL HAVE TWO MOTORS. BUT TYPICALLY ONE IS USED. CONSULT DIESEL DIAGRAM FOR WIRING TWO MOTORS.

MOTOR LEAD 2  
MOTOR LEAD 1



"Special" Lighting Output location may vary per model for certain lighting features such as:

- MARS Lights
- Strobe Lights
- Emergency Lights
- Warning Lights
- Flashing Beacons
- Ground Lights
- Work Lights
- Number Boards
- Lit Gauges

IT IS RECOMMEND TO TRACE THE WIRES FROM THE LED TO THE PIN OUTS ON THE BOARD

WIRE COLOR WILL VARY

(IF EQUIPPED)

# RCMC Wiring Diagram

## (Diesel/Electric)

WIRE COLOR WILL VARY

Diagram 3

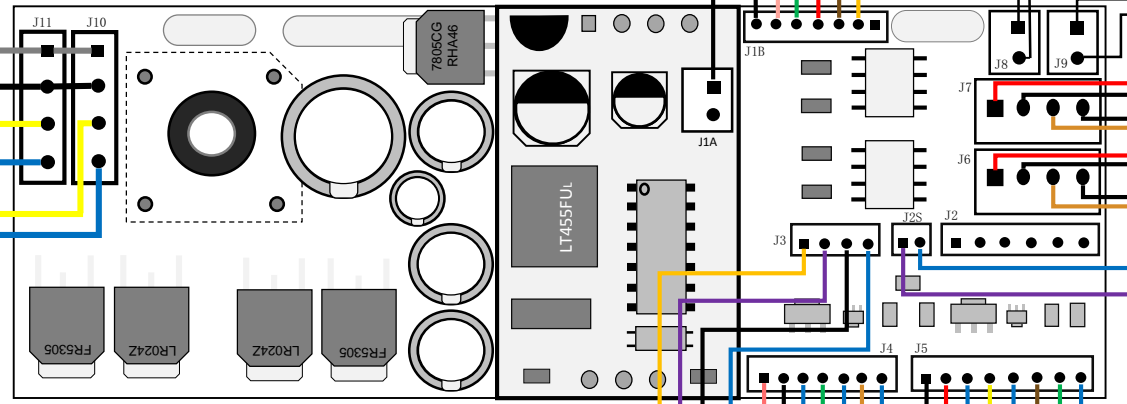
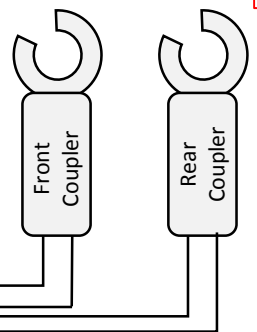
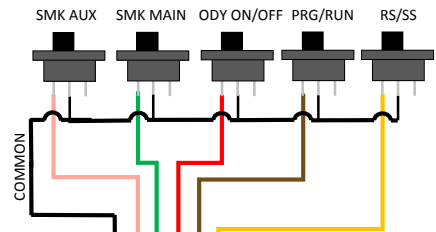
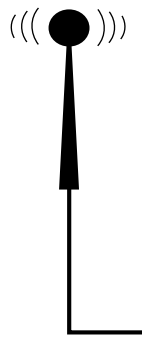
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LED's are Polarity Sensitive.  
If installed backwards they  
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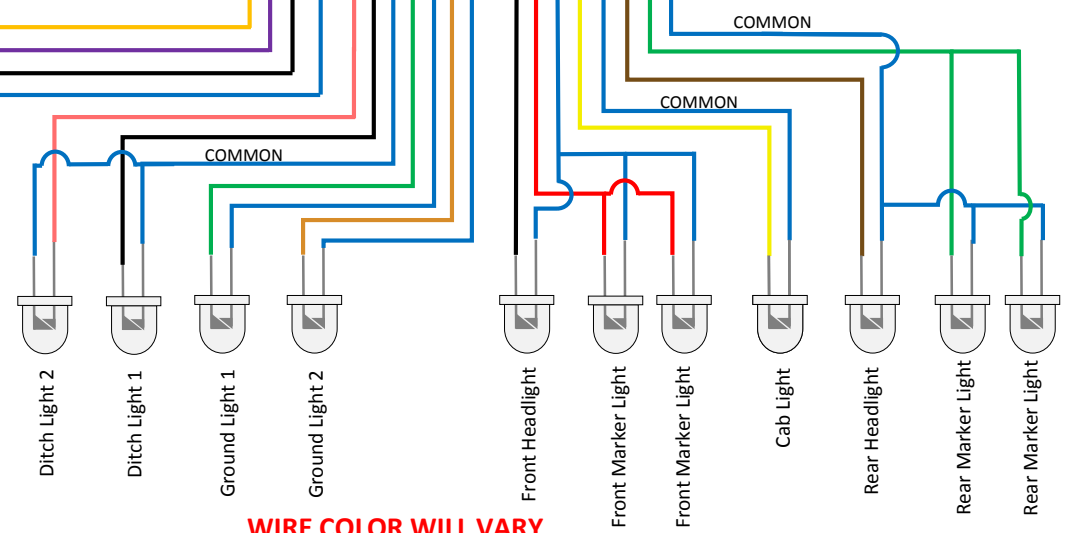
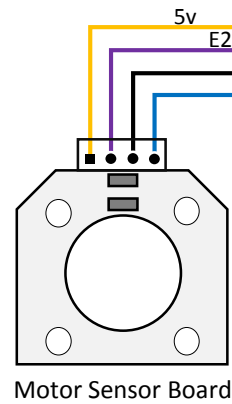
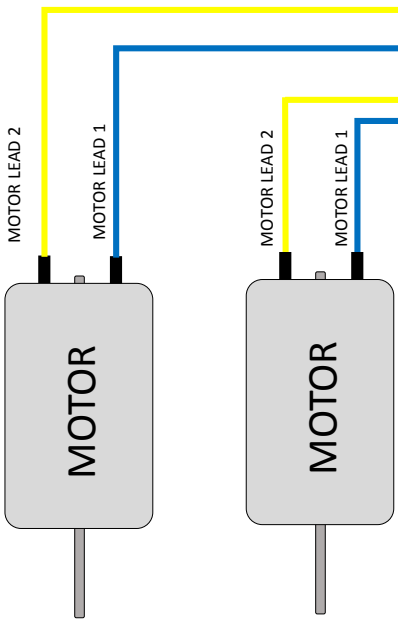
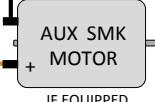
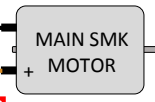
(Hot)  
Center Rail Pick Up

TRACK  
CHASSIS  
GROUND

(TYPICALLY) GRAY



CONNECTS TO  
SOUND BOARD.  
SEE DIAGRAM 3b



**"Special" Lighting**  
Output location may  
vary per model for  
certain lighting features  
such as:

- MARS Lights
- Strobe Lights
- Emergency Lights
- Warning Lights
- Flashing Beacons
- Ground Lights
- Work Lights
- Number Boards
- Lit Gauges

IT IS RECOMMEND TO TRACE THE  
WIRES FROM THE LED TO THE PIN  
OUTS ON THE BOARD

WIRE COLOR WILL VARY



# RCMC Wiring Diagram

## (Non-Powered Unit)

WIRE COLOR WILL VARY

Diagram 4

**NOTE:**  
Each RCMC board is programmed for the specific product it came from. Make sure when ordering a new RCMC board, it has the correct part number for the item you are repairing.

(Hot)  
Center Rail Pick Up

TRACK  
CHASSIS  
GROUND

(TYPICALLY) GRAY

**NOTE:**  
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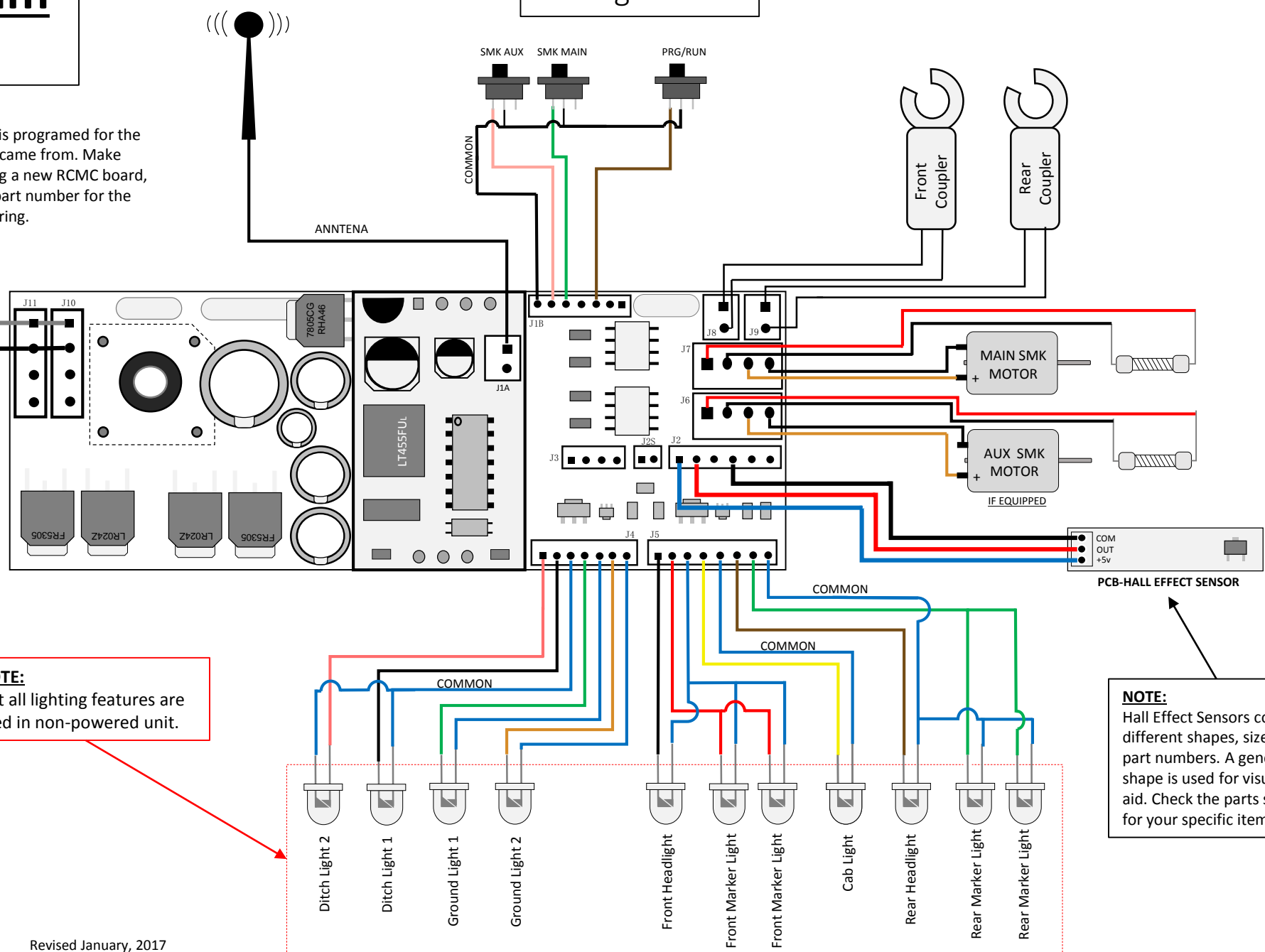
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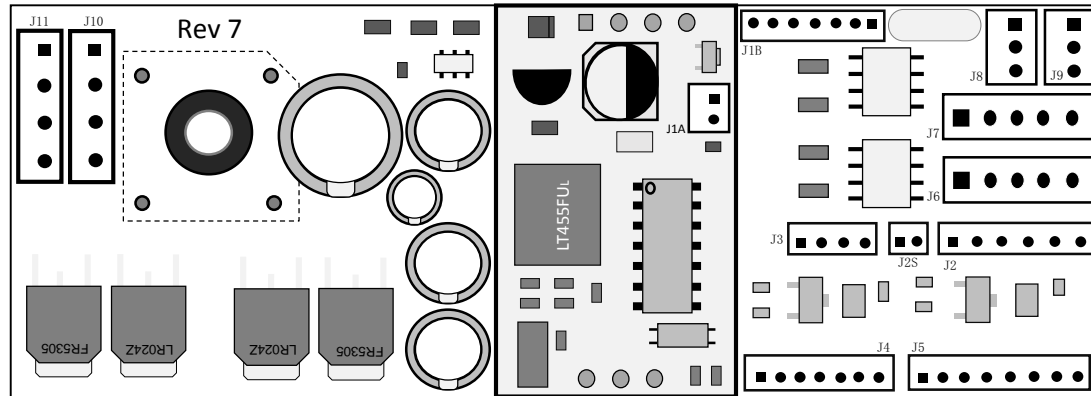
IT IS RECOMMEND TO TRACE THE WIRES FROM THE LED TO THE PIN OUTS ON THE BOARD

**NOTE:**  
Not all lighting features are used in non-powered unit.

**NOTE:**  
Hall Effect Sensors come in different shapes, sizes and part numbers. A generic shape is used for visual aid. Check the parts site for your specific item.

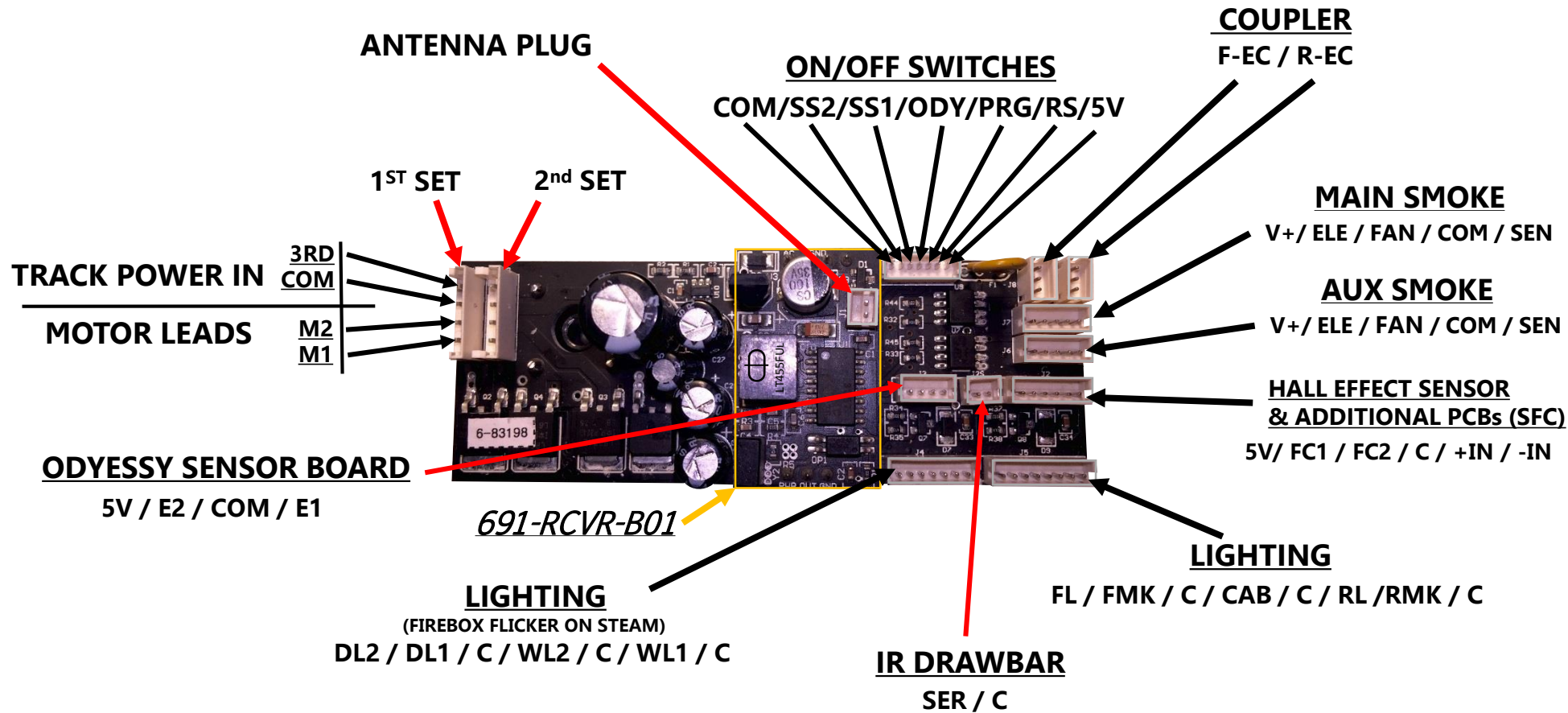


RCMC  
WITH THERMISTORS



# RCMC PLUG BREAK DOWN

(with Thermistors)



| RCMC PIN BREAK DOWN |                           |
|---------------------|---------------------------|
| ABRV                | TERM                      |
| 3RD                 | HOT (CENTER RAIL PICK UP) |
| COM                 | COMMON GROUND             |
| M1                  | MOTOR LEAD 1              |
| M2                  | MOTOR LEAD 2              |
| SS1                 | SMOKE SWITCH 1            |
| SS2                 | SMOKE SWITCH 2            |
| ODY                 | ODYSSEY SWITCH            |
| PRG                 | PROGRAM/RUN SWITCH        |
| RS                  | RAIL/SIGNAL SOUNDS SWITCH |
| 5V                  | 5 VOLTS +                 |
| F-EC                | FRONT ELECTRO COUPLER     |
| R-EC                | REAR ELECTRO COUPLER      |
| V+                  | POSITIVE OUTPUT VOLTAGE   |
| ELE                 | HEATING ELEMENT           |
| FAN                 | SMOKE FAN MOTOR           |
| SEN                 | HEAT SENSOR RESISTOR      |
| FC1                 | ?                         |
| FC2                 | ?                         |
| FL                  | FRONT LIGHT               |
| FMK                 | FRONT MARKER LIGHTS       |
| RMK                 | REAR MARKER LIGHTS        |
| CAB                 | CAB LIGHT                 |
| RL                  | REAR LIGHT                |
| SER                 | SERIAL DATA LINE          |
| DL1                 | DITCH LIGHT 1             |
| DL2                 | DITCH LIGHT 2             |
| WL1                 | WORK/GROUND LIGHT 1       |
| WL2                 | WORK/GROUND LIGHT 2       |
| C                   | COMMON GROUND             |
| +IN                 | ?                         |
| -IN                 | ?                         |
| E1                  | ?                         |
| E2                  | ?                         |

## NOTE:

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Diagram Perfected By:

**Bruk Bannister** with help from **Lionel LLC.**

Revised January, 2017

## NOTES:

- (C)= COMMON GROUND TO BOARD NOT CHASSIS GROUND

# RCMC Wiring Diagram

(Steam) WITH THERMISTOR

WIRE COLOR WILL VARY

Diagram 5

**NOTE:**  
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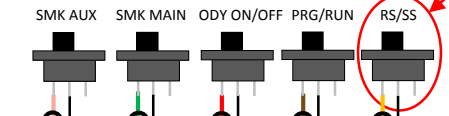
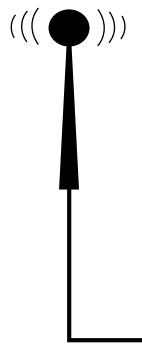
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CONSULT DIESEL DIAGRAM  
FOR WIRING TWO MOTORS.

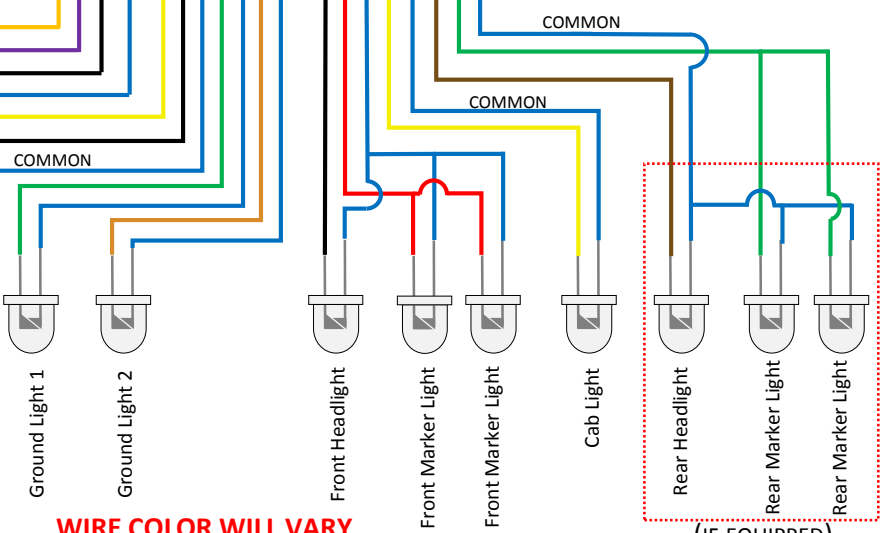
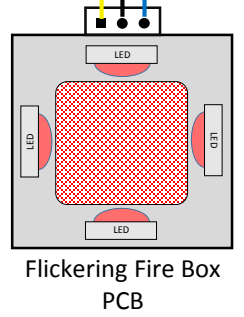
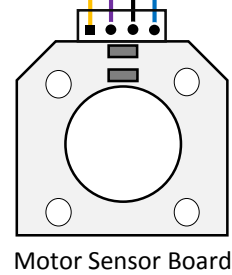
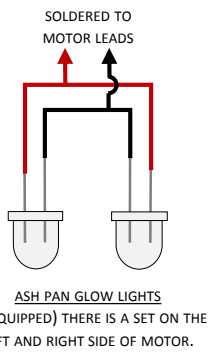
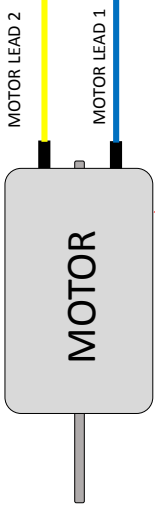
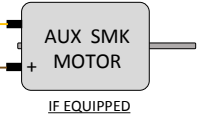
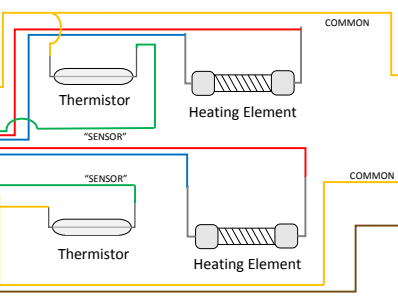
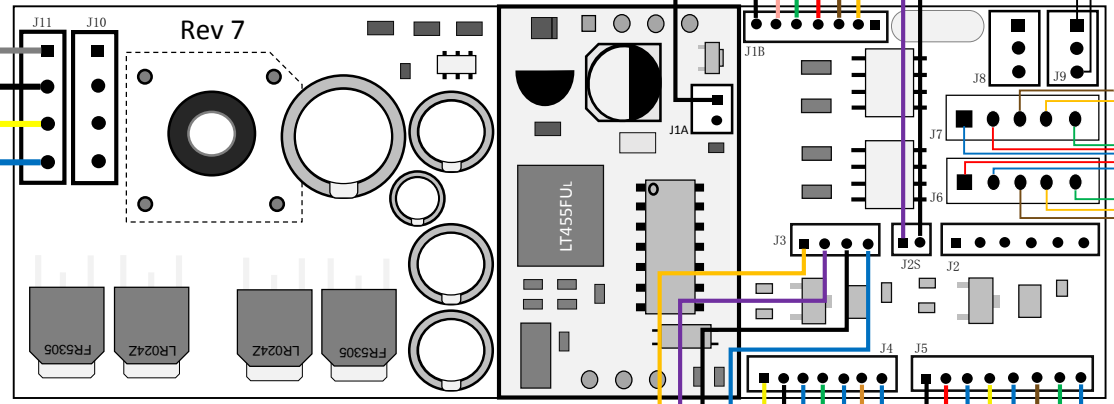
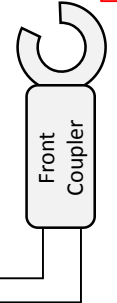
(Hot)  
Center Rail Pick Up

TRACK  
CHASSIS  
GROUND

(TYPICALLY) GRAY



IR Drawbar  
Transmitter



"Special" Lighting  
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OUTS ON THE BOARD

WIRE COLOR WILL VARY

# RCMC Wiring Diagram

(Steam with Tether) WITH THERMISTORS

WIRE COLOR WILL VARY

Diagram 6

**NOTE:**  
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TRACK CHASSIS GROUND

(TYPICALLY) GRAY

ANNTENA

PCB FEMALE PLUG END

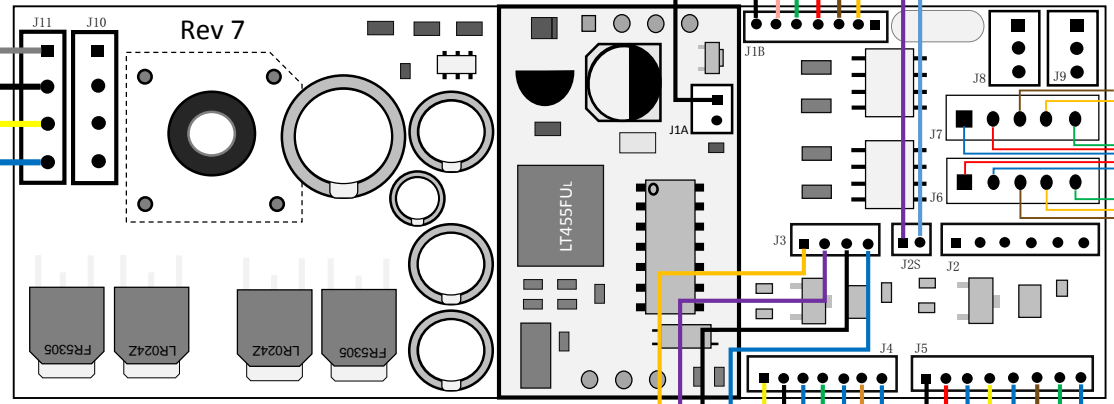
SERIAL

COMMON

TRACK CHASSIS GROUND

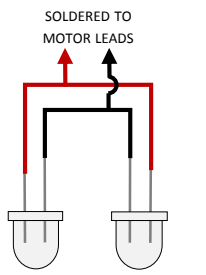
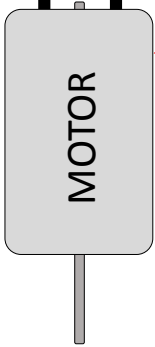
(Hot) Center Rail Pick Up

SEE (Diagram 11) FOR CONNECTION TO RS-LITE BOARD

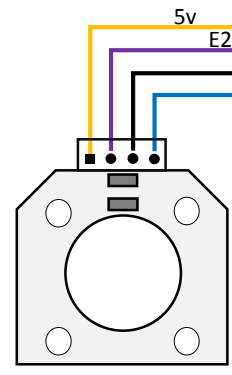


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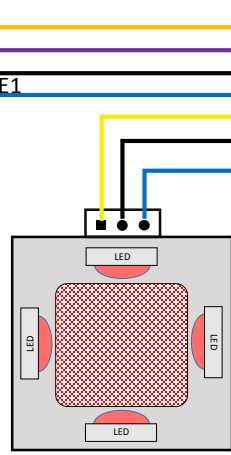
MOTOR LEAD 2  
MOTOR LEAD 1



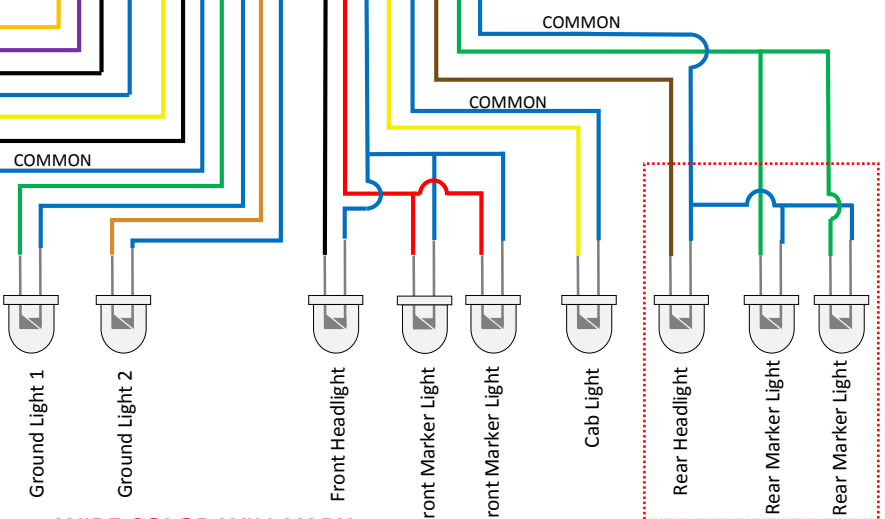
ASH PAN GLOW LIGHTS (IF EQUIPPED) THERE IS A SET ON THE LEFT AND RIGHT SIDE OF MOTOR.



Motor Sensor Board



Flickering Fire Box PCB



"Special" Lighting Output location may vary per model for certain lighting features such as:

- MARS Lights
- Strobe Lights
- Emergency Lights
- Warning Lights
- Flashing Beacons
- Ground Lights
- Work Lights
- Number Boards
- Lit Gauges

IT IS RECOMMEND TO TRACE THE WIRES FROM THE LED TO THE PIN OUTS ON THE BOARD

(IF EQUIPPED)

# RCMC Wiring Diagram

(Diesel/Electric) WITH THERMISTORS

WIRE COLOR WILL VARY

Diagram 7

**NOTE:**  
LED's are Polarity Sensitive.  
If installed backwards they  
will not work.

**NOTE:**  
Each RCMC board is programed for the  
specific product it came from. Make  
sure when ordering a new RCMC board,  
it has the correct part number for the  
item you are repairing.

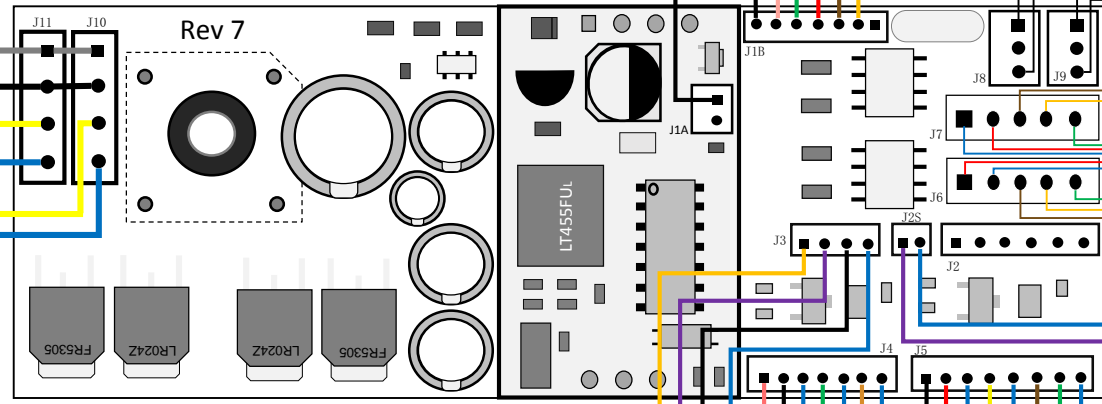
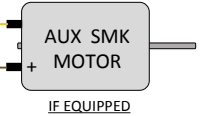
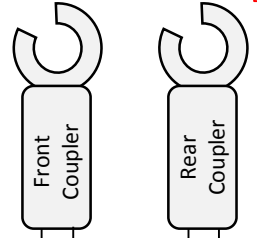
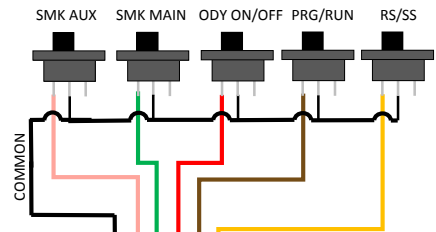
(Hot)  
Center Rail Pick Up

TRACK  
CHASSIS  
GROUND

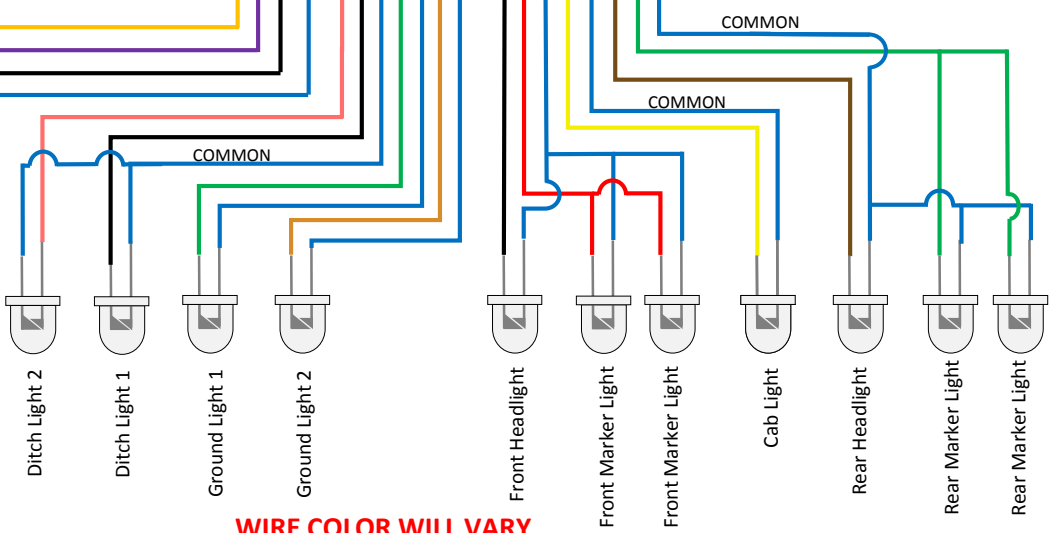
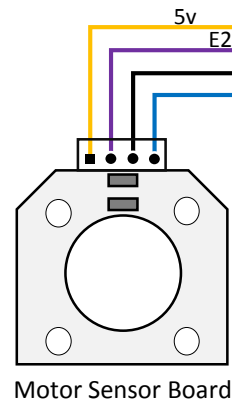
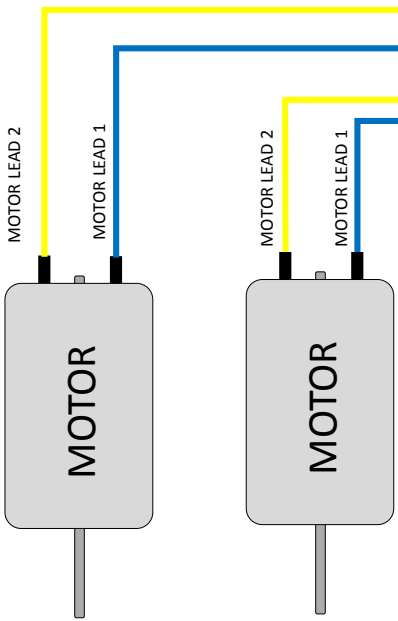
(TYPICALLY) GRAY

Rev 7

ANNTENA



CONNECTS TO  
SOUND BOARD.  
SEE DIAGRAM 3b



“Special” Lighting  
Output location may  
vary per model for  
certain lighting features  
such as:

- MARS Lights
- Strobe Lights
- Emergency Lights
- Warning Lights
- Flashing Beacons
- Ground Lights
- Work Lights
- Number Boards
- Lit Gauges

IT IS RECOMMEND TO TRACE THE  
WIRES FROM THE LED TO THE PIN  
OUTS ON THE BOARD

WIRE COLOR WILL VARY

# RCMC Wiring Diagram

(Non-Powered Units) WITH THERMISTORS

WIRE COLOR WILL VARY

Diagram 8

**NOTE:**  
Each RCMC board is programmed for the specific product it came from. Make sure when ordering a new RCMC board, it has the correct part number for the item you are repairing.

(Hot)  
Center Rail Pick Up

TRACK  
CHASSIS  
GROUND

(TYPICALLY) GRAY

**NOTE:**  
LED's are Polarity Sensitive. If installed backwards they will not work.

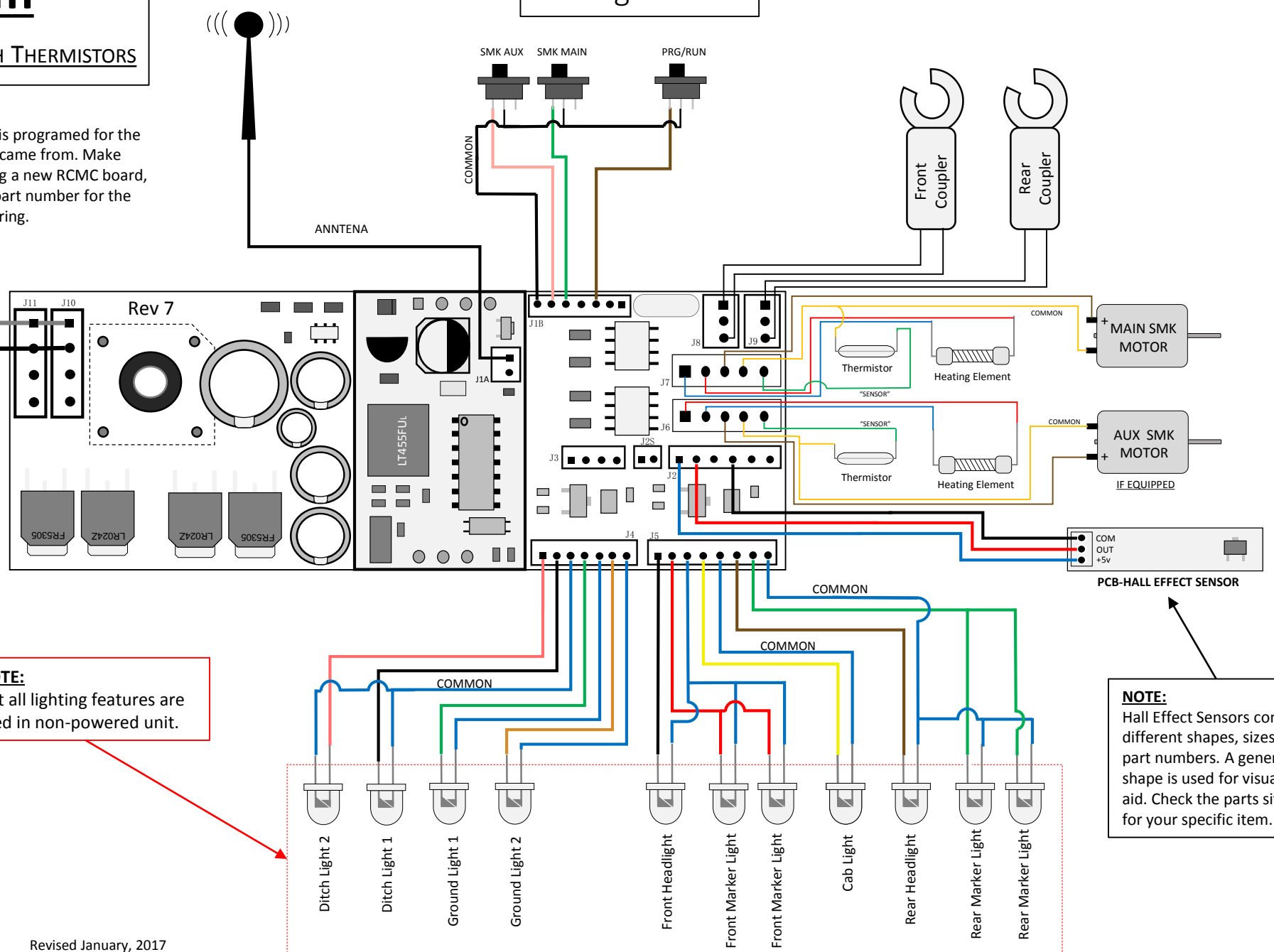
**"Special" Lighting**  
Output location may vary per model for certain lighting features such as:

- MARS Lights
- Strobe Lights
- Emergency Lights
- Warning Lights
- Flashing Beacons
- Ground Lights
- Work Lights
- Number Boards
- Lit Gauges

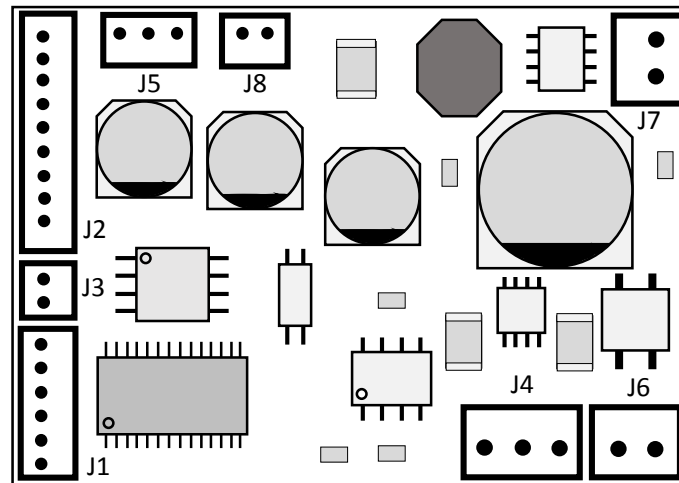
IT IS RECOMMEND TO TRACE THE WIRES FROM THE LED TO THE PIN OUTS ON THE BOARD

**NOTE:**  
Not all lighting features are used in non-powered unit.

**NOTE:**  
Hall Effect Sensors come in different shapes, sizes and part numbers. A generic shape is used for visual aid. Check the parts site for your specific item.

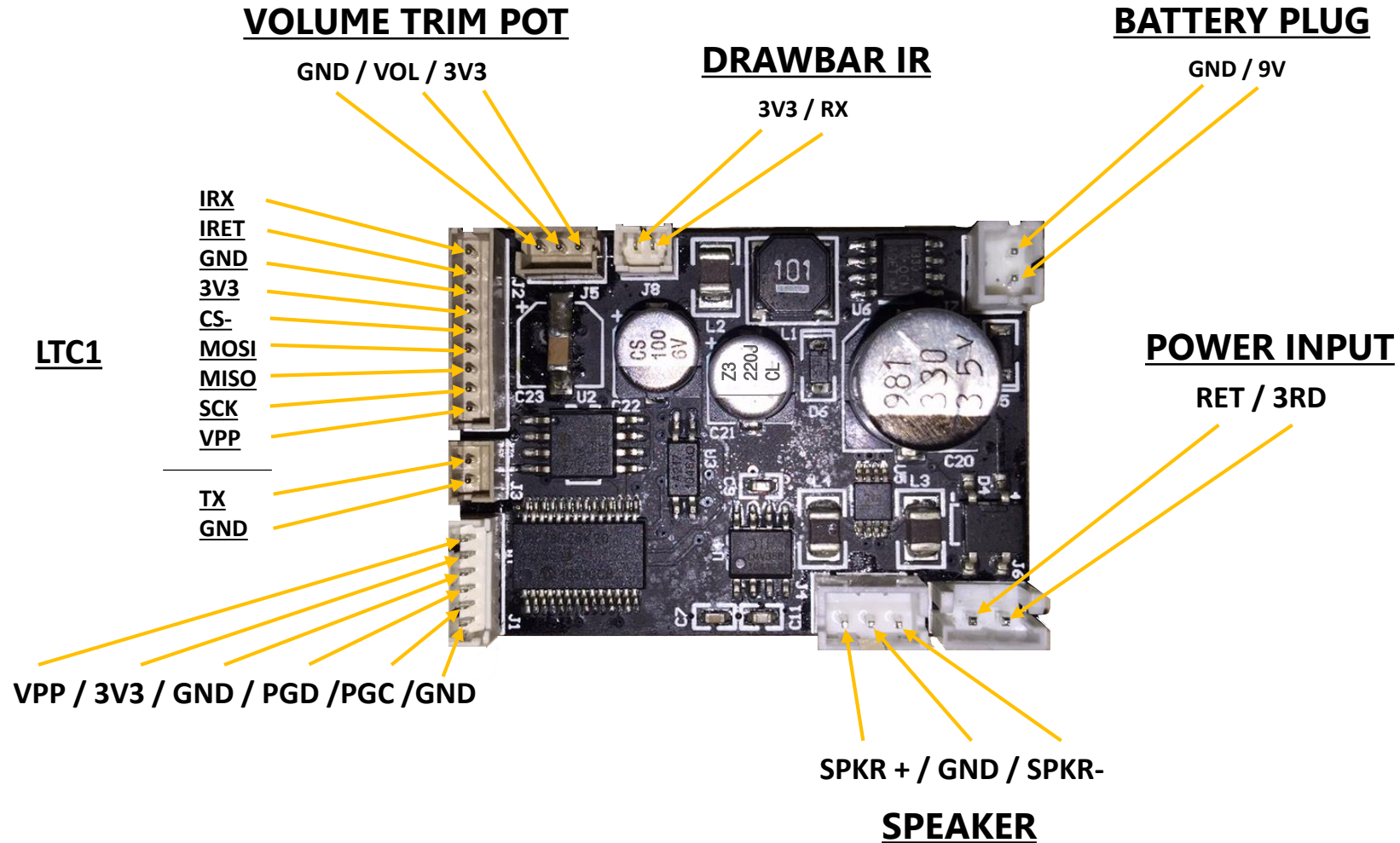


# RailSounds LITE





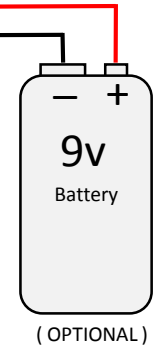
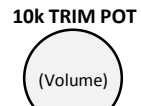
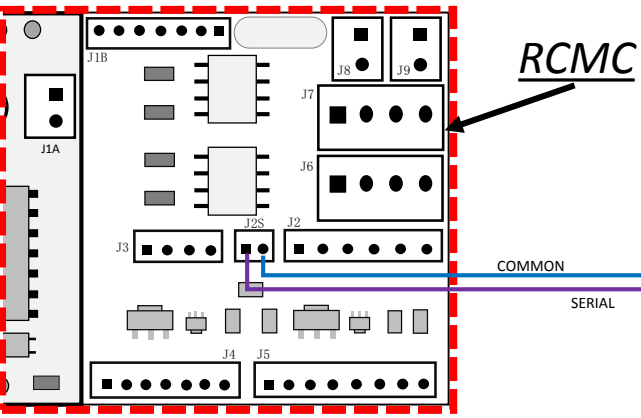
# RAILSOUNDS LITE PLUG BREAK DOWN



**WIRE COLOR WILL VARY**

# RAILSOUNDS LITE Wiring Diagram (Diesel/Electric)

Diagram 9

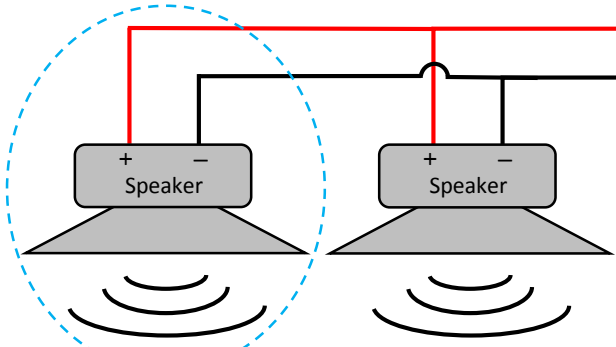
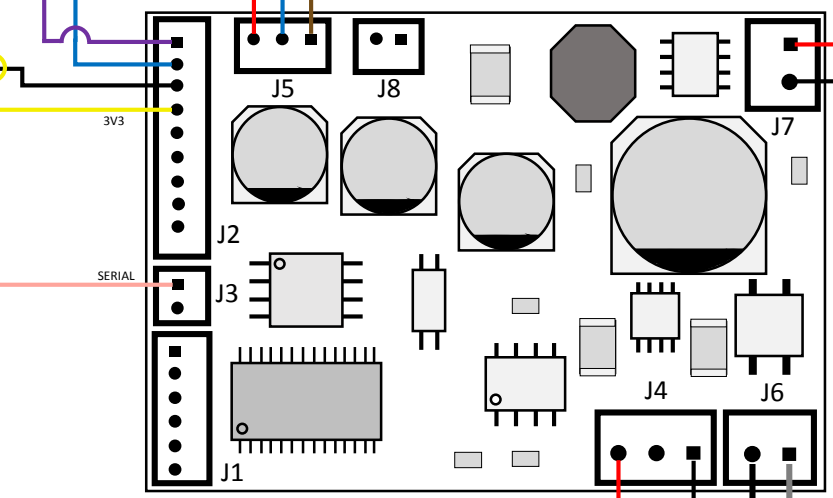
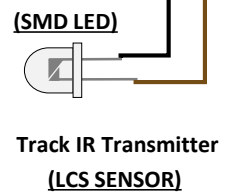
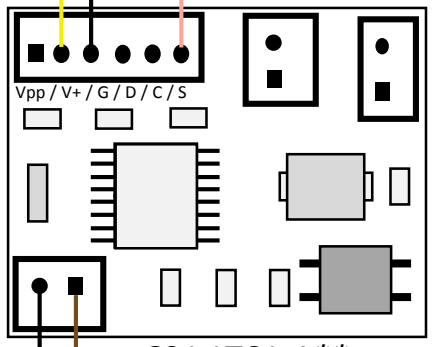


9 volts +  
-

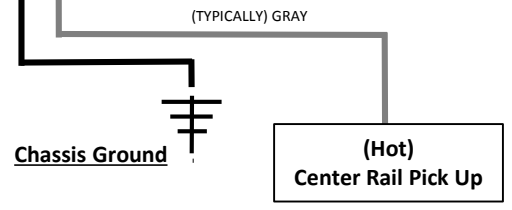
**NOTE:**  
Each sound board is programmed for the specific product it came from. Make sure when ordering a new sound board, it has the correct part number for the item you are repairing.

**TRACK I.R. DECODER/DRIVER BOARD**

- LTC1 Board controls lighting, coupler functions and communicates with LCS track.



IF EQUIPPED WITH TWO SPEAKERS



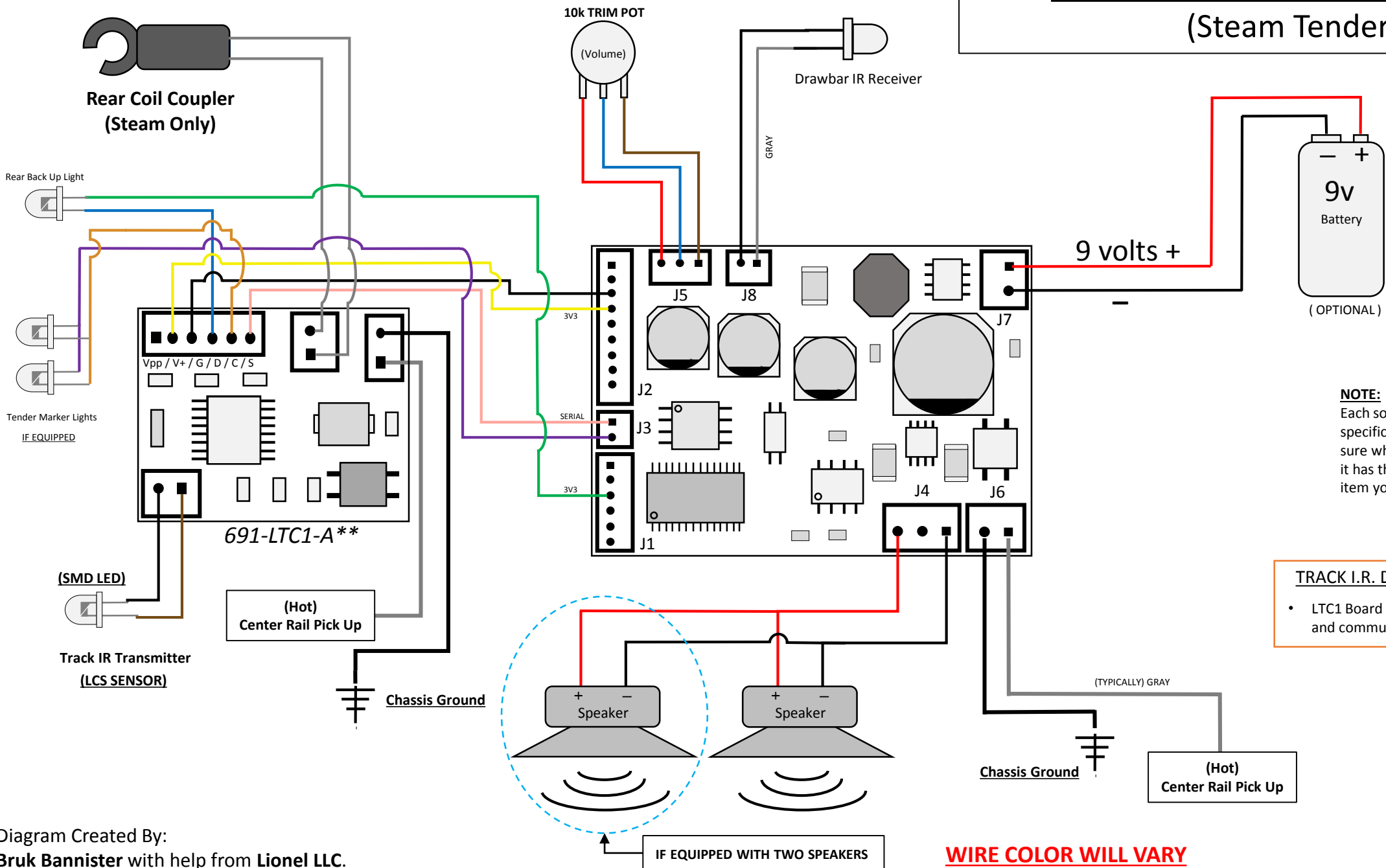
**WIRE COLOR WILL VARY**

**WIRE COLOR WILL VARY**

# RAILSOUNDS LITE Wiring Diagram

## (Steam Tender)

Diagram 10



**NOTE:**  
 Each sound board is programmed for the specific product it came from. Make sure when ordering a new sound board, it has the correct part number for the item you are repairing.

**TRACK I.R. DECODER/DRIVER BOARD**

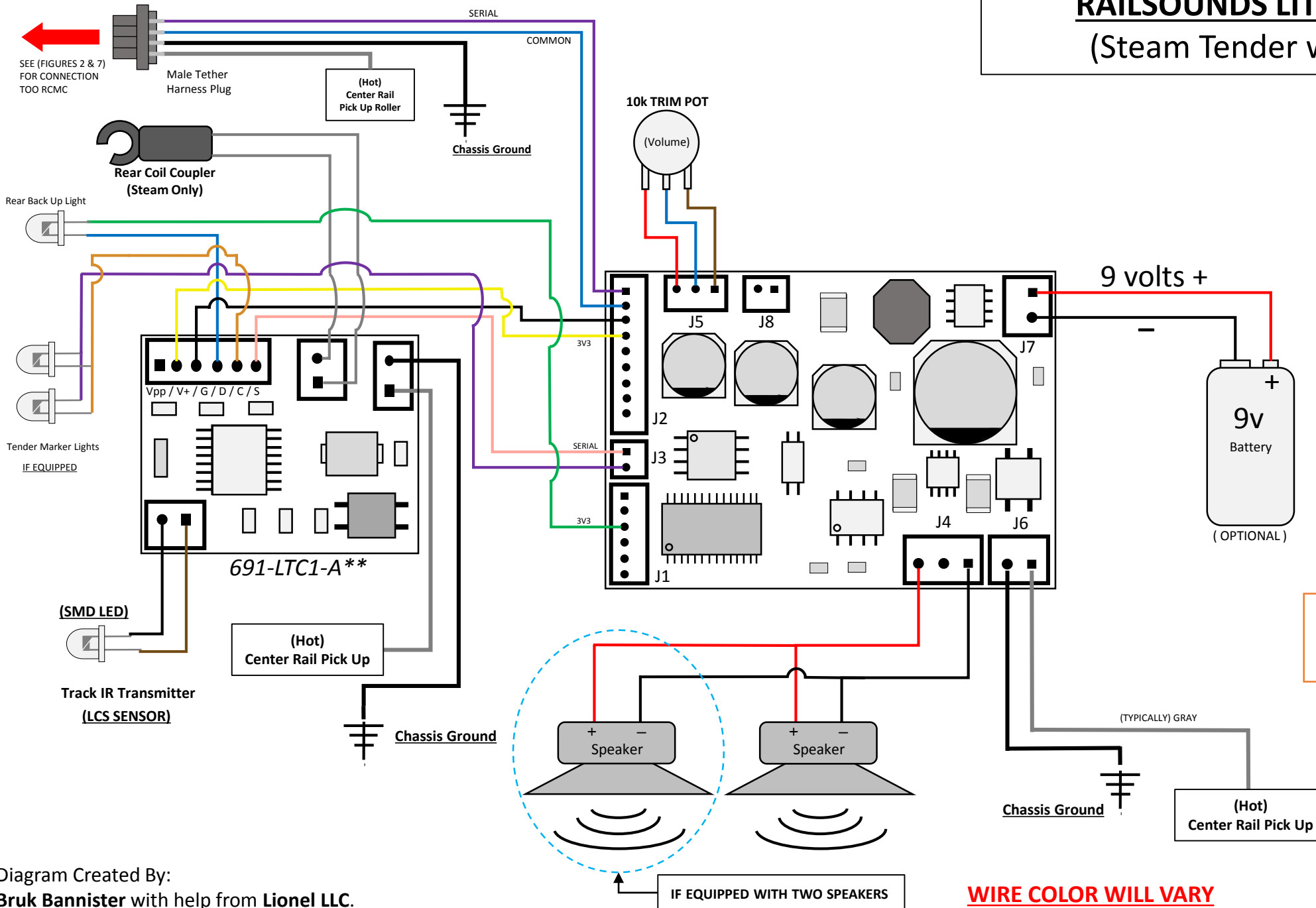
- LTC1 Board controls lighting, coupler functions and communicates with LCS track.

**WIRE COLOR WILL VARY**

**WIRE COLOR WILL VARY**

# RAILSOUNDS LITE Wiring Diagram (Steam Tender with Wire Tether)

Diagram 11



**NOTE:**  
The "Male Harness plug" is used for a visual reference only, the wire location might vary. Always test pin outs with a meter to avoid damage to both the RCMC board and RS-LITE board.

**NOTE:**  
Each sound board is programmed for the specific product it came from. Make sure when ordering a new sound board, it has the correct part number for the item you are repairing.

**TRACK I.R. DECODER/DRIVER BOARD**

- LTC1 Board controls lighting, coupler functions and communicates with LCS track.

IF EQUIPPED WITH TWO SPEAKERS

**WIRE COLOR WILL VARY**