EV Controls T2C User Guide

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New for 2020 the EV Controls TC - 2

EV Controls dash 4+

EV controls dash app

Chris Tapp

Free

EV Controls App

Features

- Dual 240mhz processors
- Real time operating system
- 2 CAN buses
- Bluetooth and Wifi enabled
- Dashboard and control app available now in the app store for iPad EV Controls App
- Weatherproof sealed ABS enclosure and main connector
- Firmware updates delivered OTA (over the air)
- Drive, neutral, reverse and regen switch inputs
- Drive, neutral and reverse indicator light outputs
- Inverter cooling fan control output
- Brake/regen lights control output
- Reverse lights control output
- Control outputs for positive and negative contactors, and precharge relay
- equipped standalone programmable controller designed to provide a user friendly interface for the control of a Tesla drive unit

The **EVControls T-2C** is a feature rich controller that provides microprocessor controlled inputs & outputs required to automate the startup and run procedures required for the safe and reliable operation of a Tesla drive unit conversions.

The built-in bluetooth and wifi capability are designed to interface with any current Apple device using the EV Controls App giving the operator instant access to real time information on system conditions that include battery voltage, charge rates, operating temperatures, system trouble codes system.

The control units real time operating system allows for future firmware updates via over the air programing.

Disclaimer

The installation of the EV Controls© controller requires that the end user have a thorough understanding of applicable electrical principles and is fully aware of the inherent dangers of working with electric vehicle high voltage systems as they apply to the design, construction and operation of an electric vehicle.
Under no circumstances shall EV Controls© be liable for direct, indirect, consequential or incidental damage or injury resulting from the use of EV Controls© components in the construction and operation of custom built electric vehicle.

Wiring Guidelines

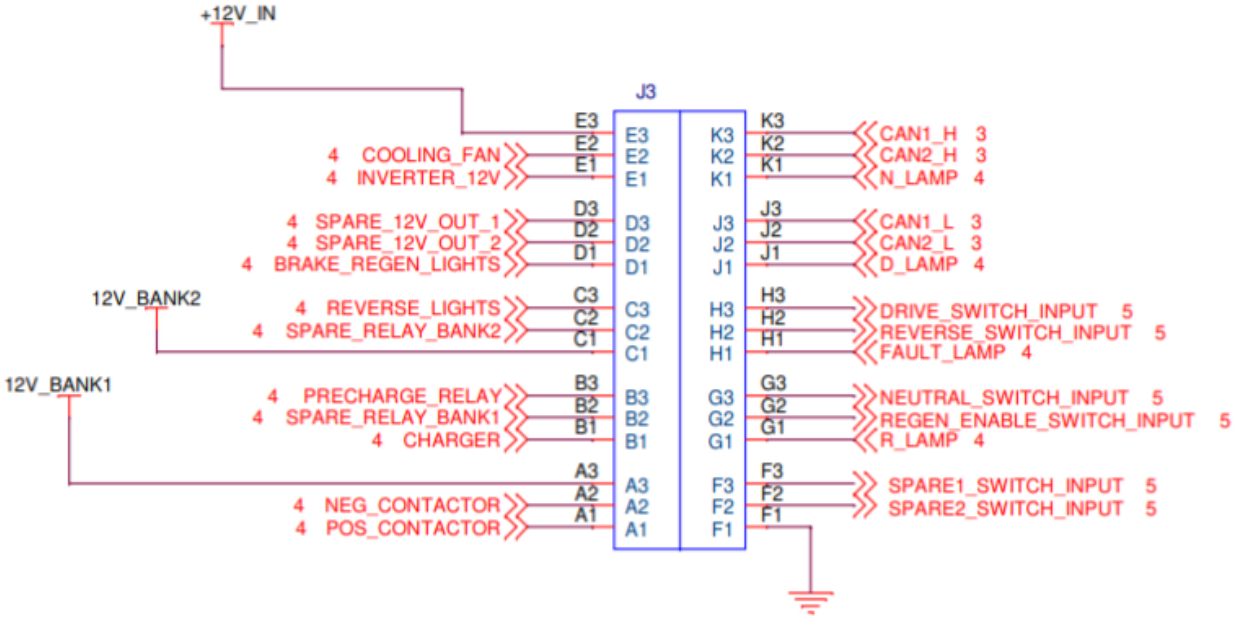
- The following diagrams use Tesla color codes where possible and assume that you will be using Tesla connectors for:
    - The drive inverter
    - Accelerator pedal
    - Brake switch
- The controller is equipped with the female side of a multi pin connector
- Your purchase includes a matching male side for the connector and required crimp connectors
- Connection details for the connector are included in the controller pinout diagram
- You must observe the fusing information provided in the included drive inverter diagram failure to do so may result in controller damage
    - Additional fusing should be added post controller for other controlled devices
    - Brake Lights
    - Reverse Light
    - High Voltage Contact relays
- All CAN communication wiring must be twisted pairs
- Can communication wiring must be located as far as possible from high voltage wiring to prevent CAN communication interference
- It is recommended that you begin your project by drawing a color coded wiring diagram for your completed project

What you must provide

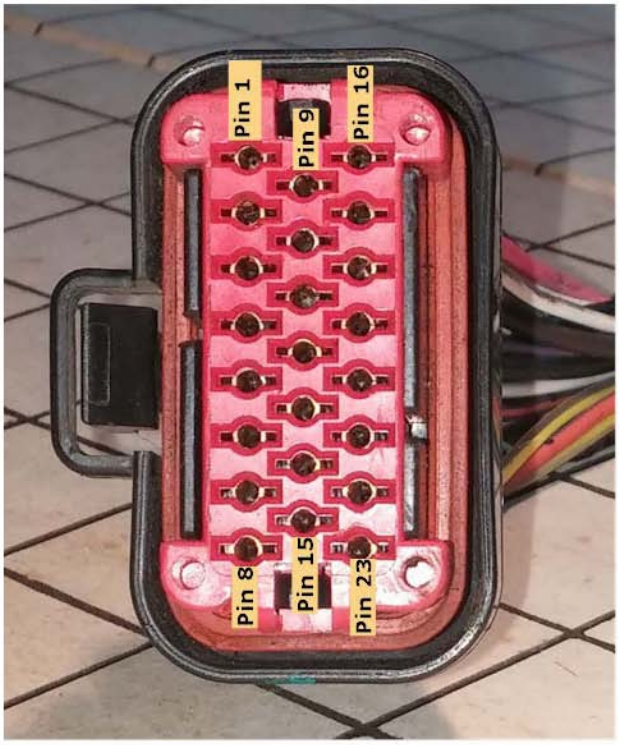
This guide is based on the assumption that you will have the following components in your possession

- Suitable drive unit (please email our support department to verify suitability)
- Drive unit wiring harness including inverter connector and shielded encoder harness with connector
- Tesla accelerator pedal with connector and a portion of the associated harness
- Brake switch with connector and a portion of the associated harness
- All associated wiring, fuses, contactors and switches
- A 12volt power source

ModICE WIRING HARNESS CONNECTOR

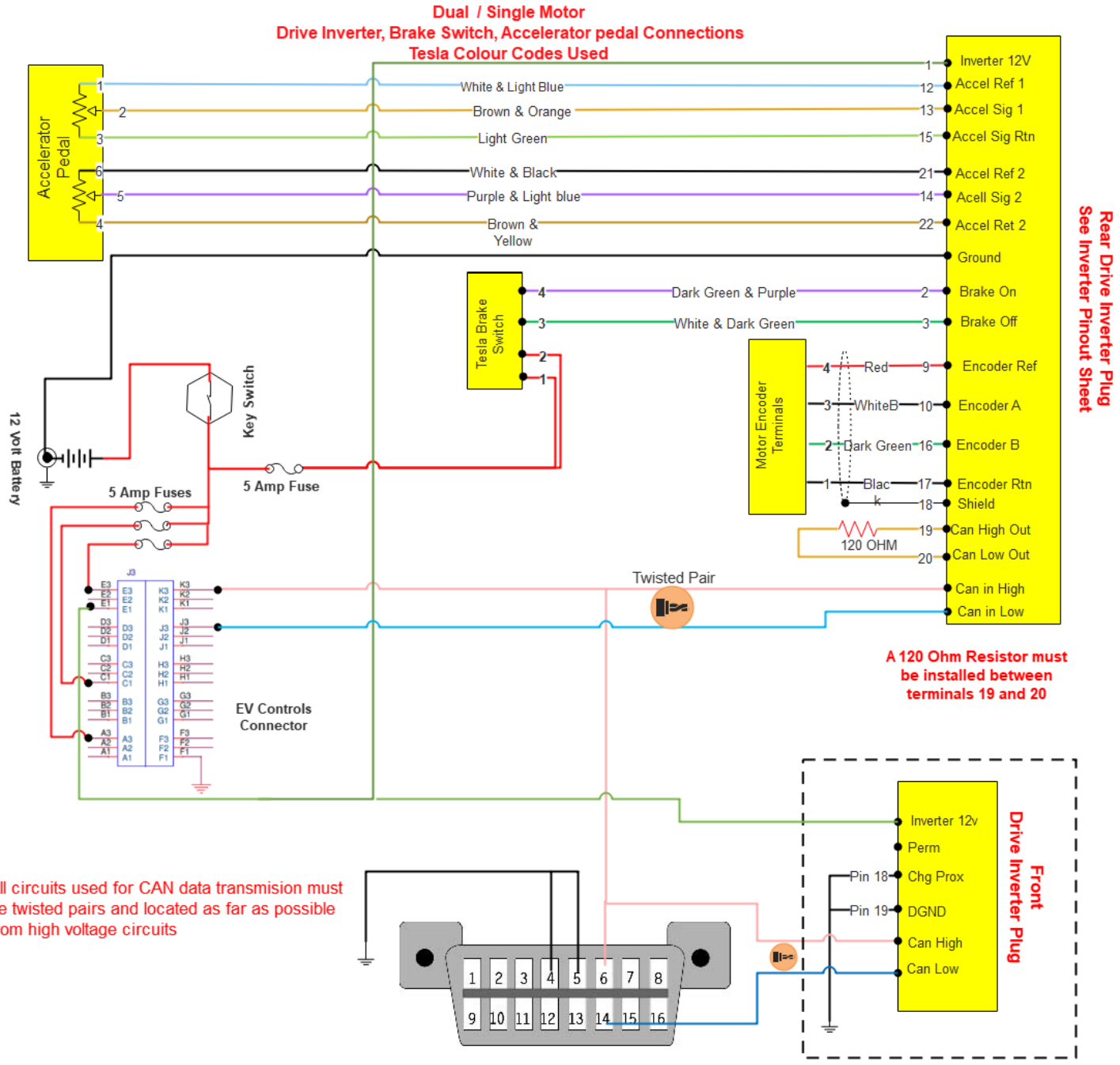


Drive inverter connector (Not Supplied)



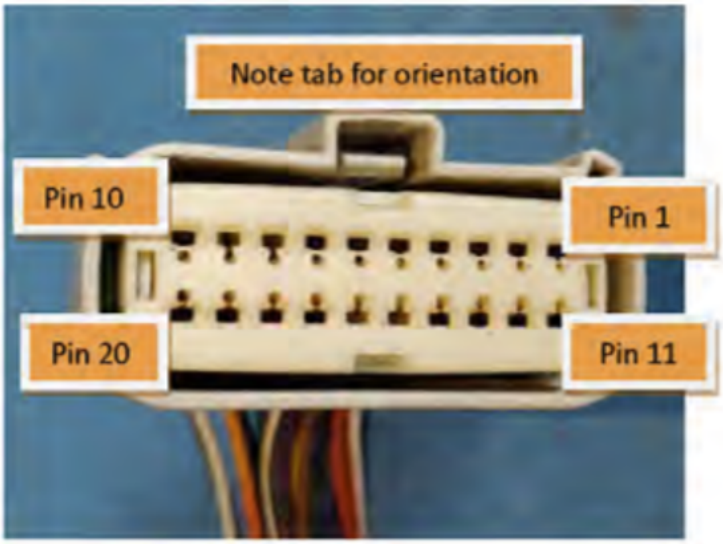
Cav	Col	Gauge
1	BN	1
2	DG/VT	0.5
3	WH/LG	0.5
4	PK/WH	0.5
5	LB/WH	0.5
6	OG/VT	0.5
7	YE/GY	0.5
8	YE/BN	0.5
9	RD	0.5
10	WH	0.5
11	BK	1
12	WH/LB	0.5
13	BN/OG	0.5
14	VT/LB	0.5
15	LG	0.5
16	DG	0.5
17	BK	0.5
18	SH	4.01
19	LG/RD	0.5
20	LG/DB	0.5
21	WH/BK	0.5
22	BN/YE	0.5

PIN NUMBER	Application
1	Key Power
2	BRAKE ON
3	BRAKE OFF
4	CAN HIGH IN +
5	CAN LOW IN -
6	NOT USED
7	NOT USED
8	NOT USED
9	ENCODER REF
10	ENCODER A
11	GROUND
12	ACCEL REF 1
13	ACCEL SIG 1
14	ACCEL SIG 2
15	ACCEL 1 SIG RTN
16	ENCODER B
17	ENCODER RETURN
18	ENCODER SHIELD -
19	CAN HIGH OUT
20	CAN LOW OUT
21	ACCEL REF 2
22	ACCEL SIG RTN

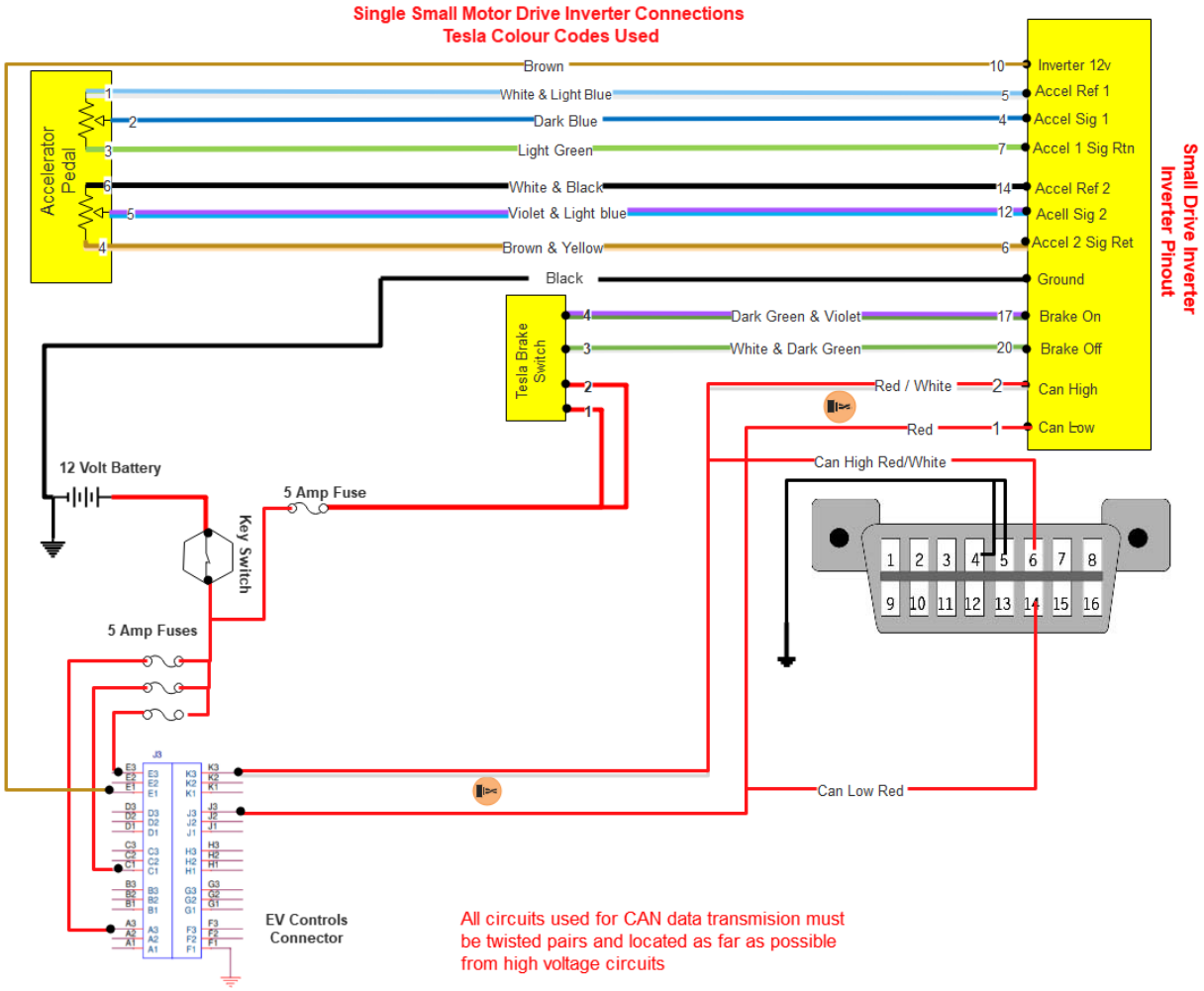

Dual / Single Motor
Drive Inverter, Brake Switch, Accelerator pedal Connections
Tesla Colour Codes Used
Accelerator Pedal
White & Light Blue
Brown & Orange
Light Green
White & Black
Purple & Light blue
Brown & Yellow
Inverter 12V
Accel Ref 1
Accel Sig 1
Accel Sig Rtn
Accel Ref 2
Acell Sig 2
Accel Ret 2
Ground
Tesla Brake Switch
Dark Green & Purple
White & Dark Green
Brake On
Brake Off
Motor Encoder Terminals
Red
WhiteB
Dark Green
Blac k
Encoder Ref
Encoder A
Encoder B
Encoder Rtn
Shield
120 OHM
Can High Out
Can Low Out
Can in High
Can in Low
Rear Drive Inverter Plug
See Inverter Pinout Sheet
12 volt Battery
Key Switch
5 Amp Fuses
5 Amp Fuse
Twisted Pair
EV Controls Connector
A 120 Ohm Resistor must be installed between terminals 19 and 20
All circuits used for CAN data transmision must be twisted pairs and located as far as possible from high voltage circuits
Inverter 12v
Perm
Chg Prox
DGND
Can High
Can Low
Pin 18
Pin 19
Front Drive Inverter Plug

Pin Identification and Connection Points

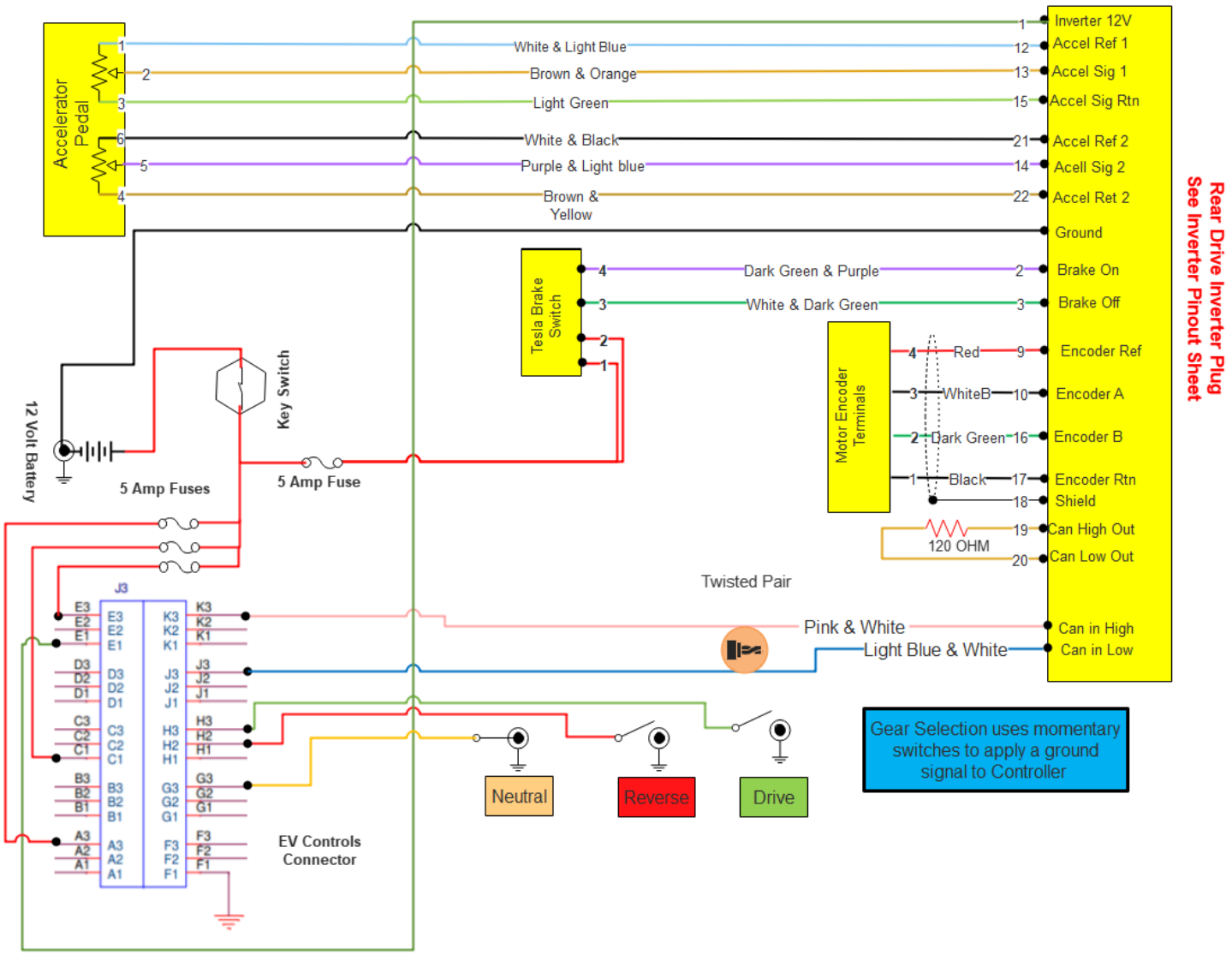
For Small “D” Motor



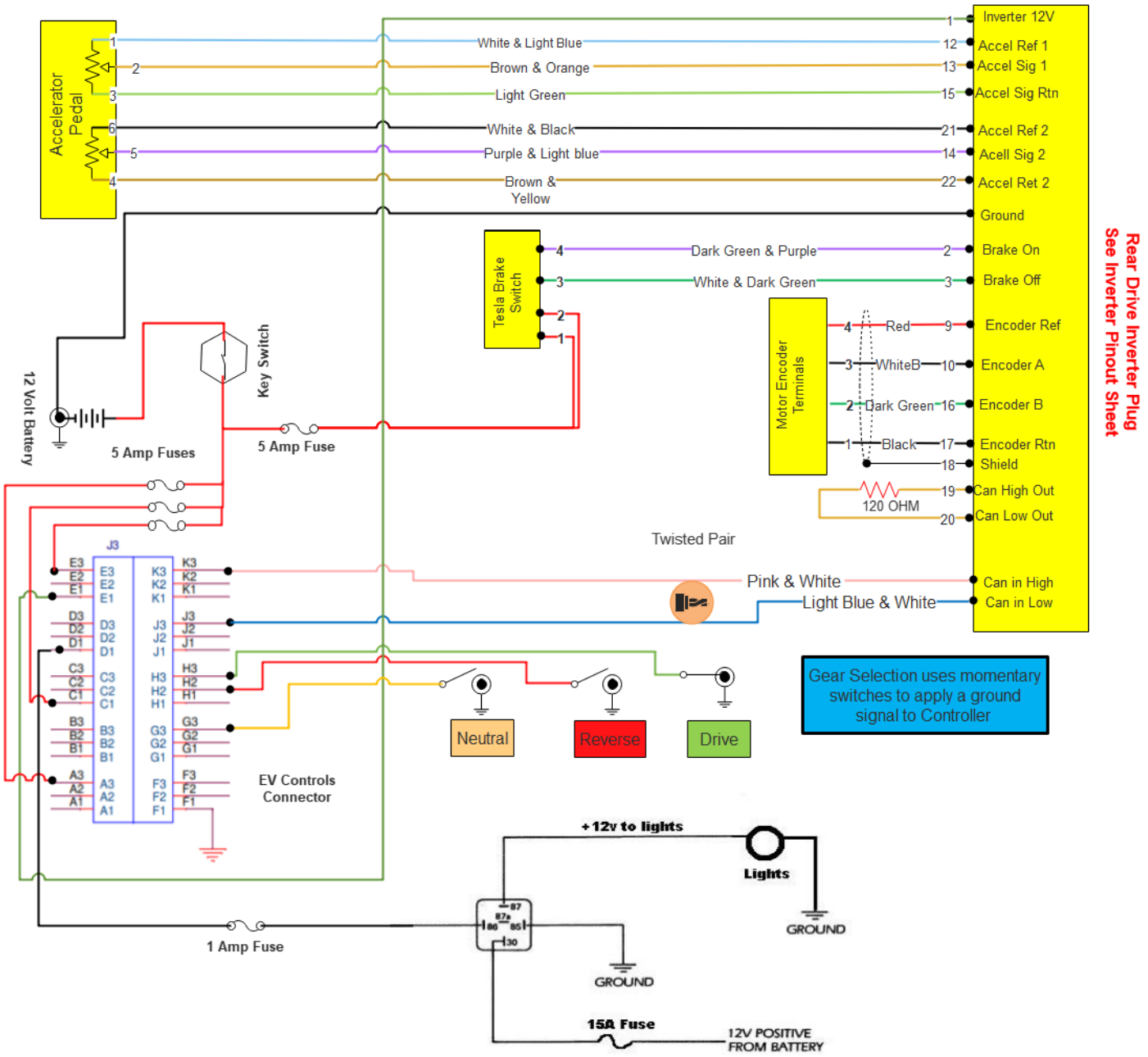
Inverter Pin Number	Wire Color	Controller Connection
1	Red	Can Low to Controller terminal J3
2	White Red	Can High to Controller terminal K3
3	Yellow and Green	Not Used
4	Dark Blue	Accelerator Signal Voltage Accelerator Pin 2
5	White/Blue	Accelerator Reference Voltage Accelerator Pin 1
6	Brown/Yellow	Accelerator Signal Return 1 Accelerator Pin 4
7	Light Green	Accelerator Signal Return 2 Accelerator Pin 3
8	Empty	
9	Empty	
10	Brown	Inverter 12V Power from Controller Terminal E1
11	Yellow/Red	Not used
12	Violet/Light Blue	Accelerator Signal Voltage 2 to Accelerator Pin 5
13	Brown	Ignition switch power to controller terminal E3
14	White/Black	Accelerator Reference Voltage 2 to accelerator Pin 6
15	Empty	
16	Empty	
17	Dark Green/Violet	Brake On – Brake Switch Pin 4
18	Orange/ Violet	Charge Proximity – Ground to enable Drive
19	Black	Chassis Ground
20	White/Dark Green	Brake Off – Brake Switch Pin 3


Single Small Motor Drive Inverter Connections
Tesla Colour Codes Used
Small Drive Inverter
Inverter Pinout
Accelerator Pedal
Brown
White & Light Blue
Dark Blue
Light Green
White & Black
Violet & Light blue
Brown & Yellow
Black
Inverter 12v
Accel Ref 1
Accel Sig 1
Accel 1 Sig Rtn
Accel Ref 2
Acell Sig 2
Accel 2 Sig Ret
Ground
Brake On
Brake Off
Can High
Can Low
Tesla Brake Switch
Dark Green & Violet
White & Dark Green
Red / White
Red
Can High Red/White
Can Low Red
12 Volt Battery
5 Amp Fuse
Key Switch
5 Amp Fuses
EV Controls Connector
All circuits used for CAN data transmision must be twisted pairs and located as far as possible from high voltage circuits

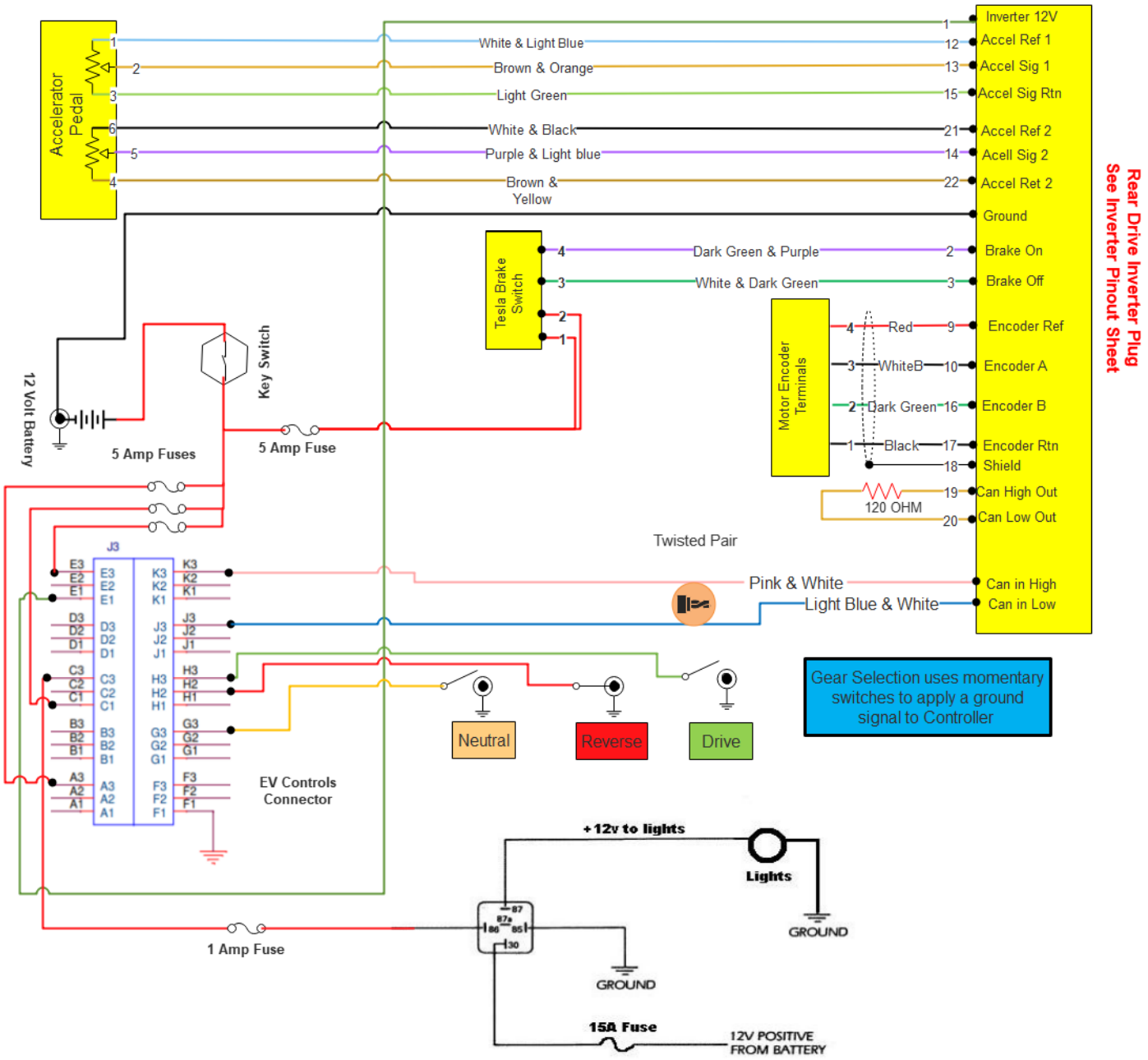
EV Controls Motor Controller Gear Select Connection Diagram
Tesla Colour Codes Used



EV Controls Motor Controller Brake light/Regen Connection Diagram
Tesla Colour Codes Used



EV Controls Motor Controller Reverse Gear Select Connection Diagram
Tesla Colour Codes Used



High Voltage Contactor Circuit