HI PERFORMANCE ELECTRIC VEHICLE SYSTEMS

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WIRING SCHEMATICS

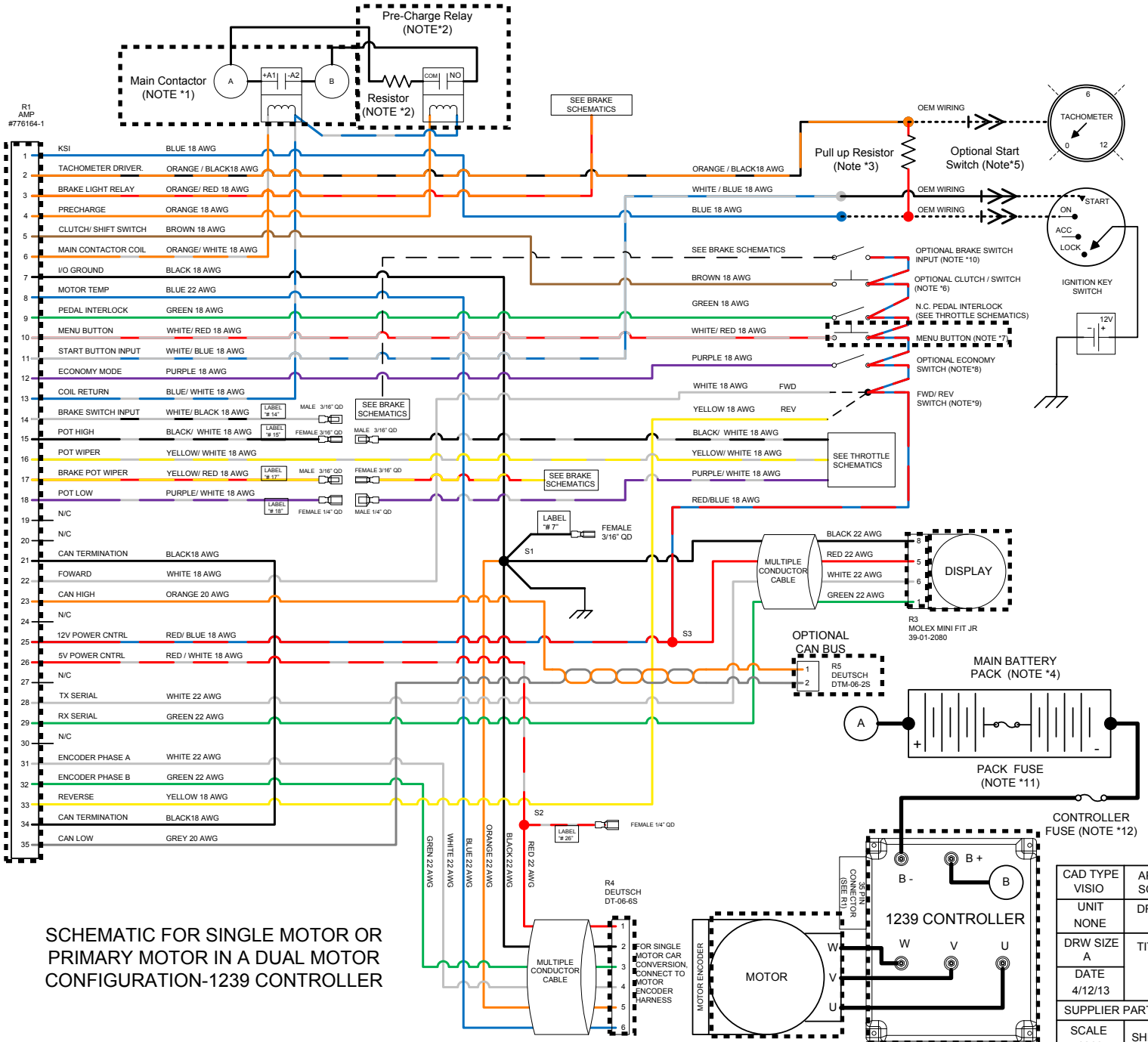
FOR SOFTWARE VERSIONS 5.13 AND HIGHER

FOR CURTIS 1239 CONTROLLER

ON-ROAD VEHICLE CONVERSION

FOR SINGLE AND WITH DUAL MOTOR APPLICATIONS

REVISION: D
Date 5/28/14



SCHEMATIC FOR SINGLE MOTOR OR PRIMARY MOTOR IN A DUAL MOTOR CONFIGURATION-1239 CONTROLLER

NOTES:

(*1) Use supplied Contactor.

(*2) Use supplied Pre-Charge Resistor and Relay (Tyco Electronics Part # T9AP1D52-12). For Coil connection, connect to small terminals.

(*3) Tachometers that are designed to work off of an ignition coil may not function properly in this application. Some tachometers may need a pull up resistor of 4.7K Ω to function

(*4) A Battery Management System (BMS) is strongly recommended if Lithium Ion batteries are used. Possible source of BMS is Ewert Energy System's ORION BMS (www.orionbms.com)

(*5) A start switch is required if Idle or Creep Torque parameters are ENABLED. See Programming Instructions. A start switch CAN be used without IDLE. See programming instructions for information

(*6) Install the Optional Clutch/ Shift Switch so that is ON when the clutch pedal is pressed. When clutch pedal is pressed the regen setting is changed to Shift Neutral Braking Parameter to prevent the motor from stalling during gear shifting. In a clutchless system, this allows you to set the coast down rate of the motor so that the gears align properly See Instructions on SHIFT-NEUTRAL BRAKING PARAMETERS.

(*7) Gives access to Drive System information. Required to access Programming and Diagnostic modes. See Programming Instructions.

(*8) Allows the use of ECONO Mode Parameters. See Programming Instructions.

(*9) Forward is CLOCKWISE motor rotation from Encoder end view. Depending on Transmission configuration, use either wire to obtain desired rotation. Use FWD & REV Switch in direct drive applications.

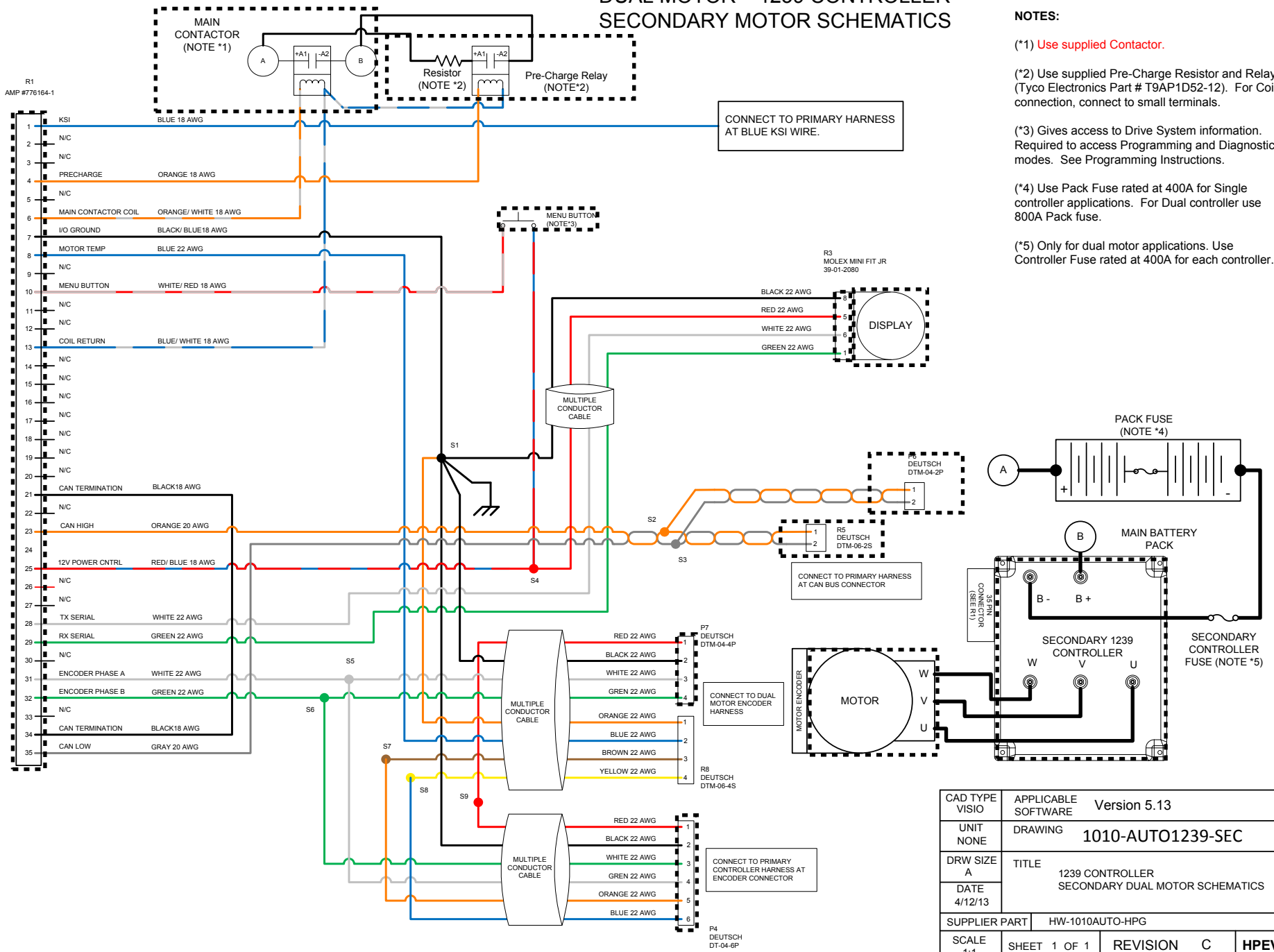
(*10) See Brake Schematics

(*11) Use Pack Fuse rated at 400A for Single controller applications. For Dual controller use 800A Pack Fuse.

(*12) Only for dual motor applications. Use Controller Fuse rated at 400A for each controller.

CAD TYPE VISIO	APPLICABLE SOFTWARE	Version 5.13	
UNIT NONE	DRAWING	1010-AUTO1239-PRI	
DRW SIZE A	TITTLE	1239 CONTROLLER ON-ROAD VEHICLE CONVERSION / PRIMARY DUAL MOTOR SCHEMATICS	
DATE 4/12/13			
SUPPLIER PART	HW-1010AUTO1239-HPG		
SCALE none	SHEET 1 OF 1	REVISION C	**HPEVS**

DUAL MOTOR – 1239 CONTROLLER SECONDARY MOTOR SCHEMATICS



NOTES:

(*1) Use supplied Contactor.

(*2) Use supplied Pre-Charge Resistor and Relay (Tyco Electronics Part # T9AP1D52-12). For Coil connection, connect to small terminals.

(*3) Gives access to Drive System information. Required to access Programming and Diagnostic modes. See Programming Instructions.

(*4) Use Pack Fuse rated at 400A for Single controller applications. For Dual controller use 800A Pack fuse.

(*5) Only for dual motor applications. Use Controller Fuse rated at 400A for each controller.

CAD TYPE VISIO	APPLICABLE SOFTWARE	Version 5.13	
UNIT NONE	DRAWING	1010-AUTO1239-SEC	
DRW SIZE A	TITLE	1239 CONTROLLER SECONDARY DUAL MOTOR SCHEMATICS	
DATE 4/12/13			
SUPPLIER PART	HW-1010AUTO-HPG		
SCALE 1:1	SHEET 1 OF 1	REVISION C	**HPEVS**

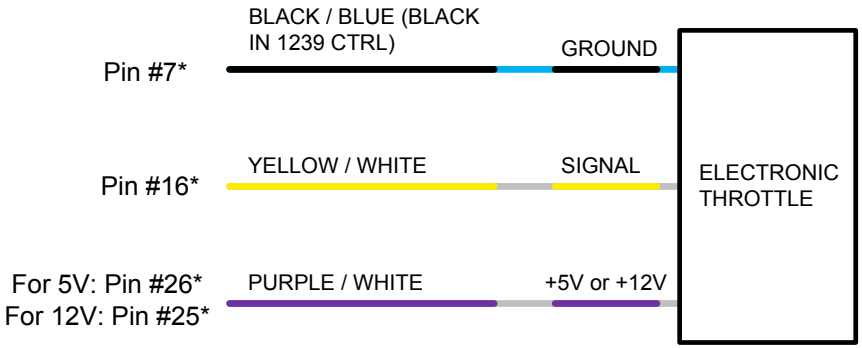
THROTTLE CONFIGURATION

Depending on the type of throttle used for the application, the different types of throttle configurations are listed within the table below. Electrical schematics are also included within the following pages.

THROTTLE CONFIGURATION	**TYPE**
ELECTRONIC without SWITCH	TYPE 1
2 WIRE with SWITCH 0-5k Ω	TYPE 2
3 WIRE with SWITCH 0-5k Ω	TYPE 3
CURTIS PB8 THROTTLE ASSEMBLY	TYPE 3

REVISIONS		
REV	DESCRIPTION	APPROVED
A	INITIAL RELEASE	1/22/2013

TYPE 1 ELECTRONIC THROTTLE**

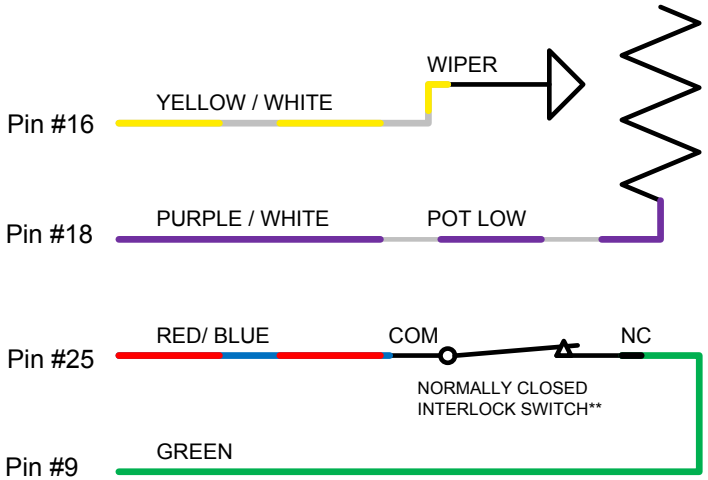


* Typical connection, verify correct voltage and connection in throttle documents or instructions.
Not all Electronic Throttles supported

** When an electronic throttle is used, the GREEN wire from the pedal interlock does not need to be connected.

CAD TYPE VISIO	APPLICABLE SOFTWARE		
UNIT NONE	DRAWING 1010-THROTTLE-001		
DRW SIZE A	TITLE ELECTRONIC THROTTLE		
DATE 1/22/13			
SUPPLIER PART			
SCALE NONE	SHEET 4 OF 4	REVISION B	HPEVS

REVISIONS		
REV	DESCRIPTION	APPROVED
A	INITIAL RELEASE	1/22/2013

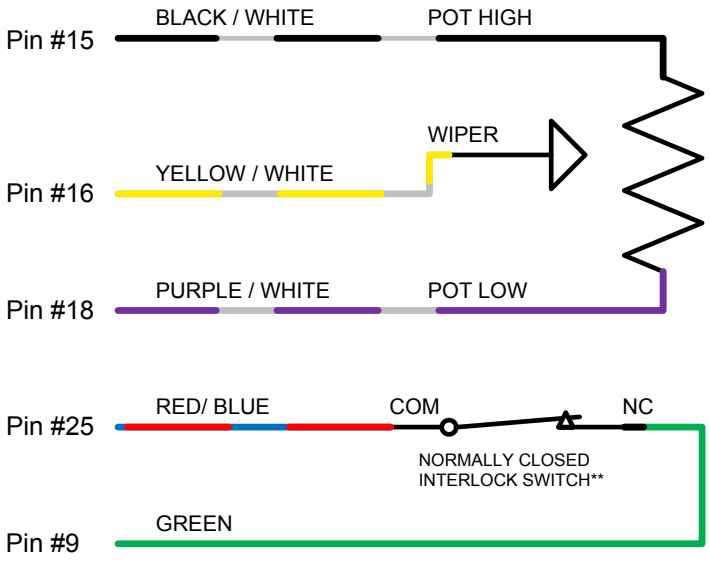


2 WIRE TYPE 2 THROTTLE

** When the accelerator pedal IS PRESSED the interlock switch is released to its NORMAL position (switch not activated) thus completing the circuit since its green wire is connected to the normally closed (NC) connection.

CAD TYPE VISIO	CAD LOC.	CAD FILE	DRW SIZE A
OPER. NO.	UNIT	DRAWING 1010-THROTTLE-001	
DESIGN	DETAIL	TITLE 2 WIRE TYPE 2 THROTTLE	
CHECKED	SAFETY		
SCALE NONE	DATE 1/22/13	REVISION A SHEET 1 OF 3	HPEVS

REVISIONS		
REV	DESCRIPTION	APPROVED
A	INITIAL RELEASE	1/22/2013

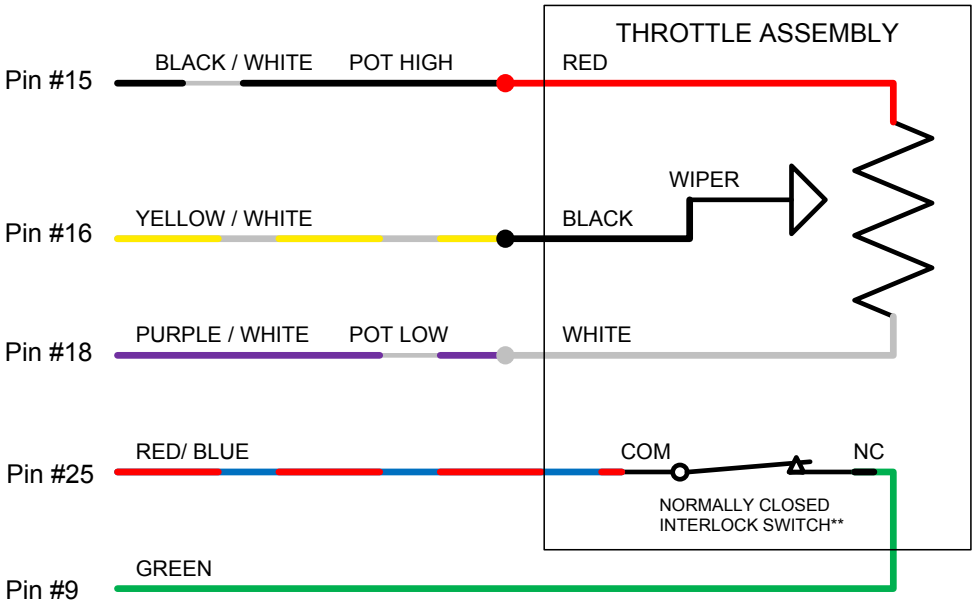


3 WIRE TYPE 3 THROTTLE

** When the accelerator pedal IS PRESSED the interlock switch is released to its NORMAL position (switch not activated) thus completing the circuit since its green wire is connected to the normally closed (NC) connection.

CAD TYPE VISIO	CAD LOC.	CAD FILE	DRW SIZE A
OPER. NO.	UNIT	DRAWING 1010-THROTTLE-001	
DESIGN	DETAIL	TITLE 3 WIRE TYPE 3 THROTTLE	
CHECKED	SAFETY		
SCALE NONE	DATE 1/22/13	REVISION A SHEET 2 OF 3	HPEVS

REVISIONS		
REV	DESCRIPTION	APPROVED
A	INITIAL RELEASE	11/27/2013



CURTIS PB8 THROTTLE ASSEMBLY

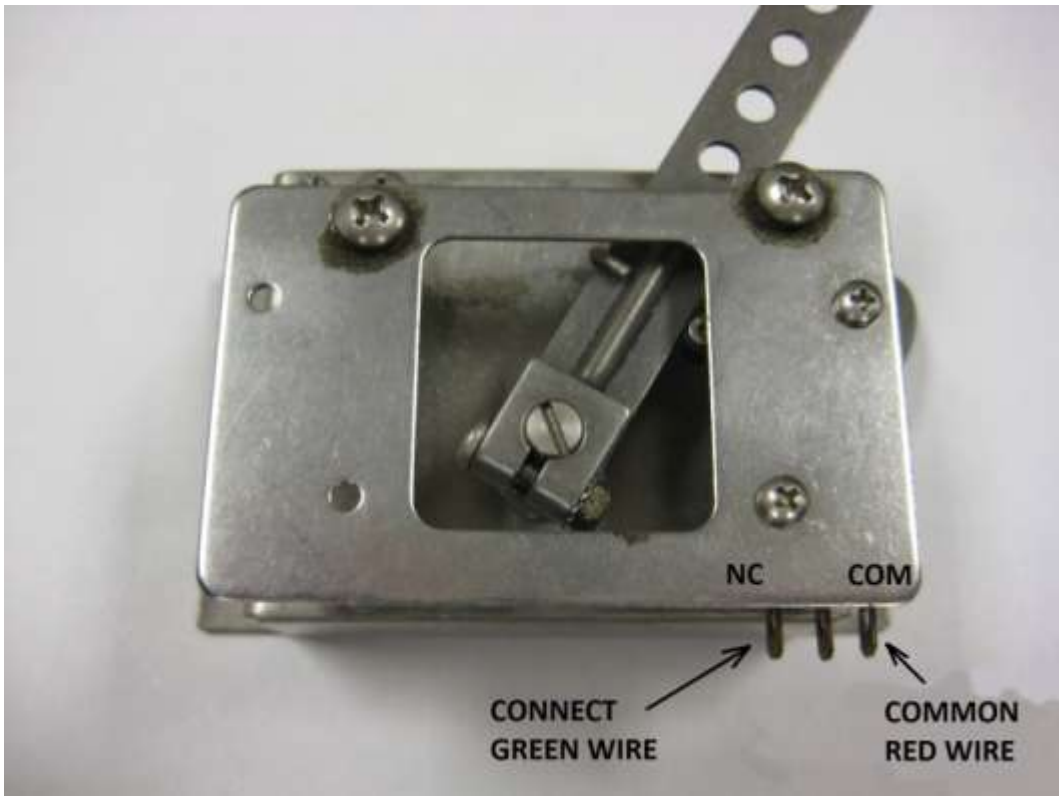
** When the accelerator pedal IS PRESSED the interlock switch is released to its NORMAL position (switch not activated) thus completing the circuit since its green wire is connected to the normally closed (NC) connection.

CAD TYPE VISIO	APPLICABLE SOFTWARE		
UNIT NONE	DRAWING 1010-THROTTLE-001		
DRW SIZE A	TITLE CURTIS PB8 THROTTLE ASSEMBLY		
DATE 1/22/13			
SUPPLIER PART			
SCALE NONE	SHEET 3 OF 4	REVISION A	HPEVS

PEDAL INTERLOCK CONNECTION

The pedal interlock connection is required for both 2 and 3 wire throttle pot assemblies. The Green wire is connected to the Normally Closed tab. The red/blue wire is connected to the common tab. See picture below.

NOTE: when the accelerator pedal IS PRESSED the interlock switch is released to its NORMAL position (switch not activated) thus completing the circuit since its green wire is connected to the normally closed (NC) connection.

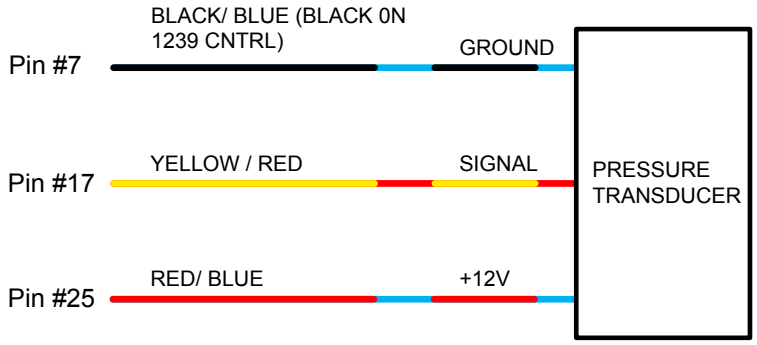


BRAKE INPUT CONFIGURATION

Depending on the type of brake input used for the application, the different types of brake input configurations are listed in the table below. Electrical schematics are also included within the following pages.

BRAKE INPUT CONFIGURATION	**TYPE**
NO BRAKE INPUT USED	TYPE 0
PRESSURE TRANSDUCER/ ELECTRONIC 0-5V INPUT	TYPE 1
2 WIRE 0-5k Ω POT	TYPE 2
SWITCH	TYPE 3

REVISIONS		
REV	DESCRIPTION	APPROVED
A	INITIAL RELEASE	2/19/2013

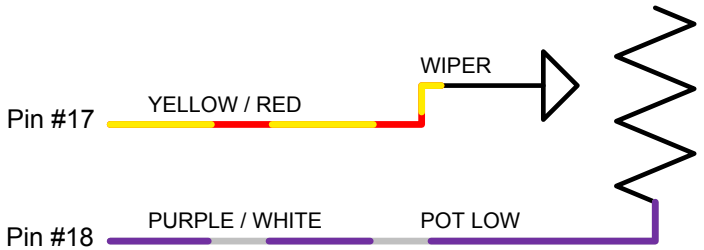


TYPE 1 PRESSURE TRANSDUCER

** Typical Pressure Transducer Ratings
- 8-30 Volt Input
- 1-5 Volt Output
- 2500 PSI

CAD TYPE VISIO	CAD LOC.	CAD FILE	DRW SIZE A
OPER. NO.	UNIT	DRAWING 1010-BRAKE	
DESIGN	DETAIL	TITLE PRESSURE TRANSDUCER	
CHECKED	SAFETY		
SCALE NONE	DATE 2/19/13	REVISION A SHEET 2 OF 2	HPEVS

REVISIONS		
REV	DESCRIPTION	APPROVED
A	INITIAL RELEASE	2/19/2013



TYPE 2
2 WIRE BRAKE POT

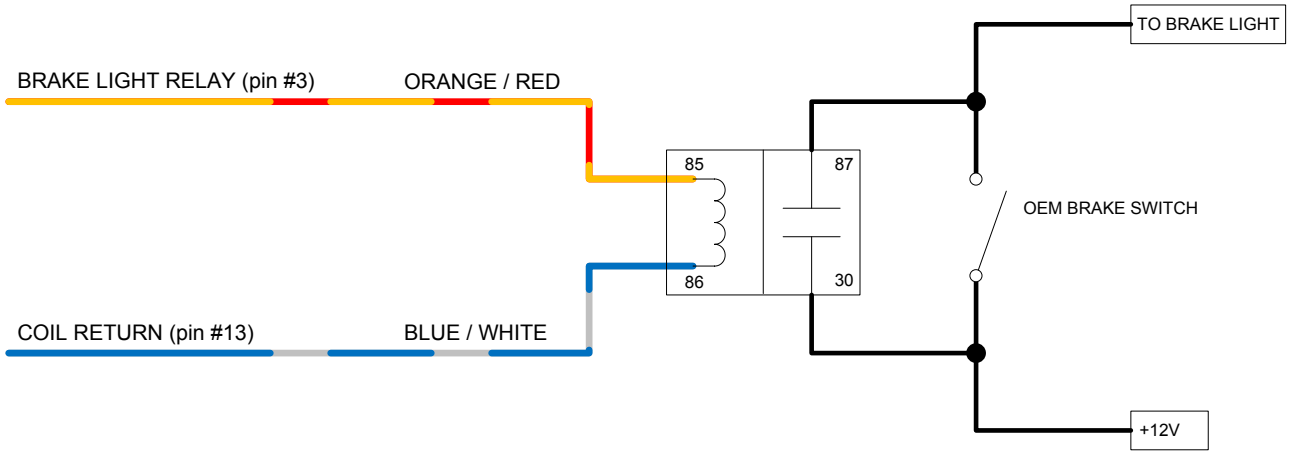
CAD TYPE VISIO	CAD LOC.	CAD FILE	DRW SIZE A
OPER. NO.	UNIT	DRAWING 1010-BRAKE	
DESIGN	DETAIL	TITLE 2 WIRE BRAKE POT	
CHECKED	SAFETY		
SCALE NONE	DATE 2/19/13	REVISION A SHEET 1 OF 2	HPEVS

OPTIONAL ACTIVE BRAKE LIGHT CONFIGURATIONS

These optional active brake light configurations are used to activate the brake lights during regenerative braking or when the vehicle brakes are being applied. Based on the brake type configuration that is being used in the application use one of the following wiring configurations.

REVISIONS		
REV	DESCRIPTION	APPROVED
A	INITIAL RELEASE	2/19/2013

ACTIVE BRAKE LIGHT CONFIGURATION
OPTION 1
FOR BRAKE TYPE 0, 1 OR 2 CONFIGURATIONS

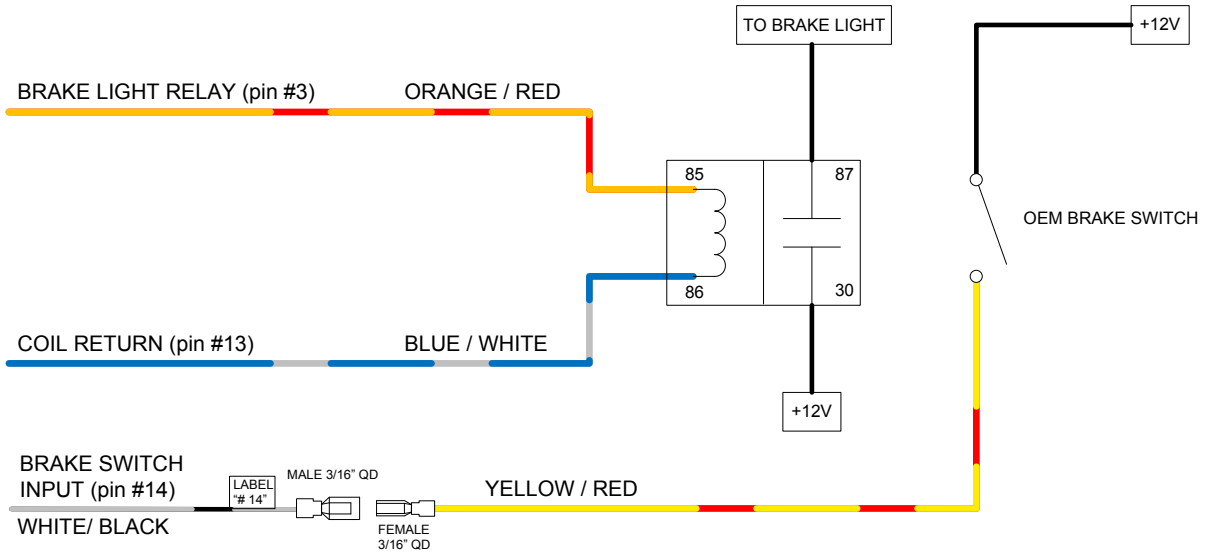


** This option turns the brake lights ON during REGEN. Brake TYPE 0 does not allow for BOOSTED BRAKE while pressing the brake pedal. Brake TYPE 1 & 2 uses a variable input for BOOSTED REGEN.

CAD TYPE VISIO	CAD LOC.	CAD FILE	DRW SIZE A
OPER. NO.	UNIT	DRAWING 1010-BRAKE	
DESIGN	DETAIL	TITTLE OPTION 1 BRAKE LIGHT SWITCH	
CHECKED	SAFETY		
SCALE NONE	DATE 12/5/13	REVISION A SHEET 3 OF 4	HPEVS

REVISIONS		
REV	DESCRIPTION	APPROVED
A	INITIAL RELEASE	2/19/2013

ACTIVE BRAKE LIGHT CONFIGURATION
OPTION 2
FOR BRAKE TYPE 3
1239 CONTROLLER



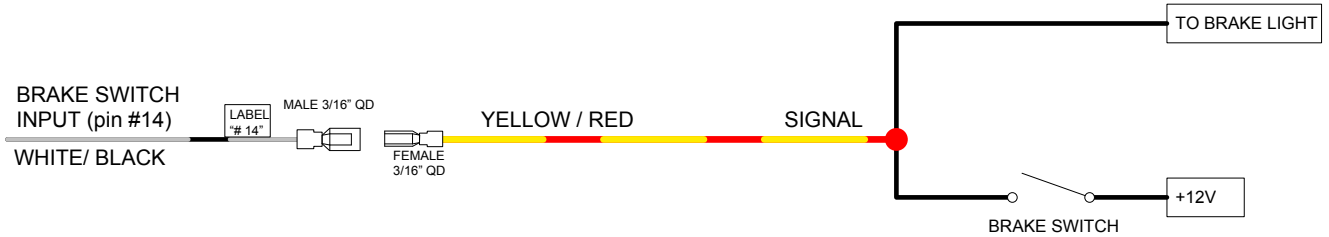
** This option will turn ON the brake lights when either of two conditions are satisfied:

1. The users foot is OFF of the accelerator pedal and REGEN is active.
2. Brake pressure is applied and the OEM brake switch is active.

CAD TYPE VISIO	CAD LOC.	CAD FILE	DRW SIZE A
OPER. NO.	UNIT	DRAWING 1010-BRAKE	
DESIGN	DETAIL	TITTLE OPTION 2 BRAKE LIGHT SWITCH 1239 CONTROLLER	
CHECKED	SAFETY		
SCALE NONE	DATE 12/5/13	REVISION A SHEET 3 OF 4	HPEVS

REVISIONS		
REV	DESCRIPTION	APPROVED
A	INITIAL RELEASE	2/19/2013

BRAKE SWITCH INPUT LIGHT CONFIGURATION
OPTION 3
FOR BRAKE TYPE 3 CONFIGURATION
1239 CONTROLLER



** This option will provide single level BOOSTED REGEN when brake pedal pressure is applied.
** Brake lights will not turn on during ACCELERATOR PEDAL UP/ REGEN.

CAD TYPE VISIO	CAD LOC.	CAD FILE	DRW SIZE A
OPER. NO.	UNIT	DRAWING 1010-BRAKE	
DESIGN	DETAIL	TITLE OPTION 3 BRAKE SWITCH INPUT 1239 CONTROLLER	
CHECKED	SAFETY		
SCALE NONE	DATE 2/19/13	REVISION A SHEET 4 OF 4	HPEVS