



1551 S. Vineyard Avenue  
Ontario, CA 91761  
(909) 923-1973

## **WIRING SCHEMATICS**

**FOR SOFTWARE VERSIONS 5.00 TO 5.12**

**FOR CURTIS 1239 CONTROLLER**

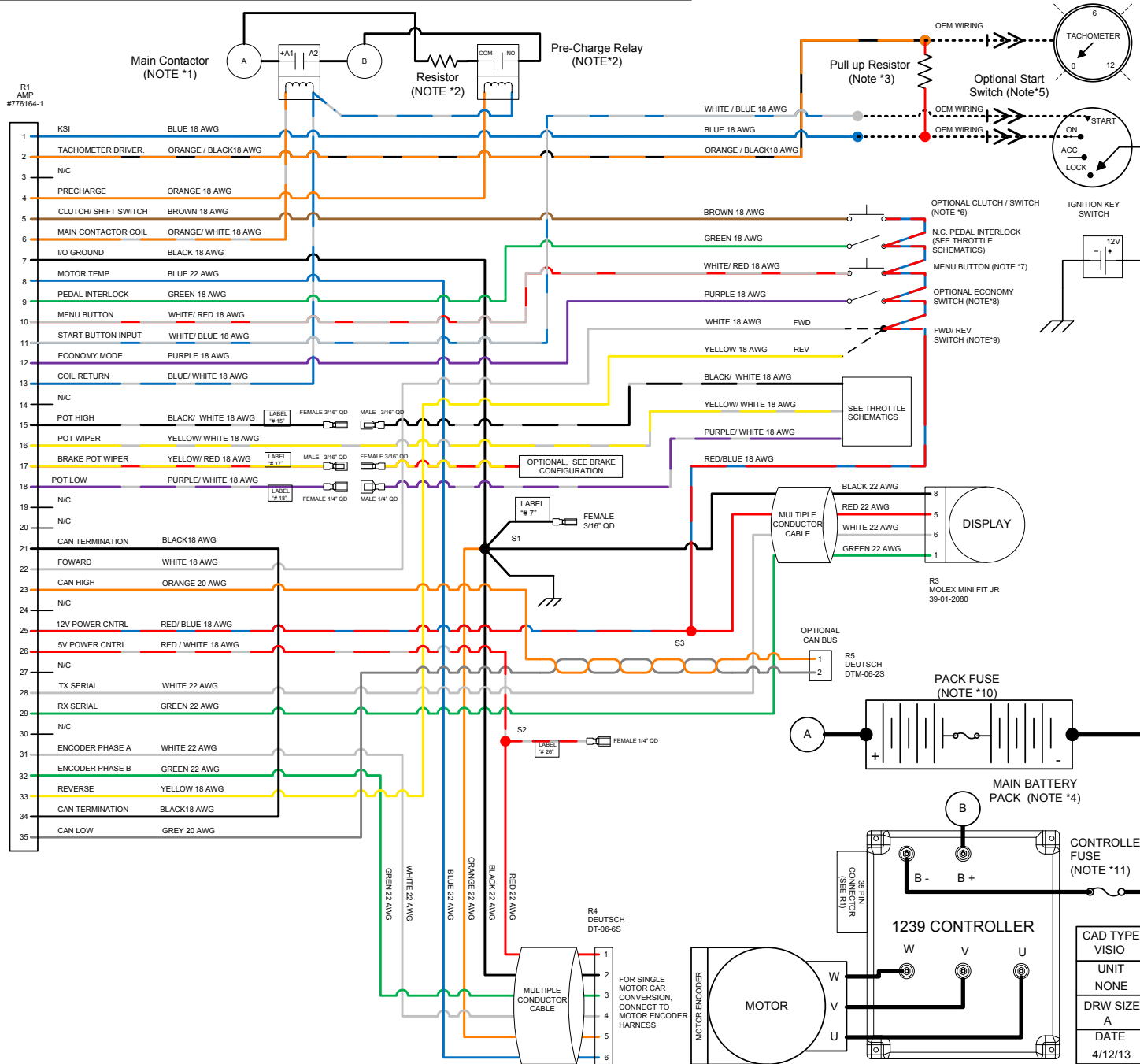
**ON-ROAD VEHICLE CONVERSION FOR**

**SINGLE AND DUAL MOTOR**

**APPLICATIONS**

REVISION: C  
Date 5/28/14

NOTICE: This drawing is the property of Hi Performance Electric Vehicle Systems Inc., and/or its subsidiaries and affiliates (individually and collectively "HPEVS"), and contains highly proprietary, confidential, and trade secret information of HPEVS. The recipient of this drawing agrees (a) to use the information contained herein for the purpose for which it was furnished by HPEVS (b) to return this drawing upon HPEVS request. This notice shall appear on any complete or partial reproduction of this drawing.



## 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 in this application. Some Tachometers may need a pull up resistor of 4.7K  $\Omega$  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](http://www.orionbms.com))

(\*5) Start switch option is required if Idle or Creep Torque parameters are ENABLE. 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 pedals 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.

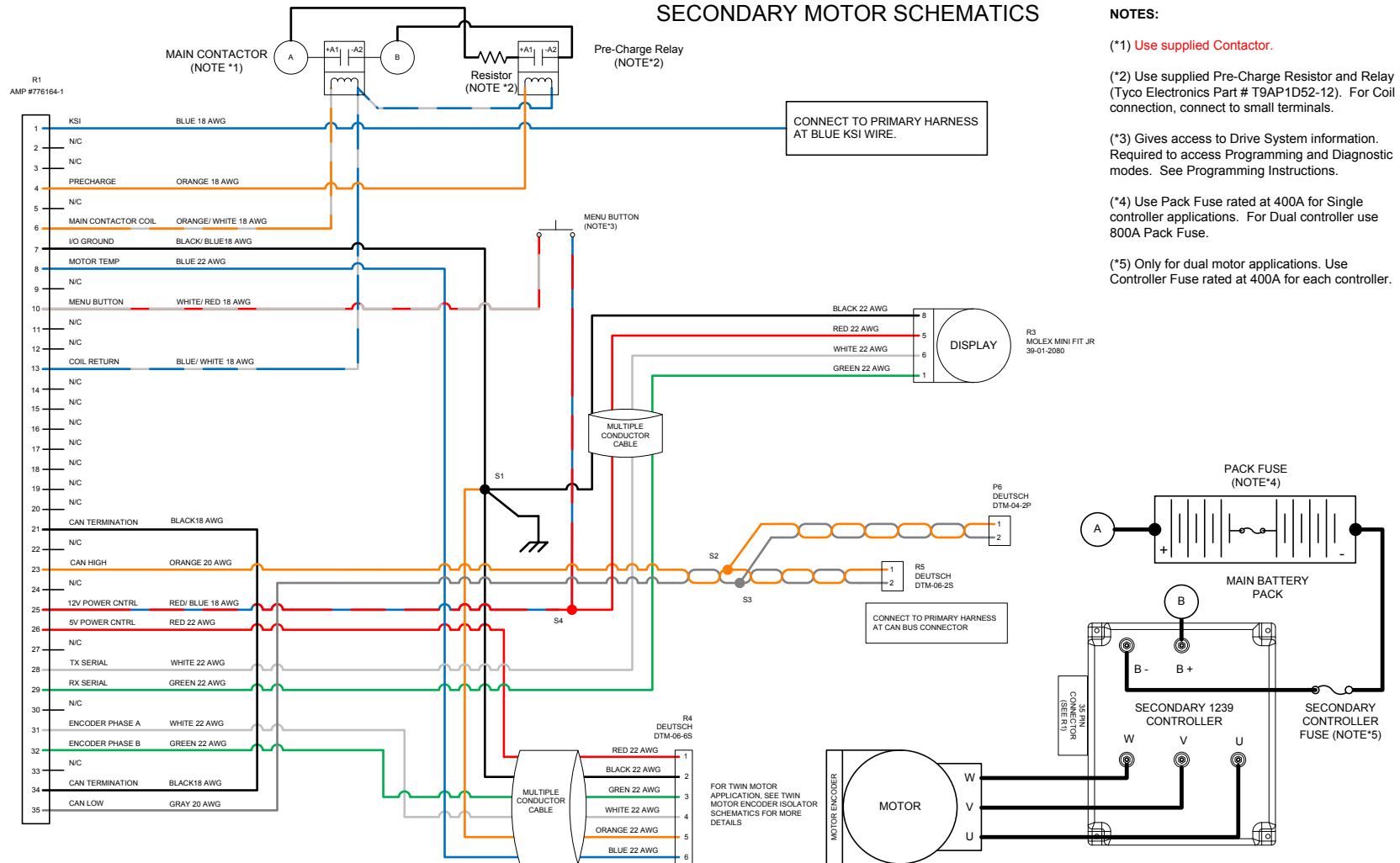
(\*10) Use Pack Fuse rated at 400A for Single controller applications. For Dual controller use 800A Pack Fuse.

(\*11) Only for dual motor applications. Use Controller Fuse rated at 400A for each controller.

|          |         |                     |  |
|----------|---------|---------------------|--|
| CAD TYPE | VISIO   | APPLICABLE SOFTWARE | VERSION 5.00 TO 5.12   |
| UNIT     | NONE    | DRAWING             | 1010-AUTO-CONVERSION-1239  |
| DRW SIZE | A       | TITLE               | 1239 CONTROLLER<br>ON-ROAD VEHICLE CONVERSION /<br>PRIMARY DUAL MOTOR SCHEMATICS |
| DATE     | 4/12/13 |                     |  |
| SCALE    | 1:1     | SHEET 1 OF 1        | REVISION A HPEVS   |

**NOTICE:** This drawing is the property of Hi Performance Electric Vehicle Systems Inc. and/or its subsidiaries and affiliates (individually and collectively "HPEVS"), and contains highly proprietary, confidential, and trade secret information of HPEVS. The recipient of this drawing agrees (a) to use the information contained herein for the purpose for which it was furnished by HPEVS (b) to return this drawing upon HPEVS request. This notice shall appear on any complete or partial reproduction of this drawing.

## 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<br>VISIO | APPLICABLE SOFTWARE   |  |  | VERSION 5.00 TO 5.12 |       |
| UNIT<br>NONE      | DRAWING   |  | 1010-AUTO-CONVERSION-1239-TWIN-MOTOR SECONDARY |                      |       |
| DRW SIZE<br>A     | TITLE<br><br>1239 CONTROLLER<br>SECONDARY DUAL MOTOR SCHEMATICS |  |  |                      |       |
| DATE<br>4/12/13   |   |  |  |                      |       |
| SCALE<br>1:1      | SHEET 1 OF 1  |  | REVISION A                                     |                      | HPEVS |

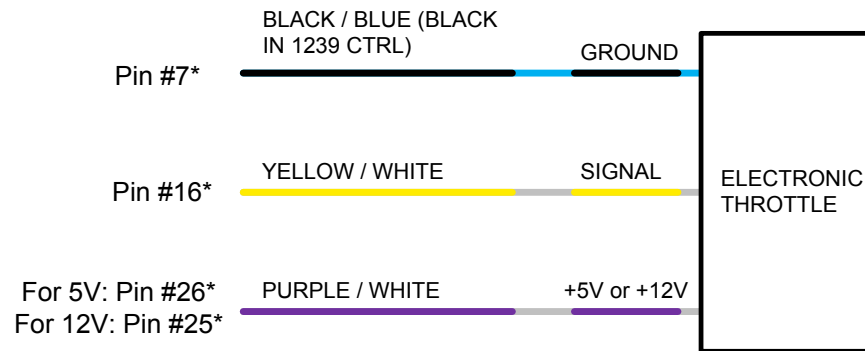
## THROTTLE CONFIGURATION

Depending on the type of throttle used for the application, the different types of throttle configurations are listed in 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 $\Omega$ | TYPE 2 |
| 3 WIRE with SWITCH 0-5k $\Omega$ | TYPE 3 |
| CURTIS PB8 THROTTLE ASSEMBLY     | TYPE 3 |

**NOTICE:** This drawing is the property of Hi Performance Electric Vehicle Systems Inc., and/or its subsidiaries and affiliates (individually and collectively "HPEVS"), and contains highly proprietary, confidential, and trade secret information of HPEVS. The recipient of this drawing agrees (a) to use the information contained herein for the purpose for which it was furnished by HPEVS (b) to return this drawing upon HPEVS request. This notice shall appear on any complete or partial reproduction of this drawing.

| 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.

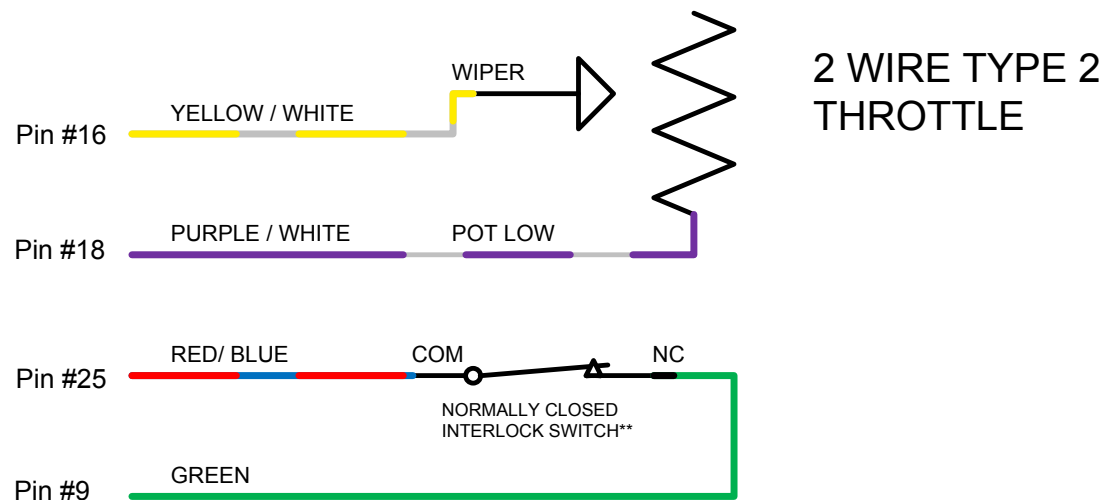
**Not all Electronic Throttles supported**

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

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

**NOTICE:** This drawing is the property of Hi Performance Electric Vehicle Systems Inc., and/or its subsidiaries and affiliates (individually and collectively "HPEVS"), and contains highly proprietary, confidential, and trade secret information of HPEVS. The recipient of this drawing agrees (a) to use the information contained herein for the purpose for which it was furnished by HPEVS (b) to return this drawing upon HPEVS request. This notice shall appear on any complete or partial reproduction of this drawing.

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

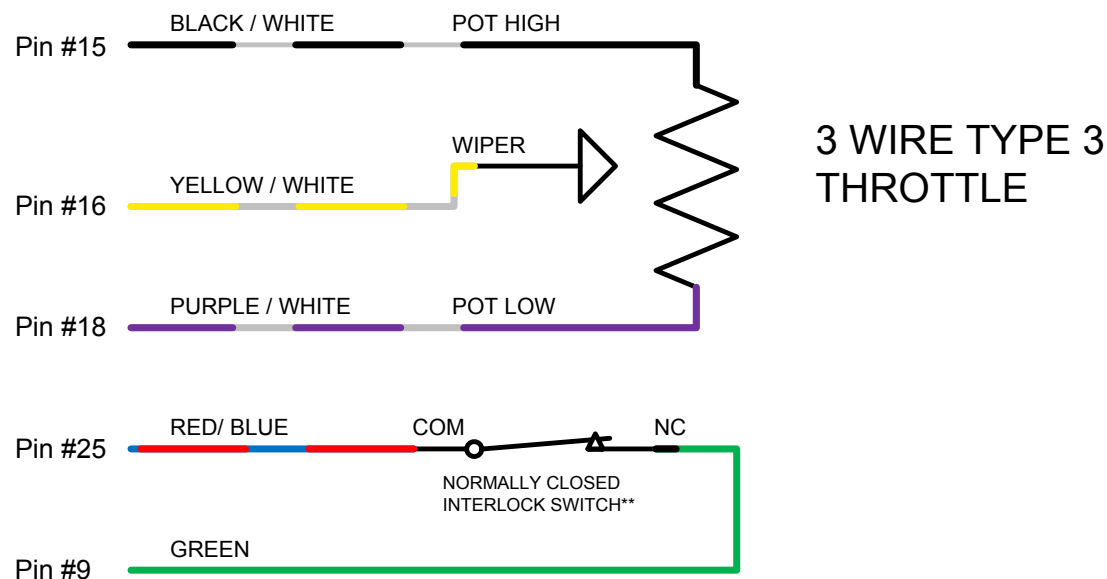


\*\* When the accelerator pedal IS PRESSED the interlock switch is released to its NORMAL position (switch not activated) thus completing the circuit since its green wire is connected to the normally closed (NC) connection.

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

**NOTICE:** This drawing is the property of Hi Performance Electric Vehicle Systems Inc., and/or its subsidiaries and affiliates (individually and collectively "HPEVS"), and contains highly proprietary, confidential, and trade secret information of HPEVS. The recipient of this drawing agrees (a) to use the information contained herein for the purpose for which it was furnished by HPEVS (b) to return this drawing upon HPEVS request. This notice shall appear on any complete or partial reproduction of this drawing.

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

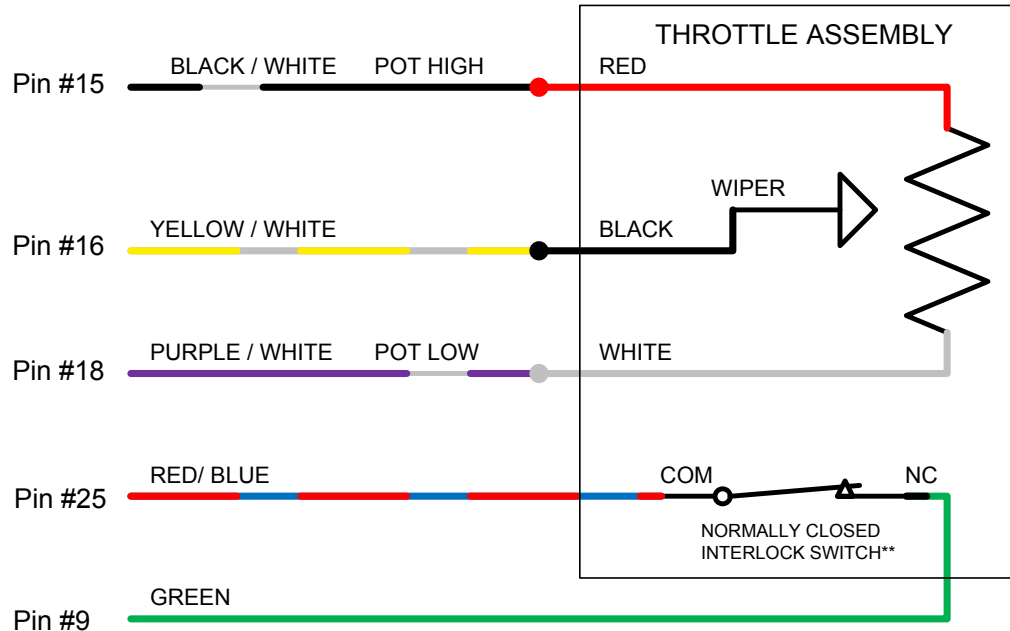


\*\* When the accelerator pedal IS PRESSED the interlock switch is released to its NORMAL position (switch not activated) thus completing the circuit since its green wire is connected to the normally closed (NC) connection.

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

**NOTICE:** This drawing is the property of Hi Performance Electric Vehicle Systems Inc., and/or its subsidiaries and affiliates (individually and collectively "HPEVS"), and contains highly proprietary, confidential, and trade secret information of HPEVS. The recipient of this drawing agrees (a) to use the information contained herein for the purpose for which it was furnished by HPEVS (b) to return this drawing upon HPEVS request. This notice shall appear on any complete or partial reproduction of this drawing.

| 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<br>VISO | APPLICABLE<br>SOFTWARE                   |            |       |
| UNIT<br>NONE     | DRAWING 1010-THROTTLE-001                |            |       |
| DRW SIZE<br>A    | TITLE<br>CURTIS PB8<br>THROTTLE ASSEMBLY |            |       |
| DATE<br>1/22/13  |  |            |       |
| SUPPLIER PART    |  |            |       |
| SCALE<br>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.



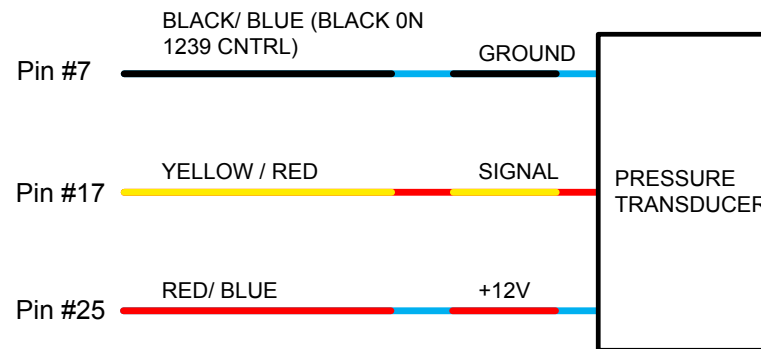
## BRAKE INPUT CONFIGURATION

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

| <b>BRAKE INPUT<br/>CONFIGURATION</b>          | <b>TYPE</b> |
|---|-------------|
| PRESSURE TRANSDUCER/<br>ELECTRONIC 0-5V INPUT | TYPE 1      |
| 2 WIRE 0-5k $\Omega$                          | TYPE 2      |

**NOTICE:** This drawing is the property of Hi Performance Electric Vehicle Systems Inc., and/or its subsidiaries and affiliates (individually and collectively "HPEVS"), and contains highly proprietary, confidential, and trade secret information of HPEVS. The recipient of this drawing agrees (a) to use the information contained herein for the purpose for which it was furnished by HPEVS (b) to return this drawing upon HPEVS request. This notice shall appear on any complete or partial reproduction of this drawing.

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



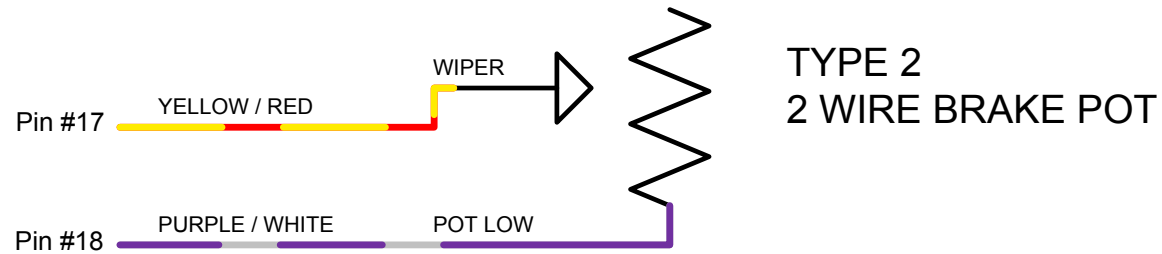
## TYPE 1 PRESSURE TRANSDUCER

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

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

**NOTICE:** This drawing is the property of Hi Performance Electric Vehicle Systems Inc., and/or its subsidiaries and affiliates (individually and collectively "HPEVS"), and contains highly proprietary, confidential, and trade secret information of HPEVS. The recipient of this drawing agrees (a) to use the information contained herein for the purpose for which it was furnished by HPEVS (b) to return this drawing upon HPEVS request. This notice shall appear on any complete or partial reproduction of this drawing.

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



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