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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: B
Date 4/11/14

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

Wire #	Wire Color / Gauge	Function
1	BLUE 18 AWG	KSI
2	ORANGE / BLACK 18 AWG	TACHOMETER DRIVER
3	N/C	
4	ORANGE 18 AWG	PRECHARGE
5	BROWN 18 AWG	CLUTCH/ SHIFT SWITCH
6	ORANGE/ WHITE 18 AWG	MAIN CONTACTOR COIL
7	BLACK 18 AWG	I/O GROUND
8	BLUE 22 AWG	MOTOR TEMP
9	GREEN 18 AWG	PEDAL INTERLOCK
10	WHITE/ RED 18 AWG	MENU BUTTON
11	WHITE/ BLUE 18 AWG	START BUTTON INPUT
12	PURPLE 18 AWG	ECONOMY MODE
13	BLUE/ WHITE 18 AWG	COIL RETURN
14	N/C	
15	BLACK/ WHITE 18 AWG	POT HIGH
16	YELLOW/ WHITE 18 AWG	POT WIPER
17	YELLOW/ RED 18 AWG	BRAKE POT WIPER
18	PURPLE/ WHITE 18 AWG	POT LOW
19	N/C	
20	N/C	
21	BLACK 18 AWG	CAN TERMINATION
22	WHITE 18 AWG	FORWARD
23	ORANGE 20 AWG	CAN HIGH
24	N/C	
25	RED/ BLUE 18 AWG	12V POWER CNTRL
26	RED / WHITE 18 AWG	5V POWER CNTRL
27	N/C	
28	WHITE 22 AWG	TX SERIAL
29	GREEN 22 AWG	RX SERIAL
30	N/C	
31	WHITE 22 AWG	ENCODER PHASE A
32	GREEN 22 AWG	ENCODER PHASE B
33	YELLOW 18 AWG	REVERSE
34	BLACK 18 AWG	CAN TERMINATION
35	GREY 20 AWG	CAN LOW

WIRE LEGEND:

- WHITE / BLUE 18 AWG
- BLUE 18 AWG
- ORANGE / BLACK 18 AWG
- BROWN 18 AWG
- GREEN 18 AWG
- WHITE/ RED 18 AWG
- PURPLE 18 AWG
- WHITE 18 AWG
- YELLOW 18 AWG
- BLACK/ WHITE 18 AWG
- YELLOW/ WHITE 18 AWG
- PURPLE/ WHITE 18 AWG
- RED/BLUE 18 AWG
- BLACK 22 AWG
- RED 22 AWG
- WHITE 22 AWG
- GREEN 22 AWG
- BLACK 18 AWG
- WHITE 18 AWG
- ORANGE 20 AWG
- RED/ BLUE 18 AWG
- RED / WHITE 18 AWG
- WHITE 22 AWG
- GREEN 22 AWG
- WHITE 22 AWG
- GREEN 22 AWG
- YELLOW 18 AWG
- BLACK 18 AWG
- GREY 20 AWG
- WHITE 22 AWG
- GREEN 22 AWG
- BLUE 22 AWG
- ORANGE 22 AWG
- BLACK 22 AWG
- RED 22 AWG

COMPONENTS AND NOTES:

- Main Contactor (NOTE 1):** A, +A1, -A2, B
- Pre-Charge Relay (NOTE 2):** CDM, NC
- Resistor (NOTE 2):** Connected to Pre-Charge Relay and Main Contactor.
- Pull up Resistor (Note 3):** Connected to Start Button Input.
- Optional Start Switch (Note 5):** ON, ACC, LOCK
- Optional Clutch / Switch (NOTE 6):** N.C. PEDAL INTERLOCK (SEE THROTTLE SCHEMATICS), MENU BUTTON (NOTE 7), OPTIONAL ECONOMY SWITCH (NOTE 8), FWD/ REV SWITCH (NOTE 9)
- Optional CAN BUS:** R5 DEUTSCH DTM-06-25
- 1239 CONTROLLER:** W, V, U, B-, B+
- MOTOR:** W, V, U
- ENCODER:** W, V, U
- 12V POWER SOURCE:** 12V, 500 A
- MAIN BATTERY PACK (NOTE 4):** 12V, 500 A
- DISPLAY:** R3 MOLEX MINI FIT JR 39-01-2080
- OPTIONAL CAN BUS:** R5 DEUTSCH DTM-06-25
- OPTIONAL CLUTCH / SWITCH (NOTE 6):** N.C. PEDAL INTERLOCK (SEE THROTTLE SCHEMATICS), MENU BUTTON (NOTE 7), OPTIONAL ECONOMY SWITCH (NOTE 8), FWD/ REV SWITCH (NOTE 9)
- OPTIONAL START SWITCH (NOTE 5):** ON, ACC, LOCK
- OPTIONAL CLUTCH / SWITCH (NOTE 6):** N.C. PEDAL INTERLOCK (SEE THROTTLE SCHEMATICS), MENU BUTTON (NOTE 7), OPTIONAL ECONOMY SWITCH (NOTE 8), FWD/ REV SWITCH (NOTE 9)
- OPTIONAL CAN BUS:** R5 DEUTSCH DTM-06-25
- 1239 CONTROLLER:** W, V, U, B-, B+
- MOTOR:** W, V, U
- ENCODER:** W, V, U
- 12V POWER SOURCE:** 12V, 500 A
- MAIN BATTERY PACK (NOTE 4):** 12V, 500 A
- DISPLAY:** R3 MOLEX MINI FIT JR 39-01-2080

TABLE:

CAD TYPE	UNIT	DRW SIZE	DATE
VISIO	NONE	A	4/12/13

- (*)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 Ω
- (*)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)

(*6) Install the Optional Clutch/ Shift Switch so that it is ON when the clutch pedal is pressed. When the clutch pedal is pressed, the Regen setting is changed to the Shift Neutral Braking Parameter to prevent the motor from stalling while shifting gears. 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.

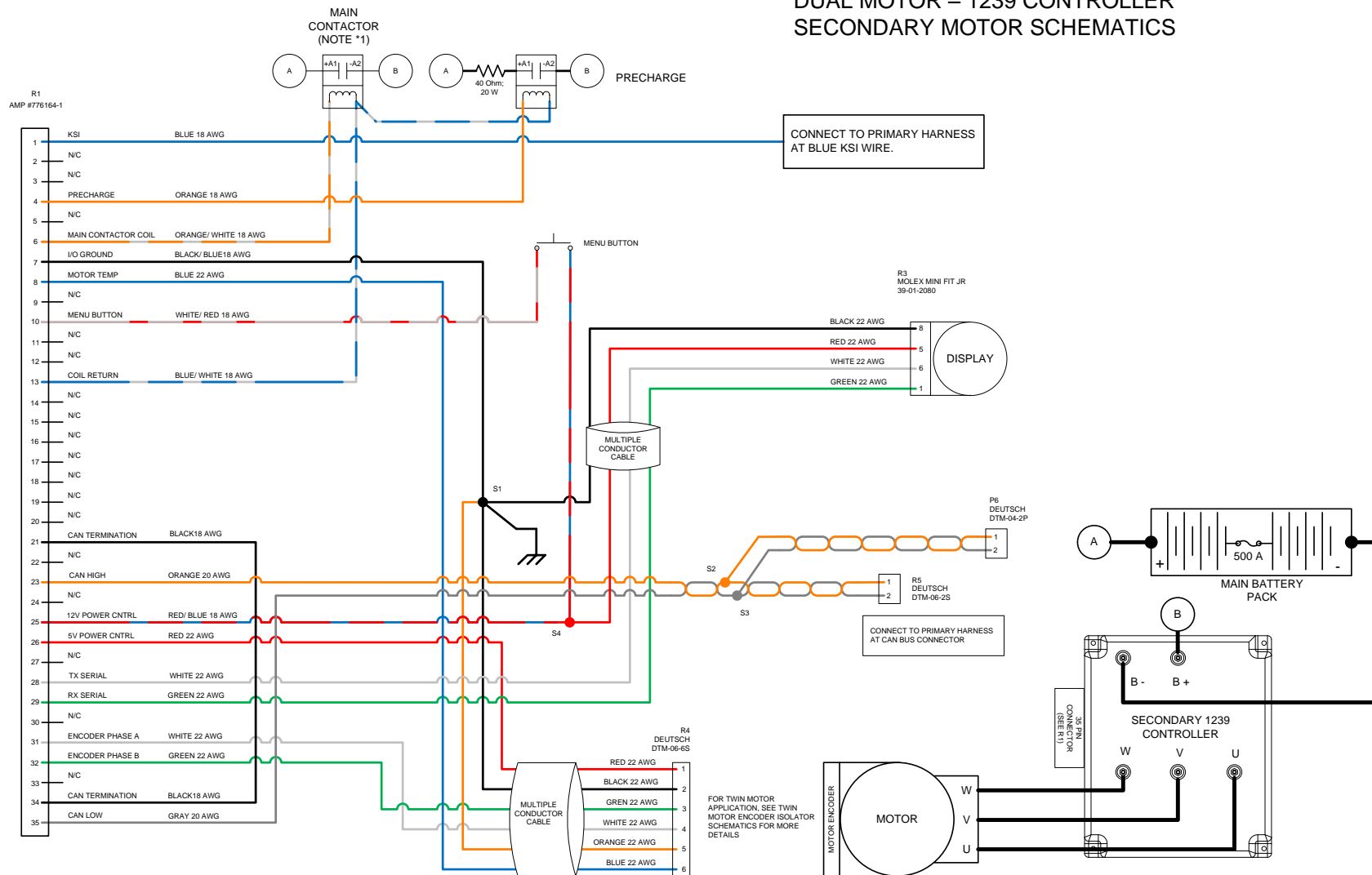
(*8) Allows the use of ECONO Mode Parameters. See Programming Instructions.

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

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

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DUAL MOTOR – 1239 CONTROLLER SECONDARY MOTOR SCHEMATICS



CAD TYPE	VISIO	APPLICABLE SOFTWARE	VERSION 5.00 TO 5.12
UNIT	NONE	DRAWING	1010-AUTO-CONVERSION-1239-TWIN-MOTOR SECONDARY
DRW SIZE	A	TITTLE	1239 CONTROLLER SECONDARY DUAL MOTOR SCHEMATICS
DATE	4/12/13		
SCALE	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 Ω	TYPE 2
3 WIRE with SWITCH 0-5k Ω	TYPE 3
CURTIS PB8 THROTTLE ASSEMBLY	TYPE 3

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TYPE 1 ELECTRONIC THROTTLE**

* Typical connection, verify correct voltage and connection in throttle documents or instructions.

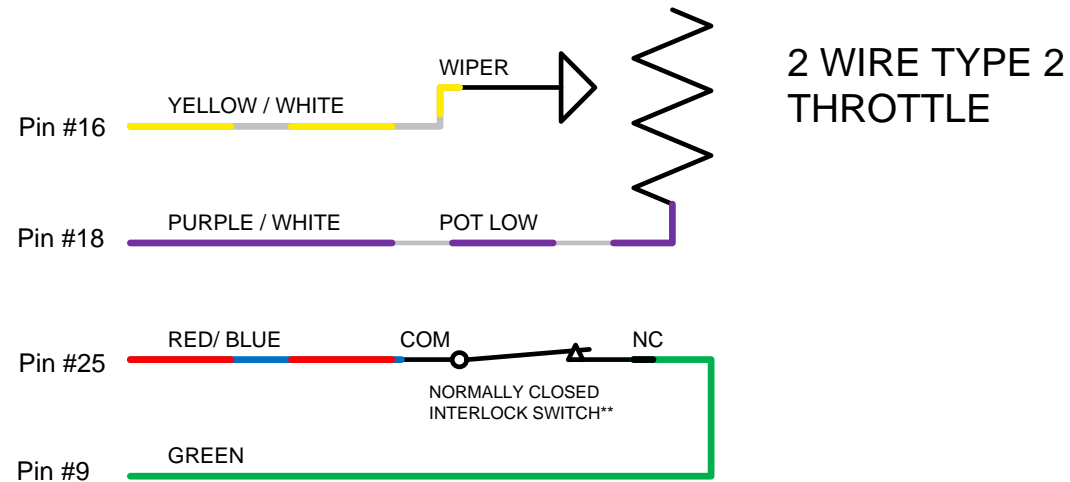
Not all Electronic Throttles supported

** 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

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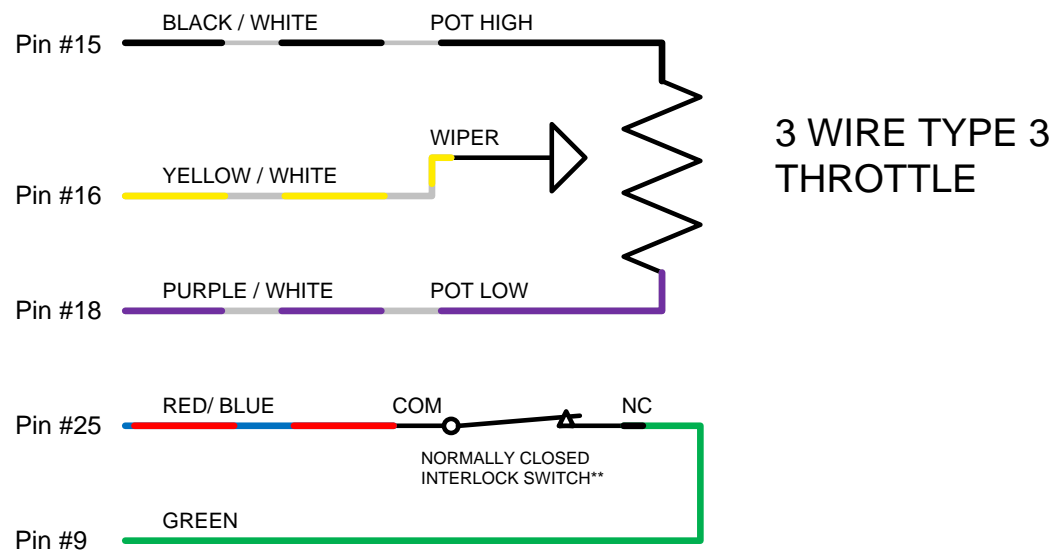


** When the accelerator pedal IS PRESSED the interlock switch is released to its NORMAL position (switch not activated) thus completing the circuit since its green wire is connected to the normally closed (NC) connection.

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

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A	INITIAL RELEASE	1/22/2013

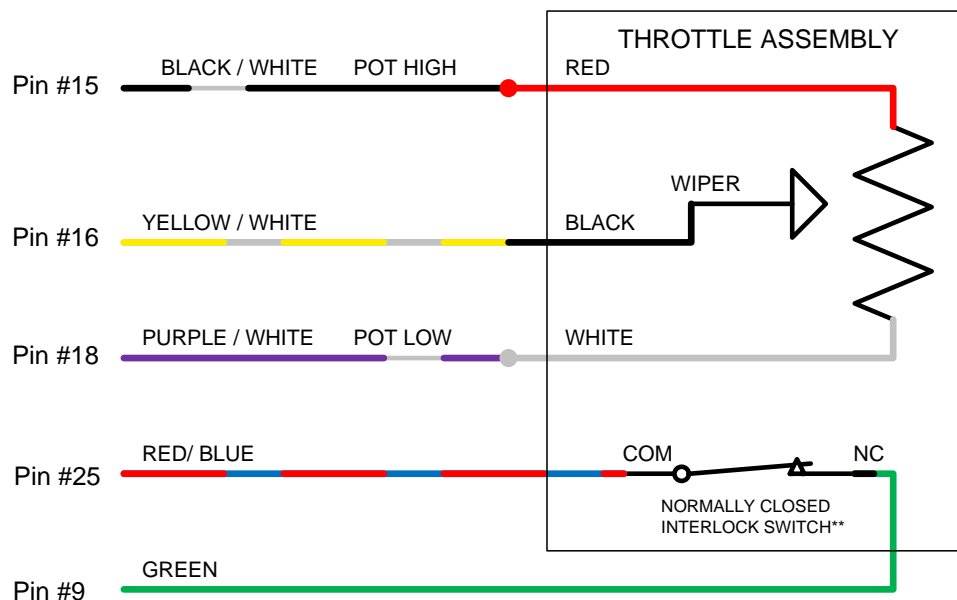


** When the accelerator pedal IS PRESSED the interlock switch is released to its NORMAL position (switch not activated) thus completing the circuit since its green wire is connected to the normally closed (NC) connection.

CAD TYPE 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	HPEVS
		SHEET 2 OF 3	

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CURTIS PB8 THROTTLE ASSEMBLY

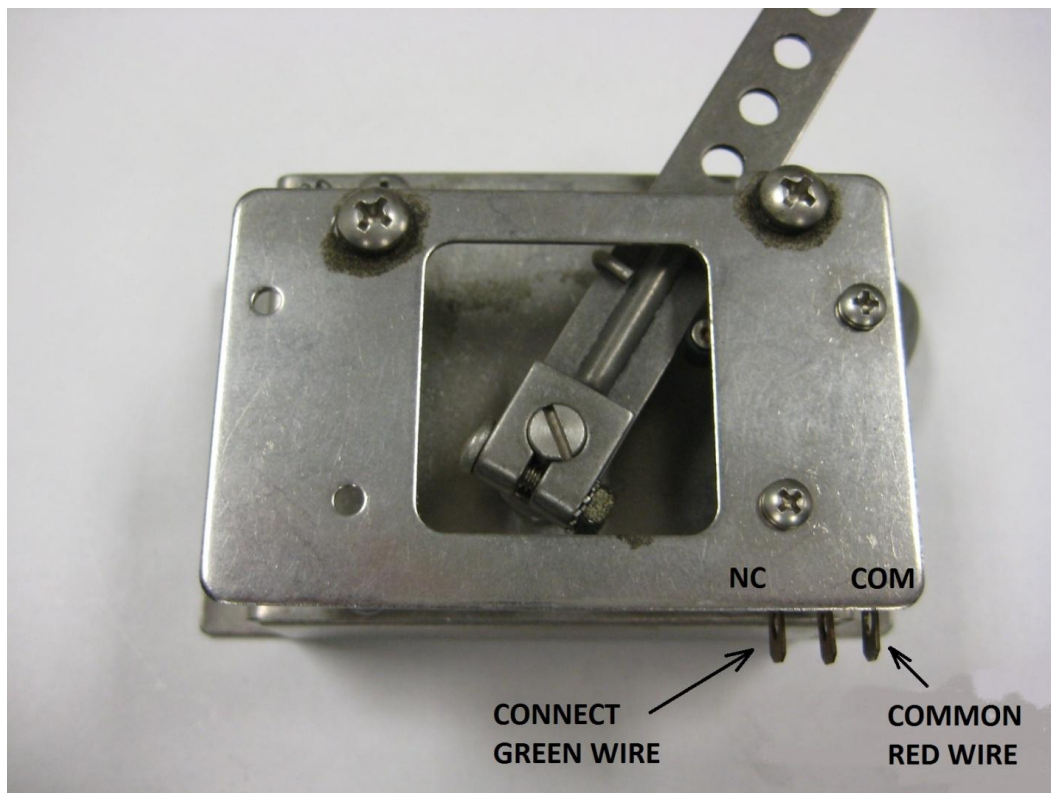
** When the accelerator pedal IS PRESSED the interlock switch is released to its NORMAL position (switch not activated) thus completing the circuit since its green wire is connected to the normally closed (NC) connection.

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.



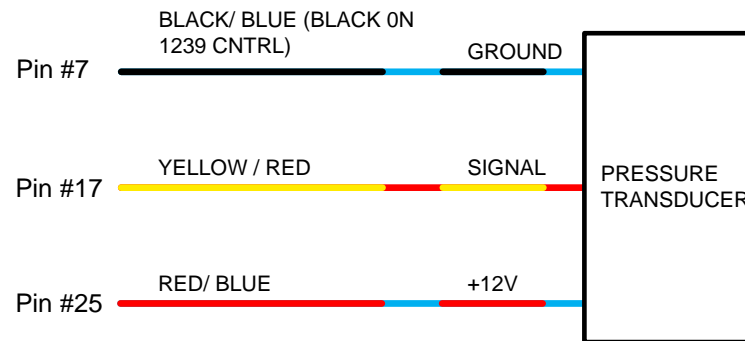
BRAKE INPUT CONFIGURATION

Depending 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.

BRAKE INPUT CONFIGURATION	TYPE
PRESSURE TRANSDUCER/ ELECTRONIC 0-5V INPUT	TYPE 1
2 WIRE 0-5k Ω	TYPE 2

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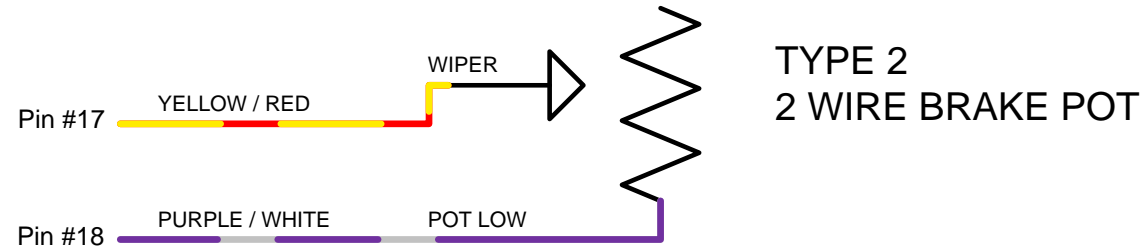
TYPE 1 PRESSURE TRANSDUCER

**** 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

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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