eStang Radiator Box Specifications

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# Features in the box

Mounts to original radiator mounting holes

Overall: front and rear contactors open and all 12V circuits off when not charging or ignition is off

Vehicle management circuit -- solid state PCA (previously 7 mechanical relays, can be DTL or microcontroller):

 Inputs (4):

 Ignition on

 Charger on

 Inertia switch out

 BMS OK

 Outputs (4):

12B (5A): front and rear contactor relays and BMS power if ignition or charger are on and inertia switch is normally closed; control mechanical relay

12C (10A): if 12B and BMS BOK, powers DCDC input and output relays and console; control mechanical relay

 Charger enable, if 12C, charger on and not stopped; cutoff if 12C goes off

 Motor controller enable, if 12C, ignition on and charger not on; warn only if 12C goes off

HV fuses

Front precharge and BMS HV sensor, 1/2A slow blow

DCDC input, 10A

Charger output, 30A

Cabin fluid heater input, 40A

HV relays

 Front contactor precharge, SS

DCDC input, SS

Front contactor, mechanical

LV fuses

DCDC output, 40A

Battery output, 40A

Ignition, 1A

Charger pilot, 1A

12B, 5A

12C, 10A

LV relays

 12B, mechanical

 12C, mechanical

Front contactor precharge resistor

Curtis 1239 motor controller

 Front precharge off then on detectors

HPEVS AC-51 motor control based on potbox deadman and variable resistor signals

 Motor temp signal

 Motor controller temp signal

 Motor current signal

 RPM signal

Charger

 12V pilot signal

 CCCV charging control for traction battery

Charger trim input

 Status signals

DCDC converter

Traction battery current sensor

8V in

Signal out

ground

12V battery current sensor, dropping resistor

Vehicle status circuit – solid state PCA (can be DTL, microcontroller or

 Inputs

BMS BOK, BEW

 Motor controller status

 Charger error, charging, done

 DCDC error; not currently implemented

 Heater error; not currently implemented

 12V battery dropping resistor voltage, not currently implemented

 Outputs

 Status off, red, yellow or green

Traction battery current sensor regulated voltage 8V

 12V battery current signal, not currently implemented

Interconnects

HVHA: 5 wires

Battery pack +/-

Motor U, V, W

HV LA: 6 wires

Heater +/-

Charger AC input

 BMS HV sensor

LV: 25 wires

Motor shaft rotation detector (3)

Motor temperature sensor (2)

12V battery interface (1)

Vehicle 12V feed (1)

Vehicle ground (1)

Wiring loom header (17): switch to screw terminal with cover

 5 in IGF ignition fused

 7 out IOR inertia switch on request

 8 in IRS inertia switch closed

 15 out 12B 12V B to rear precharge relay and BMS

 17 in BOK battery OK from BMS

 20 out 12C 12V C to console and rear contactor

 22 in CST charger stop from console

 24 in CT+ charger trim power

 25 out CT- charger trim signal

 30 in BEW battery early warning from BMS

 44 out RED red vehicle status to console

 45 out YEL yellow vehicle status to console

 46 out GRN green vehicle status to console

 71 out 5VO 5V out from motor controller to potbox

 72 in THA pot box wiper

 73 in THB pot box dead man switch

 TBD in HTFn heater fault inverted

HV safety cover

Cooling fins

Carrying handles

# Features outside the box

Fused ignition 12V signal

Inertia switch, firewall edge mounted

Circuit breaker, mounted in box next to positive terminal of traction battery pack (was previously inside radiator box)

Rear contactor and precharge circuit relay, fuse, resistor and contactor for DCDC, charger and motor controller

Front contactor precharge circuit for motor controller only

Valence BMS

 Enable 12V signal – requires inverting transistor/SS relay to convert from pulldown

pack voltage before front contactor is good

all cells between 2.3 and 4 V

each module below 60C

 Low voltage <2.9V per cell and high temp >50C warning 12V signal

 Fuel level 0 to 5V signal

 Battery max temp 0 to 5V signal

 Battery pack voltage signal

Potbox

 Deadman switch

 3 wire variable resistor 0-5 Kohms

Cabin fluid heater

 Enable input

 Thermostat control

 Pump control

Status signal

Console 1

 Charger stop momentary switch

 Charger trim pot

Cabin fluid heater control

 Stock fuel, batt temp, motor controller temp and motor temp driver circuits

 Traction battery, motor and 12V current gages and drivers

 Traction battery and 12V battery voltage gages and drivers

 Indicator lights

 Vehicle red, yellow and green

 Heater on yellow

Console 2

 Remote circuit breaker kill switch

 Brake pressure warning light, powered by switch 12V 12C