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