IFE SAFETY EXPLANATION

BRAKE LIGHT SCHEMATIC: When this value gets above a certain value, turn on the brake light! Do not use the brake pressure sensor.

BSPD SCHEMATIC: Use brake pressure and the current sense which gives a voltage value to the safety board. There are two ways to trigger BSPD. 1st. 1st way is very uncommon, and it detects if there is any sensor disconnect in the current sense or brake pressue by using the LM393 comparator. These comparators work by detecting two volatges, if the voltage on the plus pin is higher than the minus pin, it goes high. Inversely if the voltage on the minus pin is higher, it outputs ground. The pullups are there to help keep a cleaner signal. 2nd way for the intended purpose of BSPD is by using two trimpots and the signal from brake pressue and current sense, If BOTH siganls are higher than the trimpot value the fault will trigger. We determine the value of the trimpot. Double check the capacitor values for the chips.

Connector Filter: op amps powered on 12 volts, we use Zener protection diode for both the op amp and for the micro controller. Op amps must be on 12 volts, powered off of 5 will not be able to provide a high enough voltage to power the signals. On this schematic the “F” stands for filtered, and the 3\_3 stands for it being filterd from the 5v scale to the 3v scale. Precharge complete signals comes from 12 volts, so we need a way to filter that down. Precharge complete low means it is precharged. Some resistor values may need to be changed. The idea is that safety broadcasts a signal when the vehicle is done precharging, and an LED is displayed on the driver interface to show it.

Connectors: Add more test point if board space allows!!!

Enable: when the driver flips the enable, all soft faults must be regulated before you let the ground come from the enable in go to enable out. This is controlled from the software enable pin. Software enable pin goes LOW if: either BTSF soft fault is active or if APPS soft fault is active. Otherwise it can stay high.

Fault circuit…: point to improve? Using the newer latching relays we have. Not needed for functionality, but to clean up we can add the newer latching relays.

Pwr: LDO’s for 3.3 and 5v.

Controlled by software: Occurs for 1-3s after there are no faults, the care is enabled, and the brake has been pushed.

TC: more testing should be done to prove this.

TSAL: no changes need to be needed, when TSAL EN goes high. The HV light goes on, otherwise your LV light will be on. Look for bigger transistors to sink more current. TSAL HV, and TSAL LV are the ground wires for both lights. When the gate of the mosfet is triggered the light for each respective one will turn on.

Ucontroller: has the stm and the can schematic, don’t change the can schematic at all. Possibly get rid of the SPI connections. Always check a picture of the blue pill pinout to make sure the pin will work.