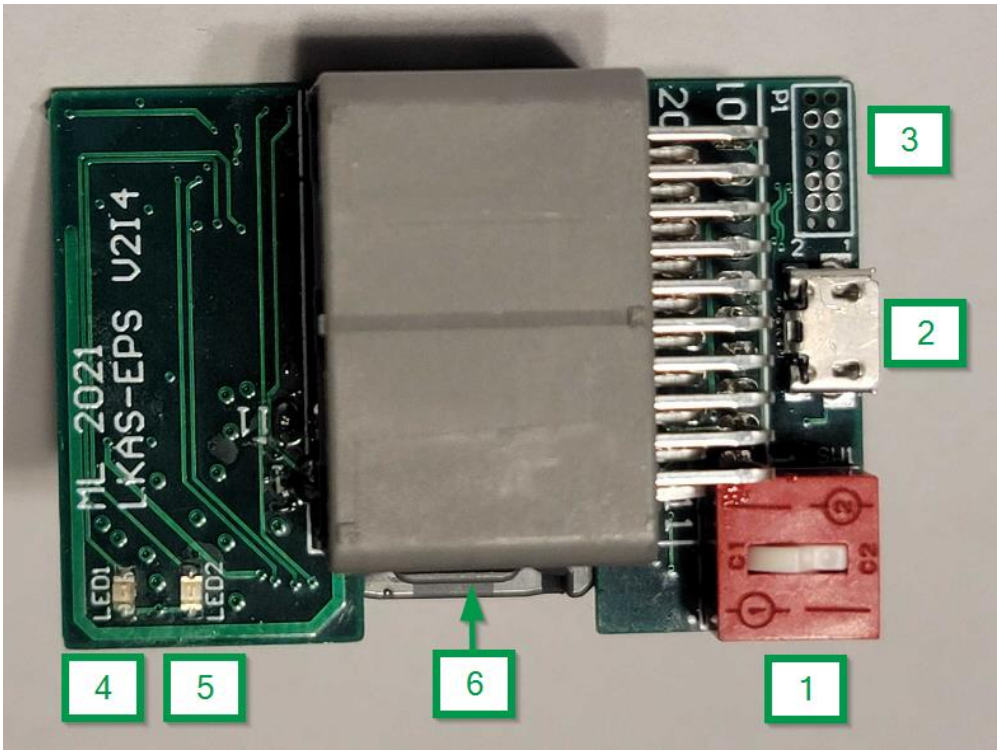
Each board is hand assembled, all solder joints are checked via microscope and tested on the road for at least an hour- so you can rest assured the hardware is in working condition. There are some things we should note about the Batch 1 boards, so I would like to highlight the details in this document.

1. **SPDT DIP SWITCH**: Controls if the serial steering lines are bypassed or not.
    a. Flipped towards the passenger (flat side towards C2) allowed the board to manipulate the EPStoLKAS and LKAStoEPS line.
    b. Flipped towards the driver (flat side towards C1) is bypassed and the board does not manipulate the signals.
2. **USB Micro B Connector**: Used to update board firmware.
    a. **Note**: The board can only be programmed when either vehicle power is off OR when not connected to the vehicle.
    b. Refer to programming guide (coming soon).
3. **SWD Header**: Used to program bootloader.
    a. STLINK-V3MINI and GRPB072VWVN-RC header required.
4. **BLUE LED**: Used as a heartbeat to validate the board is receiving power, CAN and makes it through the main loop.
    a. When first booted, there will be 6 flashes. This is “bootloader mode” and allows the board to be programmed.
    b. After the first 6 flashes, the board should enter the main program and have a 250ms heartbeat (at the time of this writing.
5. **FAULT (RED) LED:** Used to indicate fault based on various conditions in the code. The fault is viewable on CAN, via message 0x18F (STEER_STATUS).
    a. This can only be reset by restarting the vehicle and will not allow OP to engage.
6. **Locking Tab**: Allows (relatively) easy removal from the multipurpose camera unit (MCU).



7. **Flux Residue**: As you can probably tell, the board is hand soldered. And with hand soldering comes no-clean flux! So, the flux residue on the board isn't a concern, while it may not be visually ideal.
8. **Bodge #1:** It was noticed that a pullup resistor was needed on the USB D+ line after PCB fabrication, therefore the resistor and wire were added after the fact. Handle with care to avoid damage!
9. **Solder "Glob":** It was noticed that the internal pulldown of BOOT1 was not strong enough in cold temperatures which would result in erratic bootup. Therefore, the pin has been manually shorted to ground to resolve this issue. This solder joint is not a cause for concern.
10. **B-CAN** (pin 6 and pin 17): While not noted on the schematic, the B-CAN lines were added post process and should pass through without any problems.