Linear Potentiometer Mount Design Review

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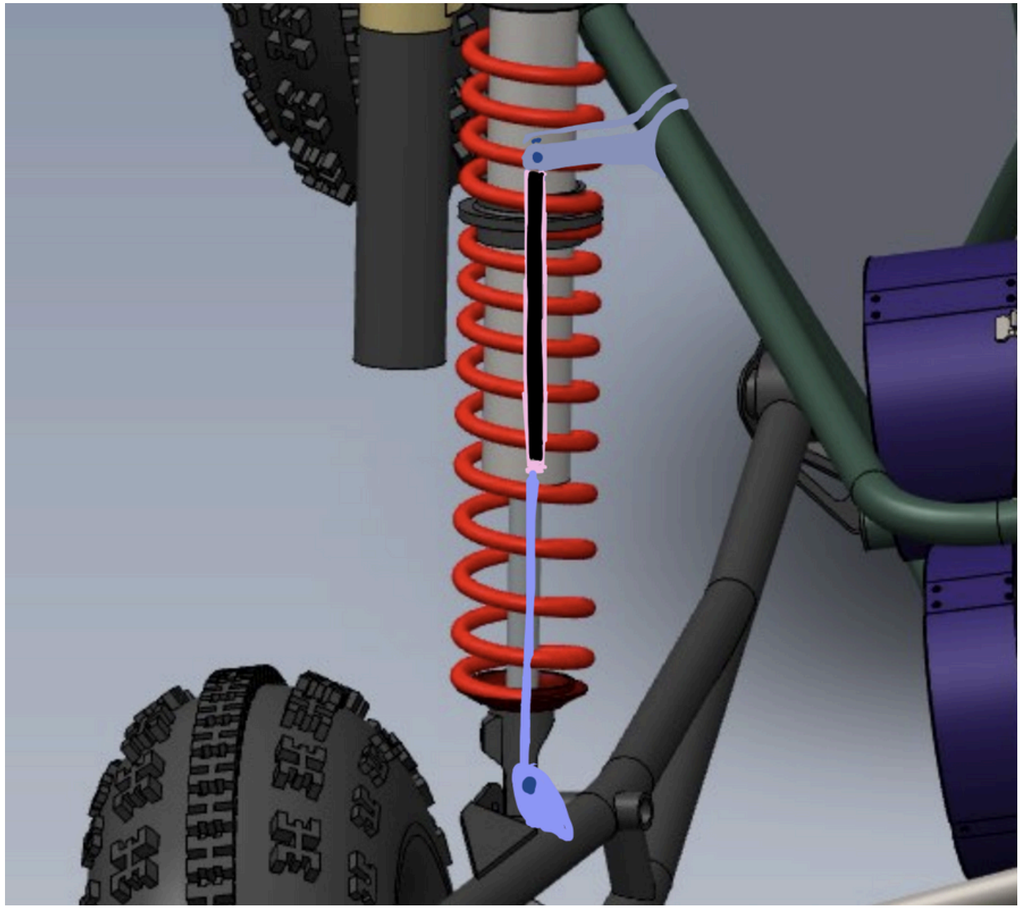
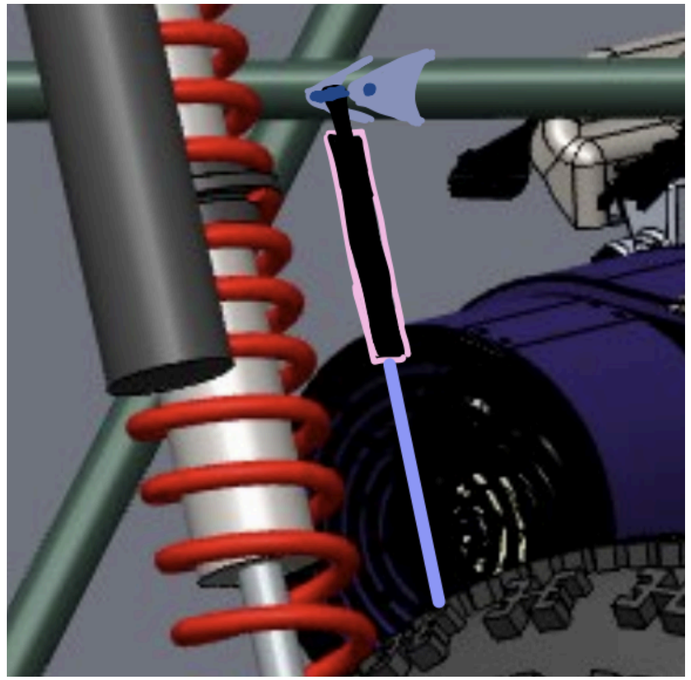
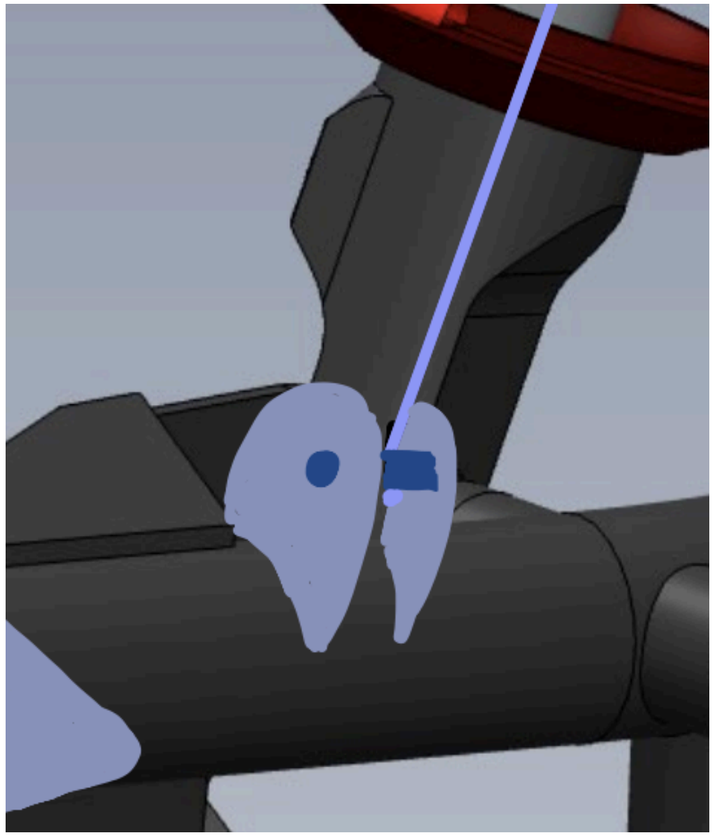
Vision

- A mount that securely fastens the potentiometer to the car
- Make sure that the travel of the potentiometer clears the maximum compression and extension of the shock
- The potentiometer runs parallel to the shock axis
- Protects the potentiometer from bending/breaking







Preliminary Sketches

Calculations

Shock

- Front: 18" (compressed) 21.25" (extended) 20.1" (normal)
- Back: 18" (compressed) 24.5" (extended) 21.8" (normal)

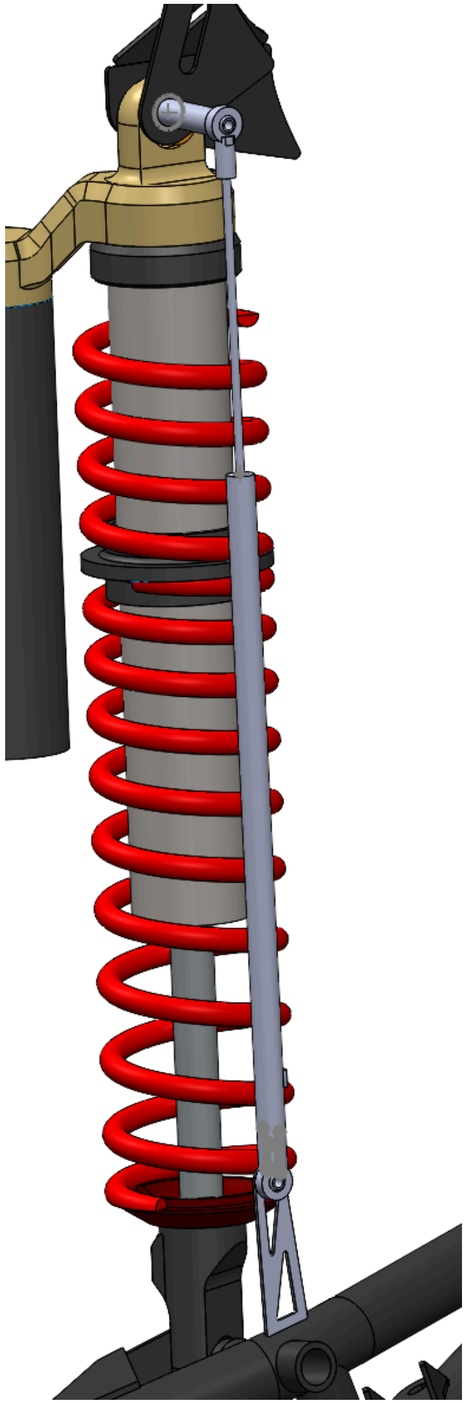
Potentiometer

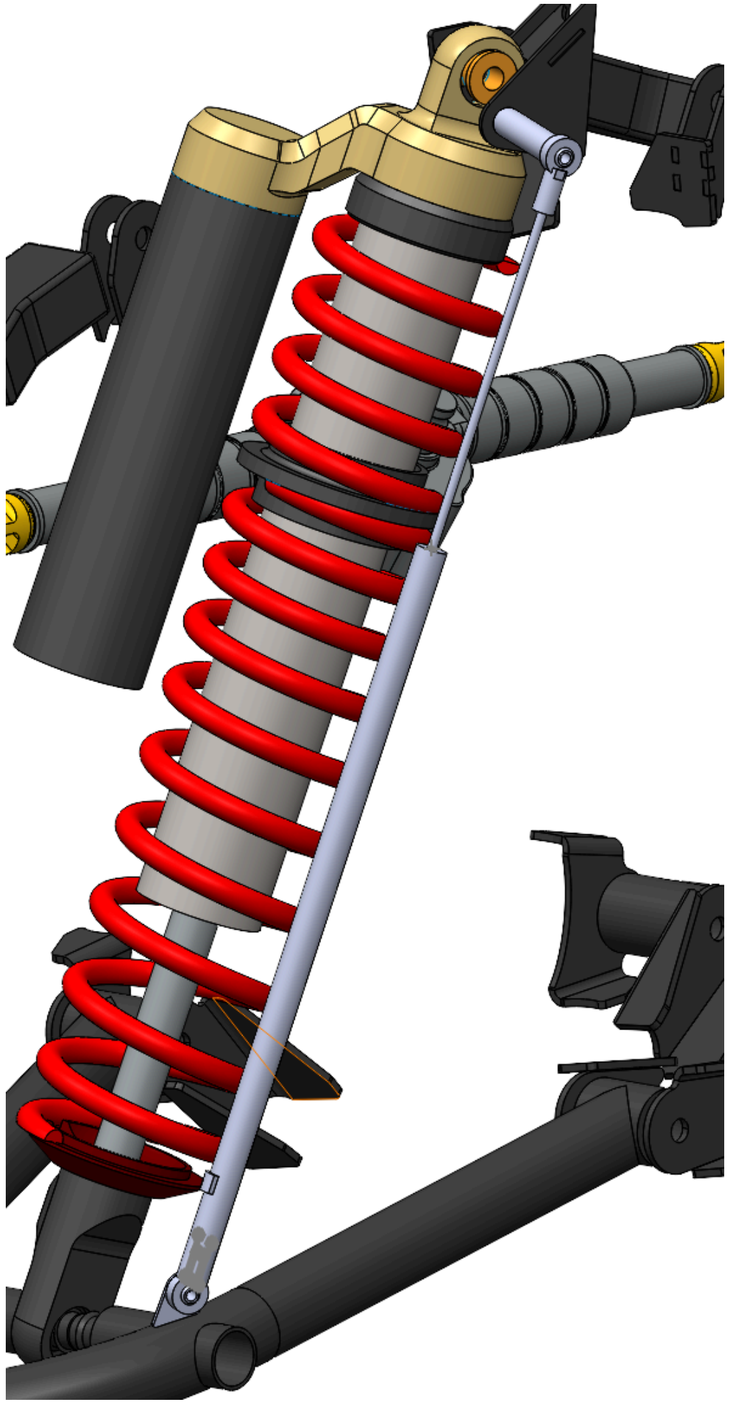
- Max extended distance: 23.5"
- Min extended distance: 13.75"

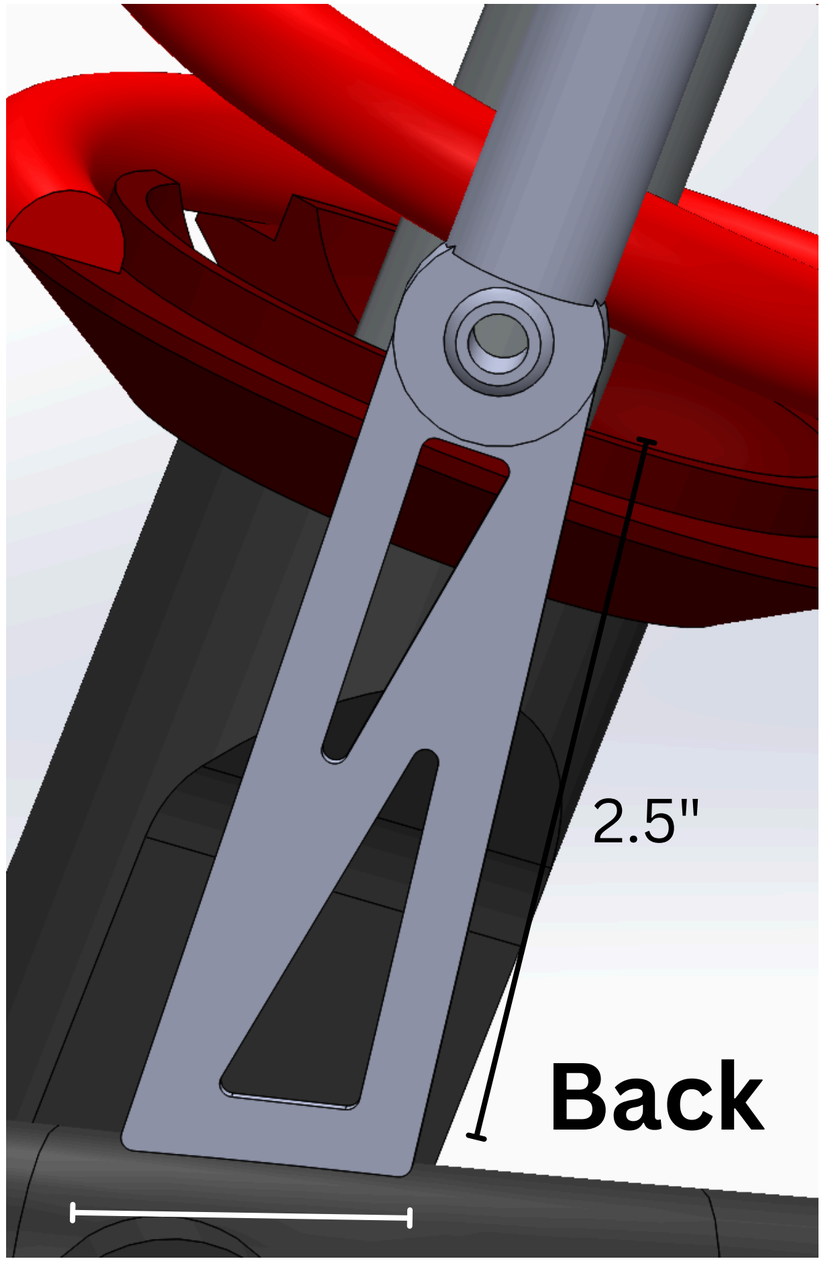
Potentiometer Normal Distance

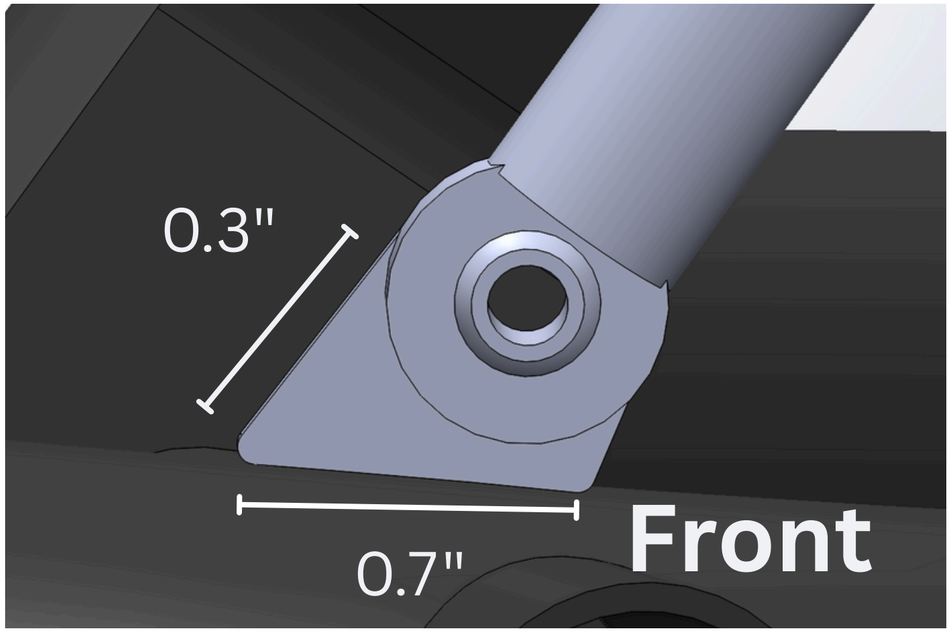
- Front: 18.9in
- Back: 18.5in

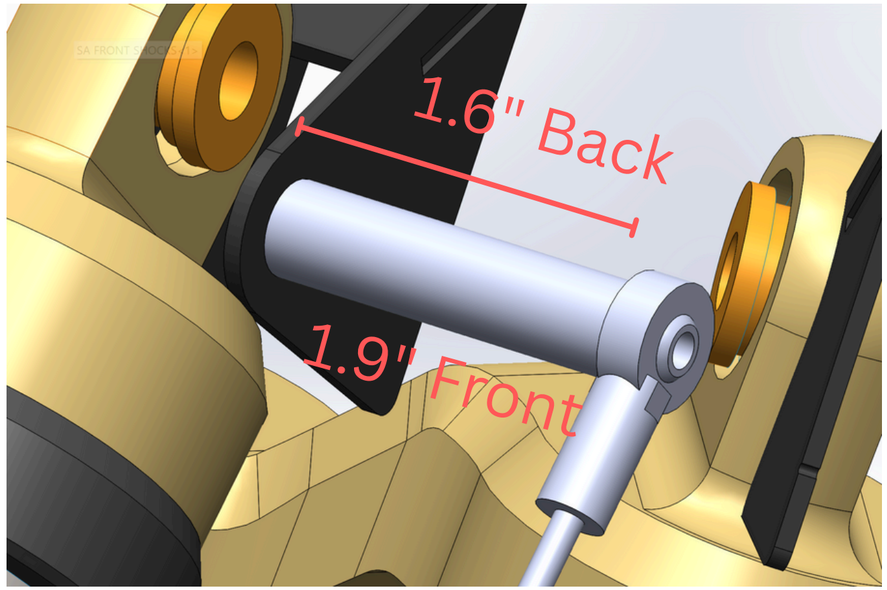
Tab Design






2.5"
Back
0.8"


0.3"
0.7"
Front


1.6" Back
1.9" Front

Design Justifications

Front

- Top:
  - Hollow Tube extension for simplicity/highly repeatable
  - Perfectly centered on the shock mount
  - All components have the same width
  - Welded on one side, screwed on one side
- Bottom:
  - Sheet metal tab with 5.5mm mounting hole
  - Sketched using intersection geometry
  - Connected to the trialing arm for parallel movement and close proximity to the shock
  - Widest part on the bottom to withstand shock loads in tension

Design Justifications

Back

- Top:
  - Same as before
- Bottom:
  - Same as before
  - Added 2 triangular slots to reduce material/weight
  - At least 5mm metal between spacing and edge

Manufacturing strategy- Top

Bandsaw/Lathe

- Precise, cut to length
- Weld other size to shock mount

Drill Press

- Drill partial-depth hole in one end

Tap

- Tap threads to match the bolt size

Steel Round Stock

- Readily available
- Uniform geometry

Manufacturing strategy- Bottom

Waterjet

- Fast turnaround
- High precision, no heat-affected zone
- Accessible in-house
- Nesting of parts to reduce waste

Sheet Metal

- 1.90mm, open to discussion
- Low cost
- Available

Welding strategy

- Top:
  - Weld the non-tapped end directly to the shock mount
  - Ensure proper fixturing to keep the cylinder and bolt head aligned during welding
- Bottom:
  - Tack-weld tab to tube/frame with tab fixed at the correct angle relative to the shock eyelet
  - Full perimeter weld
  - Ensure accurate alignment during welding