

I installed the twin stick kit to eliminate any issue related to worn out stock 4WD shift linkage.

During my installation, I also fabricated a locking mechanism to lock the linkage in HI and LO lever in the neutral detent ball locations as a way to prevent the Orion from popping out of gear. I installed a pop pin on the HI/LO selector lever. The pop pin engages into an engagement plate attached to the top of the transmission. The engagement plate has a hole located to lock the lever at HI and LO.

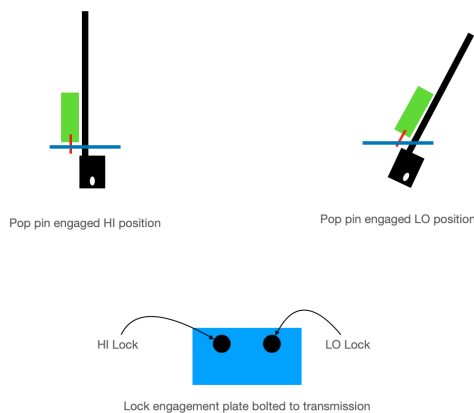


Figure 1.

After installing this locking mechanism, I never had any issues with popping out of HI. I did experience what felt like the Orion wanting to jump out of LO while on deceleration or going down and incline with the engine providing braking.

I hear an audible pop and at the same time feel the pop as a hard slip of the teeth. It's a momentary pop and not a series of multiple.

If I have the HI/LO lever locked to prevent moving. What causes the popping? It does not appear to pop when I apply hand pressure to the HI/LO lever.

To try and logically understand what's happening, I've attempted to walk through my thoughts on the following pages:

Figure 2 shows the shift fork and shift ring in neutral position in the center detent.



Figure 2

Figure 3 shows the position of the shift fork and slider ring when in LO gear.

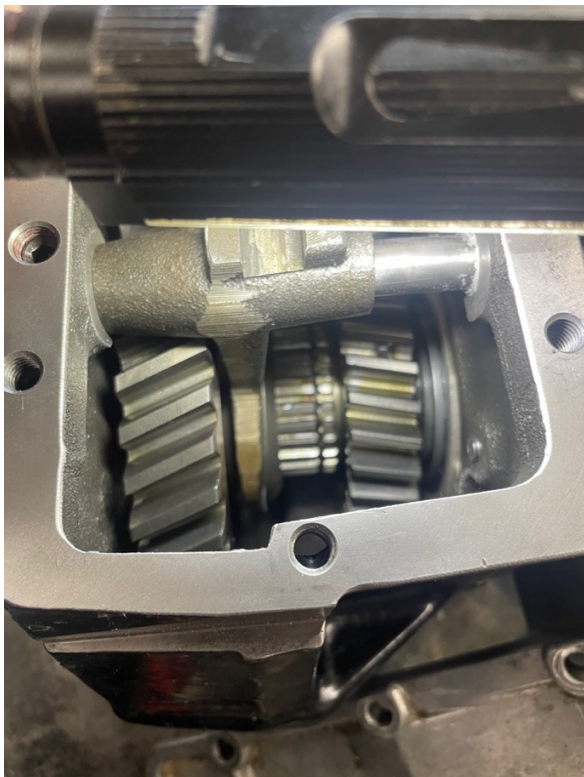


Figure 3

Figure 4 illustrates the shift ring is roughly centered over the gap between the output shaft and the low gear teeth. This appears as you would expect.



Figure 4

In this position, the shift ring should ride there unless some force acts on it to cause it to move toward the center (neutral). Only two possible forces exist... (1) force from the shift fork as transferred from the HI/LO shifter. In my case, since it's locked into place, there is no force acting on it to move toward neutral.

The second possible force comes from the low gear being able to wobble or sit canted on the output shaft which may cause the shift ring to move toward center. Figure 5 shows an exaggerated LO gear canted on the output shaft.

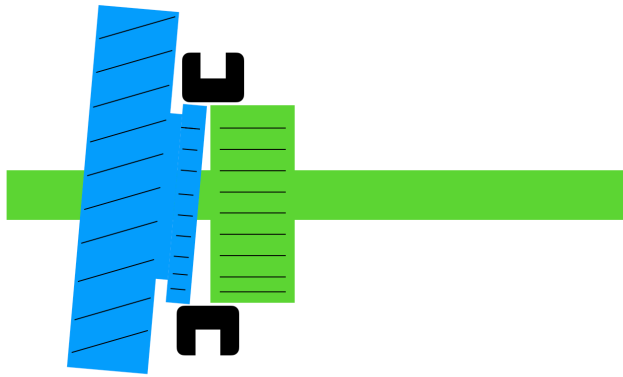


Figure 5

To experience a popping or slipping of the gears, this can only logically happen at the point where the shift ring is at the very edge of the LO gear. (see starred area on figure 6). In order for this to occur the shift ring has to travel almost $\frac{1}{2}$ inch. Movement of this much is impossible with my lever locked in position so how is this happening?

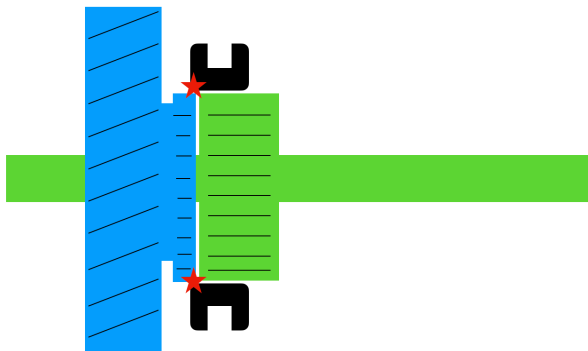


Figure 6

Is a slip/pop possible with the shift ring in the normal detent position and the LO gear is canted on the output shaft like Figure 5? I would think not. That depends on the tolerance between the Orion gear and the shift ring. With both being new, I wouldn't think this isn't an issue.

With firm hand pressure applied to the HI/LO lever, I don't get any popping? Does this mean that the pressure is keeping the gear from canting on the output shaft? If so, then the tolerance between the Orion gear bushing and the output shaft is too great. **We can test this theory with a new gear or a new bushing pressed into the gear I have.**

Is there a specification for tolerance for the Orion gears and the output shaft?

For reference, the following is a picture of my fabricated locking mechanism. I have a temporary wire attached to lift the pop pin. My plan is to have a more professional solution once I proved the concept.



Figure 7