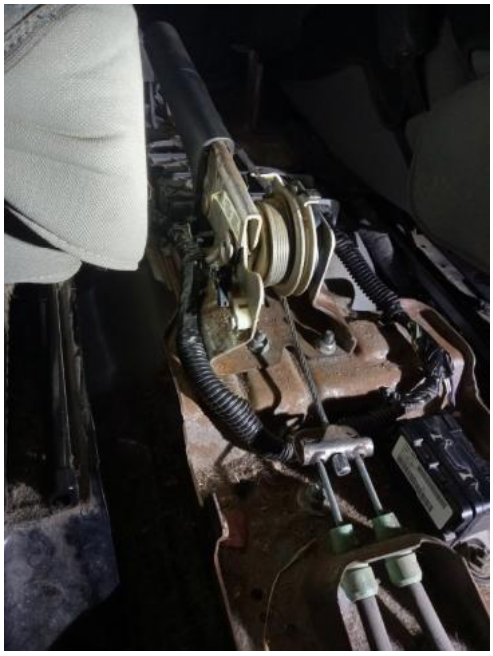
Jeep Parking Brake



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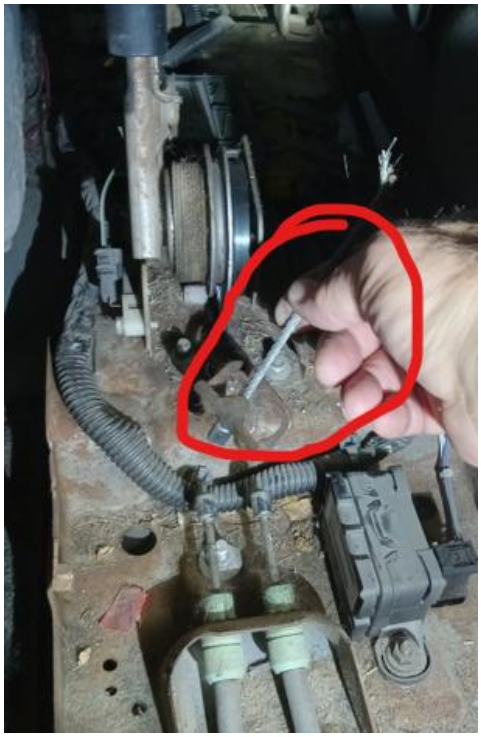
Purpose

This document describes the steps taken to repair a broken Jeep parking brake.

One day after pulling into the garage and pulling up the parking brake lever, something snapped and the lever ceased to have any useful functionality.

Investigation

After fiddling around for a while trying to figure out what had actually broken, I eventually identified that the cable joining the parking brake lever assembly to the brake cables had snapped – see below.



Attempt to Fix Old Lever

Cable Repair

I was able to solder the cable back together using a 250W gun and silver solder – see below.

The joint was not perfect but it does appear to be pretty solid. As I was later to find out an issue was introduced here – the soldered cable was about ½" longer than the original.

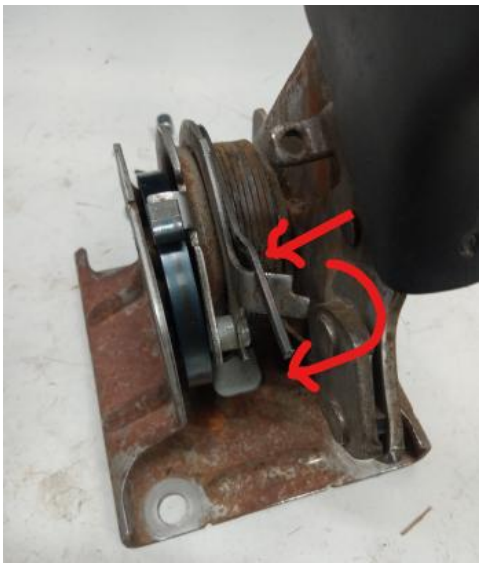
I was pleased with the results and proceeded to try and understand "what" the purpose of the two springs were and how the assembly was actually supposed to work.

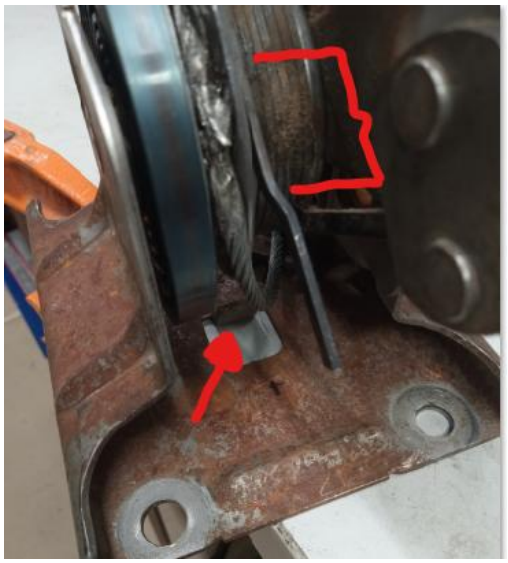
Understanding the Functionality

I spent hours of frustration before I finally found a good explanation online here.

Basically, the clutch spring (the one connected to the lever) “grabs” the drum when you pull up on the lever, and releases it (so it can move freely) when you lower the lever. The clock spring applies a constant light tension on the cable so that the brake shoes (at the other end of the cables in the wheels) don’t bounce around when the brake is released.

While trying to understand the functionality, I was fiddling with it and trying to see what happened if I moved the various spring connections around. Unfortunately, in doing so, I damaged the clutch spring trying to get it past the grey tab it was resting on by forcing it with some pliers. It turned out that the solution was much easier and you could simply rotate the tab under it to the other side – but I did not know this.



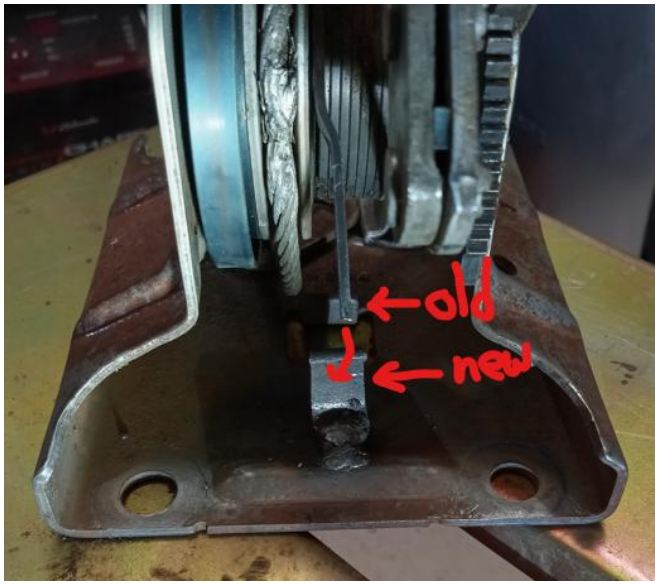


You can see above (left) that the clutch spring was initially closely wound on the drum, but that about an inch of it had been bent up (by me – right above) which prevented it from making contact with the clutch stop tab (arrow in right above.)

This meant that the clutch would never release and would always move “with” the lever arm.

Welding New Clutch Stop Tab

I ended up having to add a new clutch stop tab. I initially tried to do this by adding a simple bolt or some such but nothing worked out and I ended up welding a new tab to the plate – see images below.



This took me some time as it had been years since I last welded anything – but it turned out surprisingly well! You can see above the 'new' tab now stops the damaged clutch spring 'earlier' than the 'old' tab (which worked before I damaged the clutch spring.)

This was exciting – the mechanism worked properly again. The clutch spring properly 'grabbed' the drum when you pulled it up, and 'released' the drum when you lowered the arm to the bottom position.

Conclusion – Old Lever

I put everything back together (see below) and tested out the repairs.

Unfortunately, with the lever raised, there is not enough tension on the brake cables to prevent the Jeep from rolling even on a modest incline.

As I mentioned earlier, this is partly due to the soldered cable being longer, my damaging the clutch spring, and the fact that the adjustment for the clock spring is wearing out after almost 20 years of use. Fortunately, I had the foresight to order a new parking brake lever assembly (Mopar part #52059887AE) which should arrive in a few days.

So, while I was not entirely successful in fixing the old unit, I learned a lot about parking brake functionality and will soon have a proper replacement part and functioning Jeep again!

Installation – New Lever

The new lever finally arrived (after USPS delays due to weather and Christmas) a week late – but it did get here.

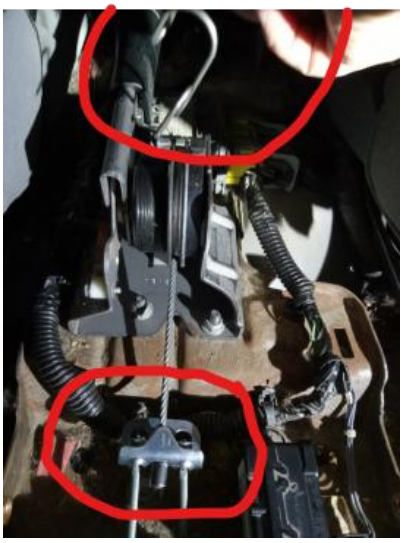
You can see below a comparison of the old lever (left) and the new lever (right.)

The new lever is (obviously) in much better shape, but the part that surprised me was the metal wire clip going from the arm to the pulley lever (see image above right.) This finally explained the purpose of this pulley lever which was confusing me before – it is so that you can get everything (tension, cable lengths, etc.) properly setup on the bench and then pull the clip off after you install it!

Knowing this, and having the clip, makes the job way easier!

Installation Steps

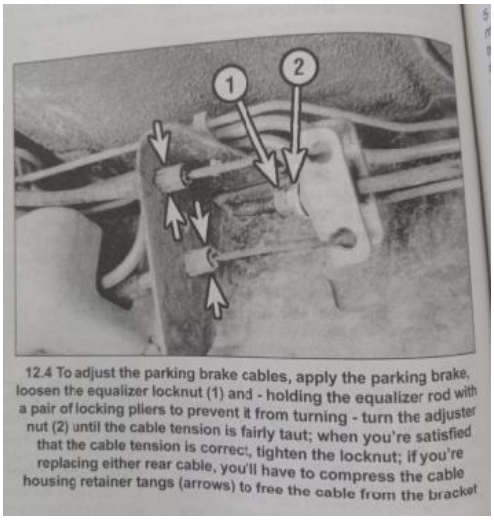
1. With the spring clip installed and the lever down (left image below) connect the cable sled to the brake cables (it will be easy because the cable is being held 'loose' by the spring clip) and bolt the assembly to the deck using the four bolts.
2. Remove the spring clip (center image below) – the clock spring will immediately take up the slack in the cable and the sled cable connections will tighten up.
3. **IMPORTANT** – because you are (presumably) replacing this in an old and worn-out Jeep, it is critical to push the sled towards the lever assembly (with the lever down – right image below.) This will take up the extra slack due to dirty cables and rusted and worn parts that the clock spring is unable to overcome. In my Jeep I was able to push it about another inch. This establishes the initial 'starting position' for the lever movement.
    a. If you omit this step, you will end up wasting days figuring out clever solutions to apply more tension on the cable – see Brake Adjustment section.
4. The brake should properly engage around click 6-8 or so now. However, you will need to crank it up to click 10-12 to be able to get the lever high enough to drop the cover back over the assembly. Secure the cover using the original four bolts in each corner and lower the lever to its bottom position.
5. Your parking brake should now be in working order.


Brake Adjustment Notes

I wasted several days and a bunch of money buying extra parts to overcome the slack in the brake line. The fix turned out to be a very simple push in the installation steps. **This is left here for historical purposes – you should NOT have to perform these steps.**

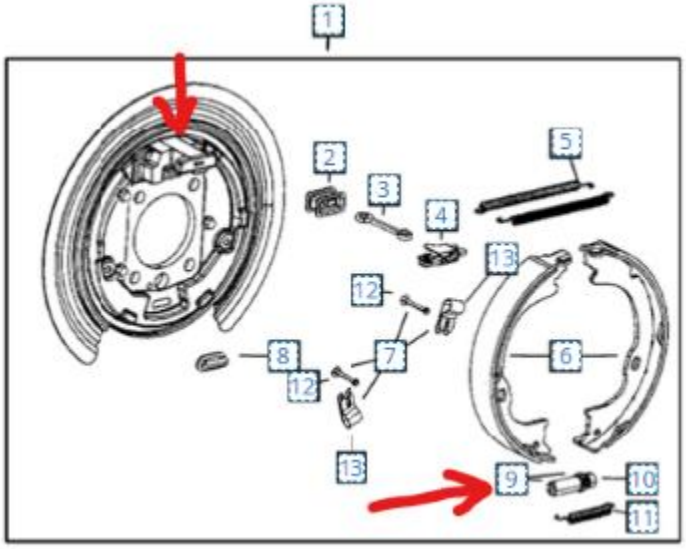
The manual shows that you can adjust the cable length with the adjuster nut (below left) however the cable in my Jeep does NOT have these nuts (below right) and only has a crimped ferule at the end of the cable.



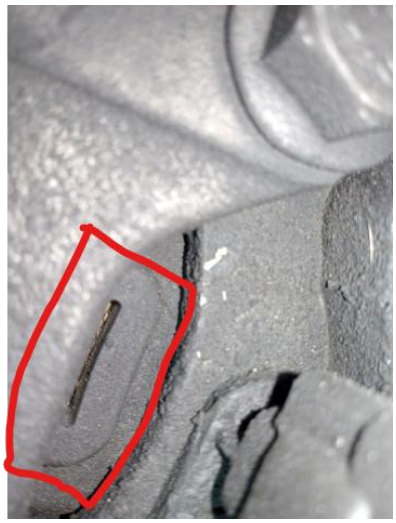
12.4 To adjust the parking brake cables, apply the parking brake, loosen the equalizer locknut (1) and - holding the equalizer rod with a pair of locking pliers to prevent it from turning - turn the adjuster nut (2) until the cable tension is fairly taut; when you're satisfied that the cable tension is correct, tighten the locknut; if you're replacing either rear cable, you'll have to compress the cable housing retainer tangs (arrows) to free the cable from the bracket

This was mildly annoying. I traced the cables all the way back to the wheel drums and there were no other adjustment points. So, the only adjustment available is the brake pad adjustment inside the wheel drum.

As can be seen in the exploded view below the pad adjustment (9) is on the opposite side from the parking cable entry.



However, the geniuses that designed this decided to place the brake calipers right on top of the access hole for the pad adjustment. See images below for access hole location (left), cable entry (right), zoomed in view of access hole almost completely hidden and obstructed by the caliper assembly.



This makes it almost impossible to get a brake spoon into the access hole for adjustment and most people I have seen online opt to remove the entire wheel and calipers to do the assembly as this also allows you to inspect the parking brake pads for wear at the same time.

Temporary Fix

As a temporary fix, I cut down a standard electrical box strain relief and inserted it between the cable ferule and brake cable sled – this pulled the cable in about ½" and allowed the brake lever to properly engage around click 9/10 (instead of the very last click 12 which was barely holding before.)

I later found a more reliable solution using split bolt connectors TJ-16(6AWG-8AWG) which provide the same ½" gap but with a much more secure connection. I ordered some copper and brass split bolts to see how they work.

Copper Split Bolts

I got the copper split bolts in the next day and tried them out. As you can see below (left) this is an improvement as you can position the split bolt anywhere on the cable – not just right next to the ferule. This looked good with the brake released, but when I tightened the brake, the split bolt slid down the cable until it hit the ferule. When I went to re-position it and apply more torque to the nut, the copper split bolt simply sheared in half (below right.) So, the moral of this is that copper split bolts do not have the strength required for this application.

Brass Split Bolts

The brass split bolts should arrive in a few days and I will try them out.