Pantera Technical Information

Group: 12   **Article:** #4   **Date:** April, 1979

Subject: PARKING BRAKE EFFORT REDUCTION

By: TOM BUTKE, THE LOOSE NUT

Probably one of the more common complaints about the Pantera is the effectiveness and location of the parking brake. Effectiveness is difficult to improve because of the relatively small size of the rear disc brake pads and the large amount of pressure required to secure the 3300 lbs. monster from motion. Thus, the only way to make the parking brake hold is to pull up harder on the handle to apply more force to the pads. Now this is great if you're a short-armed-arm wrestler, but if you can't do 75 one-armed chin-ups, you better also put it in 1st or reverse, too!

Accessibility comes into play in trying to really set the brake because the handle position is awkward and out-of-balance for the average Homo Sapien. Were it a foot pedal, or a handle rising between your knees, considerably more effort could be expended. Assuming we don't want to re-locate the handle, all that's left is to increase the mechanical advantage of the present system.

With the parking brake properly adjusted, the brakes begin to hold 2 to 3 "clicks" from the rest, and you're straining back muscles about 3 to 4 later. At this point the lever has moved thru about two thirds of its available arc. Also, at this point, unless you pry the handle upwards with an 8' – 2 x 4, the brakes won't hold on anything much steeper than level ground! If we could use the remaining travel of the handle to reach the same force applied earlier (by hand, not 2 x 4!!), the resulting force applied to the brake pads will be increased some 50%!
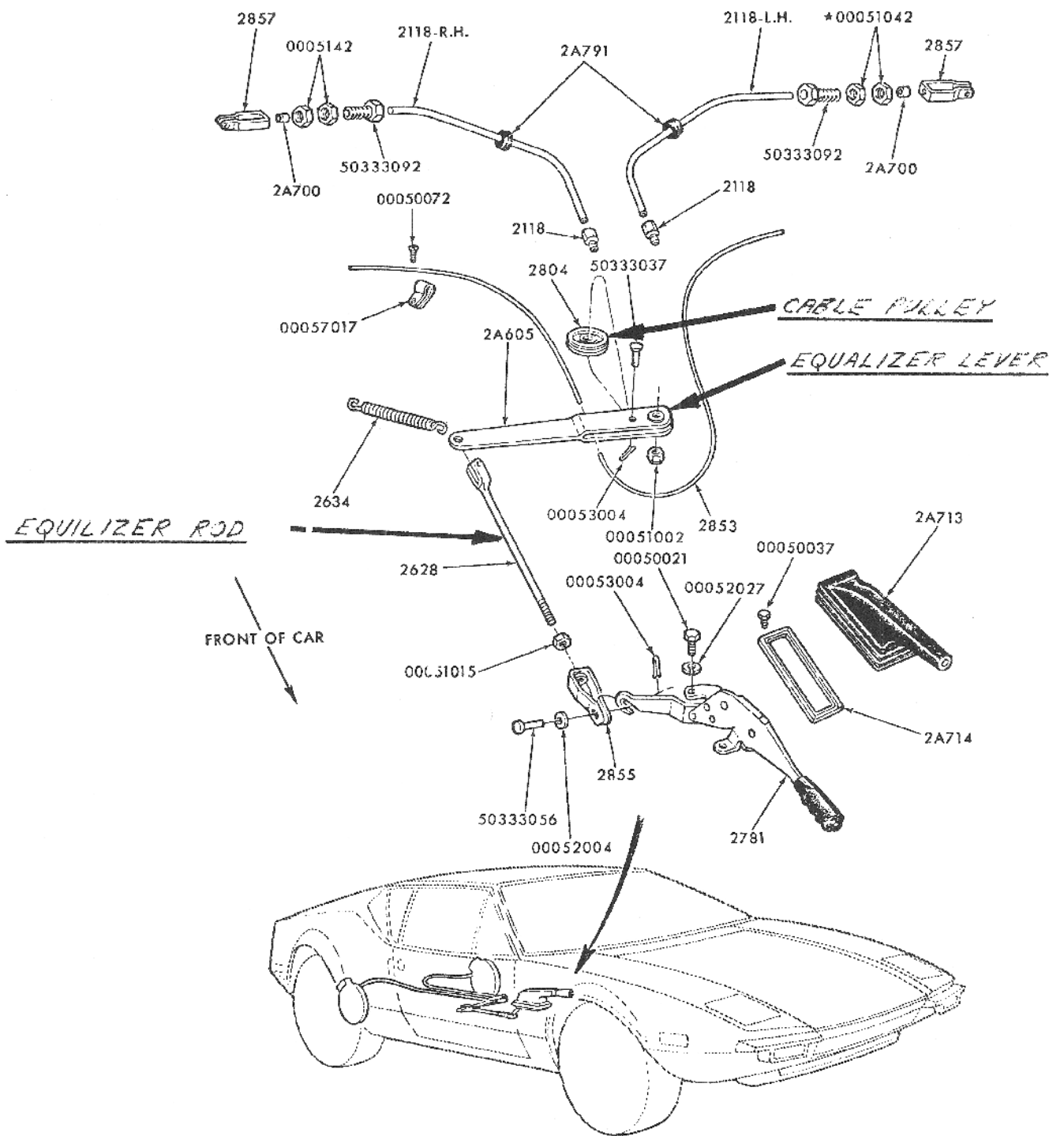
Utilizing <u>all</u> the available handle motion would not allow any room for wear or mis-adjustment, so only a portion of this should be used. But I'm sure you'll agree, even a 25% increase in effectiveness would be welcome.....or, a 33% decrease in effort for equal braking, depending upon your point of view!
At this point you should read the Pantera Technical Information article on Oil Pan

Removal, Group 21, Article #4, (also by me) as it will determine which of two approaches to the modifications you may choose to make.

First, get more familiar with the parking brake system by reviewing sketch #1. The simplest way to increase the mechanical advantage of the system is by increasing the ratio of the equalizer lever. This is done by moving the cable pulley's center closer to the equalizer lever's end pivot point. This pivot point is a bolt welded through a bracket attached to the right frame just forward of the oil pan. (Should you decide to make this bracket removable to allow removal of the oil pan per the Group 21 article, this would be a good time to do so). The modifications are as follows:
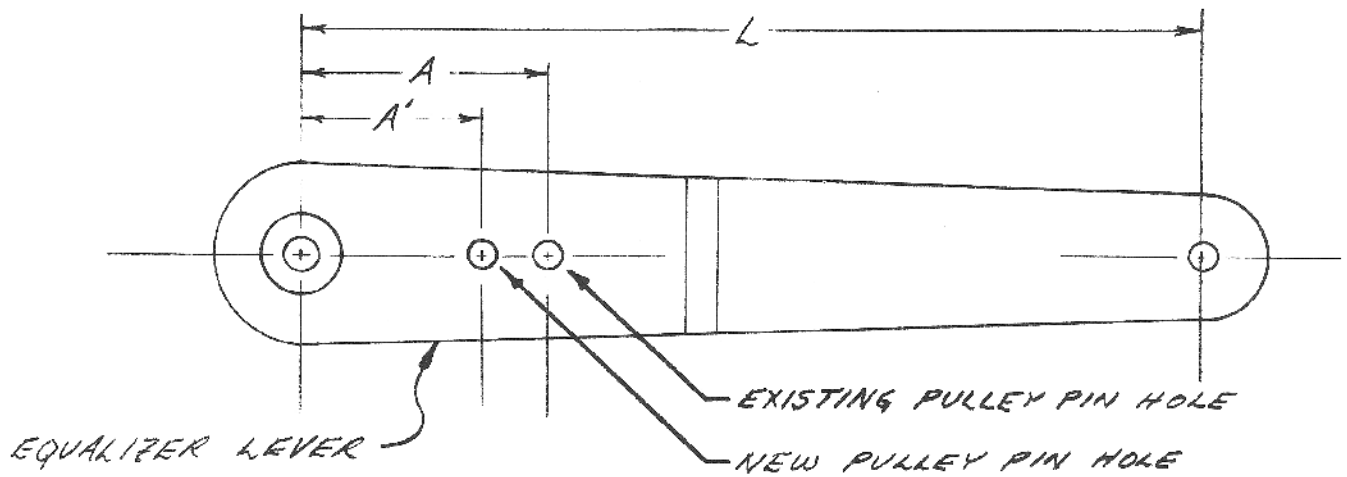
1. Remove the equalizer lever by disconnecting the equalizer rod from the hand lever, remove the return spring, remove the locknut on the pivot bolt, remove the pin from the cable pulley, and slip the equalizer lever clear.
2. Drill a new hole in the equalizer lever for the cable pulley's pin, per sketch #2.
3. Drill and cut two new "keyholes" for the brake cable terminating bushings to fit into on the bracket itself, per sketch #3. This is necessary to prevent the cable from binding due to the altered pulley location.
4. Re-install the altered assembly being sure the cables are installed in the new keyholes.
5. Re-adjust the equalizer rod for proper operation of the brake handle.

And there you have it! Should you not mind re-adjusting the brake periodically, the pulley pin hole can be placed still closer to the pivot. As each car is a little different, you should check the travel available and calculate the new hole location which will utilize the additional travel you wish to use. This is worked out on sketch #2. It's amazing what a guy will do to avoid getting his arm muscles into shape!!

2857
0005142
2118-R.H.
2A791
2118-L.H.
*00051042
2857

2A700
50333092
50333092
2A700

00050072
2118
2118

00057017
2804
50333037
2118

2A605
CABLE PULLEY

EQUALIZER LEVER

2634
EQUILIZER ROD

2628
00053004
00051002
2853
2A713

00050021
00050037

FRONT OF CAR
00053004
00052027

00051015
2A714

2855
2781

50333056
00052004

SKETCH #1

PARKING BRAKE SYSTEM
1971/   PANTERA

SKETCH #2

EQUALIZER LEVER

EXISTING PULLEY PIN HOLE

NEW PULLEY PIN HOLE

OLD MECHANICAL ADVANTAGE $= \dfrac{L}{A}$

* NEW MECHANICAL ADVANTAGE $= \dfrac{L}{A'}$

SKETCH #3

A MINUS A'

EQUALIZER BRACKET

EXISTING "KEYHOLES"

NEW "KEYHOLES"
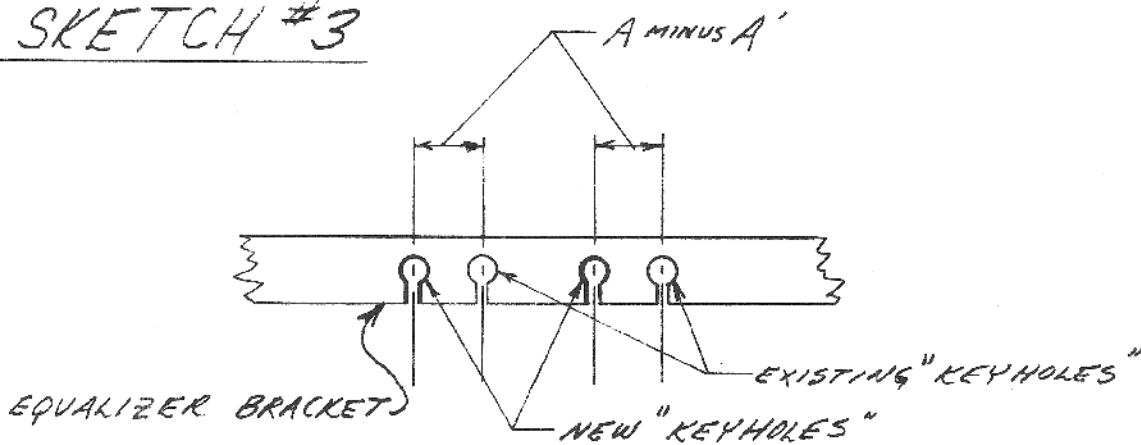
* IF AN EFFORT REDUCTION OF $33\tfrac{1}{3}\%$ IS DESIRED, THE NEW MECHANICAL ADVANTAGE SHOULD EQUAL $1.3\overline{3}$ TIMES THE OLD ADVANTAGE RATIO; THUS KNOWING ONLY A, A' IS GIVEN BY THE EXPRESSION:

$$A' = \frac{A}{1.3\overline{3}} \quad , \text{ OR } \quad A' = .75A$$