



GMC - MH ACTUATOR FOR FORCE AND DISTANCE MULTIPLICATION ON PARK BRAKE CABLES

It's long been acknowledged that the available stroke on the GMC park brake handle and the manner in which it connects to the intermediate cable , leaves a lot to be desired in terms of effectiveness. Due to State and Provincial DOT regulations and civil litigation issues , it would appear we are stuck with the OEM park brake handle and its location forever as well as its basic mode of operation. Consequently , a power assist mode on the handle was the ONLY option available if one wanted to boost the distance and force applied to the park brake cables.

The OEM cable system is just adequate for the drum brake system providing all the related components are in good shape and properly adjusted. With the application of four wheel discs and drums on the rear most wheel set , adequate results could still be attained with regards to a functioning park brake , however with the growing trend of folks wanting six wheel disc brakes AND a good working park brake ; a whole new set of challenges were introduced. Over a period of two years ; research and development was carried out to implement a system that would address the problems of finding a suitably robust and reliable disc park brake caliper and a means to operate said caliper within the confines of the OEM park brake handle. The Eldorado park brake caliper requires a great deal of force to be effective and the Kelsey Hayes caliper , although superior to the Eldorado in reliability and force requirements ; it too had the disadvantage of needing more pull distance on the cables than either the drum system or the Eldorado disc caliper.

Research and testing revealed the need for a booster that could provide an increase in pull distance and an accompanying increase in force while being limited to the constraints of the OEM park brake handle and its position. During the latter part of 2011 , a new force / distance booster was designed and tested to work with the OEM park brake handle to give an approximate 300 % increase of force and distance on the park brake cable system as compared to the OEM cable system .

The new booster may be used with or without the air assist option. The booster was coupled with the Kelsey Hayes calipers and WITHOUT air assist. Our 23 foot Birchaven GMC could be held stationary on a 12 % grade in both forward and reverse modes . The handle was not easy to pull but it could be done using only one hand. I strongly recommend the air assist option due to the speed and ease of operation. The air assist option is quite cost effective in that it only adds 10% to 12 % to the total cost of the system.

CONSIDERATIONS REGARDING IMPLEMENTATION OF 6 WHEEL DISC BRAKES : draft02

NOTE: As time progresses and taking into account that “ Corrosion never sleeps” we are finding that problems are arising on the GMC that need to be addressed. A number of the hydraulic “ hard” lines on our brake system have begun to seep brake fluid and in some instances they have completely burst. This corrosion has occurred most often under the clips that secure the hydraulic brake lines to the coach frame. Since the original lines has lasted some 35 years, there’s no reason to believe that a similar quality line shouldn’t be sufficient for a similar amount of time. There is as well , new plastic coated brake lines and of course stainless steel available from our vendors. Bottom line ; it’s time to very carefully inspect the coaches hydraulic lines.

NOTE: As above ; when we first started making stainless parking brake cables in mid 2005 , about one coach in twenty required a park brake “ Handle” cable as well as the wheel & frame cables. Now in 2012 , that 1 in 20 number has decreased to approximately 1 in 5 . Basically a 4 fold failure increase in a period of 7 years strictly due to corrosion issues.

NOTE: When considering 6 wheel discs, one must be aware that the “ combination valve” MUST be replaced due to the fact that one requires equal pressure to all six calipers for ensuring maximum effectiveness of your brake system. The brass “ PV 4 “ is the correct “ combination valve” for 6 wheel discs. **NOT the PV2 .**

NOTE: The master cylinder (MC) of choice with regards to the requirements of a 6 wheel disc system is the 34mm bore master cylinder ie. The NAPA 39309 or equivalent. This rectangular reservoir MC has sufficient volume capacity to address the volume requirements of 6 calipers. The down side of this MC is that its somewhat awkward to fill and its drops the overall system pressure by about 110 psi compared to the 1-1/4" bore MC that was the OEM MC on the 1978 coaches. Although not conclusively proven YET ! I suspect there never was a 1-1/8" bore MC on a GMC motorhome in spite of what some of the technical data on- line states.

In our case; we are running a 1- 1/4" bore MC with an auxiliary reservoir on the front chamber , ie. The chamber that supplies the 4 rear discs . We are running 80 mm calipers on the front and intermediate wheel set and the 2.60" Kelsey Hayes park brake calipers on the rear most wheel set and have a very good pedal height . The primary reason that we can get away with doing this ; is that we have extremely rigid and well fitting caliper mounts thus virtually eliminating undue caliper piston “ knock back “ issues.

The standard 1-1/4" MC can be easily and economically converted to accept a remote reservoir of the Pegasus Auto Racing type , it should be noted that it is **ABSOLUTELY IMPERATIVE** that the special connecting hose designed especially for brake fluid is used. There are very few materials that are impervious to brake fluid.

NOTE: Our Kelsey Hayes park brake calipers use ceramic brake pads due to the fact they tend to have superior gripping capacity when at ambient temperature as opposed to say, carbon metallic (CM) pads. In short they perform better in a “ park brake” application than do the CM brake pads. One drawback of the ceramic pads is that they require a significant break- in period. When we did our initial tests on the park brake application of the Kelsey Hayes system , we were somewhat disappointed with the performance ; it was good but not great. However when we did the final tests at approx. 2000 miles , the system performed flawlessly , we were able to hold the coach stationary on a 12 % grade in both forward and reverse conditions without air assist on the cable distance multiplier . The PB handle required a good hefty pull but it could be done with one hand.

NOTE: For more information of the development and testing of the Kelsey Hayes disc park brake system see the latter half of the PDF “Park brake improvements” on our website www.bdub.net/branscombe .