

GMCMI

GMC MOTORHOMES INTERNATIONAL

Bigger Brakes for the Manny Reaction Arm System

presented by Albert Branscombe

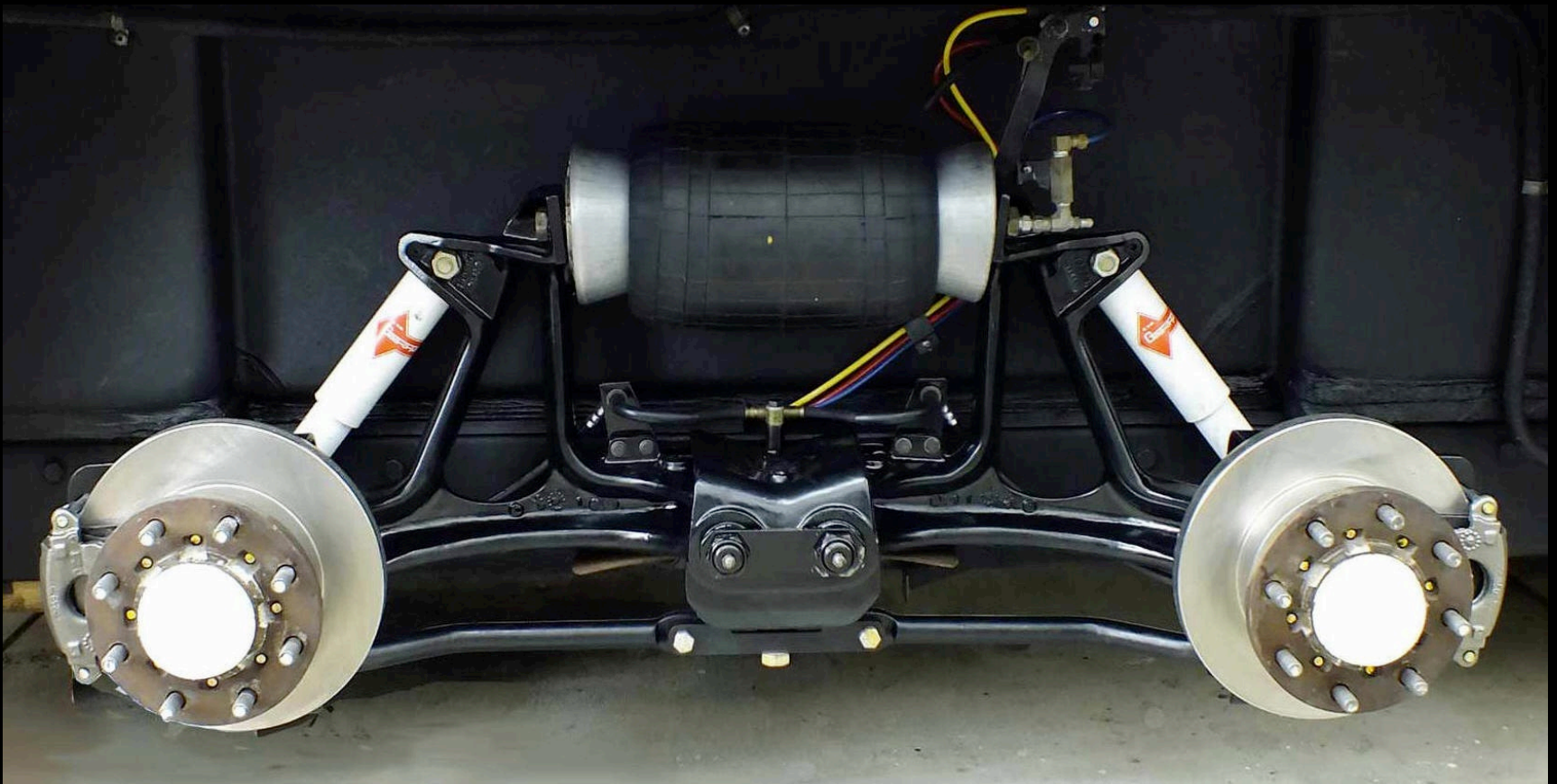
at the

GMCMI 2014 Fall Convention

Chippewa Falls, Wisconsin

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CHOOSING BRAKE CALIPERS FOR THE MANNY REACTION ARM BRAKE SYSTEM



Manny Reaction Arm Brakes :

The main objective of the Manny reaction arm brake system was to provide a reaction arm system that had at least the rear braking capabilities of the GMC OEM rear drum system but provided the convenience and simplicity of discs

Manny Reaction Arm Brakes :

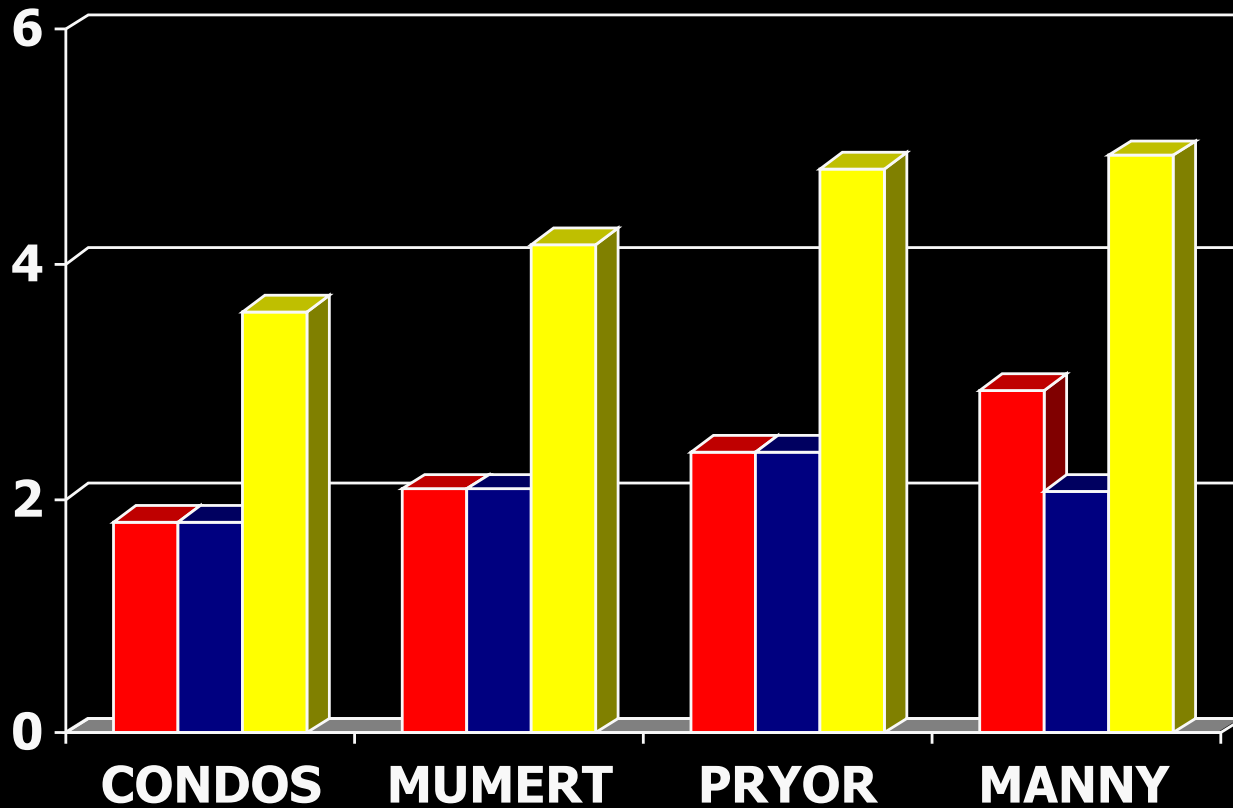
The following data is from Frank Condos, Dave Mumert , Tom Pryor and myself regarding GMC-MH rear drum braking forces

- Condos drums; 3,600 lbs.
- Mumert drums; 4,160 lbs.
- Pryor drums; 4,825 lbs.
- Manny's discs ; 4,925 lbs.

HOW ABOUT A GMC PARKING
AND EMERGENCY BRAKE ?

CHOOSING BRAKE CALIPERS FOR YOUR REACTION ARM BRAKE SYSTEM

Y – AXIS: 0 to 6K Lbs. , RED = Mid, BLUE = Rear ,
YELLOW = BOTH Rear Brake Force



CHOOSING BRAKE CALIPERS FOR YOUR REACTION ARM BRAKE SYSTEM

Summarizing the combined rear brake forces on the GMC

Calculating the braking forces of drum brakes is bordering on Voodoo Art due to the extreme non-linearity of drum brakes . However if one averages the 3 calculations of the before mentioned gentlemen ; the average is 4,195 pounds .

As can be seen the Manny reaction arm disc setup provides 4,925 pounds of rear braking force or approx. 17 % above the average.

** 1000 psi master cylinder pressure used for all calculations.*

For one reason or another , some GMC motorhome folk need (or simply want) higher capacity braking , whether they may tow heavy loads, live in mountainous regions or have a heavier than normal coach , etc. Thus they choose the size and type of brake calipers :

To optimize the GMC braking capability whether moving or stopped !

CHOOSING BRAKE CALIPERS FOR YOUR REACTION ARM BRAKE SYSTEM

- Calipers as currently supplied with the Manny reaction rod system



Rear – 54mm Eldorado
park brake caliper

Mid – 63.5 mm Camero /
Malibu brake caliper

HOW ABOUT A GMC PARKING
AND EMERGENCY BRAKE ?

Backing plates now available for both 5-1/2" and 7 " caliper spacing

- REAR WHEELS



Large Caddy 63.5mm
Park brake caliper



Large 66 mm Kelsey
Hayes park brake caliper

Backing plates now available for both 5-1/2" and 7" caliper spacing

- **MID WHEELS:**



74.6 mm caliper , same
as GMC OEM front



80 mm caliper as
commonly used on
GMC front & mid

INSTALLING BIGGER REAR DISCS ON THE MANNY REACTION ARM SYSTEM



*Removing the 63.5 and the 54 mm calipers .
And replacing them with
80 and 66 mm calipers respectively
on the mid and rear wheel set*

INSTALLING BIGGER REAR DISCS ON THE MANNY REACTION ARM SYSTEM

- Coach solidly blocked up in 6 locations and commenced removing existing parts .



HOW ABOUT A GMC PARKING
AND EMERGENCY BRAKE ?

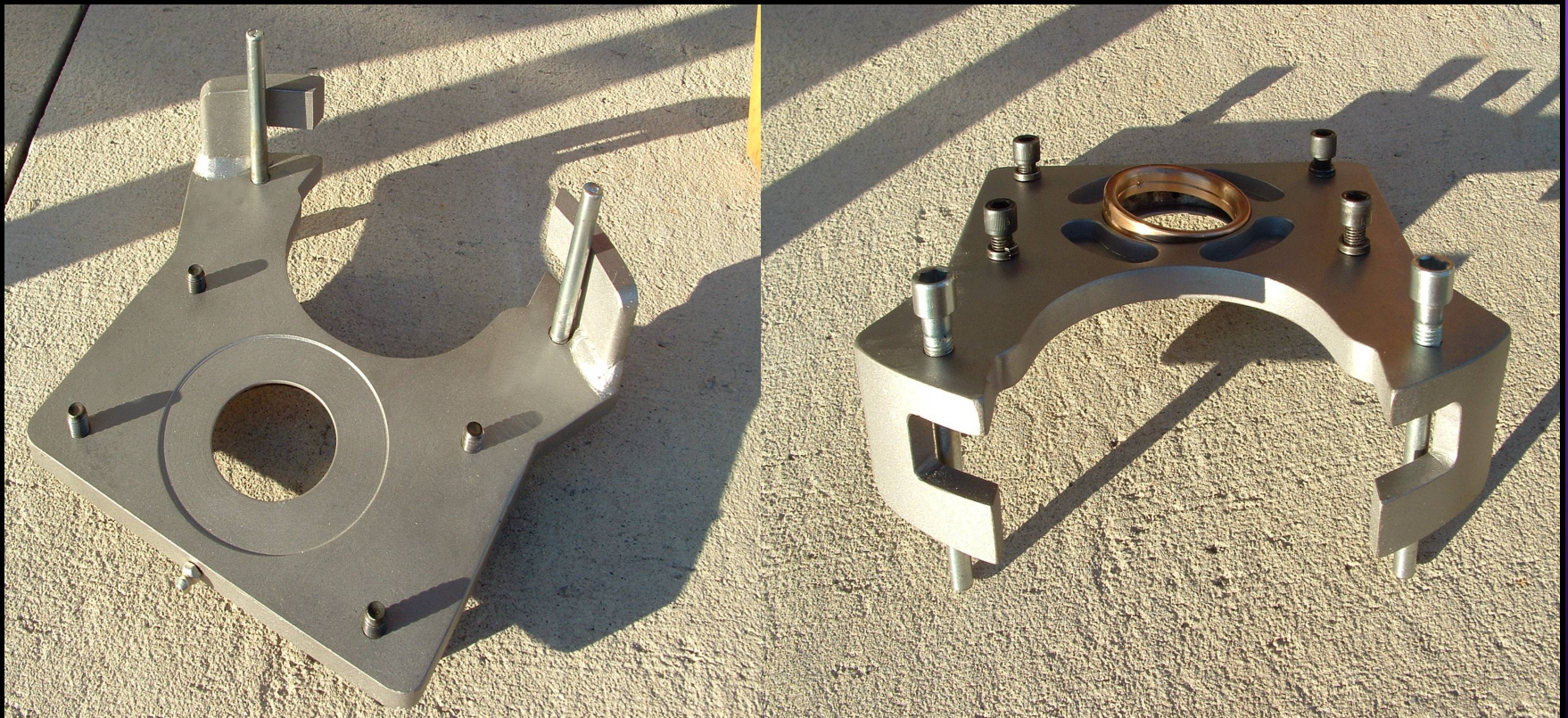
INSTALLING BIGGER REAR DISCS ON THE MANNY REACTION ARM SYSTEM

The following components were first removed to facilitate installation of the new components.

- 4 brake rotors and spacer assemblies removed from hubs .
- All existing parking brake cables and associated components removed. 4 frame brackets retained !
- All 4 brake calipers removed and flex lines capped.
- 4 - 8" caliper mounts removed from torque boxes.
- Unfortunately the " True Track Assembly" had to be removed to accommodate the mid wheel set 80 mm calipers, " True Track" bracket to be reworked later.

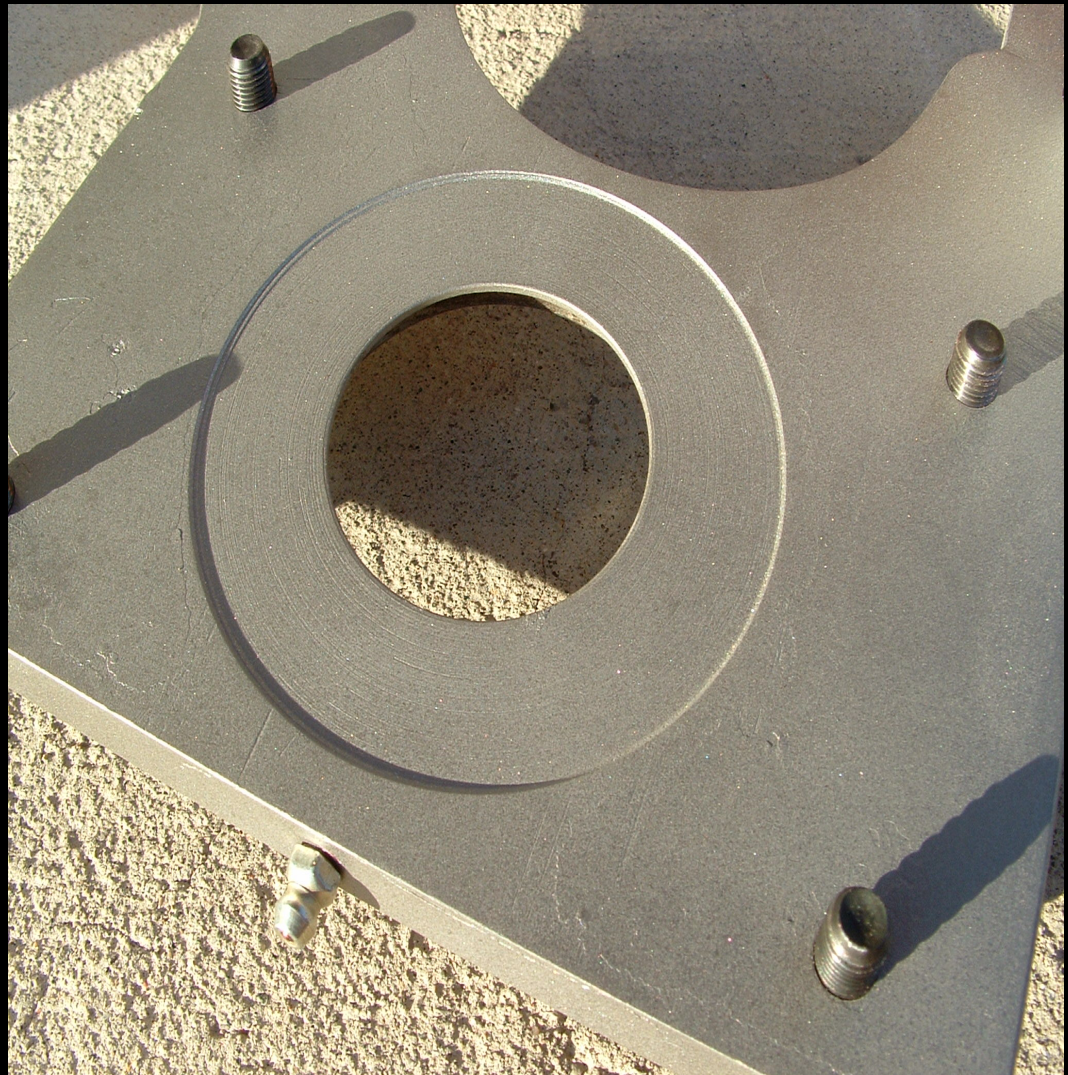
INSTALLING BIGGER REAR DISCS ON THE MANNY REACTION ARM SYSTEM

- Installation of forked Lambke caliper mount on the mid-wheel set.



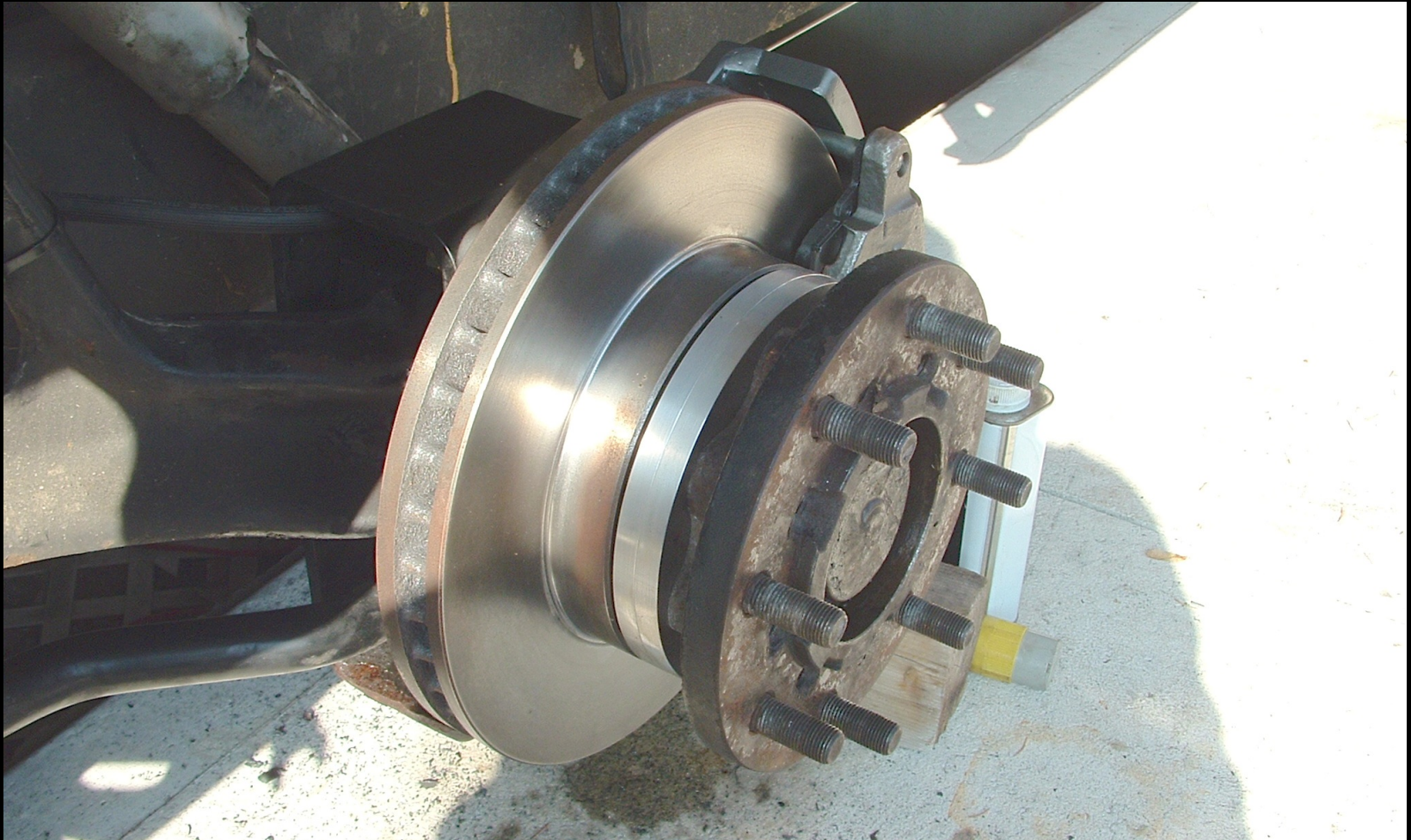
INSTALLING BIGGER REAR DISCS ON THE MANNY REACTION ARM SYSTEM

- NOTE : Generous relief machined to accommodate out of spec. hubs on the 73 / 74 GMC's in particular.
- Also bronze bushing reworked to facilitate being greased via a Zerk



HOW ABOUT A GMC PARKING
AND EMERGENCY BRAKE ?

INSTALLING BIGGER MID DISCS ON THE MANNY REACTION ARM SYSTEM

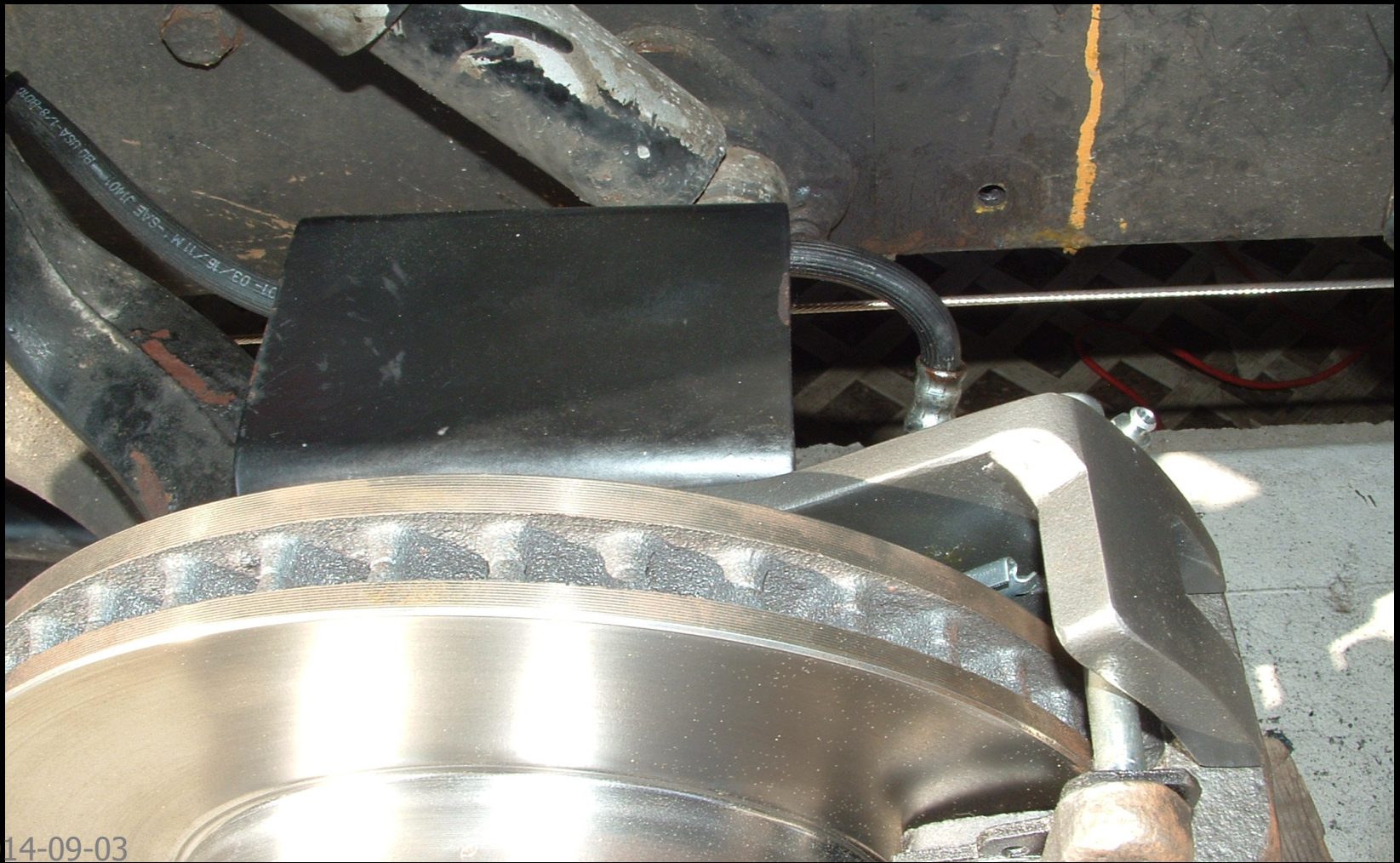


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AND EMERGENCY BRAKE ?

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INSTALLING BIGGER MID DISCS ON THE MANNY REACTION ARM SYSTEM
*Installation of 80 mm caliper & TORO 11.160" X
1.20" rotor on mid wheel set*

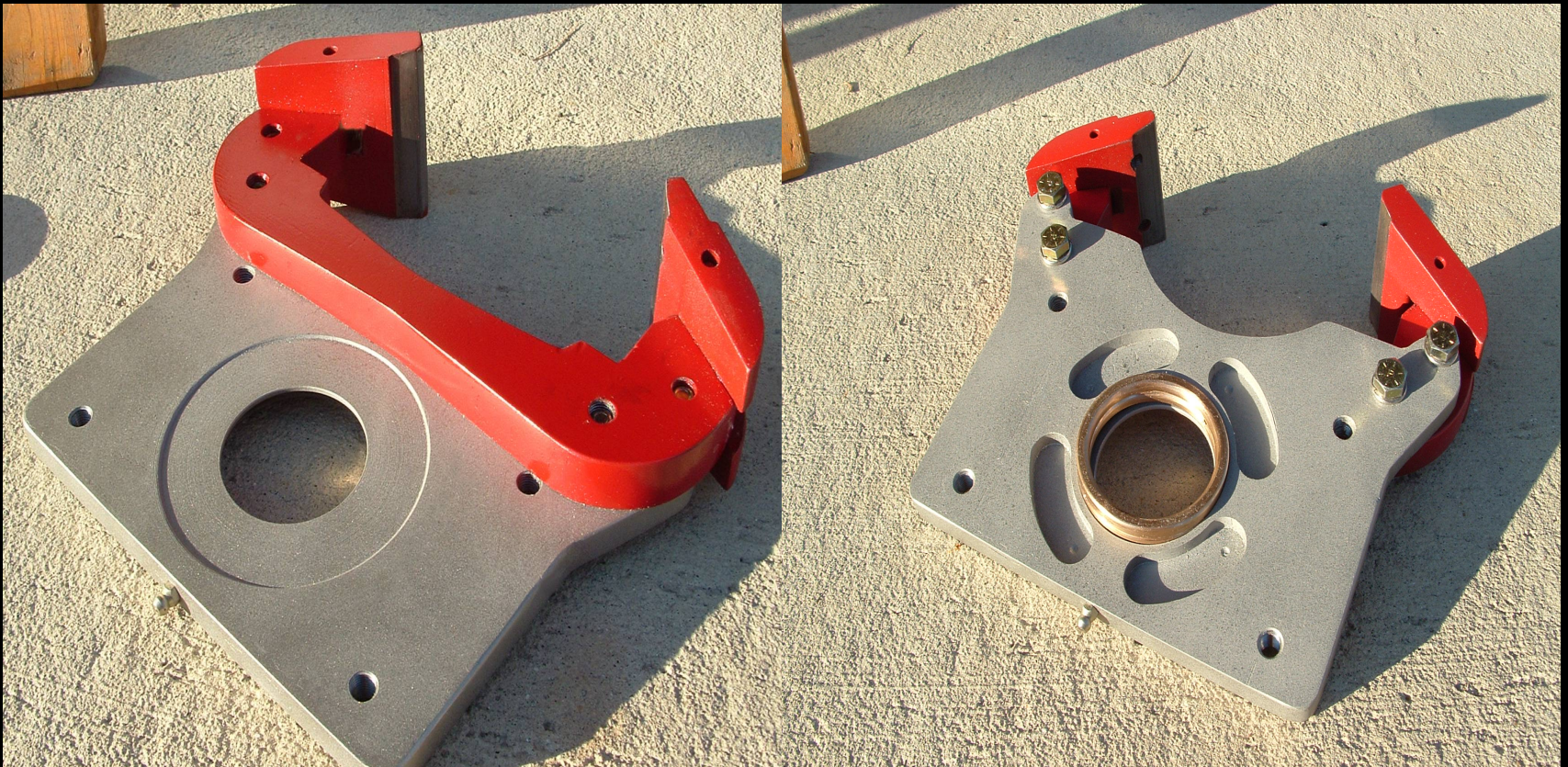


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INSTALLING BIGGER MID DISCS ON THE MANNY REACTION ARM SYSTEM

- *Fitting the large Kelsey Hayes parking brake prototype mount prior to installing the production mounts.*

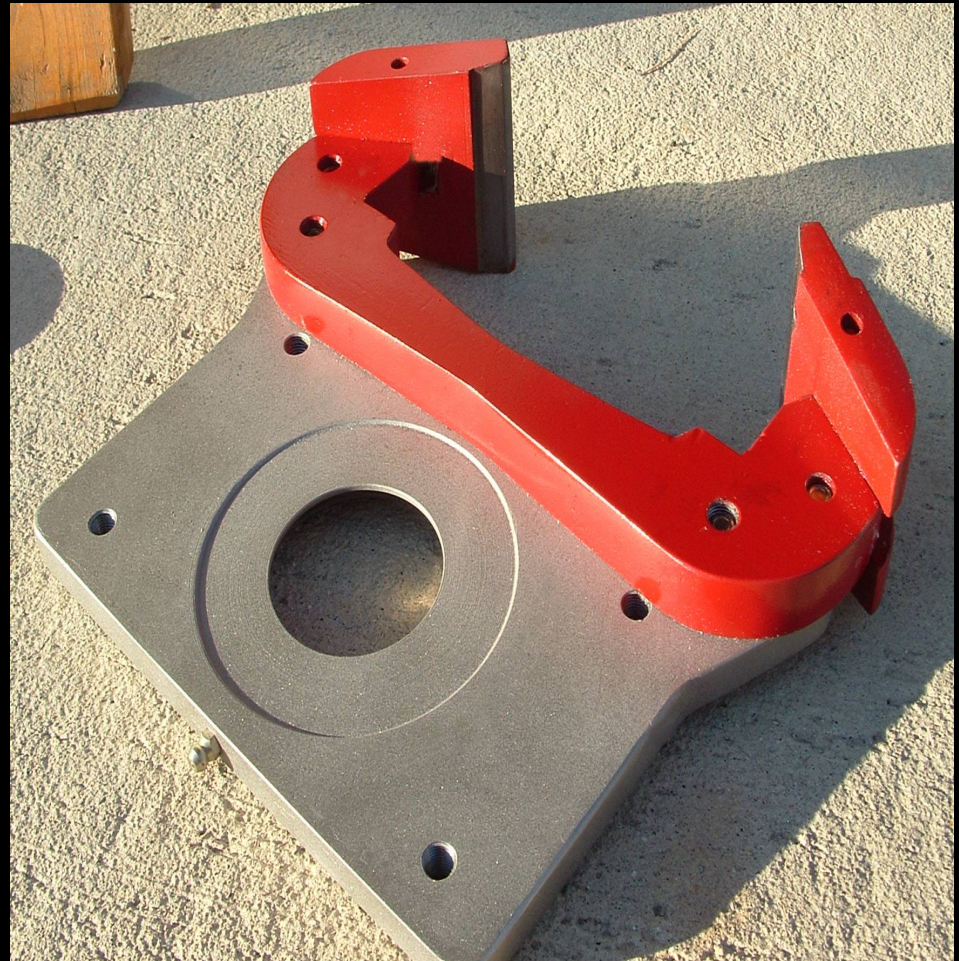


HOW ABOUT A GMC PARKING
AND EMERGENCY BRAKE ?

INSTALLING BIGGER REAR DISCS ON THE MANNY REACTION ARM SYSTEM
Kelsey Hayes rear P. Brake disc system mount

NOTE : Generous relief machined to accommodate out of spec. hubs on the 73 / 74 GMC's in particular.

Also bronze bushing reworked to facilitate being greased via a Zerk



HOW ABOUT A GMC PARKING
AND EMERGENCY BRAKE ?

INSTALLING BIGGER REAR DISCS ON THE MANNY REACTION ARM SYSTEM
2.6" *Kelsey Hayes production rear park brake disc system*



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HOW ABOUT A GMC PARKING
AND EMERGENCY BRAKE ?

INSTALLING BIGGER REAR DISCS ON THE MANNY REACTION ARM SYSTEM
2.6" Kelsey Hayes rear park brake disc system



HOW ABOUT A GMC PARKING
AND EMERGENCY BRAKE ?

INSTALLING BIGGER REAR DISCS ON THE MANNY REACTION ARM SYSTEM
2.6" *Kelsey Hayes rear park brake caliper conduit restraint (MID)* .



HOW ABOUT A GMC PARKING
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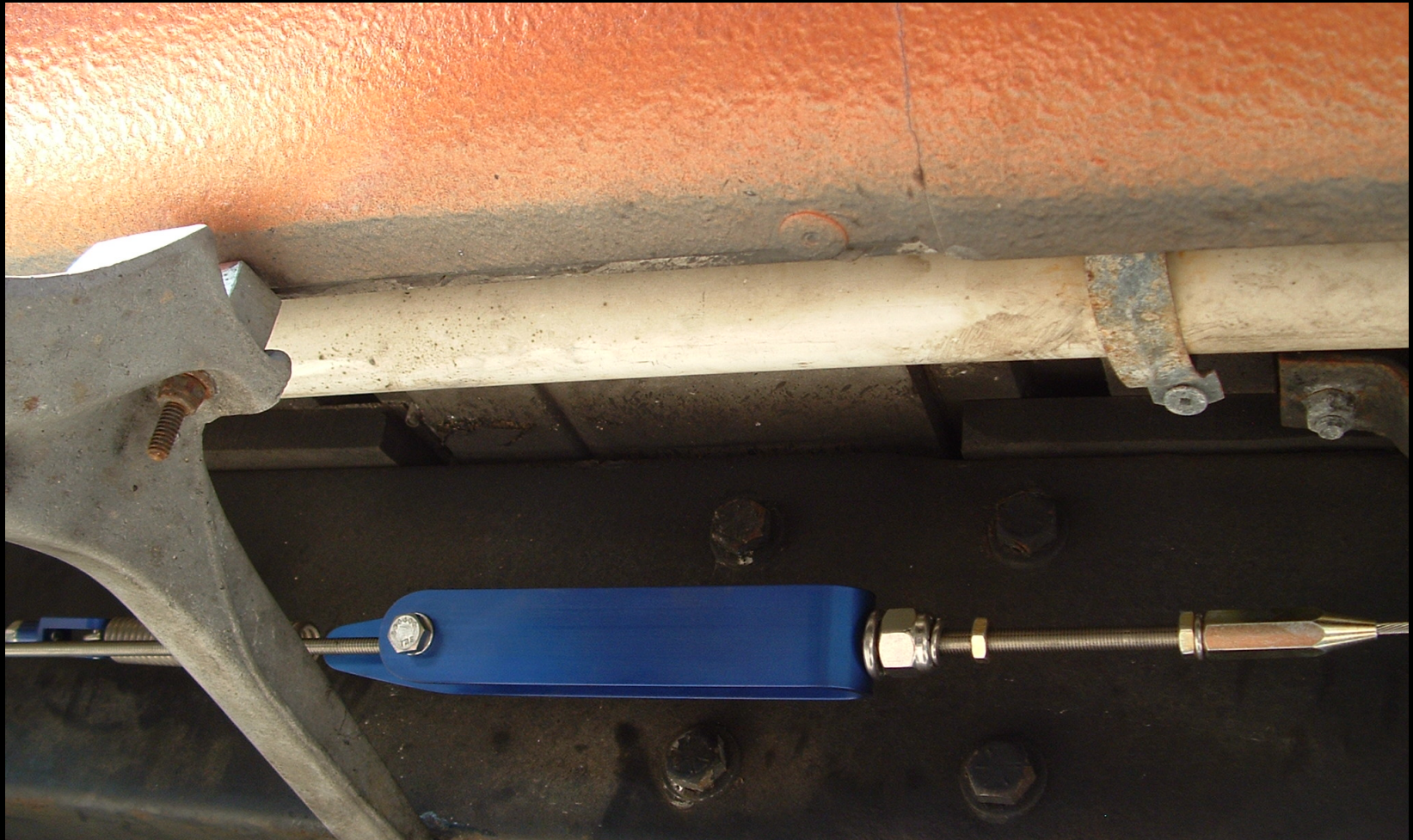
INSTALLING BIGGER REAR DISCS ON THE MANNY REACTION ARM SYSTEM
2.6" *Kelsey Hayes rear park brake caliper conduit restraint (FRONT)*



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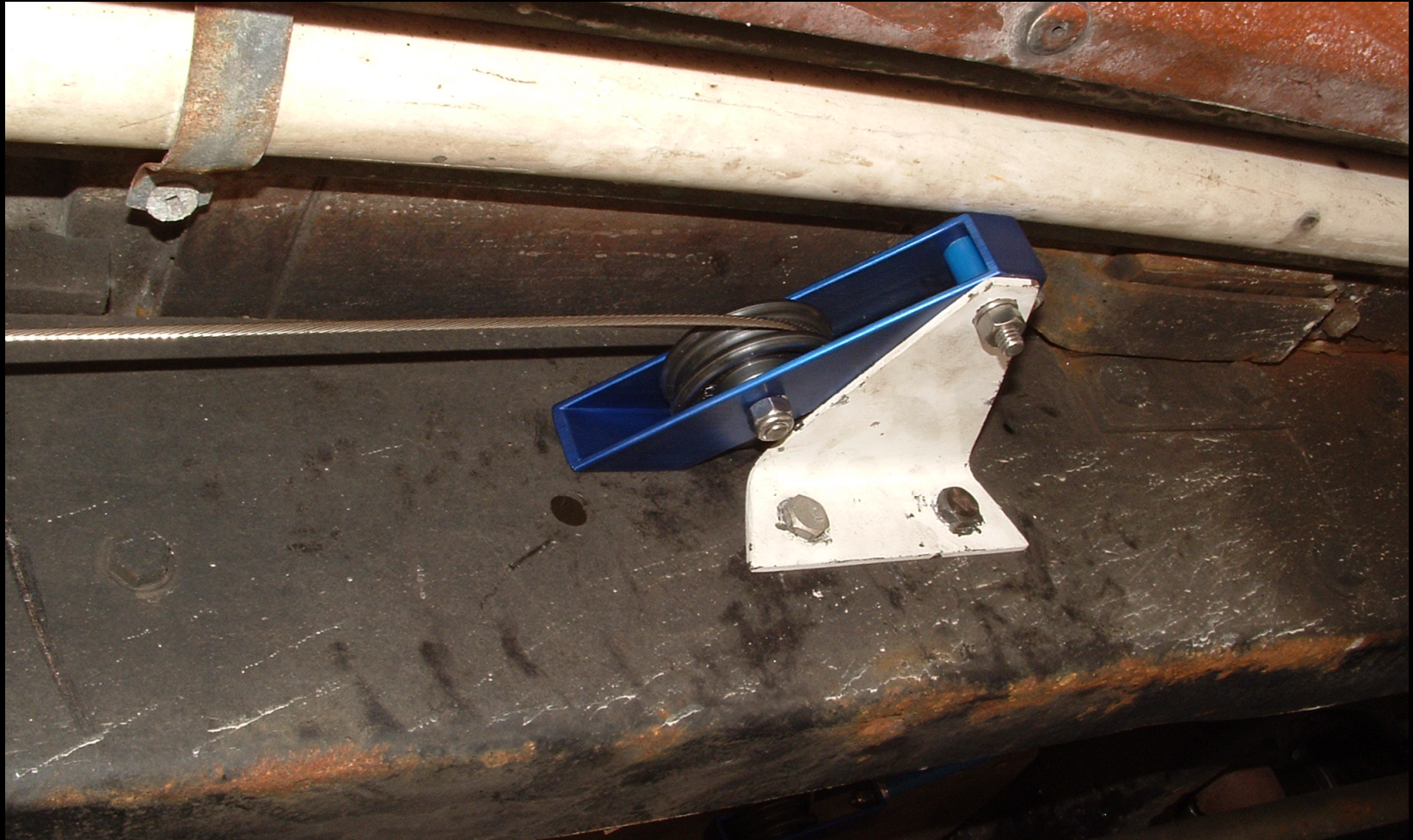
INSTALLING BIGGER REAR DISCS ON THE MANNY REACTION ARM SYSTEM

2.6" *Kelsey Hayes rear park brake adjuster yoke / retractor spring assembly*



HOW ABOUT A GMC PARKING
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INSTALLING BIGGER REAR DISCS ON THE MANNY REACTION ARM SYSTEM
2.6" Kelsey Hayes rear park brake caliper thru frame pulley

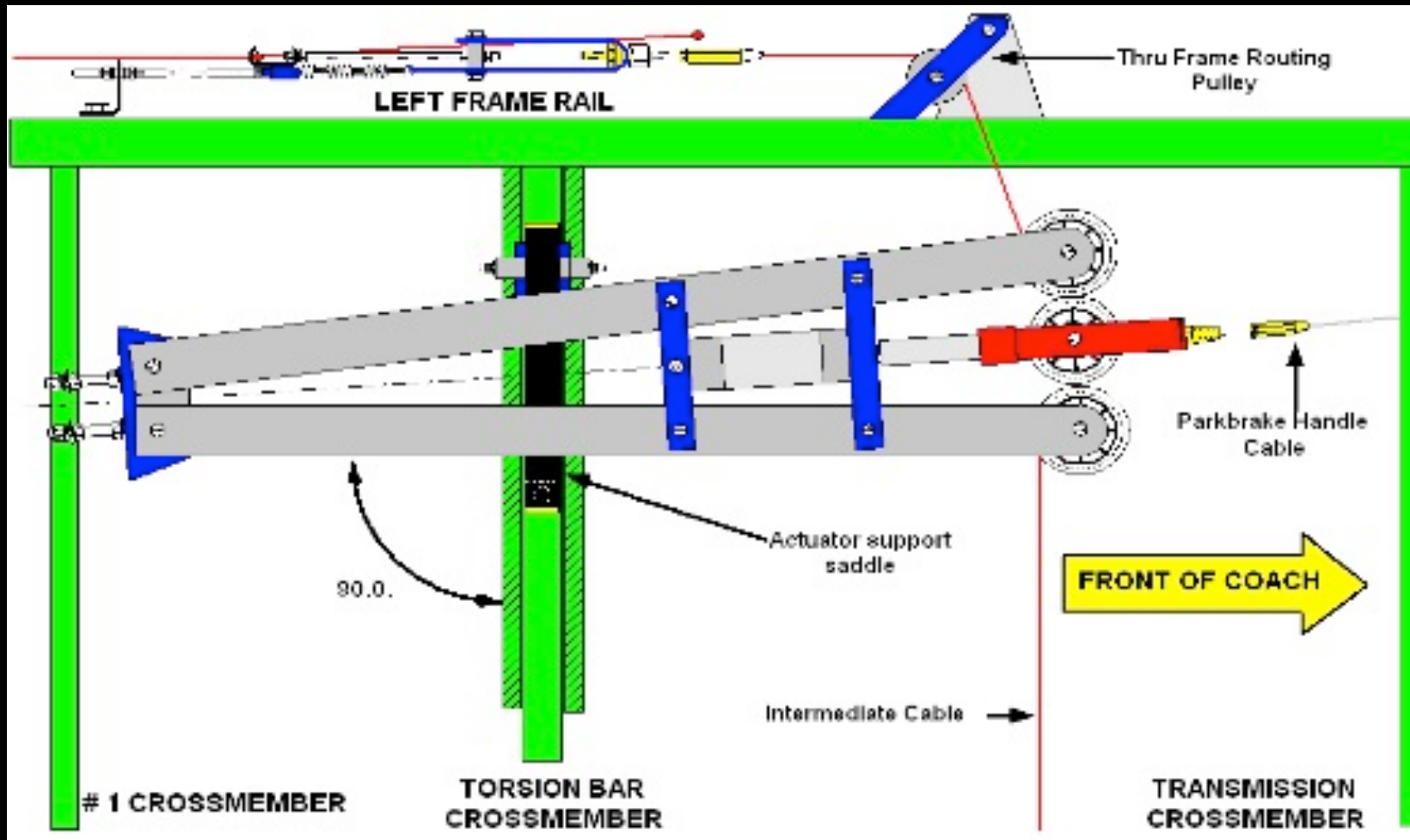


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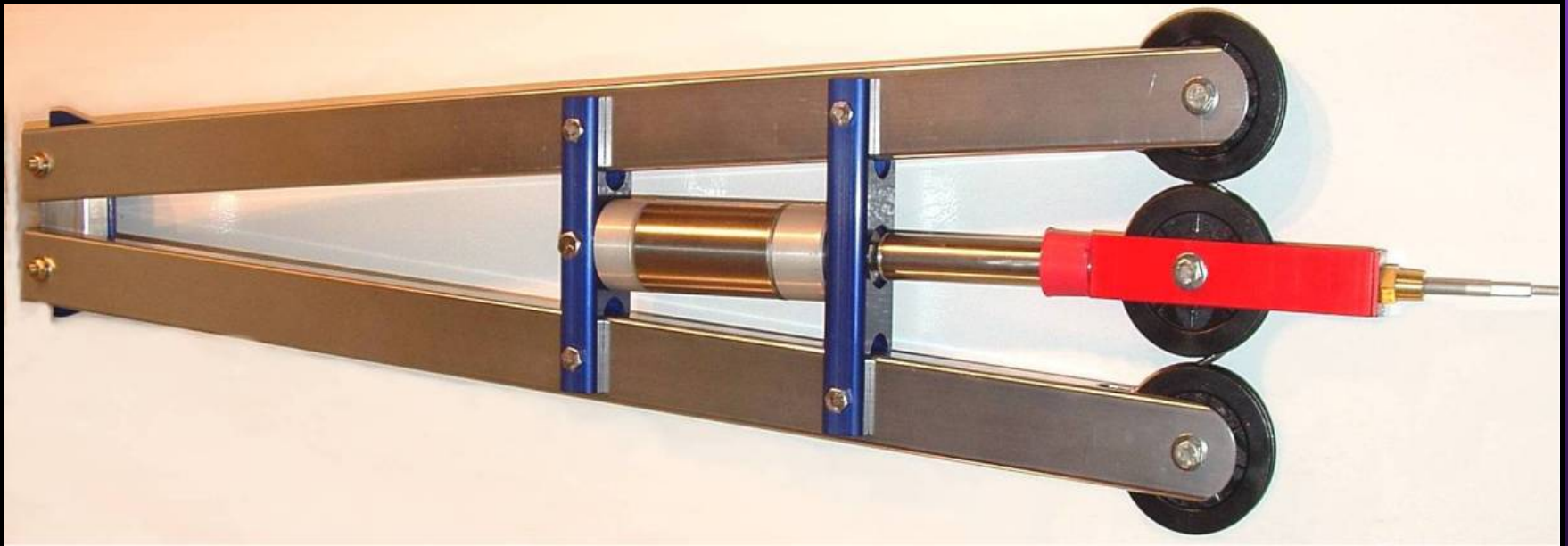
INSTALLING BIGGER REAR DISCS ON THE MANNY REACTION ARM SYSTEM
2.6" Kelsey Hayes rear park brake caliper actuator assembly pictorial



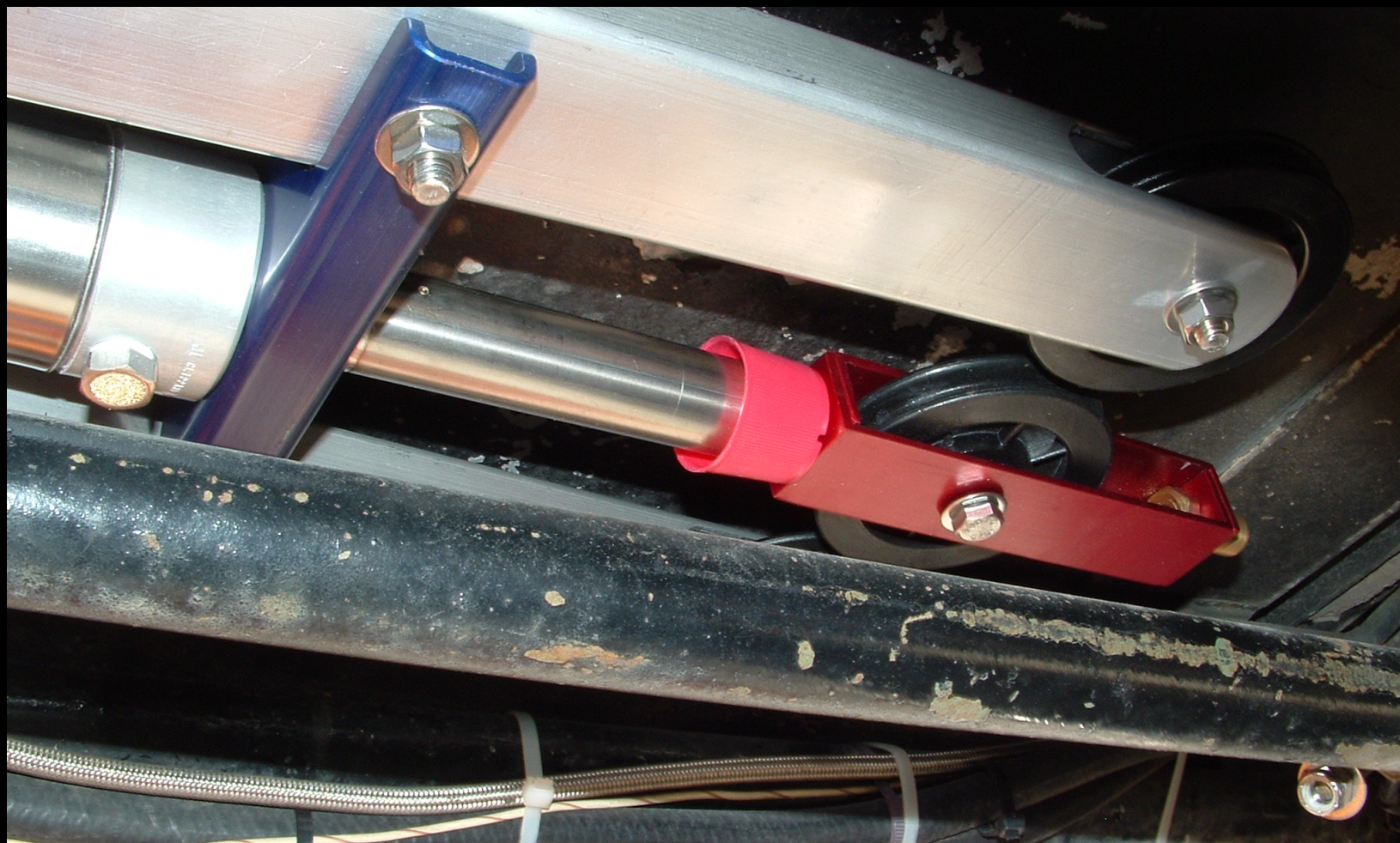
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INSTALLING BIGGER REAR DISCS ON THE MANNY REACTION ARM SYSTEM
2.6" Kelsey Hayes rear park brake caliper actuator assembly photo

Approx. 300 % increase in force and distance on parking brake cables compared to OEM setup !



INSTALLING BIGGER REAR DISCS ON THE MANNY REACTION ARM SYSTEM
Actuator piston (left) & shuttle pulley (right)



HOW ABOUT A GMC PARKING
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INSTALLING BIGGER REAR DISCS ON THE MANNY REACTION ARM SYSTEM
Shuttle pulley connection to OEM parking brake handle cable



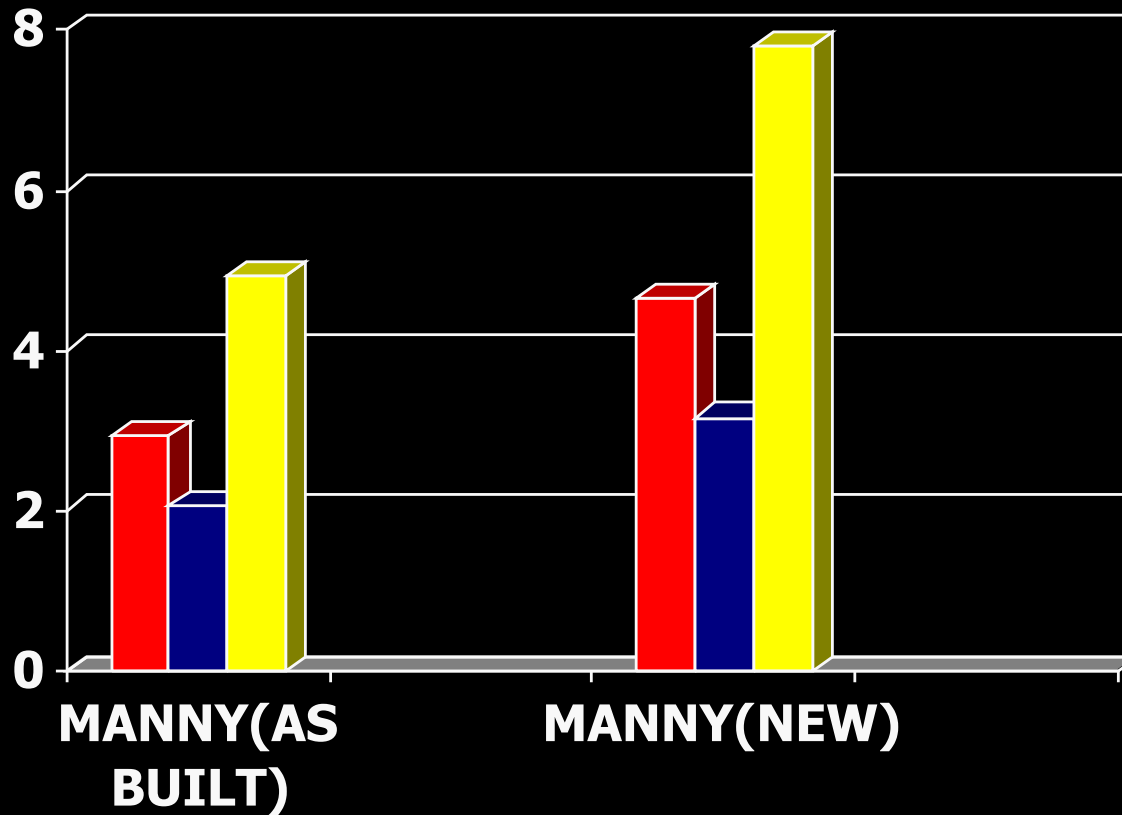
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CHOOSING BRAKE CALIPERS FOR YOUR REACTION ARM BRAKE SYSTEM

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INSTALLING BIGGER REAR DISCS ON THE MANNY REACTION ARM SYSTEM
Summary of components used for brake upgrade on GMC coach

- Manny Reaction Arm system , less rotors, calipers and 8" swivel plates
- Lambke forked caliper mounts on 10" swivel plates, spacers, TORO rotors & fastener pk.
- Kelsey Hayes caliper mounts on 10" swivel plates, spacers, K-H rotors & fastener pk.
- 450# air assist actuator & accessory pk.
- Stainless cable assembly & caliper levers

INSTALLING BIGGER REAR DISCS ON THE MANNY REACTION ARM SYSTEM

Summary of components used for brake upgrade on GMC coach

- NOTE :

On new installations , it's strongly recommended to use the equivalent of the OEM rear brake " hard lines" AND 12" flex hoses on both wheel sets. *It is not recommended to bend the metal ends of the Manny hoses or to ream the banjo fittings from 10mm to 7/16" dia. on the K-H caliper hoses due to safety reasons.*

INSTALLING BIGGER REAR DISCS ON THE MANNY REACTION ARM SYSTEM

- Prospective customers will provide their own calipers, pads & hoses because of warranty issues and it will be more economical for them to buy locally.
- To ensure quality control and overall system performance , components will not be sold individually .

INSTALLING BIGGER REAR DISCS ON THE MANNY REACTION ARM SYSTEM

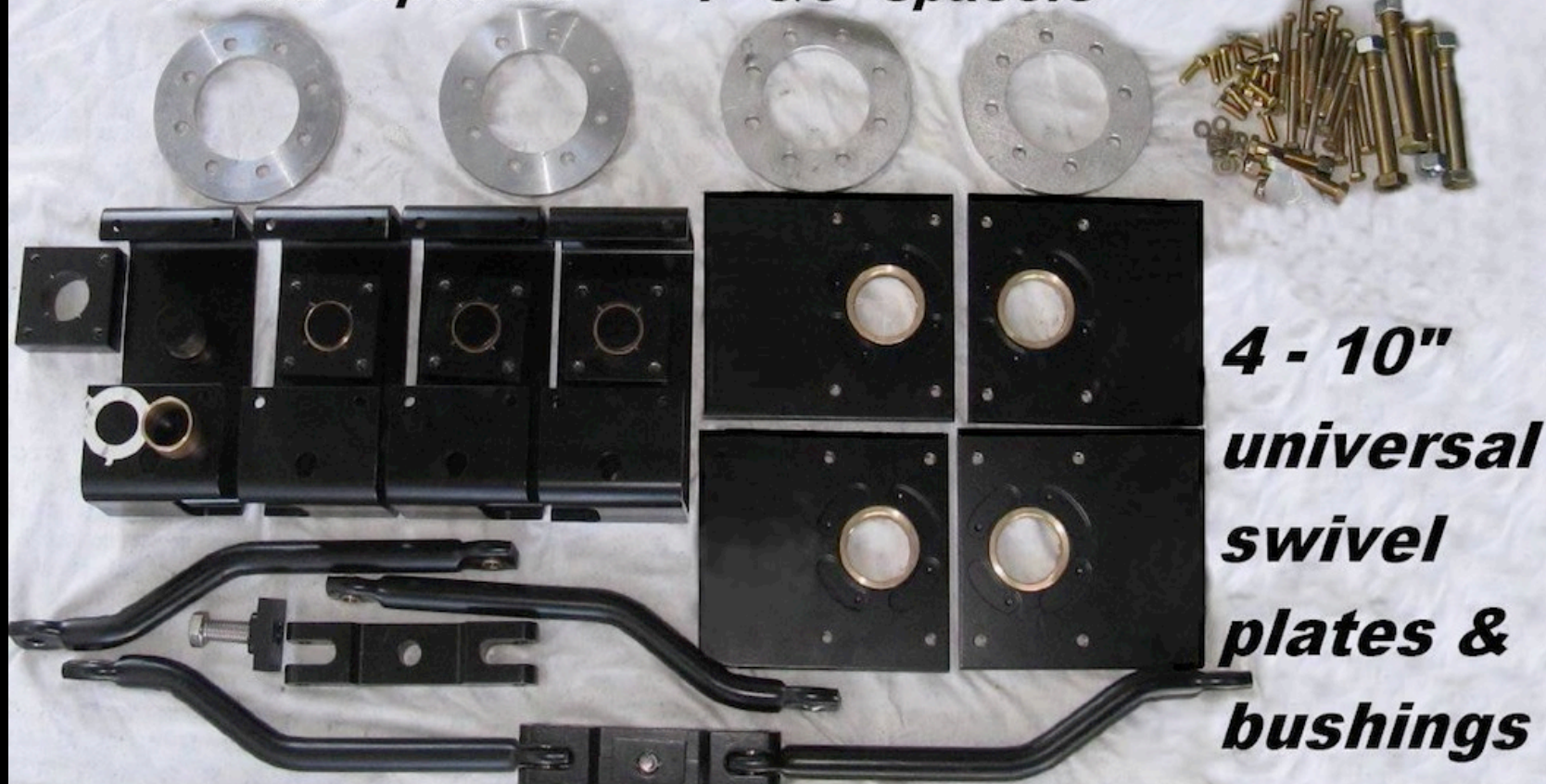
Manny's Reaction Arm Upgrade Kit

Aluminum Spacers

4 - 1/2" spacers

4 - 3/8" spacers

*Fastener
Pack*



*4 - 10"
universal
swivel
plates &
bushings*

For more info : Call or email

- Manny's Transmission, (408)937-1583
mannystrans@gmail.com
- Albert Branscombe , (519)368-7129
branscoa@bmts.com