



# MARKS4WD

## Fitting Instruction for MFK20580, MFK20450 & MFK205## Nissan GQ Patrol Hydraulic Brake Booster Upgrade



### Important Information

This instruction booklet can be used standalone for the above stated conversion but we would also recommend having a workshop manual for your vehicle to cover any factory Nissan torque / installation settings to complete the Hydraulic Brake Booster installation to your Nissan GQ Patrol.

The instruction booklet describes the required modifications (if any) and installation process in order for our kit to fit and work properly. These instructions **make no assumption** on whether additional changes need to be considered or made. It is highly possible that other aspects of your vehicle and/or third party products, eg. Engine, transmission etc. will have an impact on all that is required for you to achieve your desired outcome.

Marks 4WD Adaptors do not and cannot take responsibility for knowing everything that may impact on your conversion. Before beginning any work, thoroughly work through the sequence of changes, work and potential impact of your conversion. You must ensure you completely understand all the factors that may impact on achieving your desired results.

# Kit Contents

This kit contains the following parts. Before beginning any work ensure that you have all parts.

<i>Part No.</i>	<i>Quantity</i>	<i>Description</i>
• MFG20450	1	Pre-assembled hydraulic brake booster Includes pushrod, banjo bolts and copper washers
• MFC20###	1	Hydro booster to power steering pump hose This line and fittings will change depending on engine fitted
• MFC20424	1	Hydro booster to steering box hose
• MFC20134	1	Booster to pedal stirrup
• CWC49	2	M14 copper Washers
• CWC51	2	M16 copper Washers
• MFC20353	1	M14 Banjo bolt
• 6LOLA	#	Low pressure return line (length depends on application)
• BT-M8-25	2	Bolt - M8 x 1.25 x 25mm H/T Z/P
• BT-M8-50	4	Bolt - M8 x 1.25 x 50mm H/T Z/P
• SW-M8	2	Spring washer – M8 – S/S
• FW-5/16	2	Flat washer – 5/16 – S/S
• FW-M8	2	Flat washer – M8 – H/T Z/P
• TFP14-06	1	3/8 barbed Tee piece

## Step 1 Removal of Vacuum Brake Booster

You will need to first remove the factory Nissan brake booster assembly.

In most GQ applications you will not need to disconnect the hard lines from the master cylinder to fit the hydro boost. You may need to disconnect wiring near the battery box to give enough room to work.



**Image 1.1** Nissan factory brake booster and master cylinder setup.



**Image 1.2** Removal of 2 nuts, bracket & vacuum pipe.

Remove the 2 nuts that are holding the master cylinder to the brake booster.

Remove the vacuum hose bracket - not required

Remove the vacuum pipe from brake booster

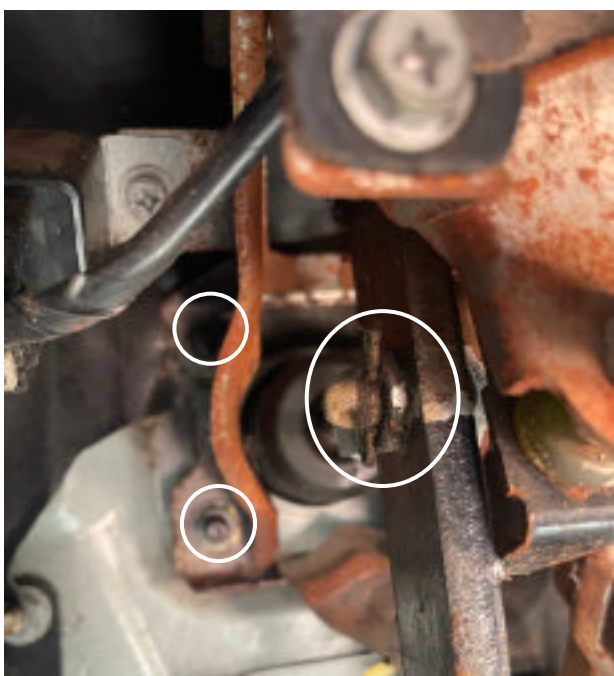
See **image 1.2** for the location of the nuts and vacuum pipe

Unclip the solid brake lines from the inner guard and move the master forward away from the booster.

If you are reusing the master cylinder now is a good time to clean the unit ready for reinstallation.



**Image 1.3** Removal of 4 nuts & vacuum pipe.



**Image 1.4** Removal of the cotter pin and nuts.

Remove the cotter pin and main pin to disconnect the bracket from the brake pedal.

Remove the four 12mm headed nuts that secure the booster to the firewall - save these nuts, cotter pin and main pin as they are reused on the hydro booster install below



**Image 1.5** Retain 4 nuts, the cotter pin and main pin

The booster can now be removed from the firewall

## **Step 2 Assembly of New Hydro Booster**

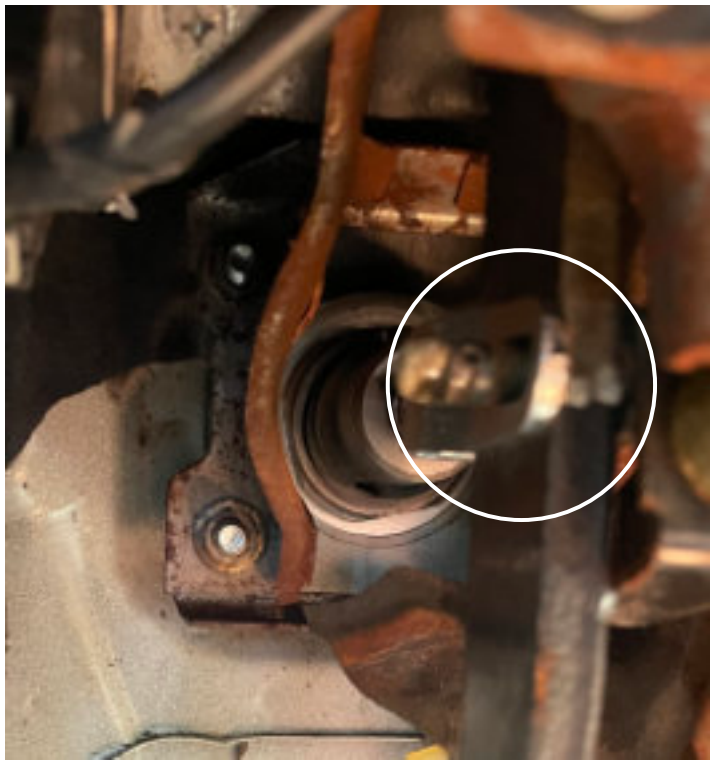


**Image 2.1** Make sure the push rod is fitted in the hydro booster.

Make sure the push rod is fitted to the hydro booster with the tapered end facing towards the master cylinder – as per image 2.1

### Step 3 Fitting the Hydro Booster

Note: A second set of hands makes alignment during this process much easier



**Image 3.1** Alignment of booster.

Feed the Hydro booster assembly through the firewall, lining up the two pre-fitted M8 bolts with the firewall holes.

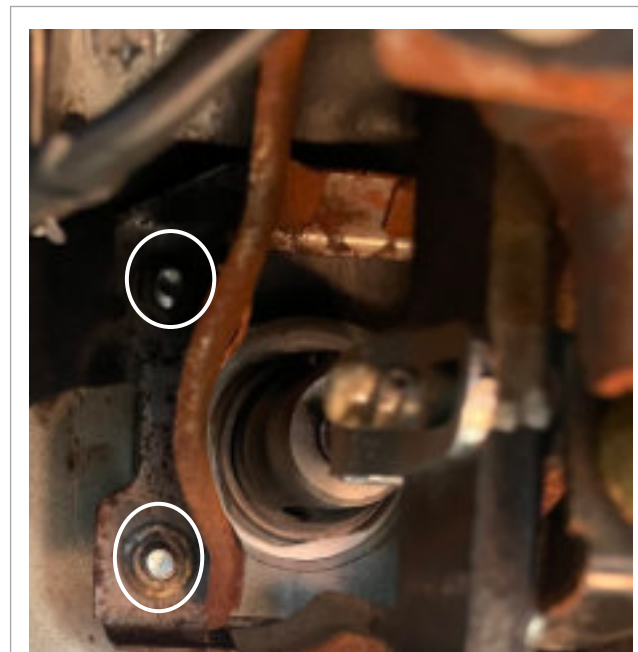
Get your helper to make sure the pedal saddle slips over the pedal inside. Image 3.1

This step can be fiddly without a helper.



**Image 3.2** Fit the two other bolts to hydro booster

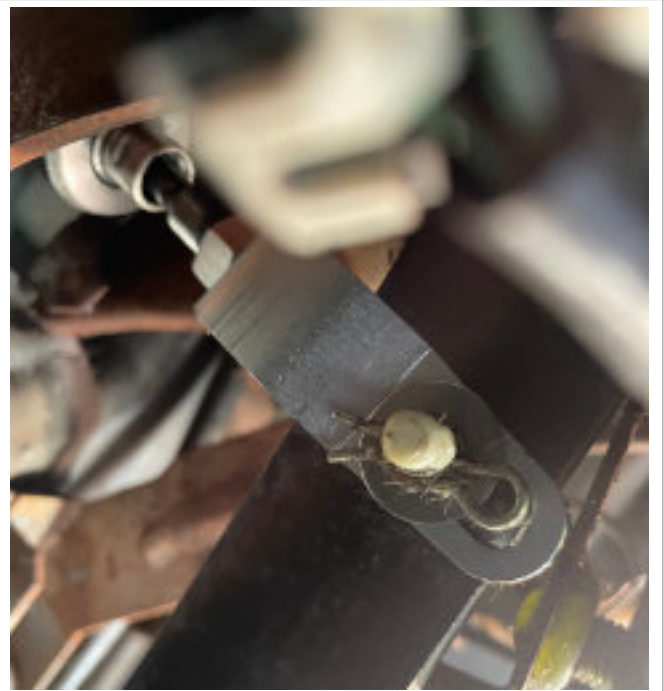
Fit the other two M8 x 50mm bolts to the booster.



**Image 3.3** Fit the factory M8 nuts to the bolts

Tighten the nuts to 25Nm once all is aligned.

Fit the factory Nissan pin with one of the supplied FW-5/16 washers on either side and install the cotter pin as per image 3.4.



**Image 3.4** Cotter pin install



**Image 3.5** Adjust the pedal saddle

You will need to adjust the pedal saddle by using a spanner across the flats (as circled in the photo Image 3.5)

Adjust the saddle until it is positioned as per the photo on the left - tighten the locking nut (Image 3.4 & 3.5).

Clearance between pedal stopper & threaded end of stop lamp switch is 0.3 - 1.0mm

Use the following bolts and washers to bolt the master to the hydro booster

- BT-M8-25 x 2
- SW-M8 x 2
- FW-M8 x 2

Tighten bolts to 25Nm when aligned.

Reclip the solid brake lines to the inner guard - you may need to gently bend the hard lines to suit.



**Image 3.6** Fit the master cylinder to the hydro booster

## Step 4 Remove and Replace Hydraulic Lines

You need to remove the factory Nissan power steering line which runs from the steering box down and across to the power steering pump on the engine. Remove the line completely – it is not reused. Keep the banjo bolt as this is refitted in the power steering pump.

Note: Once you crack this line power steering fluid will drain out – have a bucket and rags ready.

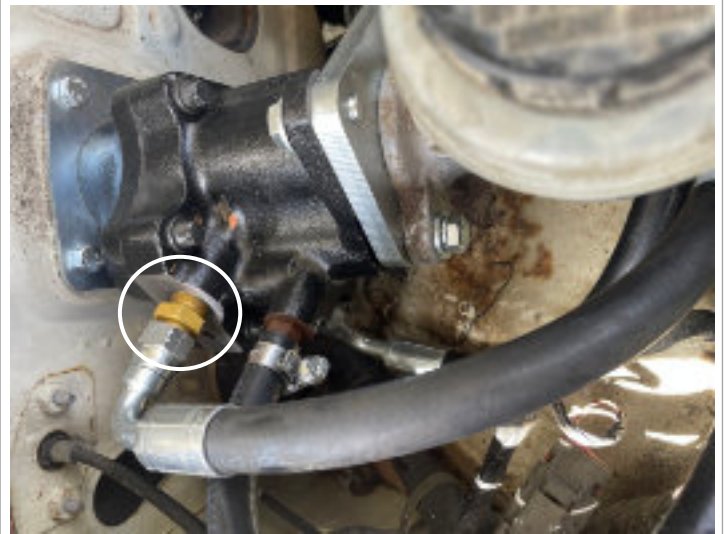
Fit the shorter line in your kit between the Hydro booster and the Nissan steering box.

Route the line forward, under the master cylinder and around the battery tray. Orient the banjo so the hose clears the steering coupling.

Image 4.1 Connect 90° end loosley to gold fitting on hydro boost

Image 4.2 Connect banjo fitting to hose then to steering box

Use the supplied copper washers and banjo bolt.



*Image 4.1* Booster to power steering pump



*Image 4.2* Booster to power steering pump



*Image 4.3* Booster to power steering pump

Run the longer line up around/under the Hydro booster and secure loosely to the black fitting on the booster

(Image 4.3)



**Image 4.4** Fitment to pump

Run the new hose under the hydro booster, around the battery tray and the steering box. Follow the original power steering line route across to the power steering pump.  
Connect the banjo fitting to the hose, fit to the power steering pump with new copper washers supplied using the original banjo bolt.  
Note: the above may change depending on engine fitted

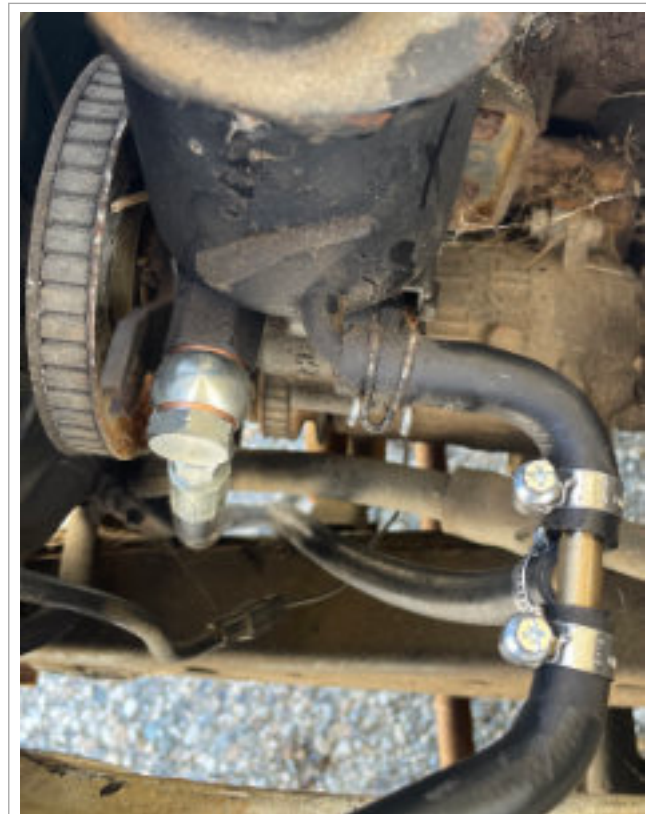
Image 4.4 shows the connection to a standard TB42 power steering pump.  
Other engines such as TD42, LS will be different.

Fit the supplied low pressure return hose to the barb on the hydro booster and secure with a hose clamp. See Image 4.6

Route the hose to the power steering reservoir bottle. You can route it with the high pressure lines at the front of the engine or around the firewall.



**Image 4.5** Low pressure hose to barb



**Image 4.6** Fitment of low pressure return

Cut the factory return hose and join in the hydro boost return line using the supplied T piece and hose clamps. The new return line needs to be teed into the factory return line as close to the reservoir as possible to avoid restriction. See Image 4.6



Secure the new hydraulic lines to your vehicle making sure they will not foul on things such as the steering coupling, sharp edges, etc.

Depending on your engine bay you may be able to use P clips and or cable ties to secure the lines. Once the lines are in place tighten all fittings on the hydro boost, power steering pump and steering box. Torque fittings on hydraulic booster and steering box to 20Nm  
Torque the banjo into the power steering pump to 50Nm  
Torque the hose to M16 banjo to  $\frac{3}{4}$  JIC fitting to 32Nm

### ***Step 6 Fit Braided Brake Lines to Vehicle (if purchased)***

Fit braided brake lines to your vehicle as per the directions provided in your factory Nissan workshop manual.

Make sure the copper washers are replaced with the new ones supplied.

### ***Step 7 Blank Off Vacuum Supply Pipe***

Install the blanking plug to the steel vacuum pipe or directly to the manifold (if there is no clutch booster). Use a lubricant to assist in getting it installed. Image 7.1 example



***Image 7.1 Vacuum blanking plug***

## ***Step 8 Fill the System with Fluid***

Note: We have found that some vehicles suffer from a whine in the power steering if different grades/types or incorrect fluids are run. Flush the system and fill with the correct fluid for your vehicle.

This step is easiest when you have a helper. The system is easiest bled with the front wheels off the ground either on axle stands or on a 2 post hoist.

Fill the power steering reservoir with the recommended fluid for your vehicle. With the front wheels off the turn the steering wheel lock to lock and keep adding fluid until the level stops dropping.

Bleed brakes as per step 9. Start your vehicle, turn the wheels lock to lock and then depress the brake pedal, make sure you keep topping up the reservoir. You will need to perform the above step a few times to make sure all the air is bled from the system. If you notice there are lots of air bubbles emulsified in the fluid you will most likely need to bleed the system again once the air bubbles settle.

## ***Step 9 Bleeding the Braking System***

This step is easiest when you have a helper. Bleed the system in the order your workshop manual recommends for your vehicle.

Fill the master cylinder with the brake fluid recommended for your model.

Bleeding the system fitted with the hydro boost is only slightly different from the standard method. Once pressure is applied on the pedal you need to crack the bleeder valve, bleed the fluid through and when the pedal gets low lock the bleeder off like normal.

## ***Step 10 Check for Leaks & Road Test***

Check all connections to make sure there are no leaks from either hydraulic connections, hoses or brake lines.

Test drive the vehicle up to normal operating temperature.

Again check all connections to make sure there are no leaks from either hydraulic connections, hoses or brake lines.

## ***Step 11 Get the Brake Upgrade Certified by your Engineer***

## Terms and Conditions

Thank you for purchasing this product manufactured by Marks 4WD Adaptors. Components supplied in this kit are designed and machined for a specific conversion only as outlined in this guide. Modifications to or substitution for any of the components without the written consent of Marks 4WD Adaptors will void any possible warranty or return privileges.

The following instructions are intended as a guide and only for Marks 4WD Adaptors kits. If you do not fully understand the steps, modifications or changes required to complete the conversion, contact our sales department for more information. We recommend that you purchase a service manual pertaining to your vehicle for specific torque values, wiring diagrams and other related information.

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