



Fitting Instructions : Part Number 168PL05 **To suit Nissan GU / GQ Front (31 Spline Axle) H233B Diff**

The following instructions are designed to make fitting the Pro Locker as easy and as hassle free as possible with a minimum of workshop equipment. The majorities are standard home mechanics tools, however some apparatus may have to be purchased, alternatively these can be borrowed. There are several types of axle housings currently in use, however all critical dimensions for the crown wheel & pinion carrier and diff centre are the same.

Below is the minimum list of tools needed to satisfactorily complete the job. TJM Products Pty Ltd recommends fitting is carried out by an Authorized TJM Distributor or a qualified mechanic & TJM Products Pty Ltd takes no responsibility for incorrect fitment.

Tools Required

- Torque wrench
- Drill
- Drill bits (Various Common Sizes)
- Loctite # 262 Stud Lock
- Loctite # 567 or Teflon thread tape
- Gasket Silastic
- ¼" BSP parallel tap
- Nylon hammer
- Steel hammer
- Rattle gun or ratchet
- Breaker bar
- Thread adjuster tool / Centre punch
- Basic spanner set imperial & metric (open end & ring)
- Basic socket set metric
- Dial gauge with magnetic base
- Gasket scraper
- Allen key set
- Cable ties & Rags
- Split tube / convolute to cover "hard line"
- Bench with vice
- Replacement oil, (We recommend Castrol EPX 85-140 weight, High Viscosity Extreme Pressure Gear Oil) **NOTE – DO NOT USE LSD oil**



Serious 4WD Equipment

Component Check List

IMPORTANT – Before commencing fitment, read instructions carefully so that you fully understand the entire process.

Please check components listed below to make sure all parts are supplied.

Item No	Description	Qty	Part No
01	Bulk Head Fitting	1	92364
02	Hose Fitting Barbed End Male	1	92365
03	Bulk Head Fitting O-Ring	2	92366
04	Reinforced Rubber Hose	1m	87664
05	6mm / Heavy Duty Airline Push In Fitting	1	92033
06	6mm Airline	3m	87665
07	6mm Airline Push In Fitting Elbow	1	92034
08	Solenoid Valve	1	92035
09	Nipple 1/8 BSP Plated	1	92036
10	Replacement Crown Wheel Bolts	9	92048
11	Actuator Switch Base	1	92458
12	Actuator Switch Cover - Front	1	92459
13	Pro Locker Bumper Sticker	1	92039
14	Pro Locker Hemisphere Assembly	1	87605
15	Actuator (Air Cylinder & Brass Line)	1	92346
16	Actuator Bracket	1	87677
17	Actuator Hex Bolts	2	92045
18	Actuator Spring Washers	2	K0915
19	Bearing Set	2	92191

Differential Backlash Setting: 6-8 thou (0.15 – 0.20mm)

Torque Wrench Settings

Differential **crown wheel bolts:** 105 ft.lb (142Nm)

Differential bearing cap bolts: 73 ft.lb (99Nm)

NOTE – As this TJM Pro Locker has larger bearing journals than standard, you will need to replace carrier bearings with set provided.



Serious 4WD Equipment

Removing The Existing Diff Centre

1. Raise the vehicle on a hoist, or jack the appropriate end of the vehicle up and place on stands. If using stands make sure you have chocked the wheels that are still on the ground and leave the vehicle in neutral, **drain the oil from the diff.**
2. Remove both front wheels. Disconnect the connecting rod and drag link from the hubs. Using a 22mm socket remove the two bolts retaining the brake caliper, remove calipers off to one side **NOTE – Do Not remove brake hose,** Tie the calipers off to one side so that there not hanging by the brake hoses.
3. Remove the six bolts holding the hubs to the brake disc, remove the hub and brake rotors. Remove the circlip from the end of the axle. **NOTE – some vehicles which have ABS have a “pick up sensor” which needs to be removed.** With a 14 mm socket remove the six bolts on the stub axle and remove stub axles.
4. Remove the axles and place to one side.
5. Using two 17mm ring spanners loosen and remove the bolts connecting the tail shaft to the pinion flange.
6. Lift the tail shaft up under the floor and tie it to something solid, making sure that it cannot drop down unexpectedly. Alternatively remove the nuts connecting the tail shaft to the transfer case and remove the tail shaft assembly as a whole and place it to one side.
7. Using a 14mm socket remove the nuts holding the diff centre into the axle housing. **NOTE – there could be brake lines attached to the centre remove bolts retaining them.** The centre maybe stuck to the gasket and the seal will have to be broken using a nylon hammer.
8. Remove the centre by moving it up and down while pulling it backwards; be very careful when the centre comes free of the bolts as it is very heavy. Alternatively use a transmission hoist to lower the diff centre onto.
9. Place the diff centre on a suitable bench, you may choose at this stage to wash the centre with kerosene and leave it to one side to drain or blow it out with compressed air.



Removing The Carrier And Crown Wheel

1. The remaining work on the diff centre is best performed with the centre held in a stout vice. However, the job can be performed on the bench alone. Using a centre punch and a hammer, place a single punch mark on the bearing retaining cap on the crown wheel side, followed by another punch mark on the corresponding side on the diff centre. Perform the same on the **non** crown wheel side except this time use **two** marks per side. **This operation is necessary as the holes for the bearings are bored in one operation and the caps are not interchangeable.**
2. Using a 10mm ring spanner, remove the locking tabs and bolts from the bearing caps.
3. Using a 19mm socket remove the bolts connecting the caps to the centre. It is best to lightly rest against the crown wheel with your chest as sometimes the carrier can fall out.
4. If the carrier does not come out by itself, use a breaker bar placed down the journal hole to lever the carrier out.
5. Place the carrier on the table and use a 17mm socket to remove the bolts holding the carrier to the crown wheel. You may have to place the carrier in a vice. Use a nylon or copper hammer to knock the crown wheel off the carrier and place the old carrier to one side.



Setting Up The New TJM Pro Locker Carrier

1. Take the new TJM Pro Locker carrier and face the crown wheel side up on the bench. Clean the crown wheel with kerosene and blow off with compressed air especially the bolt holes.
2. Position the crown wheel over the carrier making sure to align the bolt holes and knock it down onto the flange using a nylon hammer.
Tip – you may have to soak the crown wheel in hot water for it to expand slightly. DO NOT HEAT WITH FLAME

3. Coat the crown wheel bolt threads with Loctite 262 Stud lock and screw them into the crown wheel. Place the carrier in the vice and hold securely, tighten the crown wheel bolts in several passes to the final specified torque using a torque wrench. (*Refer page 2 for torque setting*).



4. Press on new bearings (*ideally this should be done in a bearing press for equal downward pressure*).

Fitting the “Bulkhead” Fitting

- *The bulkhead fitting assembly is used to allow the outside rubber hose to be connected to the internal copper tube through the wall of the diff housing. This allows the diff and airline to be disconnected if required.*
1. The fitting of the bulkhead fitting will depend on the shape of the diff centre (there are several types). This distance will vary between 28mm and 50mm from the gasket mounting face. The fitting should be placed as central as possible on the flat area of the casting to the left of the oil gallery. NOTE – before dismantling note where sway bar sits and make sure the bulkhead fitting will clear it.
 2. Using a 3/16 drill bit, drill a pilot hole through the diff centre. *Try to position the drill bit in such a way that the clamping face of the bulkhead fitting sits square to the surface of the casting.*



3. Using a 15/32 drill bit drill through the pilot hole, again trying to keep it square. Chamfer both sides of the hole and using the 1/4 BSP Parallel tap, tap the hole as square as you can.



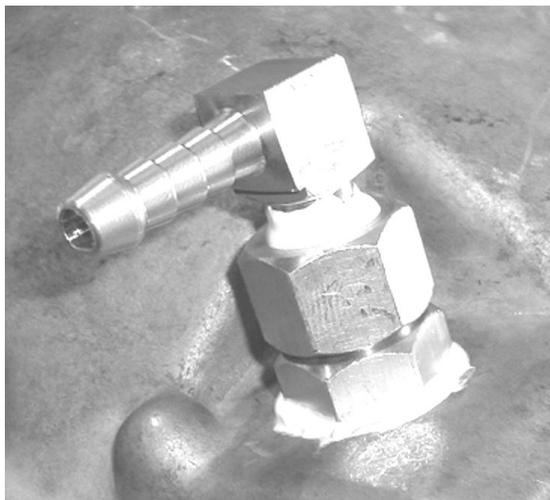
4. Lightly blow out the tapped hole with compressed air and clean out the rest of the grinding grit and metal taking care to avoid getting any in the bearing. Make sure the pinion is also cleaned properly.
5. ***Place the lock nut under the head of the fitting before screwing it in.***
The thickness of the casting at this point may vary. Using Loctite the fitting should be screwed in far enough to protrude by about 5mm on the inside of the casting.
6. Place the actuator in its position and mould the copper pipe towards the bulkhead fitting. ***Make sure you allow extra pipe to fit inside bulkhead fitting, it will not matter if the pipe is a bit long as it will bend back into place.***



7. Fit 2 o-rings over the copper tube (as shown below) and slide the o-rings down into the counter-bore pocket of the bulk head fitting.
8. You may need to use a small tool (without scrap edges to prevent seal damage) to slide the o-rings to its full stop in the pocket
9. Cut the copper tube with a pipe cutter leaving a few millimeters of extra length of tube beyond the o-rings and top of the bulk head fitting.



10. Apply thread sealant to the 90 degree elbow air line fitting and connect to the bulk head fitting.
11. Connect and apply an air supply to the end of the fitting to test the system for leaks
12. If there's evidence of a leak, you may be required to disassemble the fitting to check the o-rings are secure inside the bulk head fitting pocket.



13. If an adjustment is necessary, remove the air line fitting and inspect the o-rings for leaks.
14. Assemble and repeat leak test until the system is properly sealed.
15. Level the actuator up so that it runs parallel with the centre line of the carrier. Now hold the actuator and move it up and forward so that it leaves the diff centre open and clear. **NOTE:** the copper pipe will bend back later.

Fitting The Locking Carrier

1. The locking carrier can now be fitted back into the diff centre. This is best performed by first placing the bearing caps on the appropriate side of the diff centre on the bench and with the cap bolts in place so that they can be easily picked up later. Place the threaded adjusters on each side of the bearings and

pick the carrier up with the bearings and threaded adjusters in place, positioning the carrier centrally but making sure that there is some backlash between the crown wheel and the pinion. Engage the threaded adjusters by slowly rotating them towards the centre of the carrier ensuring they **Do Not** become cross threaded. Continue screwing until they are tight enough to hold the carrier without your support. Next position the caps over the bearings and screw the cap bolts down. If the adjusters are **not** cross threaded then the caps will be able to be pushed down into position before screwing down the bolts. Now tighten the upper cap bolts but leave the lower cap bolts loose.

2. You will now either have to buy or make your own tool for moving the threaded adjusters. *You can make one easy enough from a piece of flat bar with two pins welded on the same distance apart as the holes in the adjusters.* Alternatively you can use a pin punch and a hammer, the principle of adjusting remains the same.
3. Using a dial indicator with a stand, attach the magnetic base to the gasket face of the diff centre above the crown wheel. Adjust the dial indicator so that the plunger is contacting one of the teeth as squarely as possible. Now gently move the crown wheel back and forth without moving the pinion and read the backlash dial. (*Refer page 2 for backlash setting*).



4. The standard Nissan gear set should have 6 – 8 thou (0.15 – 0.20mm) backlash. If the dial reading is less than 0.15mm rotate the crown wheel side adjuster in the anti clockwise direction a small amount, then rotate the other adjuster in a clockwise direction until it stops turning but **do not over tighten**. Read the dial again. Continue this action until the correct backlash is achieved. If the dial reads over 0.20mm then proceed with the same process but in the reverse order. Once correct loosen each adjuster individually and then retighten to a firm but not over tight feel. Recheck the backlash and tighten the bottom bolts.

Fitting The Actuator

1. Remove the cap bolts from the non crown wheel side of the centre but leave the cap in place. Now gently pull down the actuator and plate and line up the holes over the caps. Insert the bolts and tighten them. Using a screwdriver lever the copper pipe clear of the actuator plate and the carrier in case it is touching after bending. Make sure the cap is within the cap diameter so it will not foul on the axle housing when you put the diff centre back in.

2. You will now have to connect the rubber air line fitting to the bulkhead fitting use the brass fitting supplied to connect the two. Use Loctite 567 or thread tape same as used when fitting compressor.

Tip - heat up the end of the rubber hose in boiling water to be able to push in the fittings, you may also want to smear a small amount of oil on the barbed ends.



3. Activate the actuator with compressed air to lock the carrier. If the selector ring does not move all the way, the teeth of the locking ring and the side gear are not aligned. To align them place the short axle in through the carrier journal and into the side gear, hold the axle in line with the carrier and rotate, the locking ring will fire into position when the teeth are aligned.
4. Once locked, check the clearance between the fork and the locking ring by moving the selector ring back and forth like before. If you cannot move the ring you will have to unlock the diff, loosen the screws on the actuator and move it a small amount to the right. Retighten the screws, lock the diff and check for clearance the same as before. **You may have to repeat this process several times before clearance is achieved in both the locked and unlocked position.** Try to get the clearance the same in both positions, once the clearance in the locked and unlocked position is correct and nothing is fowling tighten the actuator screws with loctite stud lock.

IMPORTANT NOTE: Make sure the actuator fork is running square to the selector ring allowing clearance to the diff itself. (Refer next page)



5. Replace cylinder in operating position, smear Loctite “Thread Lock” on the two unbrakos and screw them back in and tighten fully. Re-check the operation of the diff lock and check that the clearance between the selector ring and the fork are still correct in both the locked and un-locked position.

Finishing The Diff Centre



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1. It is now time to torque up the cap bolts (***Refer page 2 for torque setting***). Fit the locking tabs on the side of the caps. The tabs may have to be bent by tapping with a hammer until they line up with a slot in the threaded adjuster. Push the tab into the appropriate slot and fit the bolt back in and tighten. The diff centre is now ready to fit back into the housing.



Fitting The Diff Back Into The Axle Housing

1. This is basically a reversal of the removal procedure but remember to apply Silastic liberally to the mounting face of the diff centre and the drive flange mounting face before you put them back in. ***If the old gasket has been torn you will have to remove it with a scraper or air chisel and replace with a new gasket.***
2. Once the diff centre is back in position, aim the rubber hose towards the flexible brake line. The rubber hose should be closely cable tied to the flexible brake line so that the end with the push in fitting finishes up under the floor.
3. The black 6mm nylon tube running up to the compressor is then pushed into this fitting. ***Run the black nylon tube on the top side of the chassis where possible and cable tie.***

