

## **2003 L322 Range Rover Vogue 4.4 V8 (BMW M62 TUB44) With LPG**

### **In Tank Petrol Pump Replacement**

**Carried out by: Saint.V8 (Ant) 29/09/2012**

If you're following this from the landyzone Forum ([www.landyzone.co.uk](http://www.landyzone.co.uk)) you will know the plight my L322 suffered a few days previous and the indignity of being recovered home on a recovery truck!!

For those that aren't – briefly - the L322 refused to start, point blank – called RAC they checked Fuses, Relay and power to Fuel Pump, nothing...so onto a lorry and taken home.

After a few helpful suggestions and a great article from another LZ'er Gencybay took me to a post on another forum about using the fuel pump from a BMW X5 (2000-2007) – intrigued as after a few searches and phone calls – the Range Rover fuel pump unit complete is £435+VAT from LR Dealer and £333.33+VAT from an aftermarket supplier....

To clarify – the whole unit comprises the Fuel Pump Unit, the Sender Gauge Unit and the electrical connectios etc.

A few searches led me to [www.devon4x4.com](http://www.devon4x4.com) who list just the little fuel pump on its own and stated it was an easy repair the pump price INCLUDING THE VAT was £150.93 (part No. WFX500010K you'll have to put it in the search box – it won't come up in the listings!!).....intrigued now.

Needing the car for work, I unfortunately didn't have the time to wait for delivery and referring back to the comment that a BMW X5 pump is the same, I took a punt and headed to [www.gsfcarparts.com](http://www.gsfcarparts.com) as we have one just up the road to work in Heathrow.

I popped in at lunch time and picked up the X5 pump (part No. 183BM0340) list price £169.20 incl.VAT, the guy took pity on me and as I work near the Airport for an Engineering firm he gave me a bit of a discount and I got it for £152 and a few pence (thank you!!)

### **A FEW POINTS TO NOTE**

The most crucial thing when using the fuel system is to take every precaution you can –

- Fire Extinguisher (Foam, CO2, Halon – NOT WATER)
- Always work in a well ventilated area – don't do it in your garage
- Don't work over a pit – fuel vapour is heavy and will sink into it
- Have some one around who knows what you are doing
- Tape off the work area to prevent anyone getting too close who may be smoking or have some form of ignition on them!
- Disconnect the battery and allow 20 minutes for the systems to discharge
- Get yourself the RAVE manuals they are full of useful information and detail all the work procedures.
- Wear gloves – petrol strips the skin of its essential oils
- Mask would be a good idea (I didn't but better safe than sorry)
- Safety Specs – during part of the procedure if you are leaning over the pump when trying to remove it, the fuel feed connection spits fuel at you!!
- Think about the task at hand and ensure you have all the tools available to you – you want to minimise the time the tank is open so being prepared helps to reduce this time.
- Depressurise the fuel system – follow procedure in RAVE

## THE PROCEDURE

Wait for the Sat Nav system to switch off else you'll fry it, check the little red light is out on the front....



Disconnect the battery - Negative first....



Lift the rear seats up and over, remove the seat bars on the floor, remove spare wheel cover (optional – check your carpet fitment), loosen the D pillar covers by pulling and lifting from the bottom, remove the lower trim plastic cover, pull carpet up.



Lift the carpet and secure using a belt or strap – careful as the carpet can tear so avoid cable ties, use something that will spread the load a bit!





You can now access the access hatches in the boot floor – the drivers side is the fuel pump the passengers is an access hatch



Undo the 4 nuts per hatch to reveal the top of the tank and the two ports underneath



If you have loads of petrol you will want to empty the tank, either open the passenger hatch and pump out, or siphon through the filler neck.....I only had 20-25litres (1/4 tank or so) I did try to siphon out, but after a few failed attempts gave up and braved leaving it there – it was only about 3-4 inches deep!

Disconnect the wiring multiplug by sliding the outer cover to the left and lifting off



Disconnect the Fuel Pipes (noting there positions) – the Red collar needs lifting while you push down on the angled connector, I used a screwdriver to lever up the Collar and a pushed down and lifted all in one go – you'll get the idea when you give it ago....



Move them to the side (on refitment I tied them together out of the way so I wouldn't lose them!!)

I used a drift and hammer to knock the metal retaining ring around to loosen it – caution advised no sparks and etc....

The feed connection on the pump does spit at you so be careful if you lean over it, but you will be able to lift the pump up about 6 inches and you'll see a connection on the side of the pump, this connects to the second sender unit and pick up in the nearside tank saddle. Getting at it is a faff, I managed to get a screwdriver in and using a finger moved the locking tab over and carefully levered off the connection – the official way is to stick your left arm in the passenger access hatch and do it from inside the tank! – More about that on refitment.



This picture is from the refitment btw!!

Using cable ties or string etc tie the cross pipes up so you don't lose them into the tank or you'll be fishing for them later!!



You can now very carefully lift the pump from the tank, have a bucket ready as the unit will be filled with about a pint or so of fuel. Be cautious of the very delicate looking level sensor and the venture pipe, so when you lift it out, gentle wiggling and tilting is needed to get it out of the hatch – at first it looks like it won't fit through the hole with the white collar and seal in the way, but with patience and forethought you can get it out – I did!!



A shot of the cross connection port on the pump...(ignore position of O Ring – more on that later and yes there should only be one of them)



Turn the pump upside down and drain the fuel into a suitable receptacle to empty the bottom of the pump of any fuel inside it.

The Sender assembly looks very delicate, and to split the unit to replace the pump, you have to get rather manly with it, so I recommend removing the sender, locking tab just under it, and with a push it slides upwards and off, disconnect the wiring plug, and ensure you don't chaff the wires when getting them out from under the little clip on the side – a screwdriver helps!





Pop the little plug/cable tidy thingy off to free the pump motor wires



Now it is time to get manly with the pump unit. The part you want to split is the lower part, and I put it across my knee like snapping a piece of wood, with the venture pipes upwards and carefully popped it open – there are a couple of internal pipes that holds it together, so when you get to pulling the thing apart be firm but careful.



Viola – the little pump unit is tucked in the bottom....using a screwdriver and a pair of pin-nose pliers disconnect the pipe clamp and the electrical spade connections to the pump....



Lift out the black ring, and using a screwdriver, gently pop the pump vibration damper carrier out of the mounting points....and lift out pump and strainer



With some thought and tug you can pull the pump out of the vibration damper/strainer housing – try not to pry the lugs back too much – you don't want to snap them, but a good tug will pull the pump out....



Time to compare the two pumps (the X5 Pump is on the right in all pictures)



They look identical to me (bar the plastic colour obviously)



Push the new pump unit into the vibration/strainer housing, noting that the pick up is offset, so match it up with the correct point on the strainer....

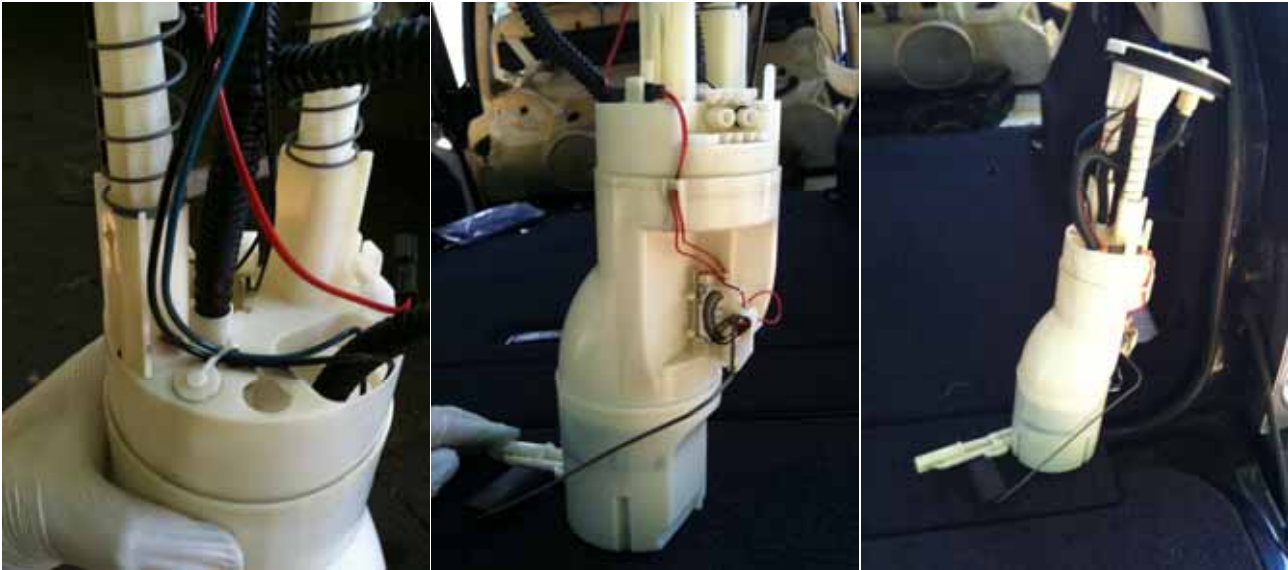


Clip the new fuel pump/strainer etc back into the bottom of the venture housing again, and put the black plastic ring back. Use a Screw driver to gentle pop the vibration damping spheres back into their sockets. Reconnect the pipe using a jubilee (original can't be reused) and reconnect the Electrical connections – they are different sizes so you can't get it wrong!) Ensure Jubilee clip is well away from the electrical connections for obvious reasons!!



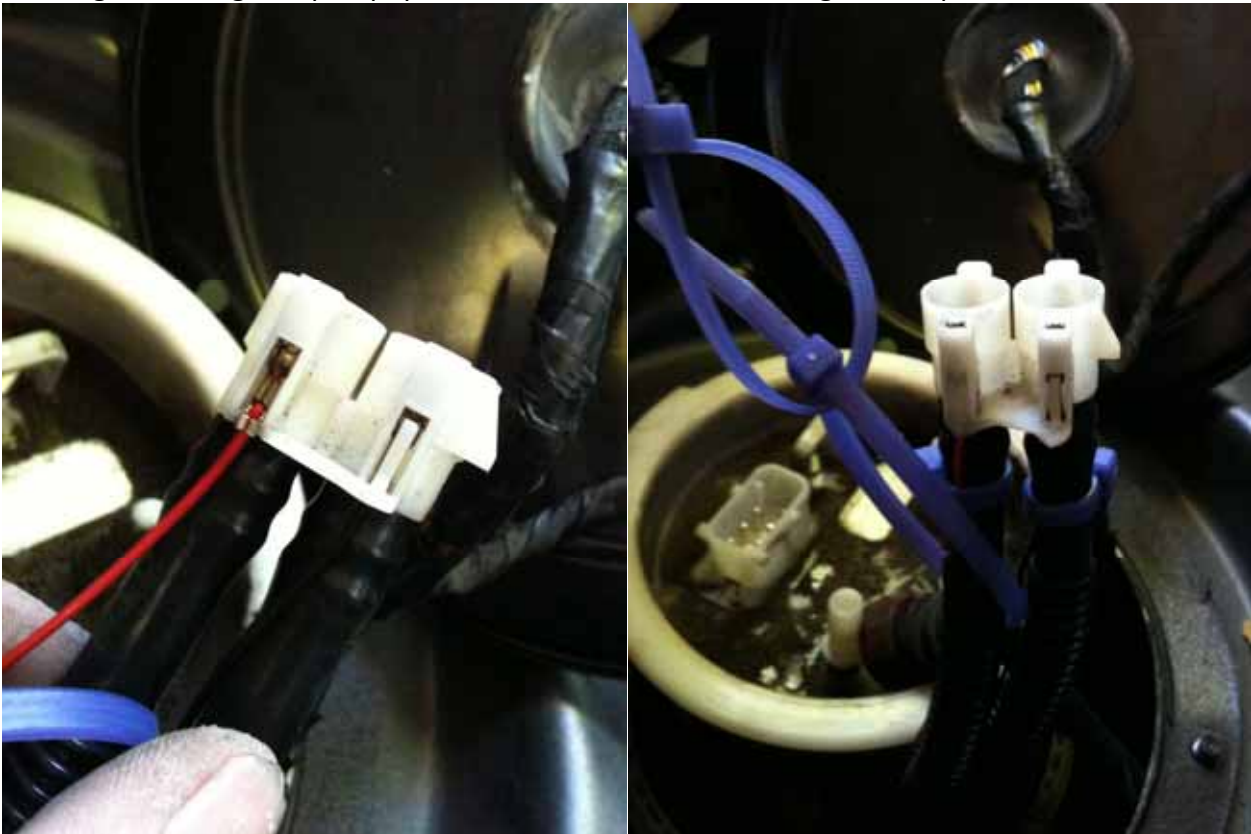


Push the unit back together, ensuring the two pipes realign (the little black one is just a vent pipe and doesn't connect to anything!). Route the electrical cables under the clip and pop back into place. Reattach the sender gauge and reroute the wiring back under the side clip and plug back in....the fuel pump unit is ready to put back!!



Time to put it all back!!!!

Using reverse wiggling and tilting, pop the pump unit back into the tank opening – now comes the fiddly bit, reconnection of the cross over pipes and cables.....I noticed that I had broken part of the connection allowing the wiring crimp to pop out – a deft mix of Araldite to glue into place was needed...

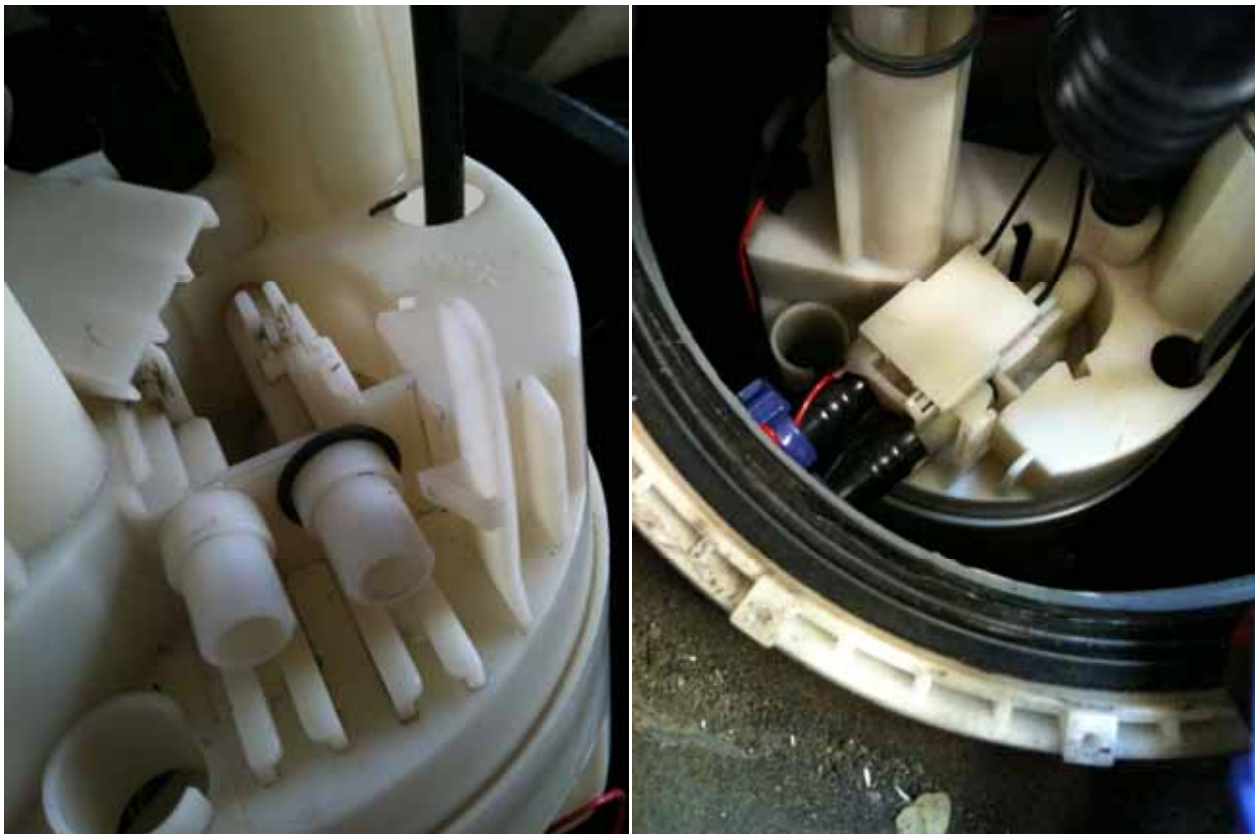


Now that O ring I mentioned above.....

To get the connection back on, you have to get up close and personal with the fuel tank and the boot floor, Laying on your belly in the boot, get as tight up to the back of the seats as you can, and stick your left arm into the access hatch on the passenger side – I am 6'3" with good length arms, and of decent muscular size, but with a wiggle and squeeze I can get my arm in just with a bit of scraping, you push the connection onto the pump....damn thing would fit.....tried for about 10 minutes, nothing!!!

Took the pump back out and reinspected to ensure nothing was broken, nope all looked good....I took the O ring off and the connection slid on like warm knife through butter – so the O ring is in the way....ahhh now I see my mistake, the O Ring needs to be placed all the way up against the pump unit body – when I removed the connection it had rolled forward!!, so pushed that back into place, refitted the pump and the connection slide on perfectly.

(Note I removed the electrical connection on top by lifting the locking tab underneath and sliding forward off the unit – not necessary to do so but I did hence why it is disconnected in the Left Hand picture)  
Right Hand picture – all connected again!



I bought two new seals for the hatch and pump (about £6.50incl.VAT each from LR Dealer) but the seals were in good condition with no visbles splits, cracks, crazing, deformation or indents, so a small amount of Vaseline to ease fitment of the hatch and pump. I will keep the seals and if I notice any strange smells I will replace with the new ones!

The pump is spring loaded to ensure it remains seated on the bottom of the tank, so to get it back on and the ring in place was a major pain the backside.....after trying to push it down with one hand and trying to get the ring back on with the other, I just couldn't get both hands in that space at the same time – so I put the ring over the pump, and used a hammer handle to push down the pump (ensure it fits snugly into the rubber seal at the top) and do the ring up with the other hand – real bugger to do but with patience and a few rest breaks to calm down – the ring was on and tapped round to tighten up – no need to hammer shite out of it, just a good amount of torque – use your common sense!!!

Same with the passenger side hatch cover...

Push the fuel connections back on the right places!! And reattach the multiplug (forgot to take that picture but it is reattached)





Replace the access hatch covers and do up the 4 nuts per hatch, replace the carpet and tuck it in to all the right places, replace the D pillar trim pieces, put the seat attachment rails back, put the seats back.



Tidy the tools away while leaving the doors and tail still open to vent any residual vapours still in the cabin.

Reattach the battery – avoid sparks and do it in one move without hesitation – the Range Rover hates electrical sparks!!

Put key in ignition, and turn to position 2 for 30 seconds, turn off and do it again...after that 30 seconds, start the car – and if like me you were successful, after a cough and splutter she'll roar back into life again....

Reset the steering angle sensor by turning steering to lock hold for 3 seconds to lock hold for 3 seconds back to centre (this will get rid of the warnings etc!!)

Now grab a coffee you've done well!!!

