

# DISCO3CLUB

Land Rover  
Discovery 3

## Bodsy's Brake Bible

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## 1. Introduction

Welcome to **Bodsy's Brake Bible**. The aim of this 'Bible' is to provide a single area for all information relating to the servicing and maintenance of your Discovery 3 2,7 TDv6 braking system. It can be used as a basis for the V6 and V8 Petrol as well as the 3.0l TDv6, but I cannot guarantee it will be exactly right for those variants as I have not used this on those models. If you have used this guide on those models and have any updates we could use (inc pics) then please e-mail them to me and I will update this accordingly.

Please note that these are guidelines only and you should ensure that you are competent in the use of the tools required and take the necessary safety precautions. If you have any doubt of your competence, please contact your nearest Land Rover dealer or Land Rover independent garage who will be pleased to carry out this work for you.

Neither the author nor Disco3Club/Disco4Club can accept any responsibility for any accidents or injuries sustained whilst undertaking the work depicted in this bible.

All of the photos (unless otherwise indicated) are from my Discovery 3 MY07 TdV6 HSE.

Further technical information is available from Land Rover's subscription services GTR website, which can be found here:-

<http://www.landrovertechinfo.com/>

I acknowledge the assistance of members of the Disco3.co.uk forum and Land Rover® GTR for the initial guidance and advice before I commenced this guide which supersedes my previous collection of posts and other information.

## 2. Tools that may be required

Please find a list below of the tools that you will need to have in order to complete the tasks set out below.

Pliers	Optional Ratchet	T50 Torx Bit
Brake Cleaner	Trolley Jack	Breaker bar
Spanners, 13/15/17mm	Socket 13mm 15mm bi-hex 21mm bi-hex	Calliper Retraction Tool or similar
Copper Grease	Torque Wrench for 6Nm, 35, 40-90, 140, 115, 270Nm	Latex or other protective gloves or barrier cream
Wheel Chocks (bricks or similar)	Axle Stands	Allen Key 4mm



All torque settings contained within this 'bible' are manufacturers recommended settings.

Optional additions to the tool kit are:-

- 1) Regular cups of tea/coffee
- 2) Box of plasters for grazed knuckles
- 3) A suitably sized swear box, depending on a combination of a) location b) weather c) temperature d) 'help' by young children/dog/neighbours ☺

### 3. Jacking Points and Axle Stands

The standard jack that comes with the Discovery 3 or 4, is widely regarded as 'not very good'. If you are going to do any work on your vehicle that requires raising the chassis, then we would recommend that you purchase or borrow a suitable trolley jack.

The Discovery 3 / 4 weighs in excess of 2.7 tonnes, so you need to ensure that you have a jack that is capable of supporting both the weight of the vehicle and the height that is required.



Most hydraulic jacks are suited to standard sized cars. Your Discovery has a height range that requires a jack ideally capable of lifting 520mm.

One popular jack is the Clarke CTJ3000G, it is a heavy duty trolley jack available (at time of creation) at Machine Mart

<http://www.machinemart.co.uk/shop/product/details/ctj3000g-3-tonne-professional-garage-j>

Beware, there is also a CTJ3000QL which is a quick lift version of the above. There have been reports of this model twisting under load.

There are specific jacking points underneath your car, DO NOT JACK ON YOUR AIR SUSPENSION COMPRESSOR COVER or on the long air compressor tank. You will damage it beyond repair.

Once you have jacked the car up, ensure that you use suitable axle stands to secure the car.

I have these, rated at 6T (pair) and more than sufficient height available.

But others are available, such as these

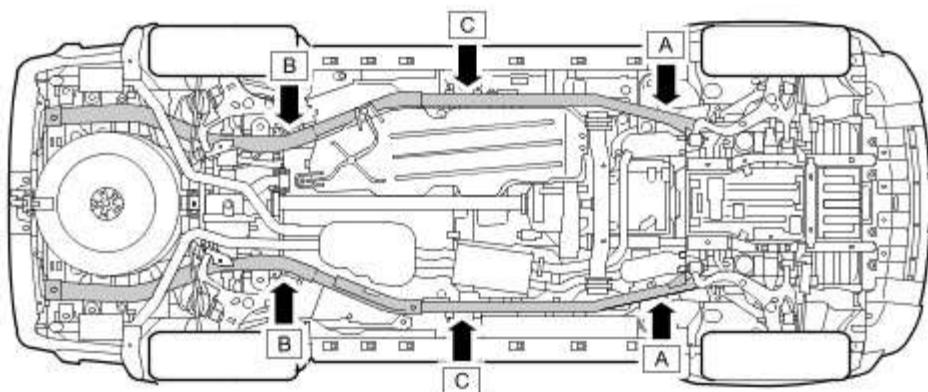
<http://www.machinemart.co.uk/shop/product/details/cax-6tbc-6-ton-axle-stands>

Others are available, but the sturdier the better.



Ensure that your vehicle is securely supported on axle stands before undertaking any work underneath it. Ensure that any wheels remaining in contact with the ground are securely chocked to avoid any unnecessary movement. If removing Wheels, loosen the wheel nuts before jacking off the ground.

**WARNING: Always chock the wheels which are not to be raised.**

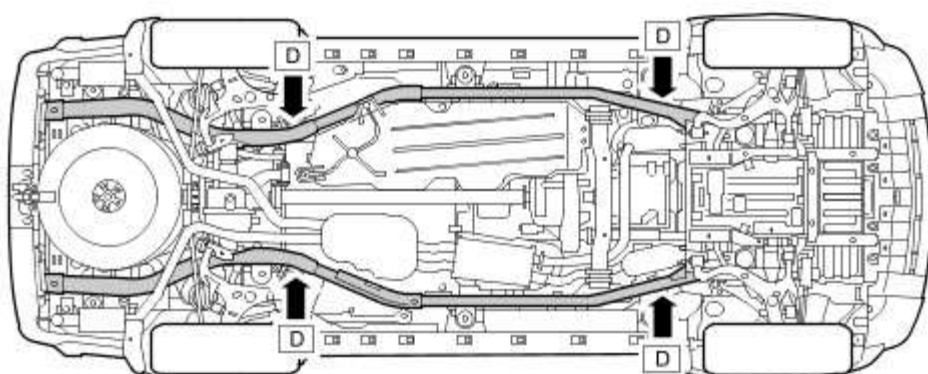


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- **One front wheel** - position lifting pad of hydraulic jack beneath longitudinal member on the side to be raised at Point 'A'
- **One rear wheel** - position lifting pad of jack beneath longitudinal member on the side to be raised at Point 'B'
- **Front and rear wheels - ONE SIDE** - position lifting pad of jack beneath longitudinal member on the side to be raised at Point 'C'


**NOTE:**

Point 'C' is in line with number 3 body mounting.



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With vehicle at desired height, position axle stand(s) beneath longitudinal members and adjacent to the lifting pad of the jack at appropriate point(s) D.

 **CAUTION: Position suitable material between axle stands and longitudinal members to prevent damage to the longitudinal members.**

Carefully lower jack until vehicle rests on axle stands. IB:PICS TO BE ADDED SHORTLY.

Once the car is securely raised, you can remove the wheel nuts using a 22mm socket and breaker bar. If you have a locking wheel nut, please ensure that you have found this before commencing work.

When you have finished your work, re-fit the road wheels and secure the bolts. When you have lowered the car back on the ground, you will need to ensure that the road wheel bolts are tightened using the Torque wrench, set to 140Nm.



#### 4. How to change the Brake Pads - Front

Ensure that your vehicle is securely supported on axle stands before undertaking any work underneath it. Ensure that any wheels remaining in contact with the ground are securely chocked to avoid any unnecessary movement.

##### Change Front Brake Pads

Pliers

Copper Grease

Socket 13mm

Brake Cleaner

Optional Ratchet

Torque Wrench

Spanners, 13mm, 17mm

The Discovery 3 has a Dual piston calliper brake system for the Front. It relies on hydraulic pressure from the braking system to push brake Pads onto the rotating Brake Disk. Over time, the Brake pads will wear down, eventually causing a loud scrapping noise as the brake pad backing plate grinds into the steel disk. If you have reached this point, then in all likelihood, you will need to replace the Brake disks as well as the pads.

The front Passenger side disk also has a brake wear sensor. If you have NOT broken through this sensor, then it can be safely re-used. Otherwise you need to ensure you have a replacement at the time of fitting.

Jack the car up (see Axle Stands & Jacking Points) Remove the front road wheels.



Once you have the road wheels removed, then you can remove the Brake pad wear sensor. (Front Passenger Side)

Use a pair of pliers to carefully extract the sensor. You may find that the brass contact in the sensor is also removed. Providing that you don't lose it or it doesn't ping off into a deep hidden crevice, then it should be able to be easily re-fitted.

You should pull the sensor directly backwards until it is removed.



Here you can see the sensor without the brass contact (which has remained on the brake pad).



Here you can see the brass contact which needs to be re-fitted or the whole sensor replaced.



You should also lift the Brake nipple protector and uncouple the sensor from it.

It should be able to be dangled down behind the hub.

Using a 13mm Spanner on the outside Calliper bolt, you also need a 17mm spanner to hold the inner nut. It was quite a tight fit for the 17mm spanner to fit in (width of spanner).

Undo the lower calliper bolt and discard (you should get new bolts with your replacement OEM kit, but CHECK FIRST) Only the outside bolt will come out, the inner bolt should move freely.

Then do the same for the top bolt, although after loosening the bolt, swing the brake calliper up to reveal the brake pads.



Remove the Brake Pads (these pads still had plenty of life, but I changed them as I was changing the disks)  
Note Calliper had been fully removed in these next pics, this is not necessary for just replacing the front pads.



Remove the Metal shims (one bottom and one top)





This is what you should expect from an OE set of Front Brake Pads.

2 replacement Bolts (the Blue is thread loc)

2 replacement Shims (you can re-use old Shims, but best to have replacements)

2 OE Brake Pads

Fit the new Shims to the Calliper holder (note new disks had been fitted before this). The Shims just press on & click into place.



Before fitting the Brake Pads, ensure you use a liberal coating of Copper Grease to the top and bottom lugs of the brake pad to keep the brake pads easily moving. Applied by tube in this case.



Re-fit the brake pads with the friction surface facing inwards. Be sure that there is no grease on the front of the brake pad.

With the brake Calliper, spray plenty of brake cleaner on the calliper and then use a Calliper Piston Retraction tool or other home made device to retract the brake callipers into the body. This should be done as squarely as possible. (NB. It may require you to remove some of the Brake Fluid from the Master Cylinder, but I didn't need to when I did all four wheels).

Re-Fit the Brake Calliper into position and re-fit the bottom calliper bolt that came with the Brake pad kit using the 13mm and 17mm spanner. Then remove the top calliper bolt (discard it) and replace with the other bolt from the Brake pad kit.

Tighten the bolts to 35Nm using the torque wrench and 13mm socket.







With the Brakes all attached, ensure that the Brake Pad Wear Sensor has the metal clip on it before pushing gently back into position. Ensure that the brake Bleed Nipple is covered with the rubber cover again.

Repeat for the opposite side.

**Note** Brake Wear Sensor is only on one side of each axle.



## 5. How to change the Brake Pads - Rear

Ensure that your vehicle is securely supported on Axle stands before undertaking any work underneath it. Ensure that any wheels remaining in contact with the ground are securely chocked to avoid any unnecessary movement.

### Change Rear Brake Pads

Pliers

Copper Grease

Socket 13mm

Brake Cleaner

Optional Ratchet

Torque Wrench

Spanners, 13mm, 15mm

The Discovery 3 has a single piston calliper brake system for the rear. It relies on hydraulic pressure from the braking system to push brake Pads onto the rotating Brake Disk. Over time, the Brake pads will wear down, eventually causing a loud scrapping noise as the brake pad backing plate grinds into the steel disk. If you have reached this point, then in all likelihood, you will need to replace the Brake disks as well as the pads.

The rear drivers' side disk also has a brake wear sensor. If you have NOT broken through this sensor, then it can be safely re-used. Otherwise you need to ensure you have a replacement at the time of fitting.



Jack the car up (see Axle Stands & Jacking Points) Remove the rear road wheels.

Once you have the road wheels removed, then you can remove the Brake pad wear sensor. (Rear Driver Side)

Use a pair of pliers to carefully extract the sensor. You may find that the brass contact in the sensor is also removed. Providing that you don't lose it or it doesn't ping off into a deep hidden crevice, then it should be able to be easily re-fitted.

You should pull the sensor directly backwards until it is removed.



The sensor without the brass contact (which has remained on the brake pad) can be seen in the Front Brake Pads section as well as the brass contact which needs to be re-fitted or the whole sensor replaced.



Using a 13mm Spanner on the outside Calliper bolt, you also need a 15mm spanner to hold the inner nut. It was quite a tight fit for the 15mm spanner to fit in (width of spanner).

Undo the lower calliper bolt and discard (you should get new bolts with your replacement kit, but CHECK FIRST) Only the outside bolt will come out, the inner bolt should move freely.

Then do the same for the top bolt, although after loosening the bolt, swing the brake calliper up to reveal the brake pads.



Remove the Brake Pads (these pads still had plenty of life, but I changed them as I was changing the disks) Note Calliper had been fully removed in these next pics, this is not necessary for just replacing the front pads.

Remove the Metal shims (one bottom and one top)



This is what you should expect from an OE set of Front Brake Pads.

2 replacement Bolts (the Blue is thread loc)

2 replacement Shims (you can re-use old Shims, but best to have replacements)

2 OE Brake Pads



Fit the new Shims to the Calliper holder (note new disks had been fitted before this). The Shims just press on & click into place.





Before fitting the Brake Pads, ensure you use a liberal coating of Copper Grease to the top and bottom lugs of the brake pad to keep the brake pads easily moving. Applied by tube in this case.

Re-fit the brake pads with the friction surface facing inwards. Be sure that there is no grease on the front of the brake pad.



Note the chamfered edge on the pads showing at the bottom to assist with bedding in.

With the brake Calliper, spray plenty of brake cleaner on the calliper and then use a Calliper Piston Retraction tool or other home made device to retract the brake callipers into the body. This should be done as squarely as possible. (NB. It may require you to remove some of the Brake Fluid from the Master Cylinder, but I didn't need to when

I did all four wheels).

Re-Fit the Brake Calliper into position and re-fit the bottom calliper bolt that came with the Brake pad kit using the 13mm and 15mm spanner. Then remove the top calliper bolt (discard it) and replace with the other bolt from the Brake pad kit.

Tighten the bolts to 35Nm using the torque wrench and 13mm socket.



With the Brakes all attached, ensure that the Brake Pad Wear Sensor (drivers side rear) has the metal clip on it before pushing gently back into position.

Rear Passenger side



Rear Drivers Side





## 6. How to change the Brake Disks - Front

Follow the instructions in section 2 to remove the brake pads.

### Tools Required to Change Front Brake Disks

Pliers	Copper Grease	Torque Wrench
Brake Cleaner	Optional Ratchet	Strong Wire or String
Spanners, 13mm, 17mm	21mm Bi-Hex socket	T50 Torx Bit
Rubber Mallet	Socket 13mm	Breaker Bar



Discard the brake pads and ensure you fit new brake pads when you fit new brake disks. See section 4. **How to change the Brake Pads - Front**

Fully remove the calliper and ensure that it is supported so that you do not put too much strain on the brake pipe components. I used a piece of strong wire and tied it to form a loop. As per picture.



Then find the Torx Screw (Size T50) on the face of the disk.

Clear out any brake dust or mud from the screw head. Brake Disk cleaner is ideal.

Insert the Torx and gently tap it in with a hammer to ensure it is fully home.



Then undo the Screw carefully. I generally tend to very slightly tighten the screw to break any seal that has formed and then undo the screw. The hub may still move,

so I start with a few sharp taps on the end of the ratchet to get the screw moving.

You then need to remove the calliper bracket.



There are two 21mm Bi-Hex bolts. These will be very stiff and require a breaker bar to undo.

For the top bolt, you could also remove the cable bracket if you need to gain better access, just be careful with the wheel speed sensor cable.



Bottom Bolt should be clear.



With the Bracket removed, KEEP THE BOLTS, these do not get replaced in a disk kit.



The T50 screw can be removed, along with the brake disk. The disk MAY need to be gently tapped off with a rubber mallet or similar.



You can see the new and old Disk side by side. The old disk has a very prominent 'lip' on the inside of the disks. This can sometimes be removed as long as the width of the disk is still within tolerance.



Put the new disk on, remembering to align the Torx Screw hole onto the hub. When re-fitting the screw, I put some medium thread lock on to keep it in place.



Using the Torque Wrench, set it for 35Nm and tighten the Torx screw.

Tap the Disk on fully and check the torque setting again.



You then need to re-fit the Calliper carrier bracket. Again, I applied some medium thread loc before re-fitting.

Set the Torque Wrench to 275Nm. Note that this is very high and most 'normal' torque wrenches will only go up to 200Nm.

When both bolts have been re-fitted and the torque set, continue to refit the brake pads and calliper. See section 4. **How to change the Brake Pads - Front**





## 7. How to change the Brake Disks - Rear

Follow the instructions in section 5 to remove the brake pads.

### Tools Required to Change Rear Brake Disks

Pliers	Copper Grease	Strong Wire or String
Brake Cleaner	Optional Ratchet	T50 Torx Bit
Spanners, 13mm, 15mm	15mm Bi-Hex socket	Breaker Bar
Rubber Mallet	Socket 13mm	32mm Socket (1-1/4")
Flat Blade Screwdriver	Torque Wrench	

Before removing the rear Brake disks, please carry out this sequence to put the Electronic Park Brake into Service Mode. Ensure brake pads and calliper is fitted to all wheels.

In the car, press the brake pedal three times and hold the pedal down. Push down on the EPB switch for 3-5 seconds.

Go to the main fuse box in the engine bay and remove FL8 fuse 30A (pink Fuse) this will ensure that the EPB is not accidentally re-engaged.

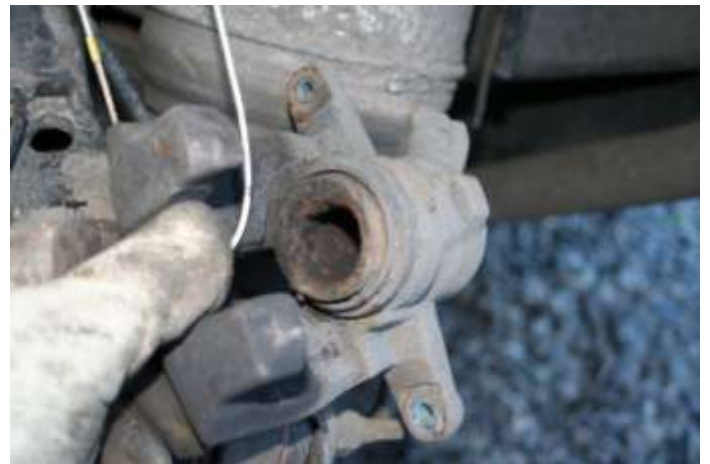
Following the first section on how to change the brake pads, lift and remove the road wheels.

Discard the brake pads and ensure you fit new brake pads when you fit new brake disks. **See How to change the Brake Pads - Rear**

Fully remove the calliper and ensure that it is supported so that you do not put too much



strain on the brake pipe components. I used a piece of strong wire and tied it to form a loop. As per picture.



You then need to remove the calliper bracket.

There are two 15mm Bi-Hex bolts. These will be very stiff and require a breaker bar to undo.



With the Bracket removed, KEEP THE BOLTS, these do not get replaced in a disk kit.

Using a flat blade screwdriver, remove the plastic log to reveal a hole.



Then find the Torx Screw (Size T50) on the face of the disk.



Clear out any brake dust or mud from the screw head. Brake Dust cleaner is ideal.

Insert the Torx and gently tap it in with a hammer to ensure it is fully home.

Then undo the Screw carefully. I generally tend to very slightly tighten the screw to break any seal that has formed and then undo the screw. The hub may still move, so I start with a few sharp taps on the end of the ratchet to get the screw moving.

Turn the disk until the hole (that you removed the plastic plug from) is at the bottom. Behind the disk, it looks like this:-

Using the flat blade screwdriver through the hole, release the ratchet one click





at a time until it is fully undone.

Then the T50 screw can be removed, along with the brake disk. The disk MAY need to be gently tapped off with a rubber mallet or similar.



You can see the new and old Disk side by side. The old disk has a very prominent 'lip' on the inside of the disks. This can sometimes be removed as long as the width of the disk is still within tolerance.



You will more than likely need to

give the disk a quick clean with brake cleaner to remove any oils that may be on the braking faces of the disk.

Put the new disk on, remembering to align the Torx Screw hole

onto the hub. When re-fitting the screw, I put some medium thread lock on to keep it in place.





Using the Torque Wrench, set it for 35Nm and tighten the Torx screw. Tap the Disk on fully and check the torque setting again.

You then need to re-fit the Calliper carrier bracket. Again, I applied some medium thread loc before re-fitting.

Set the Torque Wrench to 115Nm.

When both bolts have been re-fitted and the torque set, continue to refit the brake pads and calliper. See **How to change the Brake Pads - Rear**



**Once completed, ensure that you re-fit the FL8 fuse, otherwise your EPB will not function.**

**Ensure you carry out How to adjust the Electronic Park Brake**

## 8. How to adjust the Electronic Park Brake

The Electronic Park Brake is operated by a pair of brake shoes on the inside of the rear brake disks.

The manufacturer recommends that you strip, clean and adjust the EPB after 50 miles of off road conditions or arduous use.

If you have a loud screeching noise when the EPB is applied, then often an adjustment of the Electronic Park Brake will fix this.

This procedure **MUST** be carried out when you change your brake disks and/or brake shoes. If the pads are worn below the limit, you should replace the pads as well as go through the Electronic Parking Brake Shoe Bedding In Procedure.

### Tools Required to adjust the Electronic Park Brake

Flat Blade Screwdriver

Torque Wrench

32mm Socket (1-1/4")

Allen Key/Hex (4mm)

Ensure that your rear wheels are off the ground and the car is on axle stands or a car lift. Remove the rear road wheels.

For a Manual, you don't want the EPB to apply. You should Push the EPB button **DOWN** whilst switching off the ignition and removing the key.

For an Auto, just don't apply it.

The above should be fine if you are leaving the disks on and just adjusting the EPB.

If you're removing the disks for a full clean, then I'd recommend **putting it into service mode** and removing the 30a fuse as per section **7 How to Change Your Brake Disks - Rear** of the bible.



There are two adjustment parts to the EPB.

Using a flat blade screwdriver, remove the plastic lug to reveal a hole. Turn the disk using the 32mm Hub Socket until the hole (that you removed the plastic plug from) is aligned with the first adjustment point.



Behind the disk, it looks like this (passenger side. Drivers side will be upside down to this) :-

There are two adjustment points. One is the 4mm Hex bolt(Allen Key) (circled Yellow). The other is the ratchet (hidden at the bottom, circled in Red)

Rotate the disk again until the hole is in line with the ratchet adjuster (Red). Using the flat blade screwdriver through the hole, tighten the ratchet until it is tight.

Then take your torque wrench and 32mm socket and set it for between 40 and 90Nm.

Place it on the hub nut and if the disk turns, you need to add one click at a time to the ratchet with the screwdriver until the required torque is reached (I set my torque to 60Nm for this exercise). When the Torque is reached, then you need to release the ratchet by exactly 8 clicks back.



Finally, rotate the disk until the hole is in line with the Hex socket (Yellow) and undo this. Two full turns. This will release the tension and it should naturally move if it needs to. Tighten this back up to 6Nm.

When that is completed (on both rear wheels), replace the plastic lug and re-fit the road wheels.

If they are new disks or pads, please complete **Section 10 How to Bed In New EPB Shoes.**

## 9. How to fit new EPB Shoes

Write up and Photo's in due course. If anyone would like to provide me with their detailed write up and photo's if they do this before I do, then please feel free to send to me so I can update **Bodsy's Brake Bible!**

## 10. How to Bed in new EPB shoes

You need to bed in the EPB shoes either when you have changed the EPB shoes or you have changed the rear discs.

With the Engine running, press the brake pedal fully on and off 3 times. On the third press, hold the brake pedal down.

With the brake pedal still in the down position, pull the EPB switch upwards 4 times and then downwards 3 times. This must be completed within 10 seconds.

Your dash display will then show 'Park Brake Bedding Cycle Active' or something similar. If it hasn't, then release the brake pedal and try again.

You need to ensure that you are on a clear piece of road or land as this procedure needs to be completed 10 times.

Drive at least 19mph and maximum of 29mph and then apply the EPB switch until you stop. You then need to wait for 60 seconds or drive for 1 mile (to allow the brakes to cool down) before repeating the process. If you stop the engine or you drive over 30 MPH, the bedding in process will be cancelled. At the end of the 10<sup>th</sup> time, the bedding in mode will automatically finish.

## 11. How to replace the brake fluid and Bleed the braking system

Write up and Photo's in due course. If anyone would like to provide me with their detailed write up and photo's if they do this before I do, then please feel free to send to me so I can update **Bodsy's Brake Bible!**