FZJ80 Front Axle Rebuild

http://forum.ih8mud.com/80-series-tech/78276-front-axle-rebuild-faq.html

Make sure you save the nuts, bolts and cone washers from the disassembly. Place these parts in little bags and used a Sharp to mark where they go.

Suggested Tools and supplies:

Tools
Torque wrench
1/2" Ratchet
1/2" 18" breaker bar (or pipe to extend ratchet, might not need this)
1/2" 3" extension
1/2" 17mm socket
1/2" 14mm socket (3/8" would work too, for spindle bolts, which were really tight)
3/8" Ratchet
3/8" 6-8" extension (used only for a beating tool, don't use a good one)
3/8" 3" extension
3/8" 12mm socket
1/4" Ratchet
1/4" 10mm socket
Snapring pliers
54mm hubnut socket (probably ¾" drive, so 1/2"->3/4" drive adapter maybe)
Small pipe-wrench (10" one, look below for picture of use)
Heavy hammer, something solid, 2+lb maul or something.
Good slot screwdriver.
Brass Drift or hammer
Seal puller t-type

Supplies
6+ rolls of paper towels.
Large trashcan with bag liner.
Two oil drain pans to catch grease (1 for each side).
Several pieces of cardboard to spread parts out on.
6 cans of Brake Cleaner
1/2 gallon stoddard solvent
Tupperware-type container with snap on lid to soak bearings in

Lubricants
Gear Oil for Front Diff
Front w/o Dfferential lock 2.80 liters (2.9 US qts, 2.5 lmp. qts) Transfer Case takes the same fluid type as the Differential
w/ Dfferential lock 2.65 liters (2.8 US qts, 2.3 lmp. qts)
Rear 3.25 liters (3.4 US qts, 2.9 lmp. qts)
Hypoid gear oil API GL-5SAE 90
MolyGrease 4 pounds of lithium molybdenum wheel bearing grease for Birfs and Knuckle
Grease for Bearings (I used Mobl 1 Synth Red Stuff)
Brake Fluid if bleeding brakes

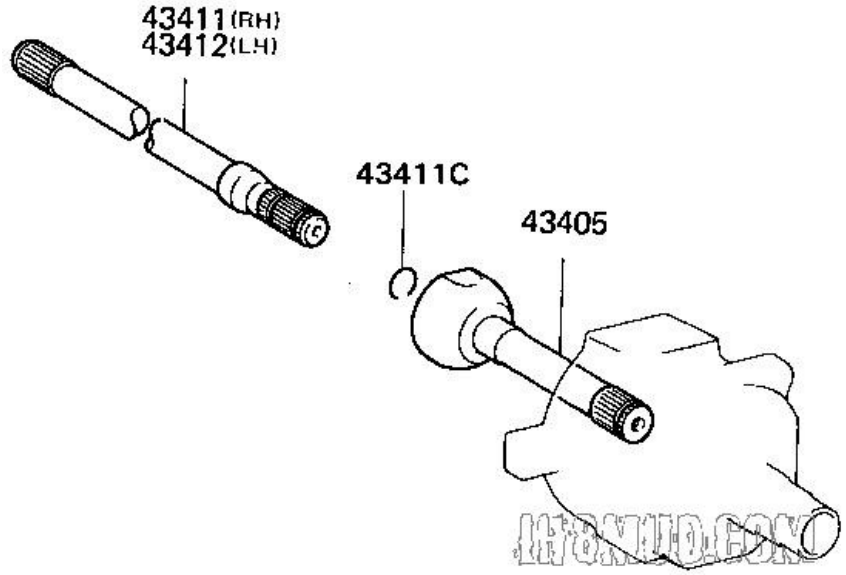
Parts
Front axle rebuild kit from Cruiser Dan (Seals, Gaskets, trunnion bearings, etc.)
Front Rotors and 100 Series Front Brake Pads.

Torque specs
Caliper bolts, 90 lb-ft
Drive flange nuts, 26 lb-ft
Wheel bearing preload, 43 lb-ft, twist hub, 43 lb-ft, back off.
Rotational pre-load, 2.9-5.7 kg.
Wheel brg LOCK NUT, 47 lb-ft.
Trunion bearing caps, 71 lb-ft.
Steering arms, 71 lb-ft.
Steering knuckle preload, 2.5-4.5 kg.
Tie rod end nuts, 67 lb-ft.
Spindle bolts, 34 lb-ft.
ABS sensor bolt, 13 lb-ft.
Steel wheel and alloy wheel with conical seat lug nuts, 109 lb-ft.
Late alloy wheel with shank nuts, 76 lb-ft.

Note:lots of folks recommend having the front diff locked if you have that option before removing the axle. Makes it easier to re-install

This write up assumes you do not pull the tie rods and leave it with original preload.

I strongly suggest you pre clean the birf area. Use a narrow screwdriver, a stiff bristle brush, and a rag to roughly clean the entire inboard face of the brake dust shield, top of axle housing and entire area around the axle ends. Then soak them with quality foaming engine degreaser for 10 minutes while sitting at the local car wash bay. Blast them clean. Recoat with the degreaser for 10 minutes. Blast them again and drive home to start the work. I suggest this looking at your picture of the ABS sensor coming out and wincing. There is a lot of nasty greasy grit collected in this area and it takes only a half hour to clean both sides down to bare metal by doing this. I only recommend using a pressure washer in this area just prior to teardown due to the potential for jamming water in the seals. But until you have experienced the pleasantry of opening this thing up and seeing only bare metal vs mounds of hardened grit, you can scarcely appreciate it and will over and over again the whole time you're working here. Very little grit fell onto my clean areas and once the project is open it's a losing proposition to initiate a good exterior cleaning. Believe me you'll be happy you did this.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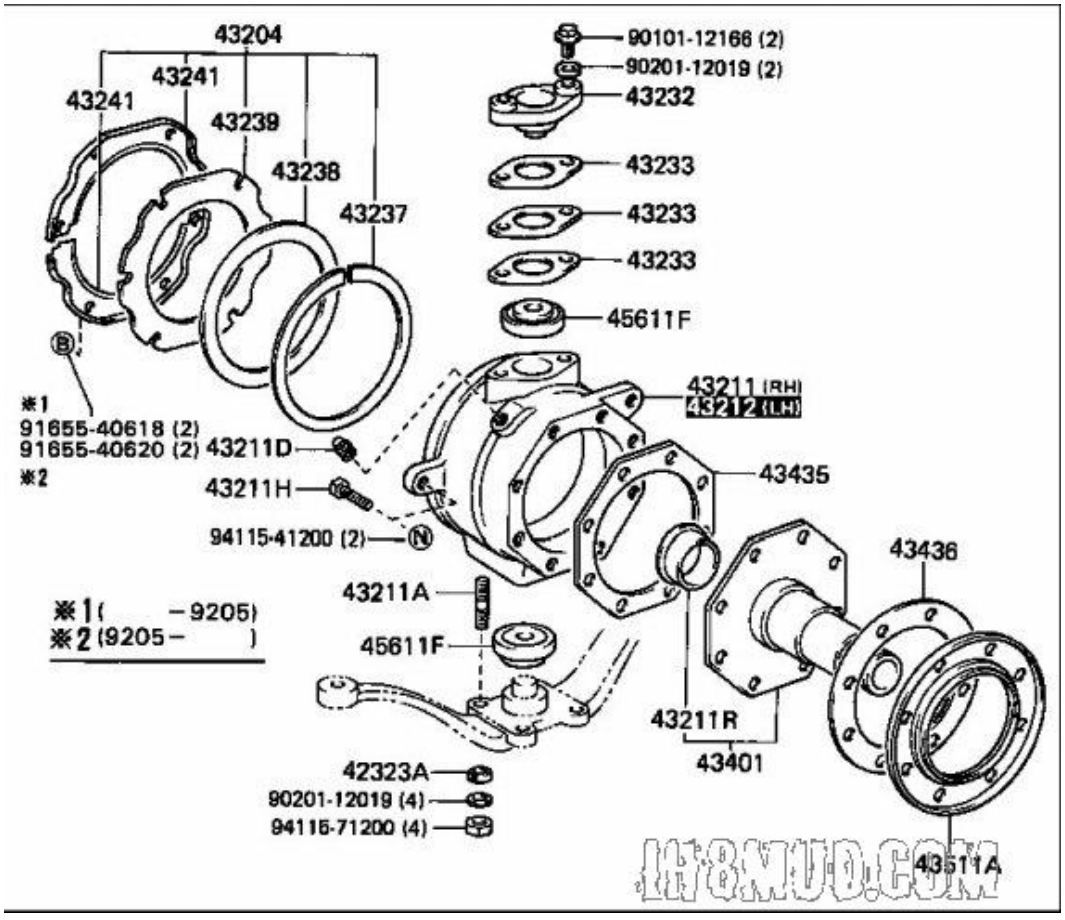
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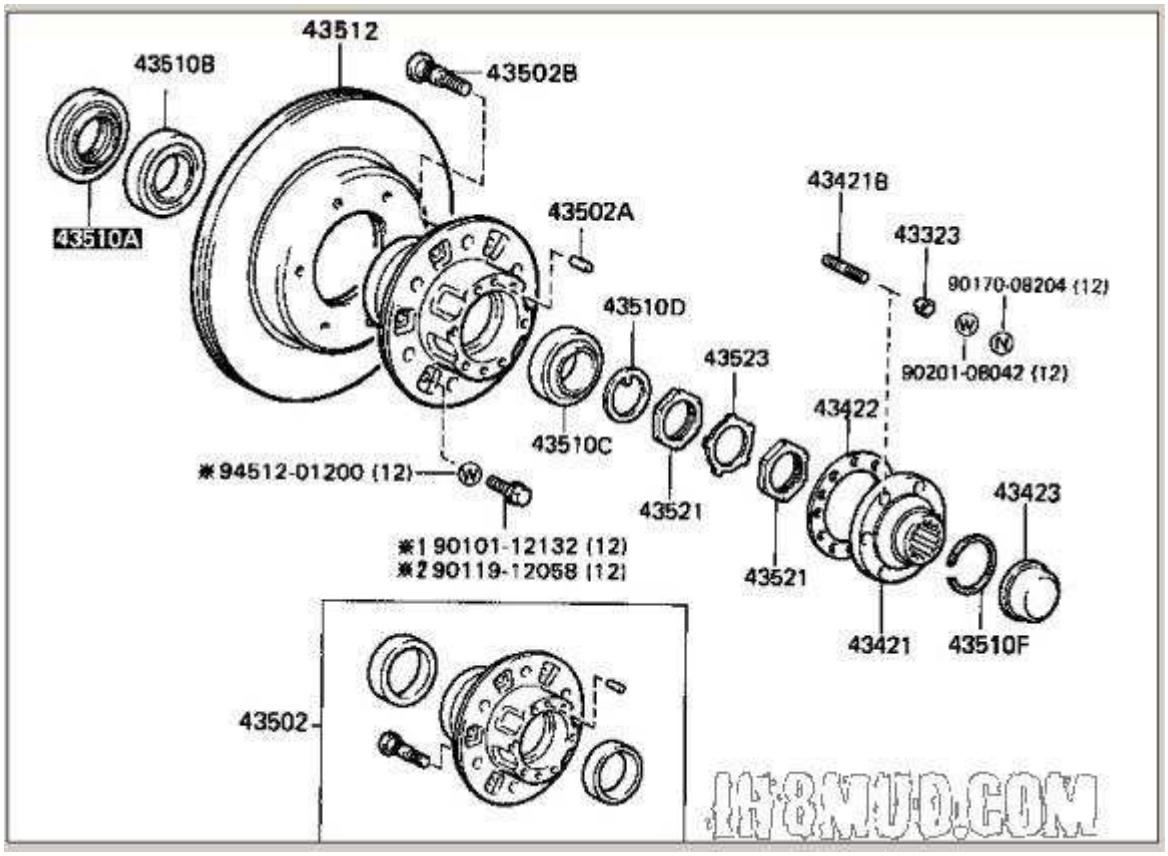


Loosen the lugs, Jack up vehicle, and place the vehicle up on jack stands. Jack stands need to be on both side of the front axle. Place a block behind the rear tire. Remove the front tires

Remove the Drain plug on the Front differential and drain the fluid. Look at the drain plug to see if there are any metal particles or shavings. Some substantial metal chips can come off the front diff drainplug - up to the size and shape of a pinkie nail. don't sweat it if you find chips.

Remove the Brake Caliper by removing the bolts on the backside. I laid the caliper in the springs rather than decabling it and draining the brake fluid. Make sure it is secure and tie it down if needed

Using a Screwdriver and a hammer, remove the grease cap from the flange. The Grease cap is the metal cap in the center shown there in the pic.

Remove the 6 nuts on the flanges. Using a Brass Drift placed against the flange bolt heads, hit the drift with a hammer until the cone washers back out and you can remove them by hand. Note: If you don't have a brass drift, you can loosen the nuts to be flush with the bolt ends, and tap with a mallet to loosen the cone washer

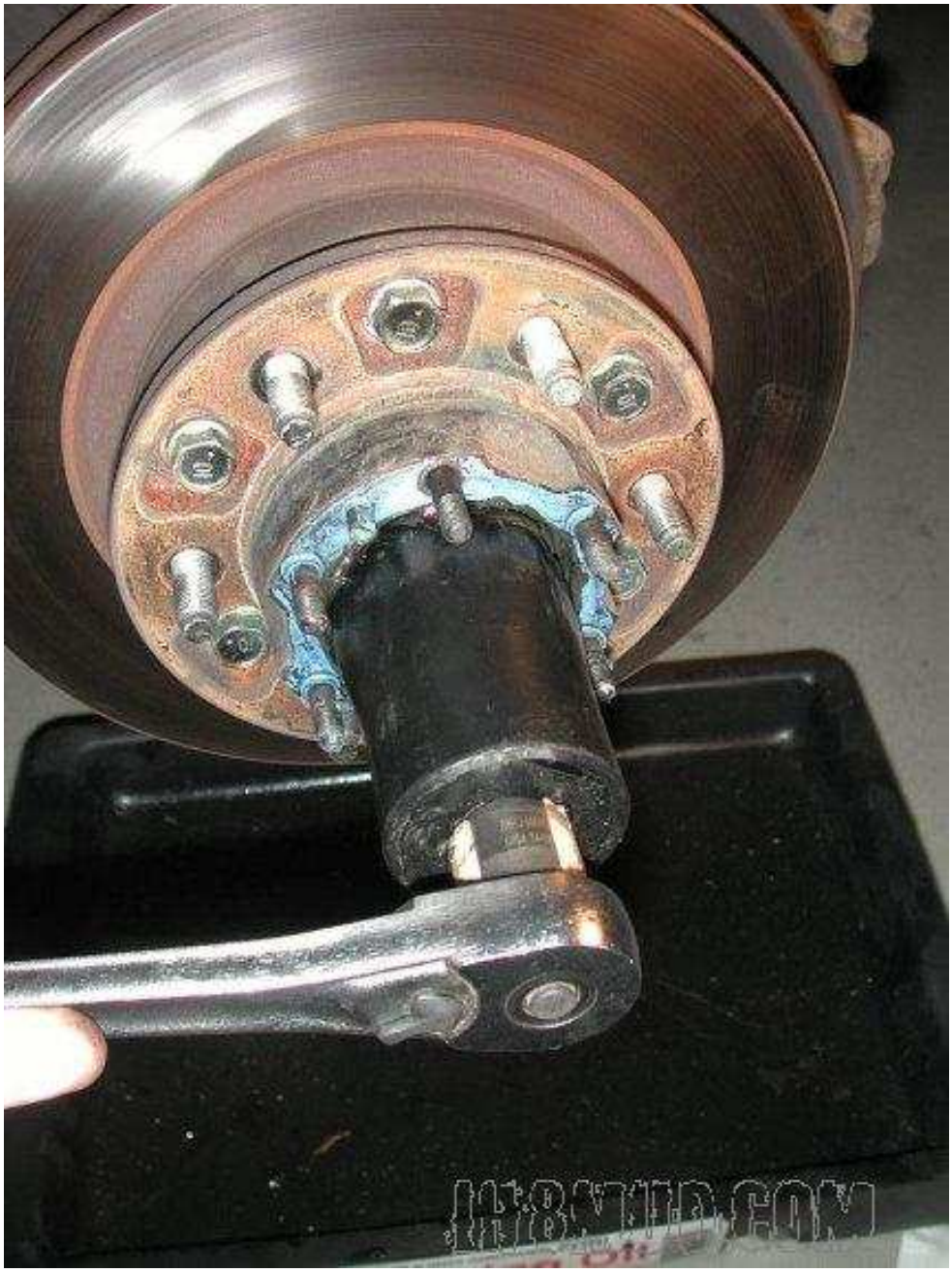
The below Pics are from my brake job showing Tire removed, Brake Caliper removed and cone washers and nuts removed from the drive plate

With the cone washers removed from the Flange, remove the Drive Plate. After the flange is removed you will need to use a snap ring pliers to remove the snap ring. Next you will see a lock washer, use a screwdriver to remove this by bending the tabs to the middle position, even with the rest of the washer.

Use the 54MM Hub Socket, remove the Lock nut.
Then remove the Lock Washer.
Using the 54MM Hub Socket, remove the adjusting nut (Used later for preload)
Then remove the thrust washer.

Remove the Hub and Rotor Disk together as one piece with the outer bearing. OK to leave outer bearing in Hub for now. It will all be cleaned up later.

Remove the 8 bolts dust seal and dust cover
The FSM suggests disconnecting the tie rod from the Knuckle arm. I did not do this step and I know lots of others didn't do it either. There is no need to.



Remove the oil seal set on the back of the knuckle.
There will be a metal retainer held on by 6 bolts.
Felt dust seal, Rubber seal , Steel ring.
Note here the order they are installed and the direction of the ridge on the rubber seal when removing it.

Remove the ABS Sensor and place it carefully into the spring or something else it won't fall from or get damaged and zip tie to spring out of the way.

Remove the two bolts (17 mm) holding the upper bearing housing to the knuckle. The bearing housing can now be gently pried off. Be careful of the shim, which varies in thickness between trucks. If you encounter difficulties, try using two flat head screw drivers at the same time at either end so that it lifts off evenly.

Loosen the 4 nuts (17 mm)that attach the lower control arm/bearing housing to the knuckle (consult FSM and remove the tie rod if you plan to check the preload) Using the brass drift and hammer, tap on the 4 bolt heads and remove the cone washers. Note: If you don't have a brass drift, you can loosen the nuts to be flush with the bolt ends, and tap with a rubber mallet to loosen the cone washer

Pull of the steering arms from the bottom of the knuckle
Using a brass bar and hammer, tap the knuckle spindle.
Remove the knuckle spindle, the gasket and the bushing that is between the birf and the inside of the

spindle.
Birf in the knuckle will be exposed. Note the condition of the sludge in the knuckle. If it is real wet, then your seal had given out mixing diff fluid with grease. Good thing your changing it.

Now Remove the birf and axle and lay it somewhere clean. Remove the Knuckle Housing

This is where you start using all that paper towel. Start wiping the inside of the knuckle out of all the grease. You can get it clean later with Brake Cleaner.

Remove the inner axle seal. I used a seal puller you can buy at any Auto Parts store.

You can see from the photo that the knuckle has all been cleaned out in preparation for being repacked with new grease. An alternate way to remove the oil seal is to use a sharp flat screwdriver

and a hammer to bend the edge in. The screwdriver can then be rotated and the side of the oil seal will collapse and the oil seal will just pop out. You can see this has been done below and the seal will now just pull out. Once out the oil will start leaking into the knuckle again - just jack that side of the vehicle up a bit. Also, prior to removing the oil seal, reach in with your finger tip and pull out the spring that is on inside rear of the inner lip - to prevent the possibility of it falling into the axle tube.

Shine a flashlight into the axle housing and look around. There should be nothing visible loose in the housing and there should be an index ring about 2 inches from the oil seal flush against the inner lip of the machined surface (it may look like part of the housing). This ring can occasionally come loose. If it has it will likely be lying in the housing and you will need to reseat it

You need to remove the trunion bearings and the races located on the top and bottom of the inner knucle.

Use a socket extension or brass drift to knock the old races out.

Now comes the cleaning part.

Take the inner and outer bearings and place them in a Tupperware container with stoddard solvent. Let them soak for at least a couple of hours or overnight.

Start cleaning the inner knuckle and axles with brake cleaner and paper towel.

Clean everything you can. When you all done, you won't wonder why lots of brake cleaner and lost of paper towels were needed.

Some at this point some will dis-assemble the birf from the axle. A benefit to doing this is to swap sides. The birfs wear on one side and swapping sides extends the life. CruiserDans kit comes with the parts for doing this task. If you are clicking, I recommend you do this step.

Clean and repack the birfield. If you don't plan to disassemble but have time then, after cleaning as best you can, drill two 1.5" holes in a piece of plywood and drop the birfields into the holes so the bowls face up then fill them with varsol and allow them to soak overnight

After the inner and outer bearings have soaked a while, spray brake cleaner on them while running the rollers on your hand to clean them. Spray compressed air on them to dry while running the bearing rollers on your hand.

Re-installation start

Install the inner axle oil seal. A big rubber mallet and a 3x3 block of wood with a face shaved to roughly the same size as the seal is the best way we found to seat it. A piece of 1.5" abs pipe will also work if you have a steady hand and cut both ends square. The seal does not seat flush in the housing but actually goes a little further in leaving a slight lip.

Slide the wiper seal kit over the inner knuckle ready for seating. Starting with closest to the center of the truck, the order is felt seal, rubber seal with ridge facing towards the differential, metal seal.

Install the upper and lower races for the trunnion bearings. Use a rubber mallet to help seat them correctly. May need a brass drift and hammer.

Grease pack the new trunnion bearings (Preferred) or old bearings. Place grease (I Used Mobil 1 Red Synth) in your palm and tap the bearing into your hand moving the rollers, rotating while you do. Keep packing until you see grease come out the inside all the way around.

Install the upper bearing

Have the outer knuckle housing handy and install the bottom bearing. Install the outer knuckle housing. May need to adjust to make sure bearings are seated properly before bolting the outer housing back on.

Check that bearing is lined up by reaching finger down from inside the inner knuckle to feel the center dimple in the bearing housing. Tighten bolts taking care to check bearing is lined up. Place cone washers and washers on the other two studs and tighten. Remove the first two bolts, install cone washers and washers and replace. Use locktite on any studs that came apart during removal.

Install cap and shim over top bearing on the knuckle with two bolts, torque to 71 lb-ft.
The 80 series knuckle is shimmed only from the top so there is no need to "center" the knuckle. The trunnion pre-load is almost always within spec if the original shims are re-used.

Grease (molygrease) inside of inner knuckle housing, place a little grease on the inner seal. Pic below is a good view of the index ring inside the axle tube:

I took some extra time on this repack to consider common failures people have experienced after repacking their birfields:

- loosening of the 4 nuts/studs on the bottom of the knuckle
First, the 4 knuckle bolts. I have done this 3 times and have always had to fiddle with reinstalling the steering arm on the knuckle - which is attached by the 4 nuts. The fit of the arm is extremely precise and will often bind while you are tightening the bolts before it is all the way on. This will leave a gap

of only a few thousands of an inch, but the arm is definitely NOT on. I verified this today by playing with it a few times and it sis easy to do. So I used a hammer to tap the arm upward every few turns of the nuts, preventing it from binding. It worked perfectly. Considering the fastening system is quite bombproof, I think these failures are simply due to the steering arm binding up just before seating all the way. Many have bought the newer torx head bolts (including me!) in fear of this loosening phenomenon, but I think tapping it with a hammer continuously until it is all the way home solves the problem

You also want to pack the Birf where it attaches to the axle. Push grease in from all sides until it starts to ooze out.

The question "Should I dismantle the CV to clean and repack it?" is often asked. Well, it's up to you. The inner axle is held in the CV "star" by a round section circlip. This circlip must be sheared to remove the axle. The normal way to remove the axle is to hold it in a vice and pound the **** out of the CV joint with a soft (but heavy) hammer. In many cases the circlip will be expanded a little and sometimes is so tight that the CV will not separate without shattering the star.

The joint can be successfully cleaned and repacked without separating it. A good dousing in solvent, petrol, kerosene, or whatever you choose, and the use of a stiff brush will remove old grease.

It is important that ALL old grease is removed. This means that to do the repack properly. The knuckle housing should be removed for cleaning. Mixing old and fresh grease, or mixing different brands/types of grease can cause the greases to break down to a liquid.

Pack the inner knuckle with grease. The FSM says to pack 3/4's of the knuckle

REPLACING THE CV (BIRFIELD)

This flat(s) on the CV that must be lined up top and bottom to remove/replace the joint. When removing, simply stick a finger in the grease to feel for the flats, put them top and bottom, and jiggle the joint while pulling it (the joint;-). When replacing, put a generous amount of grease in axle seal and slide inner axle carefully through the seal to avoid damage. The splined end of the inner axle will enter an UN-splined diameter in the side gear to locate it for entry into the spline. The driveshaft may need to be rotated a little to line up side gear spline.

A spatula, or the palm of a hand, can be used to force fresh grease down through one side of the joint until it comes up through the other.

HOW MUCH GREASE GOES IN THE CAVITY?

There is some controversy over how full the cavity should be. Suffice to say that it should NOT be totally filled. Overfilling will inevitably lead to premature leaks at wiper seals, and possibly the forcing of grease through the axle seal into diff housing and through the spindle into the wheel-bearing cavity.

Place a new Gasket in the position on the knuckle along with the bushing on the end of the axle and install the spindle.

One of the common screwups mechanics fail to do is liberally pack as much grease as possible into the spindle bushing. This is where all the "Grrrrr" sound posts are coming from - dry spindle bushings that just got a wipe of grease. There are criss crossing grease grooves in that bushing to hold grease. Pack this area liberally and thickly and also coat the part of the axle that runs in there. I

don't see this specifically mentioned and feel it is worth it. I see you do mention "grease the splines on the drive plate" which is another common error.

Place the dust cover, dust seal and a new gasket on the spindle.
torque the 8 bolts to 34 ft-lbs.

Could add to use two studs loosely screwed into housing to help line all those bits up. After adding some of the bolts you remove the studs and finish with the rest.

Clean off the ABS sensor and re-install it. Torque the bolts to 13 ft-lbs.

Pack the inside of the axle hub with grease (Should have been cleaned prior to this).

Pack the inner and outer bearings with Grease per the instructions used for the Trunnion bearings. These bearings are typically re-used unless after they are clean you notice damage.

Install the inner bearing into the hub and then install a new oil seal onto the hub. Coat the oil seal with grease

Place the axle hub with the disc side towards the spindle (Hub side out)

Install the outer bearing

Install the thrust washer

I took some extra time on this repack to consider common failures people have experienced after repacking their birfields:

- wheel bearings coming loose

In the past, and on this job today I had to really struggle getting one of my newly repacked wheel bearings to fully seat. When you're putting the disc rotor back on with the new grease seal on the back, it feels like you've solidly thunked it all the way on, but you may not have. I thought I had, but having done this many, many times it did not look quite all the way on and a light went on. I wondered if some are putting the thrust washer and nuts on at this point and then having problems with preload or simply getting the preload even though the assembly has not been pushed fully home. In my case, I was reluctant to grab the rotor and seriously heave on it because I'd degreased the rotors and my hands were greasy. With less experience in this exact situation, I might have continued with assembly and later the bearing would pop on and be loose. I don't know what it is that catches back there but I think it's simply the precise fit of the inner bearing on the spindle. At any rate, feeling suspicious I grabbed a couple fresh rags and really got aggressive with pushing it on. I was rewarded with a thunk and thought I'd bring this to everyone's attention.

So, I'm suggesting that the front wheel bearing installation be amended to include extremely close attention to making sure the rotor is all the way seated before setting up the bearings - up to and including some hammer blows with a brass or plastic hammer to seat it.

Just a couple observations today as I buttoned 'er up.

Set pre-load. This step has a difference of opinion. Some folks use a fish scale and some do it by feel. Most agree that the way they do it is the right one.

I'll repeat the steps from the FSM. Install the adjusting nut.

You adjust the pre-load using the 54mm socket. Torque the adjusting nut to 43 ft-lbs

turn the hub right two or three times. Torque the adjusting nut to 43 ft-lbs again.

Loosen the nut until the hub can be turned by hand.

Torque nut to 48 in lbf (Yes thats inch pounds) and make sure there is no play.

Using a spring tension gage (Fish scale) measure the pre-load. s/b between 6.4-12.6lbf. Adjust as required. You do this by hooking one end of the scale to the hub and seeing how much it takes to move the hub.

Here are two other methods:

Robbies
"This was how we did big trucks in the 80's. We would do the bearing preload rotate then tighten again, rotate. Then we would back off to the point that the nut was loose. Hand tighten, then check to see how much the washer would move back and forth with a screw driver. IF no movement then loosen, if real easy movement not tight enough. this was a trail and error until you got good at it. when it was just right you put the lock washer on then the lock nut and tighten to what ever the man spec's were. then check to see if you could move the washer with some force, not two handed force but some more force then it took with just the jam nut. Sound hazzy but works real well. I have been using this method for over 20 years (yea I am old, but big enough to wipp most) and it is what I use in the shop today. It takes a feel and it may take a couple of times doing it but will serve well. The way you would tell if it is too loose(before driving the truck) is with the tire and wheel on, with every thing on the ground and you shake the tire(from the top) back and forth and you have looseness, the bearing preload is not enough, do it over or you will have problems.
Junk you may want to put this in the FAQ section. later robbie"

Gumby/Landtank:
Quote:

> Originally Posted by Gumby
> I think Landtank's method was the same as mine.
>
> Tighten the inner nut to 45 lbs/ft, rotate, back off and repeat, then just until you feel resistance. Install the lock washer, then torque the outer nut to 45 lbs/ft.
>
> I use a torque wrench for Cruisers because you need to use the socket. It's easy to get carried away with a 1/2 ratchet.
>
> With cars and trailers I use a pair of channel locks. I've found that I get better feel for the pre-load torque.
>
> The rear bearings do require the special alien landing ship tool.

Install Lock washer and lock nut. Torque the lock nut to 47 ft-lbs.

Check that the axle hub turns smoothly and the bearing has no play.

FSM says to check pre-load again with scale.

Secure the lock nut by bending one of the lock washer teeth inward and the other tooth outward.

Place a new gasket in position over the axle hub.

Apply molygrese to the inner flange splines.

Install the flange on the axle hub.

Install the 6 cone washers, plate washers and nuts.

Torque the nuts to 26 ft-lbs

Install a bolt in the axle shaft and pull it out to hold it while you install the snap ring.

Using a snap ring expander, install a new snap ring and remove the bolt.

After the drive flange is fitted and the cone washer nuts are torqued, the circlip can be fitted. Screw an 8 x 1.25 pitch bolt into the axle to pull it out and expose the circlip groove.

Install the drive plate (part cap goes into)
Quote:

> Originally Posted by IdahoDoug
> Go super easy on tightening the tiny nuts on the drive plate and cone washers. The torque is in INCH pounds, so easy to break right off.

Quote:

> Originally Posted by sleeoffroad
> when installing new drive plates (Most re-use old ones), paint them before installing them. They are not coated when new.

Coat the inside of the cap with MP grease and tap it on using a rubber hammer or a drift and hammer.

Re-install the brake caliper. Torque bolts to 90 lb-ft

during the re-installation of the caliper is a great time to replace the brake pads if required. 100 series pads last longer on the front

Re-install the tires. Make sure you torque the rims to the following specs depending on which rim you have:

Steel wheel and alloy wheel with conical seat lug nuts, 109 lb-ft.
Late alloy wheel with shank nuts, 76 lb-ft.

Repeat process on other side taking it for a test drive.

After test drive, 100 miles and some time after that.

Jack up one side of car and wiggle tire to see if tire moves top to bottom. This will give a rough test if your bearings loosened up on you.

Brake Bleeding Walk Through

Ok, I hope I do not leave anything out. Open hood and remove the brake fluid reservoir cap and place a collection pan (I just used a cut down milk jug) to catch any spilled brake fluid (might not be necessary, but when you compress the caliper pistons, fluid level may rise).

Loosen lug nuts then jack up front end (use good quality jack stands at each end of the axle-before the knuckle). I just jacked up both sides and put stands under the axle and positioned the jack at the

center of axle for peace of mind. Remove the wheels (have a breaker bar or long lug nut bar - mine were obviously too tight - just had new tires installed at Tire Factory 2 months ago).

I started on the USPS. Looking at the rotor, the brake caliper is on the left. Get a good light and examine the back side (left) of the brake caliper. You will see a thin little bent wire clip holding 2 guide pins (each pin approximately 4" long) that hold the pads in. Do not pull the clip out of the guide pins just yet. Using a pair of needle nose pliers, I pushed the middle of the bent clip out of the hole at the center rear of the caliper gently. You will have to flex the clip a little-just be gentle! Once it is out of the hole, use the needle nose plyers to pull the clip out of each pin, again gently (I had read that if this breaks, you need to replace before driving - after looking at it, I would think that 2 cotter pins (1 per guide pin) would also work. With the bent wire clip out and placed in a safe place, put your hand on the flat metal spring clip that holds onto both the upper and lower guide pin shafts. Slowly pull the upper guide pin out and catch the flat metal spring clip (it will pop out if you do not have your hand on it. Remove and replace 1 pad at a time. I started with the outer pad. I then used 2 channel lock pliers and slowly squeezed the brake pad watching both pistons on that side slide into the caliper housing. Once the pad is loose, you can remove it and then compress the pistons until you can get the new pad back in. Mine went in very smoothly and I did not have to apply too much force. I was able to use the original shims (they have little tabs that help them stay on). If you do not have them, use the ones that came with whatever pads you bought (I used Napa pads until I do the front axle service and put new rotors in and then go with the 100 series pads). After compressing the pistons and inserting the new pad with shims, I inserted the guide pins back just enough to hold the new pad in place while I change the inner pad. Once you have done the same procedure with the inner pad, slide the lower guide pin all of the way through to hold the bottom of both pads then put the flat metal spring back on the lower guide pin and hold it in as you slide the upper guide pin all the way in. Reinstall the bent wire clip carefully. You are done with that side! Do the other side the same way.

I have not changed the rear pads yet (still pretty good condition), but I assume it is pretty straight forward like the front.

Now for the bleed procedure. Make sure that you have at least a full quart of dot 3 of better fluid ready. Have about 2 feet of 1/4" clear tubing. Make sure that the brake fluid reservoir is full then lay down under the PS rear, right in front of the tire and look back at the axle/brake area. You should see the bleed nipple poking out towards the top of the caliper (my back ones had the little dust caps on them. Clean the nipple off and put the box end of a 10mm combination wrench on the nipple. Slip the 1/4" clear tubing on the nipple and put the other end of the tube into a container (at least a quart size unless you want to dump during the procedure). I had a little dot 3 fluid from another container and poured it into the catch container and held the tubing in the fluid to minimize the risk of sucking air back into the nipple. Have an assistant pump the brake pedal until it is stiff and then with verbal commands, have the assistant press on the pedal as you open the bleed nipple. Once the pedal is almost down to the bottom, close the nipple. Only a few tablespoons (about half of a 2' length of 1/4" tubing) come out at a time, but flow was smooth and predictable. Have the assistant constantly check the level at the reservoir and refill when necessary. Repeat this procedure as many times as necessary until the fluid that comes out of the nipple is clear (mine was dark green at the start, then clear). It took about 30 cycles (press on brake pedal/open nipple/fluid out/close nipple) to get all of the fresh fluid to come out.

Move to the DS rear and repeat procedure (it should take fewer cycles to get the old out).

Move to the the LSPV (it is located directly forward of the DS rear axle, mounted to the frame/body). Some of these will be corroded (I had looked at a 92 LC before buying my 94 and the LSPV (did not know what it was at the time) was just a hunk of rust! I did get air out of this, so

spend some time and cycle as many times as necessary.

Move to the PS front and then to the DS. The whole idea is the start at the farthest bleed point from the master cylinder and work your way home. All in all, it was a very easy procedure and took about an hour to change front pads and bleed the whole system. The brakes were spongy for about a day after, but stiffened up after that.

I went through about the whole quart of dot 3. I was scared to attempt this without the FSM, but just read every post I could find and dived in!

BRAKE PAD BEDDING IN PROCEDURE

To ensure maximum performance and customer satisfaction, new brake pads must be bedded in upon installation. Correct bedding guarantees that new brake pads and new rotors work flawlessly together. In order to function optimally, organic brake pads must develop friction coal on its surface. This friction coal develops at a temperature of approximately 280°C (537°F). It is very important that this temperature is reached continuously and slowly. This gradual process generates temperatures that not only penetrate the surface of the brake discs and pads, but also distribute evenly through the whole disc and pad material. This is essential when using new brake discs, since the disc often shows signs of stress (due to the casting process and fast cooling) in the materials. A steady and careful warming and cooling process guarantees a good release of both materials.

The bedding in/break in procedure should be done as follows:

Drive at approx. 35 mph (60 kmh) for about 500 yards (solid front discs) to 800 yards (vented front discs) while slightly dragging the brakes (i.e. light brake pedal pressure). This process allows the brake temperature to slowly and evenly build up to 300°C (572°F).

Now, if possible, drive about 2200 yards maintaining the same speed without braking. This will allow the pads and discs to cool down evenly. After this cool-down, perform a normal brake application from 35 mph to 0. No panic stops!

Now, the friction surface has evenly developed friction coal, the pads have bonded with the disc surface, and tensions in the disc materials will have disappeared.

Only trained master mechanics should perform this procedure before delivering the vehicle to its owner. Do not expect your customer to properly finish your brake job!

This bedding process is only suitable for the front axle - not the rear. This is due to the brake force distribution of front and rear axles. In order to reach 300°C (527°F) on the rear pads you would have to drive several miles with dragging brakes. However, in that time the front brakes will be glowing red, overheating and thus destroying the front brakes.

Final note – don’t forget to clean hubs and check the wheel bearings. Also, the brake fluid should be replaced at least every 2 years.