G’day Jeepers,

Welcome to a new monthly article we’ve decided to run for the Dr Jeep segment, documenting some of the daily trials and tribulations at USA 4X4 Jeep Specialist in Melbourne, Victoria. We get around 20 jeeps thru the place in a week for all sorts of work ranging from basic services to full services, diff and transmission rebuilds, mechanical smash repairs for both private and insurance customers, suspension kits or refitting questionable suspension kits, wheels, tyres, batteries etc, etc. and boy do we get some rippers and its always been a though that these cases would make for some interesting reading. We’ll follow various stories that take longer than a week and various smaller ones listing and showing the diagnosis, the corrective surgery and future care of that vehicle.

It’s funny, most people’s second biggest financial investment in life is there vehicle, after a home, but for some reason a lot of them get forgotten and neglected, a lot of the damaged or broken parts on a jeep are due to lack of maintenance. The other problem is people cutting corners. As a whole, most jeepers have some sort of mechanical knowledge and skills and can maintain their jeep to some extent. Basic oil changes, filters, brake and tyre maintenance is all stuff we can do at home with a half decent tool kit. But for some reason, probably time restraints or a lack of facilities most jeeps get used more than they get cared for.


A lifted KJ done at USA 4X4


An 81 J20 restored at USA 4X4

USA 4X4's TJ needing a wash!

I treat my own jeep like my motorcycles, for e.g. road bikes need less maintenance as there not exposed to the mud or dirt, there filters, tyres, body, brakes, bearings, chain and sprockets all last 10 times longer than a dirt bikes. Dirt bikes get ridden in sand, mud, heavy dust and there components get a hiding compared to road bikes. So they need 10 times as much love to keep them in perfect condition. Same goes it for your jeep. Rigs used 99% on the road as daily drivers, tow vehicles or tourers need less time or effort will be the norm, but a well used off road jeep needs to be prepared for an off road outing, cleaned down upon return and some intermediate checks done before it's used as a daily driver or for the next outing if you want it to last and be reliable.

I have the luxury of a full work shop at my disposal so it's a bit easier for me but it can be done yourself at home to some extent. Cleaning mud from your suspension, engine bay and radiator, body work and brakes will make it easier to check over the basics of your rig and save yourself some money. I always end my trip with a quick or sometimes long trip to some version of a jet wash bay, and if it's really caked on mud and wheels are full of mud and miles out of balance I'll drop into the first one I see. Driving an extra 50km with wheels 1kg out of balance can kill ball joints, tie rod ends etc.

Anyway, we all know that, but most owners don't quite give there jeep the love they deserve for one reason or another, that's were shops like USA 4X4 come in, and this is the basis for this new segment, I hope you enjoy it……

One 75 CJ5 on hoist #1while a 2008 JK jets a lift #2

One sad TDi XJ we wrecked out at USA 4X4

A 2007 JK gets an ARB bar, winch, Coopers and KC's

Thru the month of June we've had the usual run of XJ, TJ and ZJ services, we see more of those models for some reason but still get our fair share of WJ's and KJ's and now a few JK's filtering in. typically most of the services we do will involve diff attention, in particular the real LSD track-loc in most jeeps get a hard time and we see a lot of clutch pack rebuilds and for the XJ and ZJ Cherokees needing rear axles on a regular basis. Older jeeps find there way to us to and one particularly famous old CJ 7 that was once know as SUB-CJ has wound up in the USA 4X4 operating theater. She's an 84 model with a 258 AMC 6 cylinder, the original AMC20 rear and Dana 30 front diffs and Dana 300 transfer case. It used t have the Borg Warner T5 jeep 5 speed but there legendary for breaking 3rd gear and the cluster gear and a few years ago when it had issues we transplanted a Tremek T176 from a J10 in there. While it has no over drive its strong as an ox.

Back in the days this jeep received a lot of custom work form the now closed down Suburban 4wd in Sydney, including YJ springs, air lockers and a Mopar fuel injection kit. The motor didn't get a full rebuild back then as the EFI kit ran well as is. When we picked up the jeep I was just in for a service, she gets used daily and the 35's don't help keep track of the distance traveled so we attend to this old jeep each 6 months regardless of the K's. Apart from the usual diff services, drain/clean/inspect/recover and refill, eng oil, filters grease and coolant service, lights, brakes and the usual check over we found it had a flutter or a miss under idle and notable at higher revs.

The owner had not noticed it, things like that sneak up slowly and if you drive it every day sometimes you just miss this sort of thing. So we investigated, pulled the plugs which all looked similar then ran a cylinder compression test that showed up OK, next took the rocker cover off to watch the rocker gear as it idled, and we noticed #3 exhaust not moving very far, we had either a crook lifter or a crook cam lobe. The fluffy noise was the exhaust not being able to escape properly.

Next we stripped off the head to get to the lifters, we found several exhaust valves burnt around the outside edge, so we sent the head out to a specialist head reconditioned for all new exhaust valves,

inlet vale grind, valve seat grind and a surface grind and new valve stem seals, at this stage we were also able to pull the lifters out of the block with a telescopic magnet, and presto, #3 lifter had a concave face, not a nice flat one like it is meant to have, the cam no doubt was in the same shape.

The new lifter on the left, the worn lifer on the right

The cam lobe below the distributor drive is rounded

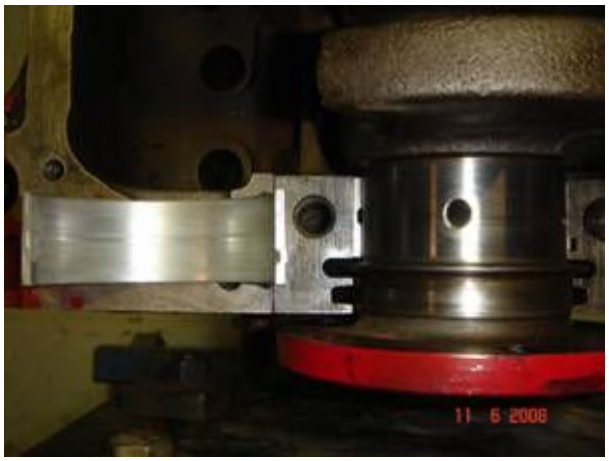

Lifters come out the same way the new ones go in.

To remove a cam from most jeeps you have two choices how to do it, most models can have the grill and radiator removed and the cam comes out forward or the motor comes out and you do the same thing on the engine stand. Give this old girl has a WARN M8274-50 high mount and custom bars and a big easy access engine bay so we opted for the latter. Old jeeps have minimal engine bay accessories and in no time at all the motor was out and on the stand.

Then we were able to remove the rest of the lifters, the timing gears and chain and remove the cam to discover a much worn #3 exhaust lobe. This motor had a rear main weep too so the sump was removed, while we were there we checked a couple of random main and big end bearings and found them all to be good and OK to reuse, then we took a good look at the cam bearings, you don't get over size cam bearings if there worn, you can only replace with std bearings and these ones were particularly worn, that's another job for a specialized engine machine shop. They have the rite tools to knock out the old cam bearings and refit and line bore check them. Only problem is they need a bare block so the rest of the motor had to be torn down. This gave us a chance to inspect the rings/pistons and bores by eye, and they were all fine. Ideally when you go this far you'd re ring the motor and whack a fresh set of bearing in but the cost adds up and after consultation with the owner we were instructed to refit the original rings and bearings.

The 258 less conrods to remove the crank.

The motor before removal to add to the fun there was a snapped head stud


The rear main cap bearing was good to reuse a decent cam bearing


A badly worn cam bearing, the soft alloy have worn away

When we got the motor back from the machine shop we were able to reassemble it on the stand, first the cam and then the lifters. Then the crank and the pistons, then the head, and on with the sump using a one piece early 4.0 gasket and the rocker cover, an alloy unit in this case. The 258 got a plastic rocker cover in 1982 to 1985 and they were legendary for warping and leaking, many after market companies make an alloy replacement for them and this motor has one fortunately.


The 258 with head, timing gears and chain

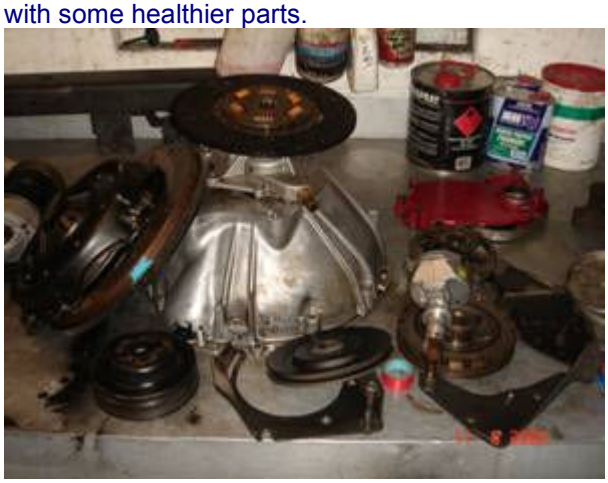

Oil pressure, distributor, filter and coil back on


water pump, EFI manifold and extractors fitted

Finally, on with the fly wheel, clutch assy that's been cleaned down with brake cleaner and lubed up the thrust bearing, then on with the bell housing ready for to go back onto the transmission..

Then on with the manifolds, the EFI manifold is customized to fit the older head and fits up nicely with the last of the new gasket kit. The 258 and the 4.0 motor have a lot of similarities, the lifters, sump, timing case, timing set etc are all identical and you can even interchange cranks to make a stroker 4.0 with the 258 crank. The bolt pattern it the same too as we proved recently changing in a 2000 TJ NV3550 5 speed in a very similar CJ. We'll write that jeep up another day.

The transmission had a little input shaft leak and at this point it's easy to lift the transfercase and the transmission out as one for a quick once over, we found another little issue with the shift rail when we looked down the shifter turret, and sine took the top off the box to see if we can refit the shifter rail with some healthier parts.

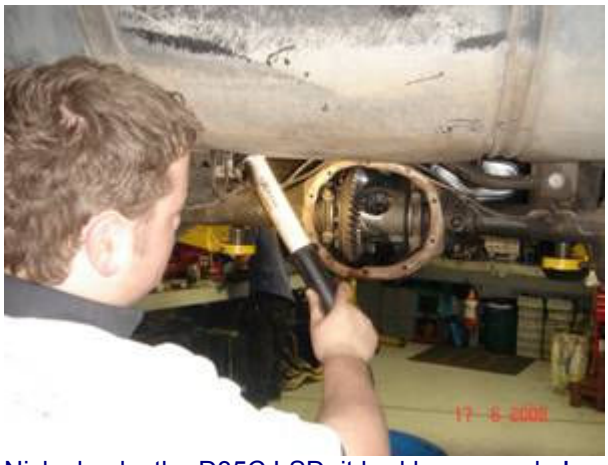


Tomorrow the motor goes back in with the transmission to be sorted out, we'll prime the oil pump by turning the motor over by hand with a fresh 5.7 liters of oil and filter and we'll be running in the cam as soon as it fires. That's 1500/2000 rpm for 10 minutes or so, and then we'll do an oil change and filter as the assembly lube used on the cam and lifters etc will have washed into the engine oil and any metal filings should be caught in the new filter. Then it's a test drive and back to the customer who's been without his baby for 3 weeks now.

In the meantime a WJ with a surging engine while towing gets a fresh external fuel filter/regulator, its 3rd since a bad tank of fuel fouled the first one, then the second one when we did as well as the in-

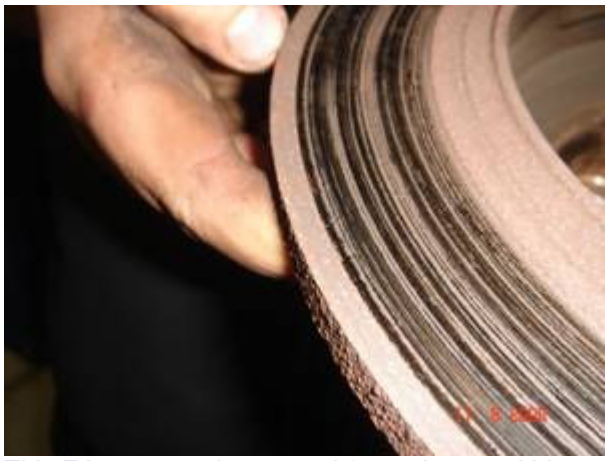
tank filter strainer that was extremely fouled, its common with fuel injected rigs, we get a lot of crusty in tank filters and poorly performing fuel pump motors resulting in a starving engine, particularly when towing. Unfortunately the WJ has no after market pump available or filters, unlike an older XJ with the external second filer and cheaper non gen pump and strainer kits. There a truck load easier too as the WJ has to come out complicated by tow bars and massive plastic bumpers where the XJ pump can be removed with the tank in position.

Another job this week is a ZJ that a bloke picked up cheap and in for a big service once over, we found the main problem this time was the rear axle assembly, the D35C has a bad habit of chewing the axles as the bearing rude hard on the axle, when you let the diff oil go the dogs the axles soon follow, they run on the same fluid and you don't give the axles a chance with steel ground into the oil. That 230Km ZJ had the usual leaking front axle seal, that means front axles out, hemi out and knocking out and back in the inner axle seals and making sure the axle itself has not grooved out where the seal runs. If it is worn we can run a speedy sleeve if on a budget or replace the axle all together. Speedy sleeved are fine stainless steel collars that can be driven onto various shafts to give a fresh surface for the seal to mate with. While those ZJ axles are out we'll have a good look at the CV boot and if it's shot non gen CV's are cheaper than just a Mopar boot so we'll go for new CV's.


Nick checks the D35C LSD, it had been run dry!


Rim damage to the front right wheel.

Tell tale diff issue with massive pinion leak


This ZJ rear rotor is grooved 2mm deep and history.

ZJ CV boot, the wet oil is an inner axle seal leak


The Patched up 4.0 manifolds are common place.

And finally, I had a weekend up in cairns to visit my old mate with his 78 CJ7; we took if from cairns to Cooktown up the coast road, we discovered that the tropics and nylon bushes in sway bars and shockers die sudden deaths on that road. By the time we made it back the poor old soft top was about to lift off on its own, we had a blast, thanks Ian.

The cairns crew and the blue kangaroo!

Ian airing down his nitro tyres! He's a pilot and tells me air craft tyres all run nitrogen, it doesn't leech out!

Ian, Simone (a TJ owner) and TW on the way to Cooktown.