Z32 300ZX Stock Turbo Rebuild using new

Center Housing Rotating Assembly (CHRA) from Z1 Motorsports www.300zx.com

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PARTS Required (Click Link for Website):

Garrett stock replacement CHRA from Z1 Motorsports	$448 per CHRA (1 required per Turbo)
Z1 4 Bolt Turbo Gaskets & Oil Feed Lines	$188

Tools Required/Recommended:

PB Blaster (you can use any bolt lubricant, but I highly recommend this one)
13mm box wrench (6 point preferably)
17mm box wrench and/or socket for oil line bolts
19mm box wrench and/or socket for cooling water line bolts
10mm box wrench (6 point preferably) or brake line wrench
0.090" or larger tip Snap-ring pliers
Needle nose pliers to remove wastegate actuator pin
Plastic Mallet
Vise

Disclaimer: Read this procedure completely before proceding. I am not a turbo expert nor do I purport to be one. Please note that you are doing all of the following work at your own risk, of your own free will. The author will not be held liable for errors or omissions in the procedure or any issues that might arise from this repair. If you don't feel comfortable following this procedure, take your turbos to a qualified shop. Some of the pictures may be out of sequence since I was a turbo rebuild virgin before this.

Zcar.com member: xmac

CHAPTER 1:

Disassembly of CHRA from housings

Goto next page

Start off by pulling the engine (http://www.ttzd.com/tech/enginetech.html) and removing both turbos http://www.ttzd.com/tech/turbotech.html . Once you remove the turbos, take many, many pictures of them PRIOR to disassembly. I took pictures as I removed every part, so that if I got stuck, I could always follow the sequence of pictures.

Before proceeding any futher (saving you time, effort, and your sanity) go get some PB Blaster at your auto parts store and dump half a can into every bolt, nut, snap ring, orifice and let the assembly sit overnight. I set mine with the exhaust side down to make sure there was blaster on the bolts at all time.

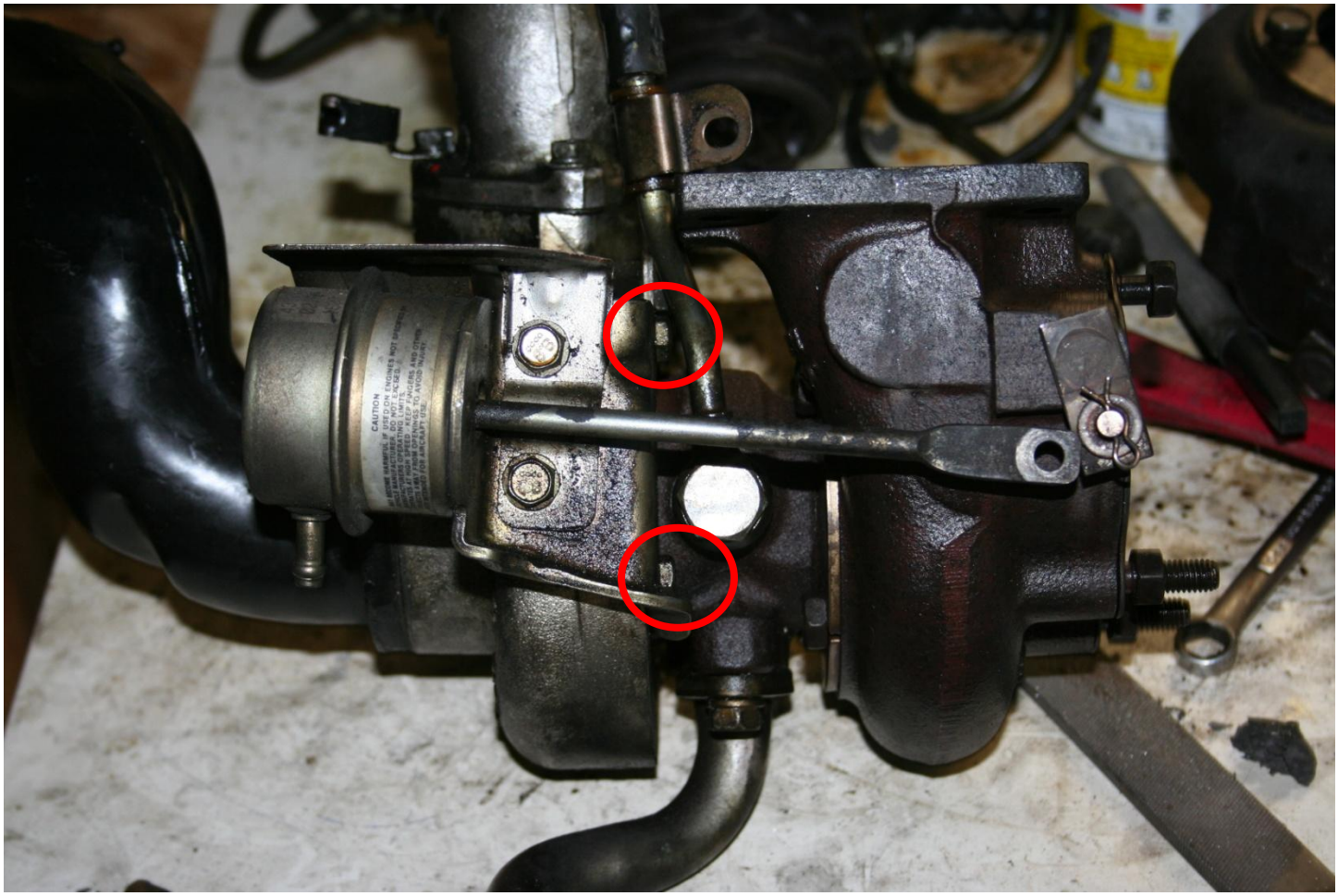
As-removed turbo assembly with inlet pipe, outlet pipe, oil drain pipe, wastegate, etc

Next remove all of the cooling water lines and oil lines including the oil drain pipe. Be sure to save the old copper gaskets if you plan to reuse them (Z1 reuses them as standard practice without leak problems).

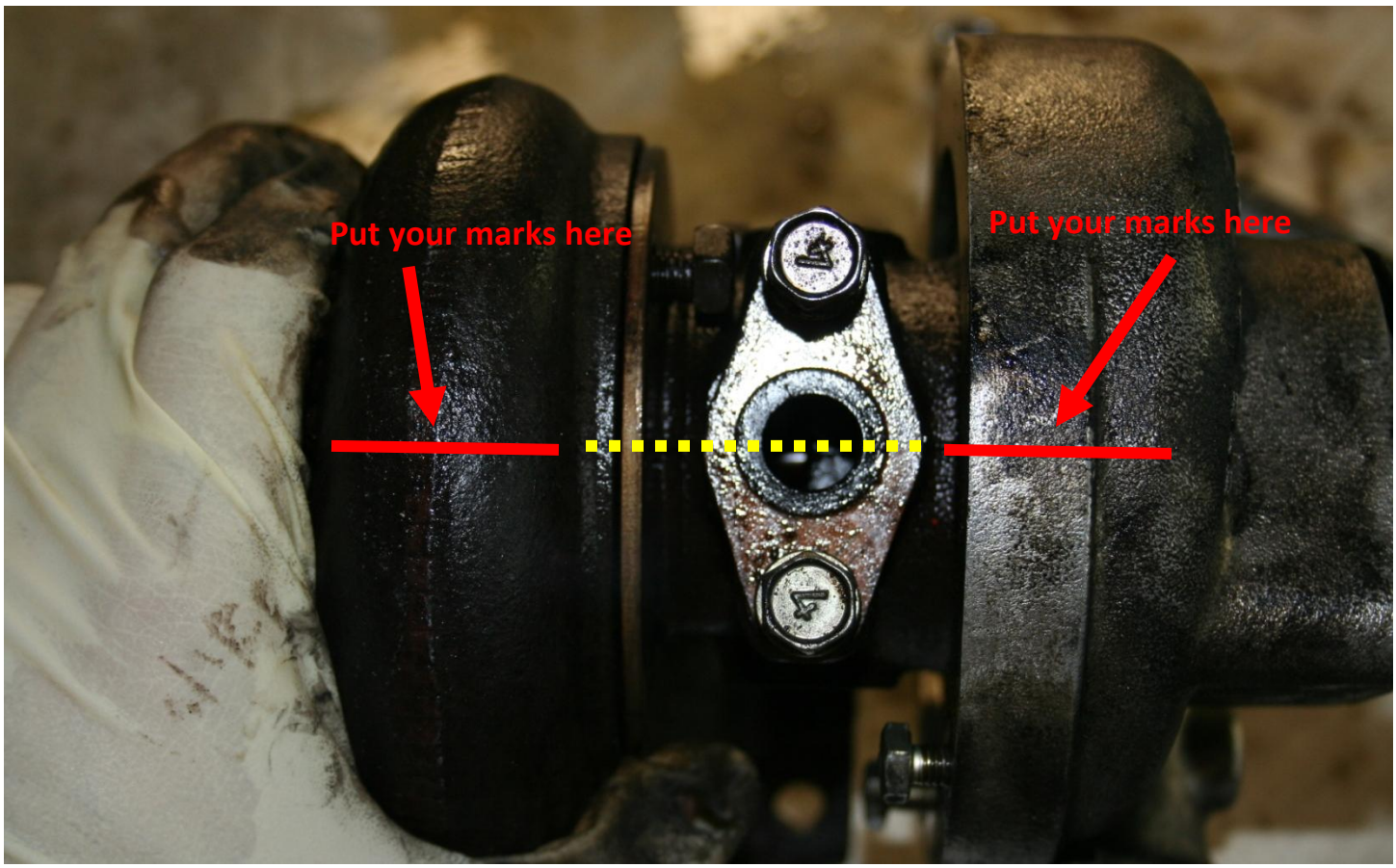
Take pictures and/or label all of the lines you remove to get the orientation right when you re-assemble. I also use the practice of re-installing the old gaskets on the mating surface with the bolts so that the surface doesn't get scratched while you move parts around. Don't use a sharpie to mark things, since you are going to dunk the parts in carb cleaner later. KEEP ALL OF THE PASSENGER AND DRIVER SIDE TURBO PARTS TOGETHER.

Now remove the piping for the compressor inlet & outlet. You should now have the turbo stripped down to the housings and the center section as below.

Next remove the c-clip or cotter pin on the wastegate arm and disconnect the linkage. Next, remove the 10mm head bolts holding the wastegate assembly to the housings - mark the positions. Save the pin and washer since you need to reuse them.



Before continuing, use a file or otherwise sharp object to mark the surface of both housings with respect to the CHRA prior to pulling the snap ring (once again don't use a sharpie). This will help you clock the assembly properly when re-assembling. I used the centers of the water and oil holes in the center section as a reference.



I also marked each housing as to whether it was Passenger side or Drivers side. Next, grab your 13mm box end wrench and remove the 4 bolts holding the turbine (exhaust side) housing. Mine were definitely tight and took some convincing to break loose, but the PB Blaster did the trick. After removing every bolt, you could see that the PB Blaster had penetrated into all the threads.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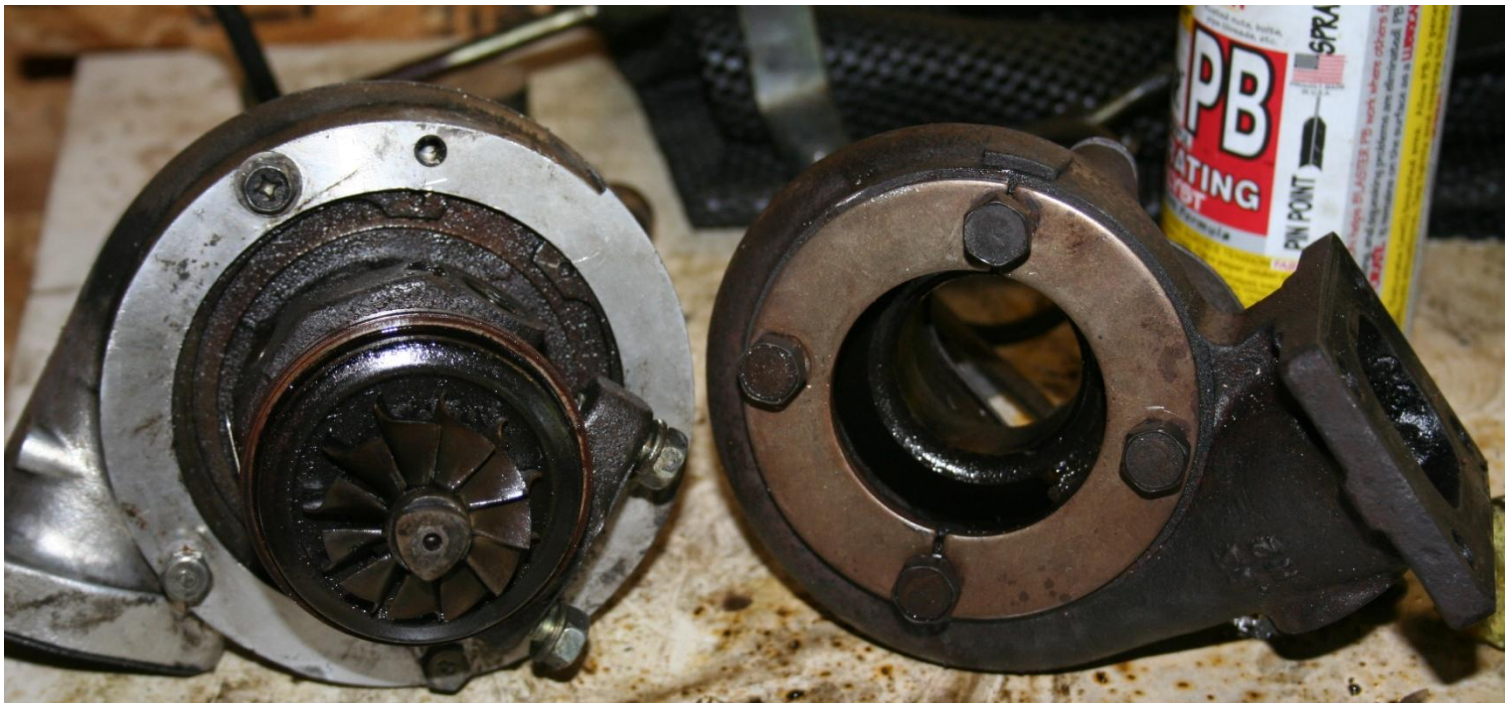
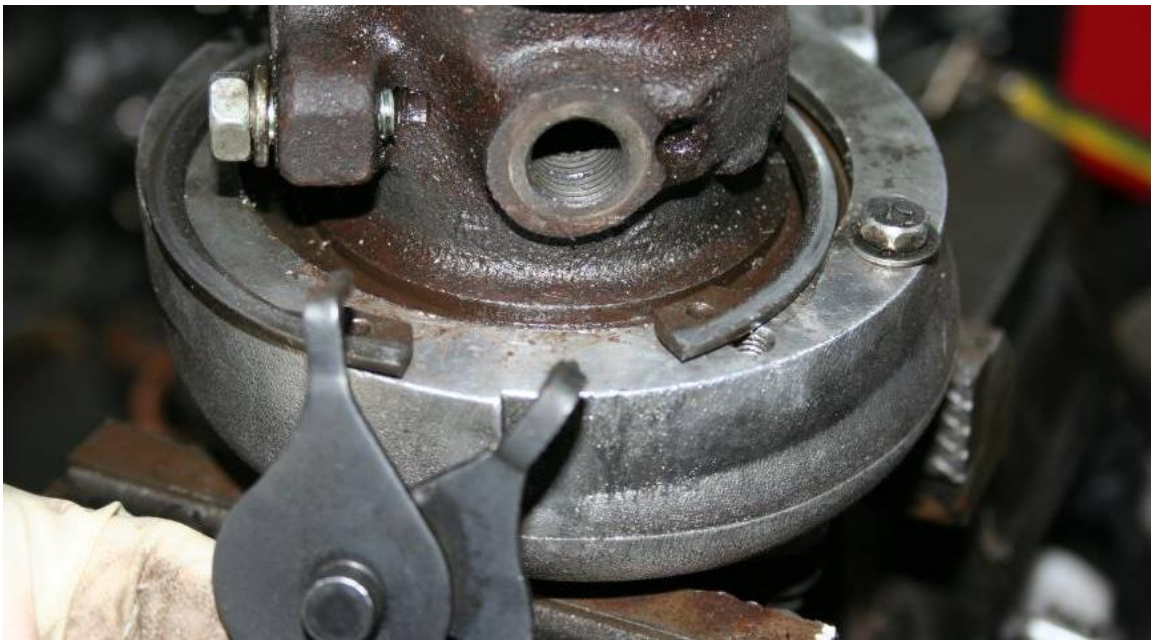
Loosen all of the bolts, but note that they cannot be removed until you hammer the housing slightly off of the CHRA. As you hammer, loosen the bolts in a repeated fashion to get the housing off. It took quite of bit of hammering with the mallet to get the housing to come off. Once removed, I made sure to keep the bolts in the same holes and the 2 half-moon holding plates at the same orientation. I'm sure it doesn't make a difference, but what the hell.

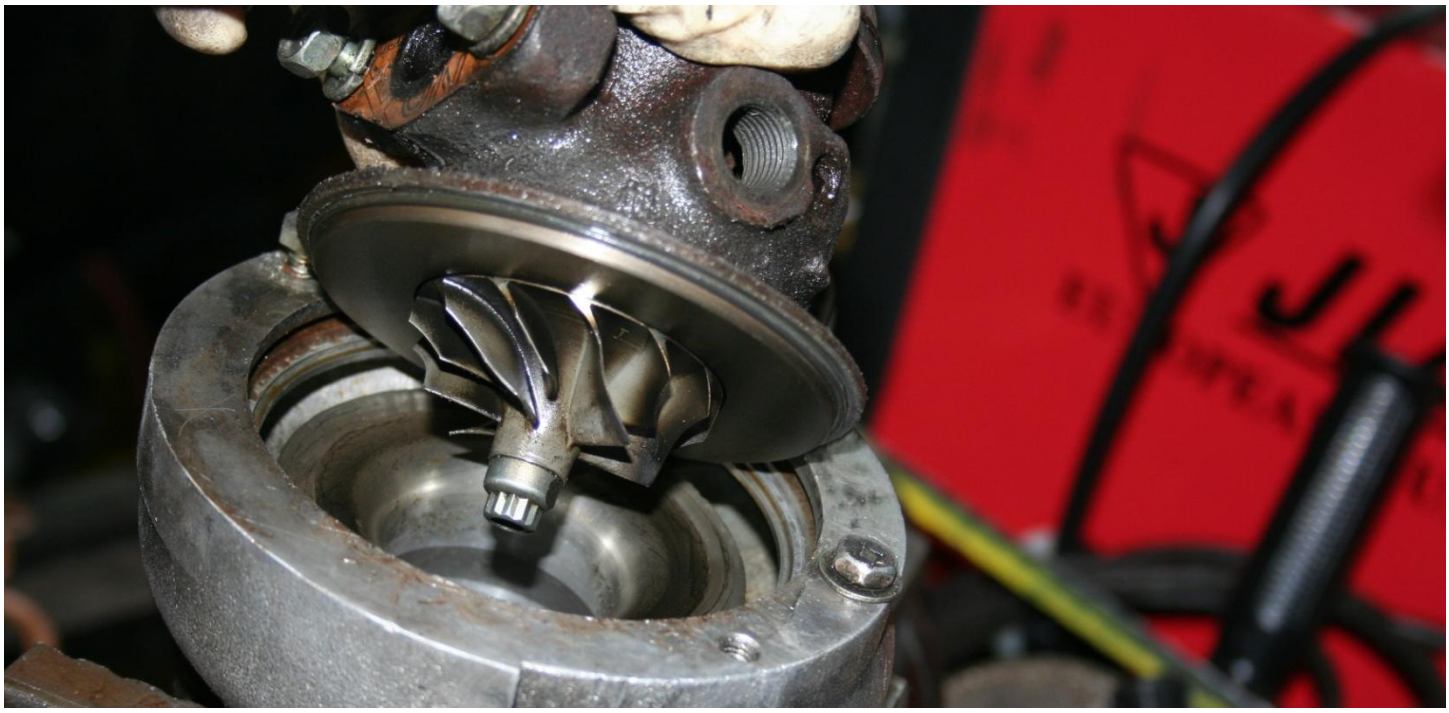


Now grab your snap ring pliers and place the compressor housing inlet in a vise with a rag to keep from damaging the surface. If you don't have a set of snap ring pliers, go to the auto store and get some. DON'T TRY ANY OTHER TOOL like needle nose pliers, garden shears, or anything other than snap ring pliers. I bought this set for $10 bucks at Kragens (a.k.a Checker Auto Parts).

Here's the part where you can feel free to cuss up a storm. This was the part that took the longest for me. Using the largest snap-ring pliers with the tips bent 90 degrees, fully compress the 4 inch snap-ring holding the compressor side (silver housing) in place. You have to compress the ring until the 2 ends meet before it will come out. Take your time with this part because it WILL be frustrating and try not to damage the snap ring. It took me a good hour to do this since the snap ring was rusty. Once you compress it completely, it can easily be removed.



You are almost finished with disassembly now. Hit the compressor housing with the mallet while holding on to the CHRA to pop it off the compressor housing. After about the 500 millionth hit, the housing will peel right off. Keep the housing over something soft so it doesn't get damaged when it falls off. Alternatively, hold the housing in a vise, and hammer off the CHRA.



Now remove you should be able to hold that powerful CHRA in the palm of your hand. I noticed that my inlet turbine was in pretty good shape, but my compressor (exhaust side) turbine had quite a bit of turbine damage. Next inspect the turbines and housings.

If your turbines have actually made contact with the housings (you should see many metal bits and grinding marks on the housings), don't pursue this rebuild any further. Once contact occurs, the diameter of the opening has changed and you have no choice but to send them out to be machined for a larger sized turbines (T25 or T28), throw them away, or make some trophies for your coffee table. Luckily mine were in decent shape and boosting 17psi, but leaking lots of oil into the plenum.

Now follow the same procedure for the second turbo if you are doing both (highly recommended). Keep all the parts from each turbo together for easier re-assembly and clocking later.

When completed, you should end up with all of the parts as below. Not bad for a few hours of work.

Before re-assembling, dunk the housings into a gallon can of Carburetor cleaner. This will get the grease and crap off of your housings. It will also remove carbon deposits from the compressor side. I left them in there for a couple of days due to the amount of grease/buildup.

I like the Gunk Carburetor and Parts Cleaner simply because it works and because it is easy to get at the local auto parts store for about $20. Just in case you are worried, it is OK to dunk the aluminum compressor side housings. However, make sure you remove all gasket material before dunking, otherwise it will get dissolved into sludge. I also took some 1000 grit sandpaper to smooth the openings and knock down any bumps after degreasing.

CHAPTER 2:

Re-Assembly of CHRA to housings

Goto NEXT page

Here are the new CHRAs. Not that it makes a difference, but notice the slight design change in the oil outlet flange. The CHRAs came very well packaged including a new oil drain gasket and installation/startup instructions

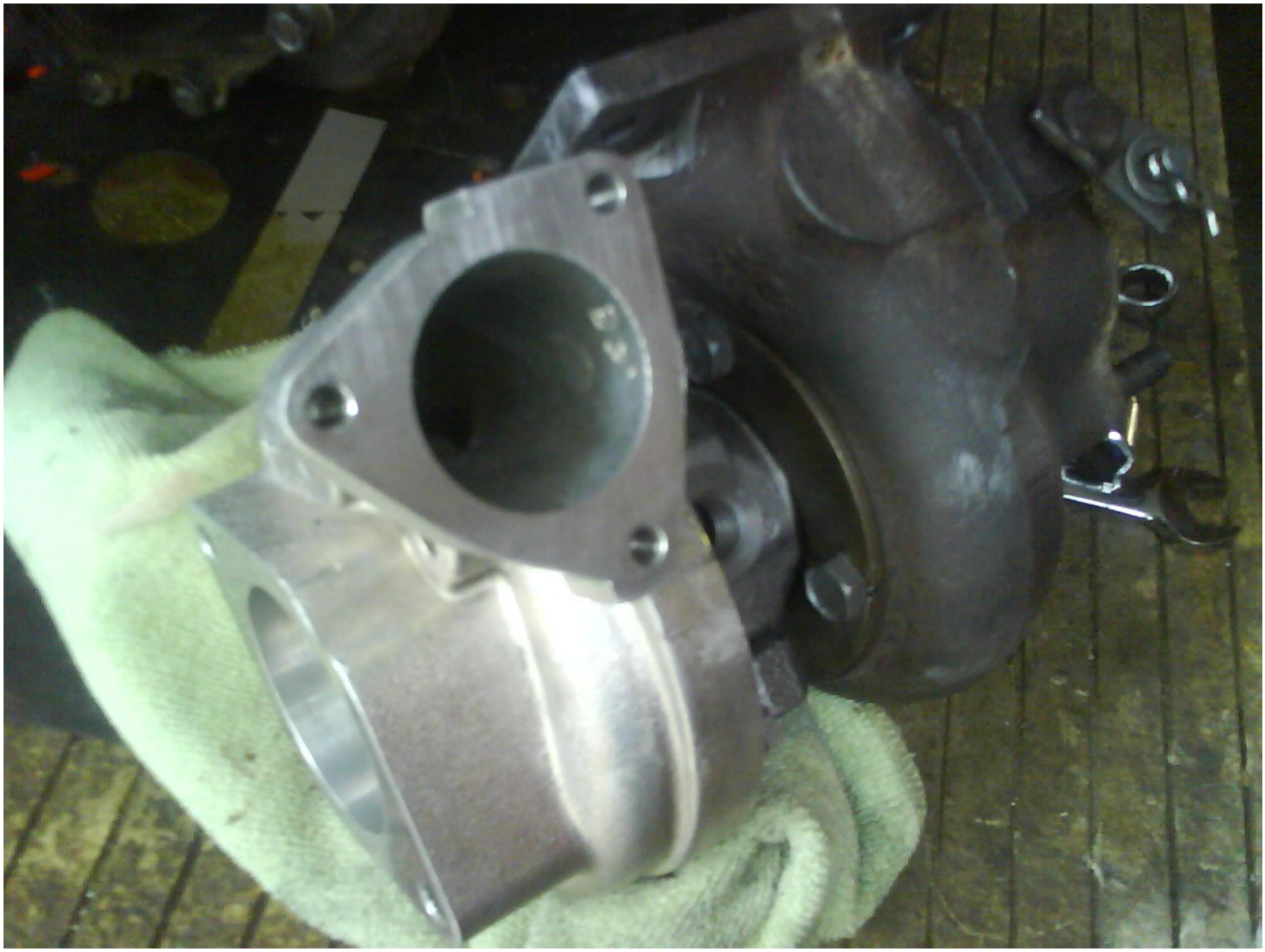
Start by removing the oring on the outer flange of your old CHRA’s and place it onto the new CHRA.

Next, place the aluminum compressor housing in a vise and look for the alignment marks. (This is where pictures of your dis-assembly will come in handy) Find your scratch marks on the housing and clock the CHRA properly. Then place the CHRA into the flange. Pull out your large snap ring pliers, compress the snap-ring and lock the CHRA in place.

Now get your half-moon plates and bolts for the turbine side. I applied anti-seize on the bolts:

Place the turbine housing alongside the CHRA. Get them close enough to put the half-moons on and start the bolts. You may need to rotate the CHRA to get some of the bolts started. Make sure you mate the correct housings together since the wastegate levers are slightly different between the drivers and passenger sides.

Once you have all of the bolts started, rotate the housing until you align your marks again. Now tighten the bolts. Unfortunately you can't get a torque wrench in there, so tighten the bolts as evenly as possible. I believe the spec is ~30 lbs-ft, so snug them down good.



Before going any further, spin the turbines with your hand and make sure they spin freely. If you hear any grinding –STOP! Check to make sure everything is aligned properly. Mine spun nicely with no wobble, no slop like the old units.

If your turbines spin freely, you are almost done. Next, loosely install the piping/plumbing parts and wastegate on the CHRA using new gaskets from the gasket kit.

Now take the assembly and place it on your engine. If there are no interference issues, you are done. Otherwise, depending on the interference cause you'll need to make trial-and-error adjustments, it may be as easy as loosening the snap-ring and rotating the housing:

Follow the tt.net turbo replacement procedure to re-install the turbos on your engine using new oil lines. I opted to replace the oil drain lines since they were only $8 each. As per the instructions, I poured some oil into the CHRA and

spun the shaft to get some oil in there. Also, prior to starting your engine, pull the fuel pump relay and crank the engine over several times prior to starting it. This will get oil into the oil lines and pressurize the CHRA. This is CRITICAL to the longevity of your turbos. Good luck!

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