As most as you know, a lot of BMW wheels, stock and aftermarket, use the 5x120mm (4.72") bolt pattern, and our GM vehicles use the 5x120.65 (4.75) pattern. The use of wheels with the BMW bolt pattern on vehicles with the GM pattern is quite common, and like many other things, there are people on both sides with strong opinions as to whether this is a safe practice or not.

I have found it very hard to find proper wheels to fit my 3rd gen without using the wrong pattern, or using large bolt on adapters, of which i am not a fan. I have found may different BMW wheels that i really like, at the right price, but the whole idea of using the "wrong" bolt pattern on my car, and the possible results are just not acceptable to me. While i have never personally seen a car loose a wheel because of this small difference is PCD (Pitch Circle Pattern, aka bolt pattern), i have heard many horror stories and seen many threads/pictures over the interweb of this possibility.

I had been looking for new wheels for my 92 since last summer, and while i want to use wide 18" wheels front and rear, my only real options were pricy 3pc wheels, or custom 2 and 3 piece forged wheels, and honestly i did not want to spend 3k on wheels for a car that i will be driving almost everyday, 9 months out of the year. I found a few options that look good and were in a much better price range, under 1500, but they always had the wrong bolt pattern, wether it be 5x120, or 5x4.5".

One night, by dumb luck i stumbled on APEX wheels, specifically the ARC-8 mesh wheel. Light weight, rotary forged barrel, an offset that is favorable for a 3rd gen (at least on the back) good looking and in the price range that i wanted. Yet they are only available in the 5x120 pattern. I decided to say screw it and bought a set through a GP on Bimmerfourms. Ended up with a great price, just over 1k for 4 18x10.5 wheels shipped to my door.

Here they are with my new brake setup

This began my quest to "correct" the wheels to the proper bolt pattern. Seriously, its only .65 mm, each stud is only .325mm off, so i figured this had to be possible by just re-cutting the 60 degree taper seat in the wheel in the proper location. I would have to cut the seat a hair deeper to remove

the entire old seat and make a new seat for the lugs. Since its such a small difference, it seemed like a good idea, and totally in the realm of possibility.

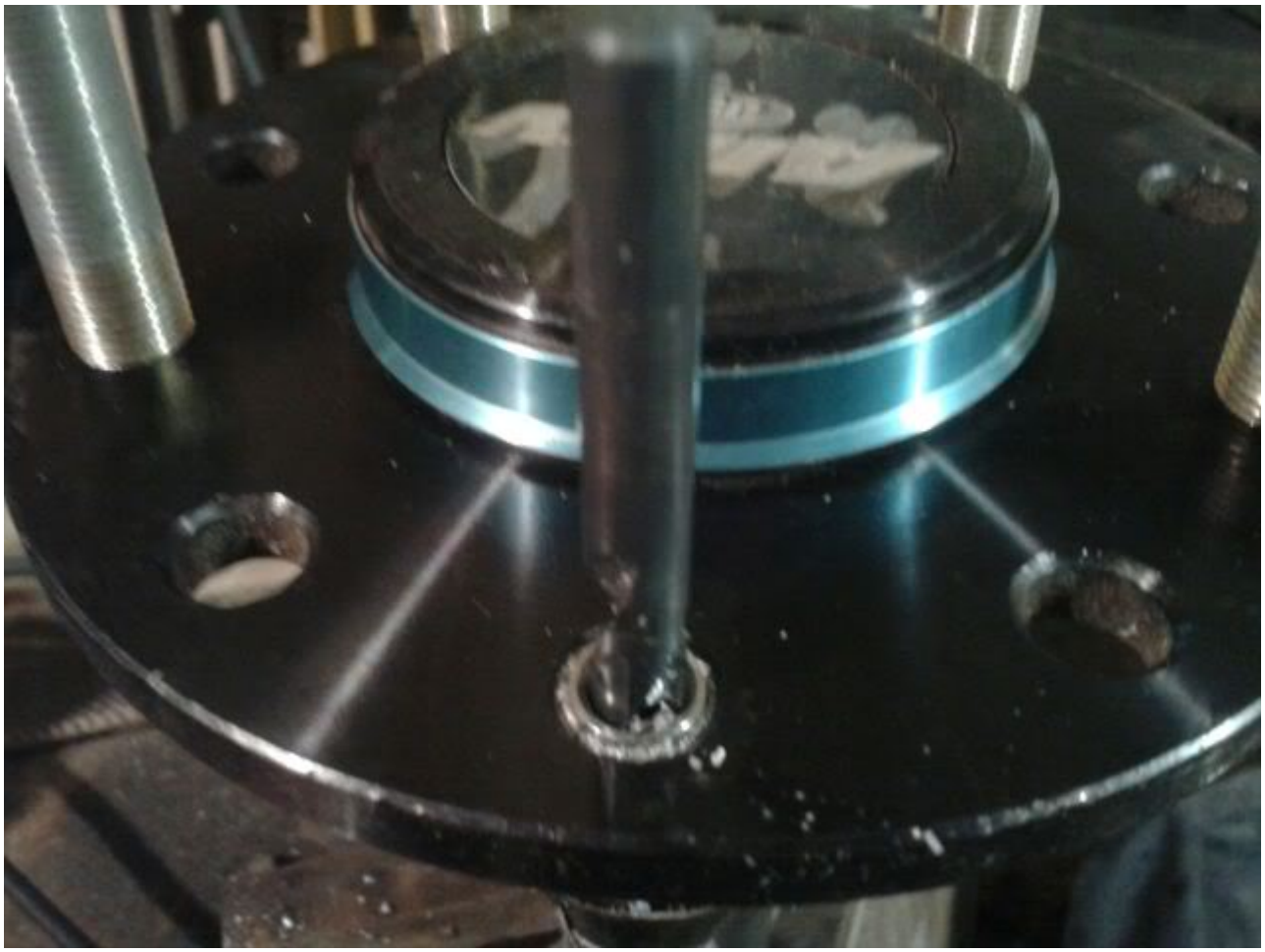
I searched the interweb for literally weeks, over a month really, various sites, boards, ect trying to find somebody else who had done this, i found nothing, and no useful info. I looked for wheel companies to do this work for me, but i was told it was not possible, and i would have to have the lug holes machined out and have steel slugs pressed into the wheels with the new pattern. It would work, its apparently common, but it can get expensive with shipping since nobody locally to me can do it.

I was about to saw screw it again, and just bolt the damn things on and go, admit defeat, and move on. But by dumb luck i stumbled on automotive head valve seat cutting tools on ebay, and they are available in pretty much any size imaginable and, more importantly, are available in a 60 degree cutting angle. This opened the possiblily of doing this work myself, so i ordered one.

So with that out of the way, i needed a way to pilot the cutter in the lug hole. I ordered some basic drill pilots from Mcmastercarr, threaded externally to 1/2-20 since i have axles with threaded studs available to use. They have a close enough ID as the pilot of the valve seat cutter, so i though i had it done. Parts arrived and i find the drill guides are left hand threaded, and are not available in right hand thread. Back to the drawing board. I was going to head over to a machine shop and have them make me something when i made another accidental discovery. The pilot of the valve seat cutter is .297", which is pretty much 19/64. With dumb luck on my side as usual, i found that 6AN plumbing fittings have that EXACT ID on the flare side, amazing coincidence! So all i had to do was stop by the speed shop and buy a 6ANx1/2-20 powersteering adapter fitting, and once i drilled the 1/2-20 side out since it was a little smaller, i had a cheap, perfect drill guide.

So finally, the leg work was done and i could attempt to convert the wheels.

The plan, use a axle shaft i recently picked up off TGO as my work stand, threaded in 4 of the studs, and my guide into the 5th hole. Added the hub-centric ring to match the wheels and i was ready to go.



Re: BMW wheel bolt pattern/PCD correction, 120mm to 120.65mm

The entire setup, excuse the mess, its been a long winter....

ok, ready to start, and either trash a wheel, or achieve greatness.

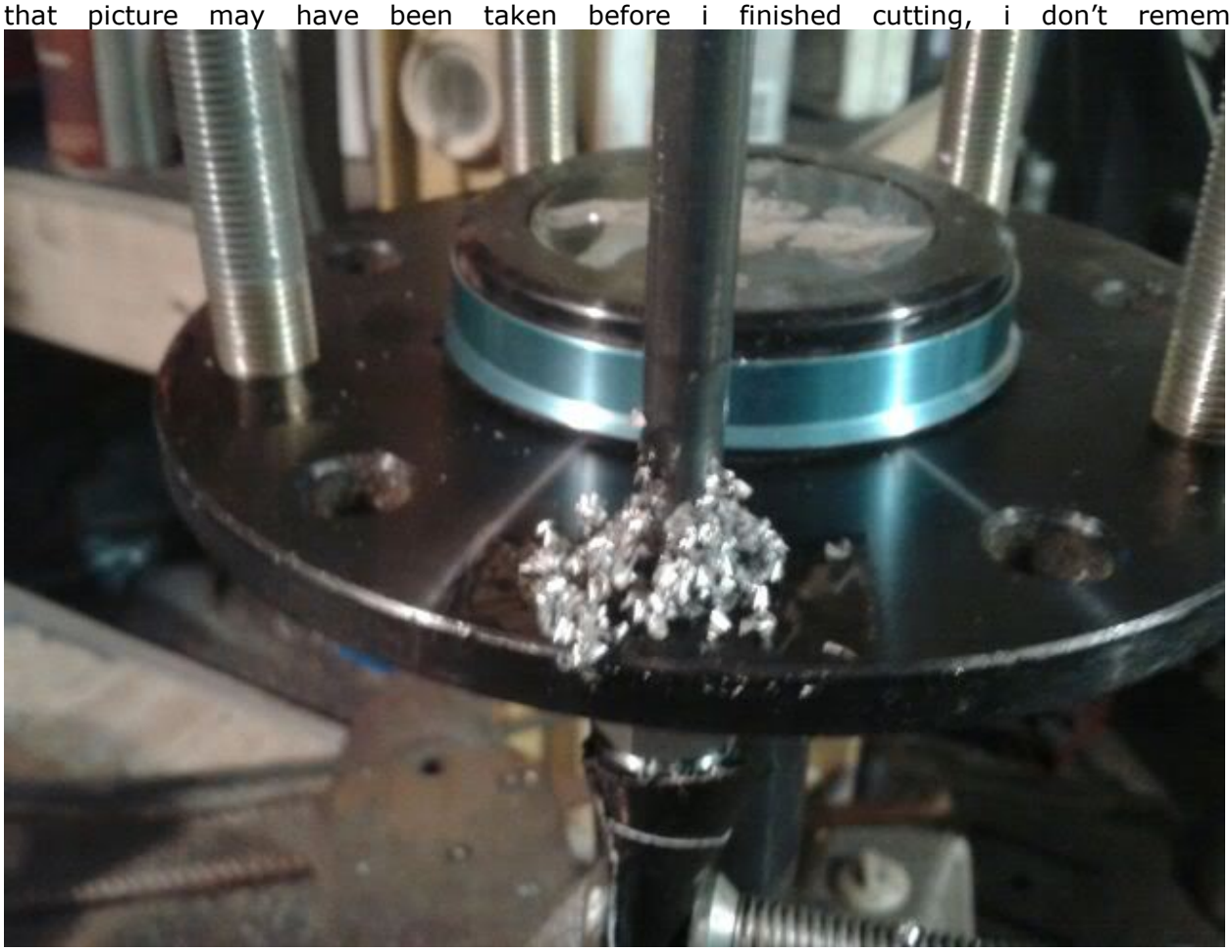
I placed the wheel on the axle, located by the hub ring, lightly and evenly tightened 4 of the lug nuts to just hold the wheel from rotating, and began.

I cut the first seat by hand, used a ratchet, and some wd40 to keep the aluminum chips from sticking and clogging up the cutter head. Took me 30 minutes to cut one seat, thats nuts, i have no patience for that, so i did what everybody does in that situation, POWER TOOLS!

against my better judgment, i grabbed my cordless drill, chucked the bit in and continued the job, drilling very slowly, and keeping everything lubed.

this worked very well, better than expected. took about 15 seconds to re-drill the seats, and probably 6 minutes each time to remove all the lug nuts, clean the chips up and move to the next seat, bolt i back down ect. After the first seat was drilled, that lug would locate the wheel by itself and the other studs were just needed to keep the wheel sitting flat on the hub, after 2 were done, i was in business.

the seat is smooth as glass, the discoloration is wd40/chips, and crap.. It all wipes off. Honestly, that picture may have been taken before i finished cutting, i don't remember.



Last edited by //<86TA>\\; 03-28-2012 at 05:08 PM.

#3

Re: BMW wheel bolt pattern/PCD correction, 120mm to 120.65mm

here is a lug nut, just tightened to where it contacts the wheel, you can see the gap between the lug and the seat because of the difference in PCD. This gives you a better perspective of how large the difference is. Its more than most people think i believe. I would seem to me that once the lug bent to fit the taper, the nut would be seating on a slight angle, so the surface area of the taper of the nut vs the wheel would not be correct, resulting on very little contact area between the two. Possibly the reason some people mention the nuts not staying tight.

here is the pilot in the lug hole, you can see that its more toward the outside of the wheel.

cutter sitting on the guide

once hole cut already, locating the wheel for the second

finished product

All 4 wheels finished in a little over 2 hours of work. I can order tires now!

Over all, not terribly hard really, however, having the threaded axles made life a lot easier. I would have had to have a press in stud machined into a guide if i didn't have these. It would still work but would have added some cost.

The valve cutter, 6AN fitting and drill bit cost me just under 80 bux. Worth every penny to no longer have that though in the back of my mind of a failure. The hub thickness of the wheel is the same as it was when i started, so no loss of strength in the wheel, and honestly, since the 60 degree tapered seat is wider now since the cutter blended the taper to the flush top of the hub where the original didnt, if anything they are stronger since the lugs seat more.

Its amazing what can be done for a couple bux with a little backyard, ingenuity. Maybe a small project for some of you guys to try sometime.