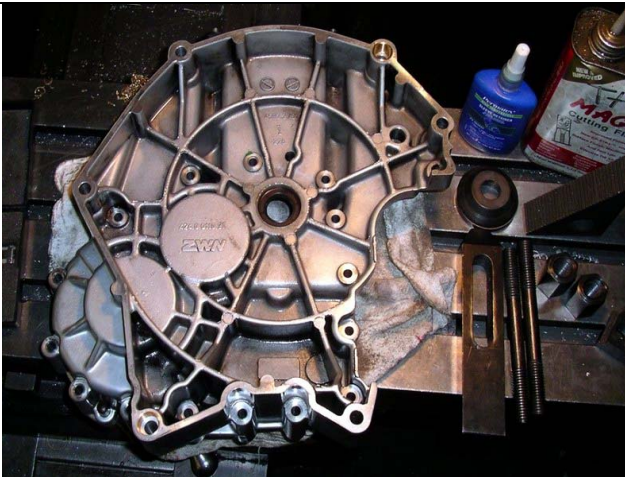




bushing pressed in place, boring inside diameter to 13.52 mm



both dowel bores offset and bushed to size



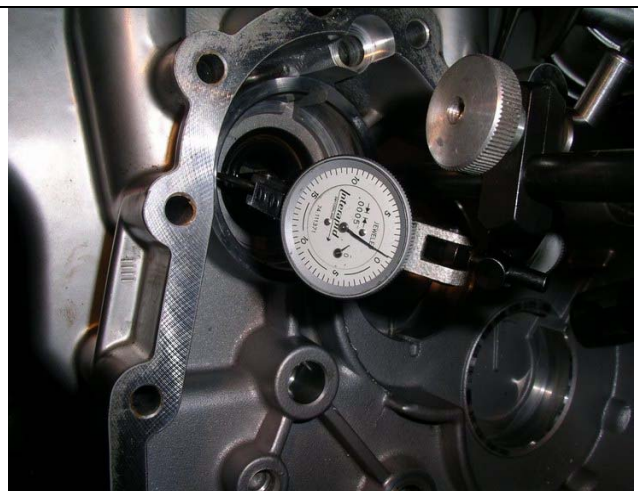
closer shot...



and closer...



zeroed at 12 o'clock



-0.0009" at 9 o'clock



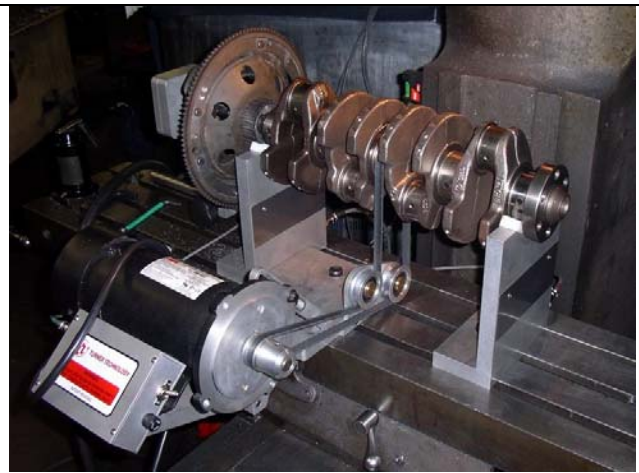
-0.0006" at 6 o'clock



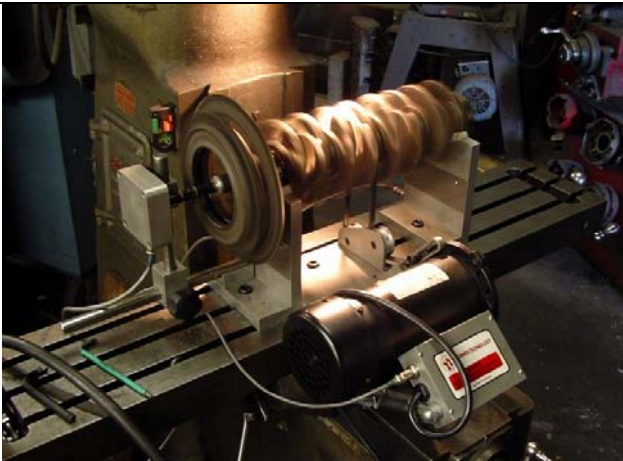
-0.0001" at 3 o'clock



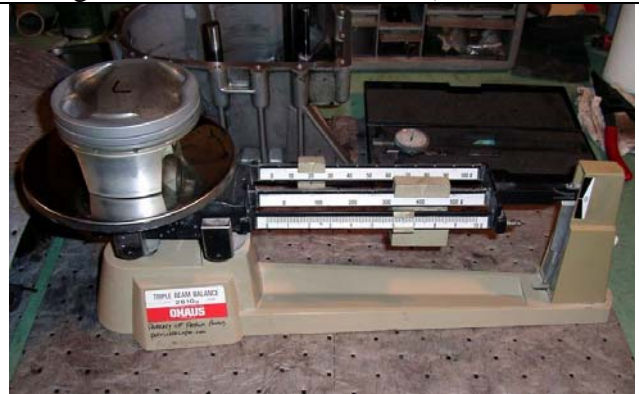
back to zero at 12 o'clock input shaft is 0.0004" to the left of and 0.0003" under the crankshaft



Flywheel and clutch mounted to a VW Golf crankshaft for spin balancing. (I didn't feel like taking the crank out of the bike...)



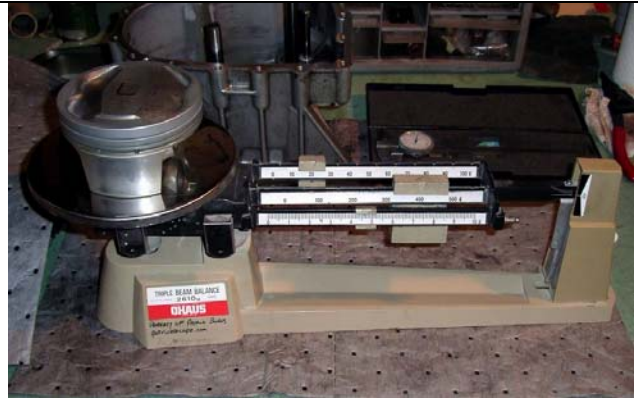
Spin test. You guys should get a kick out of this. Someone suggested I balance the clutch parts after that machine work. The balancer I have access to is a crank balancer, not a dedicated flywheel balancer. But I didn't want to pull the crank out of the bike just to do a spin balance. So I modified a crank gear on a VW 2.0 liter crank to fit the R1100S parts.



left piston is 426.5g



right piston is 424.2g



losing weight is hard
424.7g... it is half a gram tolerance

One piston was a little over 2 grams heavier than the other, so I did a little work and lightened it up almost all the way. Didn't want to knock too much metal out of the wrong places, so I stopped when I got it to within half a gram of the other.



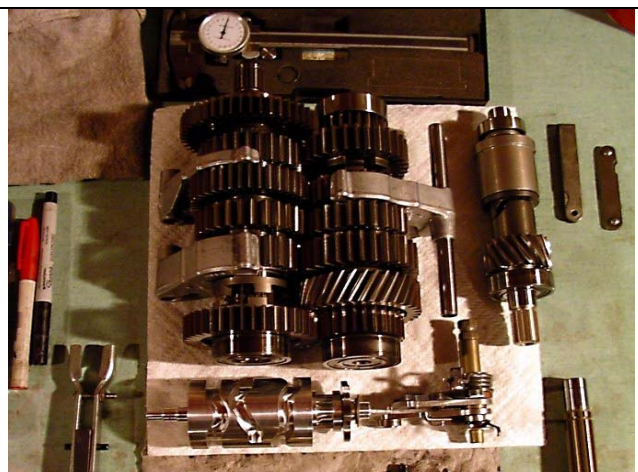
popped the seals off the bearings...
not much grease left in there 😬



that's better 😊



good as new(ish) 😊



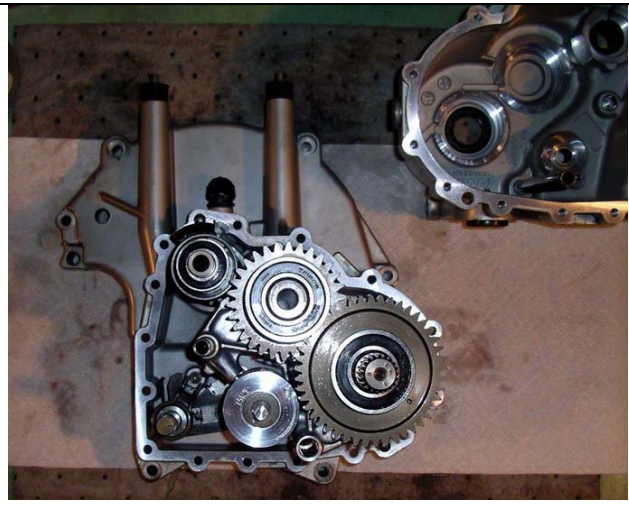
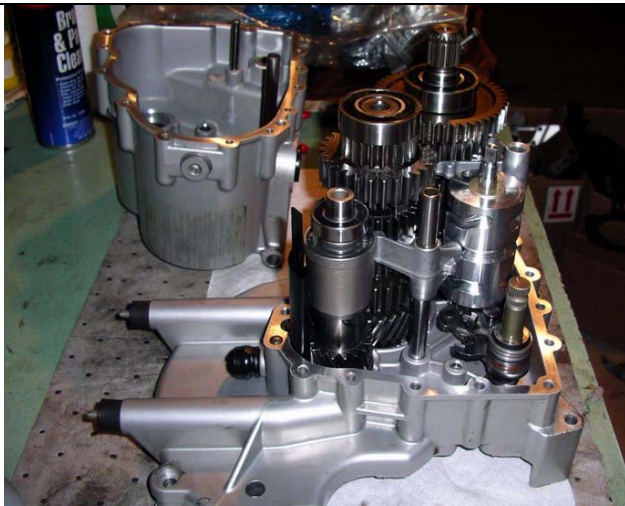
all the bits are cleaned up and ready to go



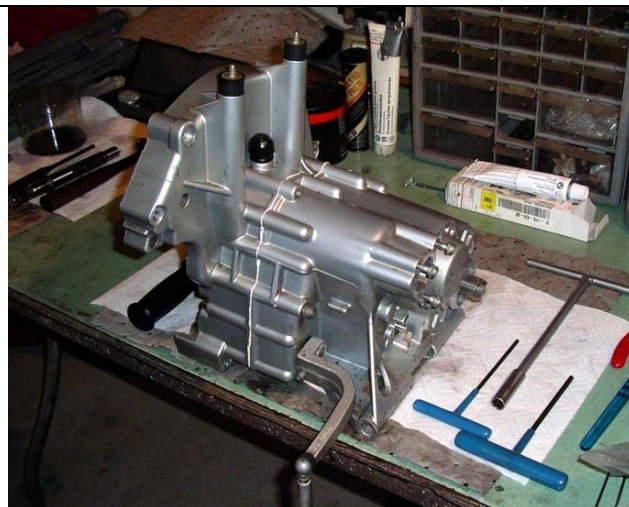
so shiny!



front case took a detour through the oven for a bit so I could slip the bearings into place



rear case visited the oven too all buttoned up



hey, what's this extra gear I have left over...
ah, probably don't need it *toss*



prepping the valve seats



with a wee bit of port work



just a light swipe with the die grinder...

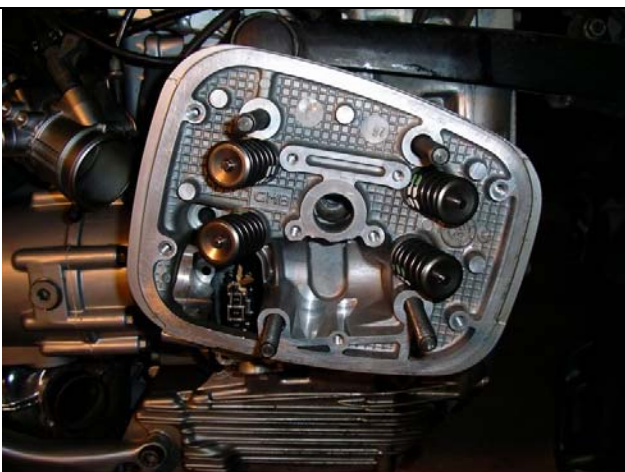




manual says "always install right cylinder first"
okay, sure... piston and cylinder installed



head all clean and spiffy, ready to go



almost done, valve gear installed, and verifying
accuracy of TDC mark on flywheel

Bob Hancock **21 Dec 2007** **R1200S**

Great #2 post Patrick! Where do you live? Can I stop by?

Do you have a suggestion about how to clean up the heads on the inside without taking them somewhere to blast? I've got some Ducati heads that could use some of that. I'd prefer to use something that doesn't require changing out the valve guides.

Fasterpatrick **24 Dec 2007** **R1100S**

What's shown in those pictures is to use an oxy/acetylene cutting torch to cook the carbon.

It's sort of like using a self cleaning oven. But you probably don't want to practice on good heads, because if you botch it up, you can easily melt valve seat inserts, or iron valve guides, because... well... you are using a cutting torch.

When you're done with that step, let the head cool a bit so you can handle it, then blast it with baking soda. You wouldn't want to use sand or glass beads, because you'll never get all the abrasive out. But with baking soda, when you're done, just wash the head in soapy water and it all dissolves and washes away.

This is the gun I used for that:

	<p>http://www.thetoolwarehouse.net/shop/UNI-007.html</p> <p>Unitec 007 Gravity-Feed Hand-Held Sandblaster</p> <p>\$40.95 On Sale!</p> <ul style="list-style-type: none"> • Fast and easy to use • Lightweight and perfectly balanced • High efficiency design with adjustable control valve to change amount of abrasive used • Long-life ceramic Nozzle • Neon red body with black pistol grip
--	--

As far as using something other than a torch and baking soda blasting... *shrug* scrape it out and use some carburetor cleaner on the rest I guess. But you're not going to get it as clean as with a torch and baking soda.

Signit98 **22 Dec 2007** **R1200S**

Ah, Bob... once you have the heads off, you may as well change the guides and do a wholesome job... it is not THAT much more work, but it will add some extra "insurance" if you will...

I'd be careful with blasting them... that can create all sorts of issues.

Pmc847 **22 Dec 2007**

Patrick, pull those rods and have them balance and install new rod bearings. If you are going to re-use the pistons have them balanced too, better yet get SJBMW 12:1 HC pistons. Even if you don't port the heads at least match the throttle bodies to the rubber mount and rubber mount to the heads.

Peter Parts **22 Dec 2007**

With that degree of wear on the spline, do you think the wear could be detected shaking the rear wheel in a high gear or is there just too much normal tolerance between the wheel and the clutch? Can you feel it through the gap with the starter motor removed? Any way besides tearing apart?

Your comment about Honda Moly grease: are you saying there is wear despite the visible residue of that grease?

Fasterpatrick **24 Dec 2007 R1100S**

I doubt you could discern that free play at the rear wheel. Maybe, but I doubt it. There's a bit of backlash in the gear dogs too. But yeah, pulling the starter off, maybe if you pulled in the clutch lever to push the pressure plate forward, and reached in to spin the clutch disk back and forth, you might be able to discern between play at the splines from the gear dog backlash inside the trans from that end. That's a good idea.

I cleaned the splines of the disk and shaft, used a brush to evenly coat them with Honda Moly 60, and you can see the wear after 23k miles more.

So I think lack of lube or quality of lube is not the root problem here.

Bob Hancock **24 Dec 2007 R1200S**

Well since I don't own a torch and have never used one and these are good heads I guess I'll just clean them up with plan B. Thanks though.....was wondering how you got them so nice.

Yeskino **25 Dec 2007 F650GS '01**

Walnut shell use to be a very popular blasting medium for blasting inside engines. There has been a lot of dry ice blasting for paint removal, but could be an effective blasting medium as well.

Both would eliminate the reside issue.

DavidSoine **26 Dec 2007 R11S '99**

Interesting work! How was the indicator stand trued to the crank centerline? (I'm no machinist).

Fasterpatrick **26 Dec 2007 R1100S**

It doesn't have to be trued to the crank. All it has to be is solidly attached. Spin the crank, and the stand spins in a circle with it. The indicator follows a circle too, and if that circle is concentric with the bore you're trying to measure, all is happy and the indicator reading doesn't change all the way around. If it is not, the indicator will tell you how far out of line the two are.

Something I did not take into account when I first did this, was the crank to main bearing clearance. Someone on the ibmwr tech list pointed it out to me and I had to go back and take the measurements again while wobbling the crank around in its bearings, then move the bushing inserts again.

So it was a little more work than indicated in those photos, but still, stock it wasn't lined up.

But the difference was more like 3 thou than 5 thou.

Peter Parts **27 Dec 2007**

But once the hard parts wore down 3 or 5 thou, wouldn't they then be sitting pretty?

Roger Albert **27 Dec 2007 99 R1100S**

Jeez no. That's just more slop and more misalignment (albeit possibly slightly slightly less binding) and thus still more wear.

JonyRR

26 Dec 2007 R1100S '99

A soda blaster from eastwood (www.eastwood.com) is the ticket for easy carbon removal. I just bought the gun (it's different for soda than for other media) and use my existing tank.



Soda blasting is a method of abrasive blasting that uses baking soda (bicarbonate) as the media. Why choose soda blasting over conventional abrasive blasting?

- * Soda Blasting is safe to use on metal, fiberglass and more Watch video on how this works
- * Cleans & Degreases: removes paint without damaging or warping metal
- * Leaves a protective film that wards off flash rust for up to 3 weeks.
- * Does not require masking-off glass or chrome
- * Soda Blasting is the environmentally "green way to blast"
- * Cleans up easily with a garden hose



Eastwood Soda Blaster Imported
Only \$259.99

- * Converts between soda blasting and abrasive blasting in less than 15 minutes
- * Welded top-loading hopper & pressure gauge
- * 8' blast hose with deadman valve
- * 100 lb capacity hopper
- * Requires a minimum of 7cfm at 80 psi

If you do the ports consider extrudehoning them (<http://www.extrudehone.com/>)



Extrude Hone is dedicated to innovating and providing advanced manufacturing processes to produce some of the highest quality engineered surfaces and edges on the planet.

A menu of technologies and equipment for deburring, polishing, and producing controlled radii are available to our customers for improving the strength, performance, and overall reliability of the components they produce.

Roger Albert

27 Dec 2007 99 R1100S

I've used soda in a cheap generic small handheld regular media blaster from harbor freight to very good results. A purpose built one with smaller jetting might be better, or maybe run longer on the same amount of soda, but a regular one works very well. Great for carburetors, and really old vintage and brass fittings.

I've never had luck with walnut media. I've tried two different grain sizes with a bunch of different orifice sizes in a pressure blaster, and have never gotten by w/o nearly instant clogging.

Pmc847 **08 Jan 2008** **R1100S**

Even if you don't port the heads at least match the throttle bodies to the rubber mount and rubber mount to the heads. There you go. Now for the TB to the boot to the head.

The black line is how much more I had to remove to match the boot to the head. First you have to match the TB to the boot then to the head.



What do you think about the TBs?
Nice step in front of and behind the butterfly, not great for flow. I had mine bored.

Fasterpatrick **08 Jan 2008** **R1100S**
Did that.

I'm leaving the throttle bodies alone. I know the person who rides the bike, and that's exactly where the line between easy gains and decreasing returns lies.

Nice work on the throttle bodies though. Did you taper them all the way to the throttle plate and back out again, or make bigger plates? What'd you do for mapping after?



Pmc847 **08 Jan 2008** **R1100S**

The butterflies are about 2.5 mm over stock. The bore tapers from 51mm down to 47.5 mm at the heads. I have not remapped. Using Laser chip and 3.5 bar pressure regulator I get 225 psi cranking pressure on a hot motor.

Fasterpatrick **12 Jan 2008** **R1100S**

Finished bolting it together and took it for a spin today. Runs good.
Cylinder and piston in place, head ready to go. Didn't stop to take pics of installing the cylinder due to oily hands and time of the essence when working with Hondabond sealer.
Left side done, valve gear installed, verifying TDC mark accuracy on flywheel.