Tech Stuff

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Tech Stuff: Oil Pumps, Oil Pans and R25â€™sOf all the oil pumps from R24-26 models I've inspected, everyone was worn way past acceptable limits. I ran the R25/3 I recently assembled and watched for oil to come up into the valve cover area. It was sort of like waiting for a ninety year old man to empty his bladder....nothing was happening.Â (I now know what I have in store for me).I then pulled the oil pump out and inspected it. (I should have done this before I assembled the engine). The manual calls for a maximum run out between the teeth of about .001". Out of the four pumps I have, they all read between .0085" and .013". Most of the problem comes from wear in the gear shafts and shaft bores. The gears wobble around inside the pump housing allowing about half of the oil to escape around the pump gears.I think I can save these pumps by sleeving the bores and replacing the gears.By the way, the pumps supposedly came in 9 mm depth gears on the earlier singles, and changed to 10 mm depth somewhere in mid production of the R25/2. The extra millimeter gave better lubrication to the engine, and later, made allowance for the drop in pressure because of the addition of two small ports in the bottom of the cylinder on the R26, which was fed directly off the oil passage to the upper gallery.That these pumps are prone to wear, might well explain why many singles have failed over the years. Another possibility might have something to do with the psychology behind owning a single versus owning a twin.Â Â Consider this scenario: â€˜Papa bought the old R25 when it was a year old. The owner sold it, because he could then own a more powerful twin. Papa rode the R25 for two years until he could afford to buy a second hand twin. The resale value of the R25 was at that time so low that Papa decided to put it away in the barn. Maybe someday little Stefan would like to ride it. Yeah sure, it would become Stefan's first bike.â€™Stefan inherited the R25 ten years after Papa put it in storage. With a new battery and fresh gas, the bike would still run. Because Stefan was not quite old enough to get his license, he was left with the choices of not riding it at all, or riding it through the woods and around the farm. Not riding it at all? What kind of a choice is that for a kid?â€™We can imagine the rest of the story: â€˜Nobody mentioned, or if they did, Stefan was not listening: that the oil needed to be changed regularly, that the engine must not be left to idle for extended periods, that the bike required regular maintenance, that heavy solid objects will not move out of the way when struck, that when an oil pan is ripped open from riding over sharp stationary objects, all the oil will run out and the engine will seize up.â€™Out of five oil pans I've repaired, three came to me with the bottoms torn open.Once in a while a very nice original R25 will turn up. Most that I have seen, though, have been badly flogged, abused or taken apart and left to sit, and half the parts scattered about and lost.The cost of restoring a single versus the cost of restoring a twin: Both are about the same. Sure, the single has one less cylinder, connecting rod, cylinder head, piston, etc. So it should cost less to repair, right? Not really, because the singles are usually in worse condition when found than are the twins. Subtract the cost of a complete cylinder/connecting rod assembly, then add the cost of frame repair, oil pump, generator (those are almost always shot), additional sheet metal work (usually worse on the singles), and the restorer will end up with a total bill about equal to that of a restoration on a twin.Frame Repair:BMW frames are assembled in a jig and welded. The earliest frames were brass welded (brazed), followed by a combined process of riveting and gas welding during the manufacture of the pressed steel frames. The tubular frames beginning with the R5 and R6 were welded, but I cannot say with any certainty that they were either gas welded or electric arc welded. Electric arc technology was available at that time. Iâ€™ve taken numerous frames from this period to my welders up in Toledo, and they tell me the welds are gas. They also mention that those welds are first rate.The point here is that during welding, things get hot and the parts being welded expand and move. When they cool, they move again. The frames were not only designed to be asymmetrical, they also moved upon cooling and though close to spec, are no longer â€˜trueâ€™. How much were they out of alignment? The bikes were probably straight enough for a rider to go down the road riding â€˜no handsâ€™ with no noticeable pull to either side. If thatâ€™s the case, then why this discussion?Because not all the frames were alike. They were still hand made, and some were straighter than others. All frames can be bent or knocked out of alignment. Some models are more prone to this than others.Frame repair might seem simple in the hands of a master. It still requires knowledge and skill. The riderâ€™s safety must be considered in any equation involving frame repair. (In some countries, there are laws regulating frame repair).

G.T. Enterprises: I discovered Vern Fueston through a message on one of the Yahoo Vintage sites. Someone wrote in telling how they had sent him a radically bent Earles fork, whichÂ was returned in straight and good working order. The best part was the reasonable price for his service.

Having had a number of frames needing attention, I started sending them to him. UPS will ship a frame across the country for as little as thirty-five bucks. Simply fasten some cardboard around any sharp edges on the frame, tape it down well, apply the necessary labels and take it to your local UPS station (UPS stores are franchised outlets, and will charge their own rates, which come close to double or more than you would pay at a UPS station).Â Â

It took about three months for the first frame to come back. The cost for the repair was about two hundred dollars, plus the seventy for the round trip. The frame arrived with the cardboard and tape treatment. It also arrived straightened, ready to clean and paint.Â

Vern tells me he can save some mighty ugly frames. I imagine that whether you would want to go through the expense and trouble would depend on how much you want to see the original bike go back together.

Note in the photo, that the lower frame members have been damaged from heavy center stand use. Vern was in the process of replacing them when this photo was made. Vern inserts snug fitting nipples where the replacement piece mates to the frame, then TIG welds them in place. The foot peg blocks are then replaced and welded. When finished, these repairs are invisible. The frame suffers no loss of strength.

Aircraft maintenance guidelines allow for a similar repair of airframe tubing, only the splice must be done on a forty-five degree diagonal seam, not at a right angle with the length of the tubing.

Tech Tip: Getting the inner races out of swing arms. Electric weld a bead around the inside of the race without letting any molten metal spill out on beyond the race. When it cools, it will shrink and should come out easily. Thereâ€™s a way to keep from burning the paint by placing a heat absorbing compound, which welders use, firmly around the painted surfaces near the bearing.Â

Broken Stud Removal : My welder (Mark) in Toledo showed this one.

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I had broken off two studs (I really ainâ€™t smart enough to quit after the first one) on a timing chest cover. Both studs had broken off about 1/16â€• inch below the surface of the aluminum part.

I considered drilling them out, but previous experience has shown that the drill nearly always walks away from the harder steel and on into the softer aluminum, leaving a problem worse than before. I showed Mark the part. He asked simply, â€œYou want that out?â€• â€œAhâ€¦.yeah, sure, of course, Iâ€™d love to have it out,â€• was the response. Without another wo the part down on his table, dropped his hood and let the light shine. Within less than a minute, he had welded up a bead in the shape of a letter â€™Tâ€™ atop the broken stud. He then picked up a pair of pliers and unscrewed the stud. He cautioned that the stud needed to be removed right away while everything was still hot. Start to finish: two minutes!

More on stud removal: I donâ€™t have photos of this one, so please try to picture in your mind what is going on. Someone hadÂ broken a 6 mm oil pan bolt off the bottom of a friendâ€™s crank case, then attempted to drill it out.

The drill bit walked on into the aluminum along side of the stud, leaving a diagonal hole that now would not match the oil pan. I donâ€™t know who invented this fix, but it works. You can do this at home if you have the tools.

I used a â€˜Dremelâ€™ tool with a 1/8â€• diameter drum shaped cutter to remove the remainder of the stud, and make the hole approximately round with close to a 9 mm diameter. I cleaned the hole up with a 9 mm drill bit, then ran a 10 X 1.0 tap down through the hole. Next came a 10 X 1.0 bolt, with enough â€˜Locktiteâ€™ to secure it. Screwed into place to a depth that made it flush at the bottom, I cut it off just above the pan gasket surface. Without scratching the gasket surface, I then filed the insert flush. The next step is to mount the oil pan, putting 6 mm bolts into all the remaining holes in order to align the oil pan, and thereby relocate the damaged hole. Mark the hole with a scribe, and center punch it.

Use a machinistâ€™s square, or something you know to be square so you can set the drill perpendicular with the gasket surface. Drill the hole with a 5 mm drill bit and tap with a 6 X 1.0 starter tap. Use cutting oil, and small turns with light pressure. Back it out frequently in order to break the chips. If you break the tap, see Broken Stud Removal above.

Tool needed: Dremel tool, available at Loewes, Home Depot, Sears, etc. Suitable cutters, go for the carbide! Theyâ€™re worth the extra money. Tap set and tap wrench, drill bits, etc. 10 X 1.0 bolt. Check at local tool supply or hardware.Does one really need to invest in these tools to remove one stud? No, not really. They are just nice to have on hand when it comes time to remove the next broken stud.Â