

WIN!
£300 WEISE
RIDING SUIT
see inside for more...



**ITALIAN
STALLION**

Bimota chassis
Ducati engine



**CR125M
ELSINORE**

Lovingly restored
off-road racer

classic motorcycle

mechanics

**FREE
HONDA**

supplement inside...
Greatest Bikes
1960s - 1990s

TRIPLE VISION

IF SUZUKI STILL MADE GT750s
THIS IS HOW THEY'D DO IT

**HONDA RCB
RACERS**

THE STORY
BEHIND
THE WORKS
ENDURANCE
MACHINES

**READERS' BIKES
IN THIS ISSUE**

- Yamaha DT1
- Yamaha YZ490
- Honda CB400F
- Suzuki RGV250
- Yamaha FZ600
- Honda C100
- Suzuki ZR50



RD400 v CB400F THE CLASSIC CONUNDRUM



MORTONS No. 281 March 2011 £3.95
03
9 770959 090209

PLUS ● Spotter's Guide: Honda CB500F ● Knowledge: How to rebuild your starter motor
● Project CB250RS returns ● Buying: Fantic Caballero ● Workshop: Epoxy repairs

WITHOUT WHOM... AM PHILPOT



Philpots have been providing hard chroming services since 1924. Today they're a mainstay of the classic fork rechroming scene.

Enter the side door of AM Philpot (Hard Chrome) Ltd with a set of pitted fork legs in your hand and you could almost have stepped back 40 years as you cross the threshold. No, the workforce is not wearing flares or button down collars and the radio isn't belting out T Rex or early Bowie. But looking for all the world like a giant combination of a fourth year metalwork room and the prep lab of the science block, anyone who has ever laid a spanner on a bike knows that this is good old fashioned, honest as the day is long, no nonsense engineering at its best.

Words & Photos: Steve Cooper

There's an immediate if subliminal feeling that your parts are going to be in good hands; most forty or fifty-somethings would feel at home here. Centre less grinders compete for floor space with presses, lathes and universal grinders at one end of the factory while at the other all manner of demoniacally dark tanks containing ferociously orange/yellow liquids vie for your attention.

Tucked in behind a large wax melting tank and partially covered is a BSA 250 Goldstar that belongs to boss Andy Morgan. Apparently the bike is Andy's personal bete noire; he's owned it for

years, can't bear to part with it yet hasn't found the time to restore it... again. Opines the boss, "We fired up the Beezer just before we found a nice warm home for it; the damn thing burst into flames so we drained the fuel and it's sat there ever since!" Plus, of course, there's the Z1000ST under covers in the canteen and the BMW R1100S kept for sunny days. If the boss is into his bikes then it's normally a good sign that he knows what the likes of us CMM readers want and need.

There's nothing like experience and continuity when it comes to any part of the bike restoration scene and these are commodities that the business has in spades. The company has been in existence for more than a century and knows a thing or two about hard chrome plating. It was founded in 1902 by Alfred Matthew Philpot who set up a musical instrument repair business and latterly began picking up work from Vauxhall Motors. Moving to a newly built house in Dunstable Road, Luton, a small workshop was constructed at the far end of the garden to accommodate the expanding business and joined by his son in 1919. Alfred purchased some more land in 1922 to expand.

Moving into electroplating in 1924, the company's reputation grew, leading to MOD contracts during WWII for hard chromed Mosquito aeroplane components. Current owner Andy Morgan took over in 1986 and set about diversifying to ensure the company continued to offer a range of expert services. Given that most motorcycles

are based around telescopic fork technology the timing couldn't have been much better and as the classic scene really started to take off the fork side of things began to expand rapidly. Moving to their current location, just down the road to Luton/Dunstable border in 1997, allowed for further growth.

The vast majority of Philpots motorcycle fork work comes in via couriers and the post and keeping a close eye on things from the off is key in ensuring you don't get a set of Suzuki Bandit forks back for your 400/4. On the premise that one set of rusty stanchions looks surprisingly like the set before and the next pair, everything gets bagged and tagged upon receipt. In fact, internal space permitting, many of the forks that pass through the company's hands also have the owner's name subtly engraved somewhere inside as a second sanity check.

Speaking to Works Manager, and fork builder, Martin Reynolds we asked how many stanchions Philpot's has received that were beyond salvage and apparently it's only one or two percent. "When we speak to a customer prior to them sending us their forks we ask them if they are obviously bent and how badly. Some companies have claimed to be able to get almost any stanchion back in shape, unless it's kinked, but we know this is simply not good working practice. If the metal is too deformed, even on an apparently minor bend, it can undermine the fork's internal structure and the customer's safety.

"Even after straightening on our presses and grinding to remove the



Chroming vats bubbling away

old plating it's still possible for the leg to be significantly compromised. Imagine the tube to be initially like a gently curved banana. It's possible to grind a few thou off the centre bend and a similar amount from the drooping ends; the tube would be geometrically true but we know the unit would be thin on one side at both ends and potentially weakened in the middle so we simply just will not process forks in this condition."

To prove a point Martin shows me a monstrous set of Yamaha motocross forks that the owner didn't check properly prior to sending and were subsequently found to be beyond repair; they've been on the shelf ever since. "We get this occasionally," says Martin, "the customer sends a pair of forks in for a total rebuild, then either finds a better pair cheaper than theirs can be repaired for or discovers they can't afford the work. We have several sets like this waiting for customer instructions." All of which is comforting to know; should you suddenly find you're out of the loop due to work commitments or illness you can rest assured your stanchions are safe.

Being a fork leg numpty I ask if, outside of the obviously bent, there are forks that Philpots simply cannot do but of course in most cases they have a solution. When USD (upside down) forks came to the fore they had to devise a methodology of getting the brake calliper cum axle boss off the lower section which in USD terms is the stanchion. Over on a workbench I'm shown an in-house designed and built jig that allows the chrome leg to be safely clamped without marking it; this allows the lower section to be removed. I point to the hole



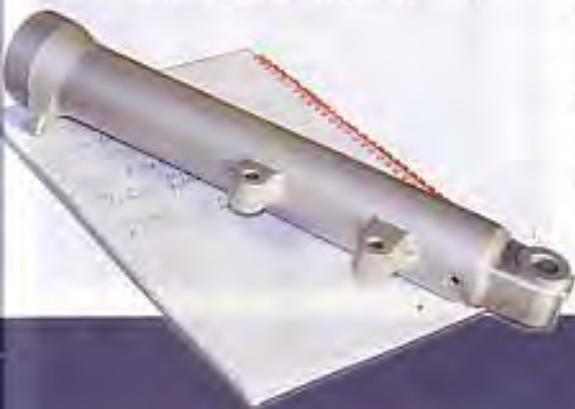
Old chrome is removed on a centreless grinder

There's a hanger for every fork leg known to man



in the boss that takes the all important securing grub screw and am told these are precision drilled out, a new one fitted and the whole assembly put back together with Loctite. Apparently little seems to faze these guys.

Most forks are essentially just hollow parallel tubes but some have an oversized cylindrical boss on the lower end that acts as part of the bearing surface and damping system. Straight tubes go through a centreless grinder to remove the old hard chrome but if there's a lump on the end this obviously presents a problem to the grinder. Thinking I might have outsmarted the system I produced such a pair but, as might be expected, the Philipots team have an answer. Martin passes my forks to Steve 'Skip' Holland who raises his eyebrows heavenwards and simply puts them over by a grinder specially set up for just such applications. That'll teach me to be smart.



So, are there any forks that cannot be repaired I ask? Apparently the company sometimes sees stanchions that are no longer round in cross section. For reasons no one is quite sure of, occasionally a set of tubes will turn up that look more like cam profiles than circles. This is about the only circumstance that trips up the impressively smooth workflow.

As we walk through the process it becomes apparent that each and every procedure is based around years of experience, an analytical approach to the metallurgy involved and an overt empathy for the subject. A typical turn around time for a pair of fork legs is approximately 10 working days, although at peak demand, when folk are all fettling over the winter months or crashing at the height of the season, this might take a little longer.

One thing that comes across is that nothing is ever rushed. Martin points out, "Typically a fork leg will see one to two days plating, at that point there's normally sufficient excess chrome on the circumference for us to grind back to specification and polish. However, sometimes we find one fork leg comes out of the tank just right but the other one will be either pockmarked or insufficiently plated. Customers tend to think of their forks as matched pairs but in truth they are anything but. ☺



Satine buffing promotes a better steel/chrome bond



Pumice and plating fluid for a final clean



Glycerol/talc mix keeps wax out of key areas



Trued to within the proverbial gnats whastit.



"Imagine back in the factory in 1978 for example. There would have been tens of thousands of identical legs all delivered from an external third party and the pair on your bike would have simply been selected at random from a factory stillage. Subtle changes in metallurgy throughout a production run will be enough to cause significant differences when we come to plate a customer's parts three decades later. There may only be a very small difference in, say, the carbon content but it'll be more than enough to show up. Depending on what we see the leg will either see more plating or we'll remove the fresh chrome, grind a little deeper and then plate again."

All of which leads on to two questions regularly asked about hard chroming: how thick is hard chrome and how does it differ from decorative plating you find on wheel rims, handlebars and the like? From a front line motorcycle manufacturer you might reasonably expect to see around 20 microns of hard chrome on a precision ground and plated fork leg; one that comes out of Philpots will have somewhere in the region of 20 times (0.40mm or 400 microns) as much chrome and it'll be to a much higher specification than the OEM item. The reason for the thinner original coating is as much to do with raw material costs as anything else; chrome is expensive and if you can get away with using the minimum when every last cent or yen impacts on the final vehicle cost, and thus profit. Skip has told me before on previous visits "Short of knocking a pair of our rechromed fork legs together hard very little will damage the plating. Chrome, when properly applied, is an excellent wear surface and that's what we endeavour to deliver to the customer."

Knowing that, why can't we have our stanchions chromed in the same way

as a headlamp rim? Boss Andy Morgan and Martin Reynolds explain, "Decorative chrome is normally flash applied over a base plating of nickel, which in turn is sometimes applied over copper, particularly if the base surface is rough or marked. Chrome is happy to adhere to nickel but the two in combination don't make a good wearing surface. In addition with the decorative process the final chrome is only a couple of microns thick and if applied to fork legs would fail in very short order."

So what else makes hard chroming so special? Well for a start it's much harder to get chrome to bond onto steel than it is to nickel. Post grinding, the forks are gently abraded to give a satined finish which produces a uniform base of increased surface area which enhances the plating bond. Where necessary molten wax is applied to key areas where the chrome isn't wanted such as the lower ends of most fork legs. This is important when the legs contain valves or drilling that would otherwise be partially blocked in the plating process.

In theory anyone could plate forks but knowing what to plate and what to avoid makes the difference between a cosmetic makeover and a professional job. Having satined, checked and waxed the stanchions Ollie Jackson then cleans the legs with a pumice stone slurry and washes off the residues ready for plating. With an average over-plate of 200-250 microns the forks are then finished, ground back to size, polished and returned to the customer; job done. And they do this on some 150-160 pairs of forks each month.

But what happens if you don't have the time, resource or ability to take apart and rebuild your forks? Again Philpots can help with a one-stop-shop service. Martin

Fitting fork seals the easy way



This how real engineering shops should look



Reynolds is the guru here and works in one of the several side workshops off the main factory area. When most of us would struggle to find one simple doofer to hold the stanchion in place while the Allen bolt is undone in the lower leg Martin has more holders, stoppers and retainers than you could shake a stick at. All are purpose made and ready for use; in the unlikely event of not having a tool of the correct shape or size there's more than enough resource on site to make the appropriate tool in a jiffy.

With the inevitable turnover in customers' parts time is money and if you have the correct tools for the job you don't waste this precious commodity. So while most of us are grubbing around trying to find a socket the correct size to use as a drift on the fork seals Philpots have a range of custom made polypropylene cylindrical dollies to hand. These devices slip over the rechromed leg and can then be used as a tubular slide hammer that swiftly, accurately and without drama drive the seal home. It's a simple, well designed

and elegant solution to a problem and typifies the level of thought that seems to go into everything.

Although fork legs rechroming only represents around 20% of Philpots turnover a number of the company's other business interests dovetail very nicely into our own classic world. Both plasma and metal spraying are available, which could be of serious use when your crank journal has picked up or your alternator has come free on its taper. The same services can also be employed on spindles or shafts and in this increasingly built-in-obsolence society we live it's good to know there are people out there willing to help recover damaged but unavailable components. Factor in the ceramic thermal barrier coatings for exhaust systems that Philpots are now offering (from their Milton Keynes site) that speeds up exhaust gas egress and it's readily apparent that they have their eye to the future.

As we're getting ready to leave boss Andy mentions he has visited the Hinckley



Triumph factory where they supply various services to the tooling shop. If Triumph is happy with this innovative and dedicated team most of us should have little worry about our precious parts in the hands of experts. There's collectively a huge amount of knowledge and expertise behind the factory doors in Cradock Road, Luton and it's good to know the people there are on hand to help keep our old warhorses on the road. ☺

CONTACT

AM Philpot

Web: www.amphardchrome.co.uk

Tel: 01582 571234