

REBUILDING OLDER STYLE FORKS

Telescopic forks don't ask for much but when they reach the leaking stage it's time to break out the tools and sort out such oleaginous incontinence.

Telescopic forks are an elegant solution to providing motorcycles with front suspension.

Lighter than springer forks and less bulky than the girder units that replaced them they rely on a sound basic design, some precision machined components, springs, oil and a few seals. As evidenced in our recent Without Whom series (Issue 281) a number of owners are less than comfortable with overhauling their forks and often send the units away for expert attention. With a bit of inside knowledge, and a few wrinkles, overhauling basic telescopic forks can be a relatively straightforward process.

I'll assume you have a manual or experience sufficient to remove the forks from the bike and move straight into the overhaul procedure. Here (**Photo 1**) we have a set of typical classic Japanese forks from a lightweight bike. These units have springs that sit outside of the inner fork tube, or stanchion, and follow the basic, postwar, design of European manufacturers. In many instances the fork springs are covered by a metal shroud or rubber gaiters. With the fork top nuts removed we can drain out the oil and take off the basic components ready to get on the tools.

1



Rusted, rough but hopefully rebuildable

PULL THE OTHER LEG

Ceriani type forks are helpfully compliant when it comes to putting them back in their yokes. The internal spring that can make fitting the fork tops a pain often conveniently extends the stanchions to their maximum length but more importantly it's normally possible to grip the chrome leg and push it through the yokes. On older type forks we have at least the spring and possibly a gaiter, shrouds and/or headlamp brackets in the way.

Because the setup relies on the compression between the seal holder and the bottom yoke to extend, the inner leg simply collapses into the outer. Manuals advise the use of a puller that screws into the top of the stanchions and allow it to be pulled through the lower yoke and up into the register of the upper. These pullers are simple threaded rods with some form of handle for a grip. The fork top bolt is the perfect example to copy;

measure the diameter and pitch and thread an inch of a piece of rod long enough to go through the yokes and into the top of the stanchion. Sometimes wheel spindles have the same thread so have a look what's in the garage or on the bike. If all else fails buy a rough fork top bolt at the next autojumble and get it welded to a suitable piece of steel. Specialist tools such as this make jobs so much simpler.

“OCCASIONALLY THE THREADS AREN'T CORRODED AND LITTLE EFFORT IS NEEDED...”



The easily removed bits... removed



3 Don't throw these away like we nearly did



4 These can prove to be irksome



5 Apply some heat before dismantling



6 Use good quality tape for protection

On the bench (Photo 2) are the spring, the spring seat, a perished gaiter and the still whole suspension unit. Neatly welded into the top of the old gaiter and almost totally undetectable are the upper spring guide and spacer (Photo 3); mine almost went in the bin with the perished gaiters so check carefully and compare what you have against a parts book before tidying up the workshop.

Putting the peripherals aside for the moment we need to get the fork leg apart so we can sort out the seal, get the stanchion replated if necessary and look at the state of the bushes etc. and this little character (Photo 4) is normally the cause of more pain, grief, anguish and swearing than anything else. This is the fork seal holder and not only does it hold the seal it also stops the lower leg falling off the stanchion... which is reassuring.

This apparently simple retainer carries an internal thread that matches a corresponding one on the top of the lower leg. Understand that the thread is typically a fine 1mm pitch and some 15-20mm wide on the lower leg and you may see an issue here. Factor in three decades of dirt, road salt and lord knows what else and it's easy to envisage why the seal holder may be reluctant to give

up its grip. British bike owners are now smirking as most of their machines have some form of machined area that allows peg spanners or specialist tools to facilitate removal.

The Japanese omitted such fripperies in the name of aesthetics so we need to employ one of several options, some heat, a squirt or two of easing oil and a large dollop of artifice. Repeatedly applying heat (Photo 5) followed by a soaking wet rag will often be sufficient to break any corrosion between the threads. Prior to this it may be good to invert the fork while draining out the old oil and take the opportunity to drizzle some penetrating oil onto the open base of the seal holder.

On the assumption that we may have a fighting chance we can try one of several methods to remove the seal holder. In order to prevent any damage to the surface I've wrapped three turns of heavy cloth backed tape (Photo 6) around the holder. Duct or gaffer tape is fine providing it's the heavy cloth type and not the thin cheap stuff. Some manuals recommend using a strap wrench but I've never had much success with these so my first port of call is normally a chain wrench (Photo 7). ▶



7 Here's hoping for a chain reaction



Applying lateral thought and leverage at the same time

One neat alternative that I've discovered is the use of an old four-stroke conrod. With a millimetre or two's clearance and a thin insert of rubber, a piece of leather or similar, the bolts can be tightened and the clamping is a full-on 360-degrees with a significant surface area of grip being brought to bear (Picture 8). If all else fails and in true bodger's style there's always the Stilsons if we get truly stuck (Photo 9). This may well be the last resort but know this; the seal holders will be heavily marked by the jaws of said implement. While all of the grunting and groaning has been going on at the top of the lower leg you might reasonably ask what's been stopping the whole thing from revolving.

Just as the stanchion is a precision ground device, the lower leg, although not machined to the same degree, is a fairly precise piece of kit and demands careful handling. Therefore it's only ever gripped at the axle mounts using a sturdily mounted vice and some scrap



Protect the axle boss with packer pieces



The key players in our story



...and if all else fails

metal to protect the chrome or paint (Photo 10). All of the above assumes the seal holder (aka fork outer tube nut) is a recalcitrant little illegitimate offspring. Occasionally the threads aren't corroded and little effort is needed.

If you are so fortunately blessed the easiest route is to once again cover the seal holder in protective tape and nip it in the bench vice. Held just tight enough to prevent any turning, insert the wheel spindle in the mounting hole of the lower fork leg and turn. It should then undo nicely but please remember to fit and tighten any pinch bolts before applying pressure or the mounting may end up fractured.

Assuming you have the seal holder off, the following shot should look vaguely familiar (Photo 11). From right to left we have; fork stanchion or inner leg, seal holder with internal seal, inner fork bush, snap ring on stanchion, threaded top of lower leg with sealing O-ring just visible above the rust and grime. A good clean down at this point is vital so that we can see exactly what we have that's reusable, reclaimable, damaged but repairable or beyond economic repair.

On the job in hand I have severe reservations about the chromed

lower fork legs which are very heavily pock marked and corroded. Although it might be possible to rechrome them I am concerned that they may be simply too thin and could become structurally weakened; therefore they will be replaced.

The fork springs and bushes will need to be measured and checked against the factory specs. Spring length is fairly simple to measure but lower bush wear may mean internal micrometers or similar. A simple dodge here is to place the bush on an unworn and corrosion free portion of the stanchion and with a light coating of fork oil feel if it's possible to rock the bush axially against the precision ground leg. Anything other than minute movement would warrant replacements. Obviously also look at the internal surface for evidence of deep scoring. Assuming your lower fork leg is in better condition than ours, wash out any old oil and marvel at the amount of metal fragments that come out. Check the inside for evidence of damage and consider whether you want to consider removing the drain screws.

So far we haven't touched them for a variety of reasons; (a) these forks don't have any, (b) we've already inverted the forks to drain off the oil, (c) the screws are potentially seized in solid and (d) they're possibly either inaccessible when on the bike or looked like they're mullared. If you're only looking at an overhaul rather than a full-on restoration it's probably advisable to leave the screws alone. If you opt to take these out you'll probably find the threaded portion will be relatively free due to the oil in the fork leg; the seized portion will most likely be where the countersunk head rests in the tapered seat. With a good pillar drill and the fork lower securely held removal/reclamation is possible but be prepared for a few potential hassles on well used, previously salt-encrusted UK bikes.



12

Seal evicted with extreme prejudice... and a simple box spanner



13

Making good as necessary

Last task on the dismantling side is to knock out the old fork seals with a suitable drift. Using something non-ferrous is a good idea here as it's less likely to damage anything but still work carefully as the seal holder contains both fine threads and an internal register for the seal to sit against. Break the register or scar it badly and leaks are almost guaranteed. If all else fails you may need to break out the big guns (Photo 12) but make sure there are no sharp edges to cause damage. With seal holders as rusty as these a re-chrome is on the cards and if the unit has seen brutal treatment it may need a little gentle reworking to bring it back in the round. Here I'm using an old copper drift as an anvil and flat headed hammer to take out some of the worst flats caused by a previous ham-fisted overhaul (Photo 13).

Hopefully the forks have come apart and you should now be looking at a small pile of parts vaguely similar to these (Photo 14). On the assumption that



14

One down and one to go

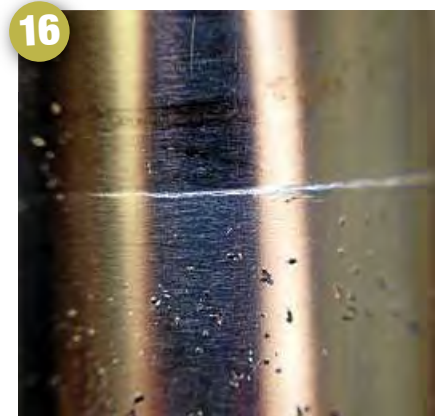
you've obtained new components ready to rebuild, the last item to be checked is the fork stanchion itself. Pitting is fairly obvious and if it's in the area of the seals when the forks are compressed rechroming is strongly advised. Photo 15 shows an unusual effect where the helix of the fork spring has fretted and hammered into the hard chrome's surface. Such damage inevitably necessitates remedial action so another trip to A M Philpot of Luton for the full works is on the cards.

If you're rebuilding a set of forks for a bike whose history is uncertain please check those stanchions carefully; they need to be straight and structurally sound; your life depends on them. The leg in Photo 16 belongs to a good mate who bought them sight unseen having been told they were repairable. Any fork leg that has a crease, fold or ridge should be regarded as scrap; recovering such faults will inevitably result in thinning or deformation of the leg with a resultant loss of strength. ▶



15

Curly-Wurly meets fork leg



16

This is emphatically not repairable

After the trials and tribulations of the strip down the subsequent rebuild is a comparative walk in the park. The fork seals are carefully drifted into the seal holders (a pair I had re-chromed earlier) with a suitable driver and to ease its passage I've added a smear of silicone grease to reduce the inevitable friction (**Photo 17**). If there's any doubt about how easy it'll be to fit the seals it's perfectly reasonable to chill the seals overnight in a freezer and fit them into seal holders that have sat in boiling water to expand them; just make sure everything is dry when you assemble the forks.

The tops of some stanchions can be unaccountably sharp almost to the point they're dangerous. To protect the seal's lip I normally carefully radius off the edge just enough to remove any cutting potential. With the fork bush placed on the stanchion so that the narrower diameter will drop in the top of the lower leg the seal holder is carefully placed over the top of the stanchion and slid down. It always pays to grease the seal and stanchion but if the seal still feel tight going over the aforementioned stanchion top you can sometimes ease its progress with a temporary taper. Here I've applied a couple of turns of thin electrical tape wound from the bottom up; this is soft enough to ease the seal over the ridge without damaging it and if the seal is reluctant to slide down the leg I can twist or screw it on following the gentle thread facilitated by the tape.

With the bush in place and the seal holder ready to screw on I add one non-factory extra as double insurance. The fork seal stops oil coming out of the top of the seal holder and the O-ring



Use grease and the correct sized driver

below the threads is allegedly supposed to stop anything passing beyond the threads. However, as many home fettlers have found to their chagrin, these old style seal holders seem to leak oil or oil mist simply because they can.

Small amounts of silicone sealer or demountable thread lock here will back-stop the O-ring, stop any oil weep and prevent the ingress of moisture that can cause corrosion (**Photo 18**). Judicious applications of masking tape ensure the chosen sealing material doesn't get on any fresh chrome or paint. If the lower edge of the holder is reluctant to rotate across the edge of the rubber sealing ring a very light coating of grease should help.

All that's left to do now is refit the forks into the yokes, bolt in the wheel and mudguard, fit the cables, adjust as necessary and add the all important fork

oil. Old specifications and books will probably advise light engine oil or ATF (automatic transmission fluid) but things have moved on a bit since then. Modern fork oils are tailor made and come in a range of weights or viscosities. Period road tests usually complained about lack of damping so with that in mind I generally use the specified volume but use a heavy or thick grade on these early forks. So there you have it, a pair of rebuilt early style forks ready for many more years of taking the various stresses and forces we simply take for granted (**Photo 19**).

In a subsequent article I'll be looking at the later forks where the spring is inside the fork leg. These so-called Ceriani type fork legs have similarities to the older legs but also a number of key differences. ☺



Tape any sharp edges and seal the threads



Nice legs, shame about the face...