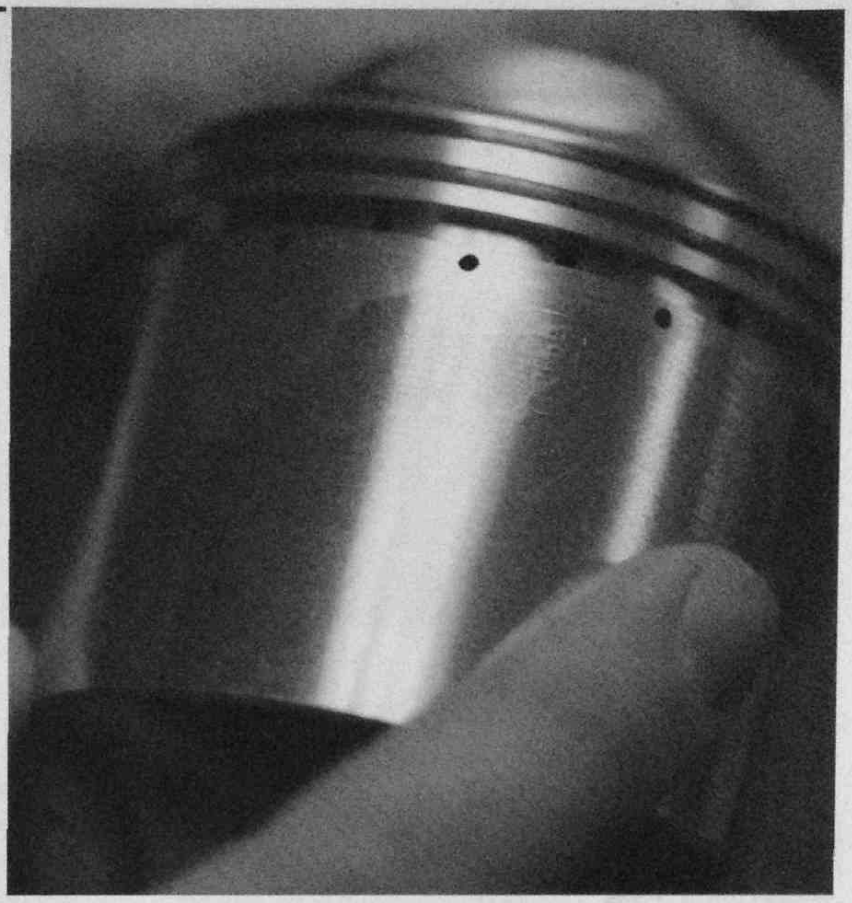
# Piston ring assembly: it's not dry, it IS dryish

BY JOHN HEALY



**Piston shows only the most sparing wipe of oil. The ring faces are free of oil.**

Seating rings with modern oils has been a problem since the introduction of SAE-SD motor oils in the early 1970's. It has been made worse when mechanics forget that the grey cast iron rings common to these old British motorcycles require a cylinder finish much coarser than their cousins: modern pre-lapped ductile iron and steel rings.

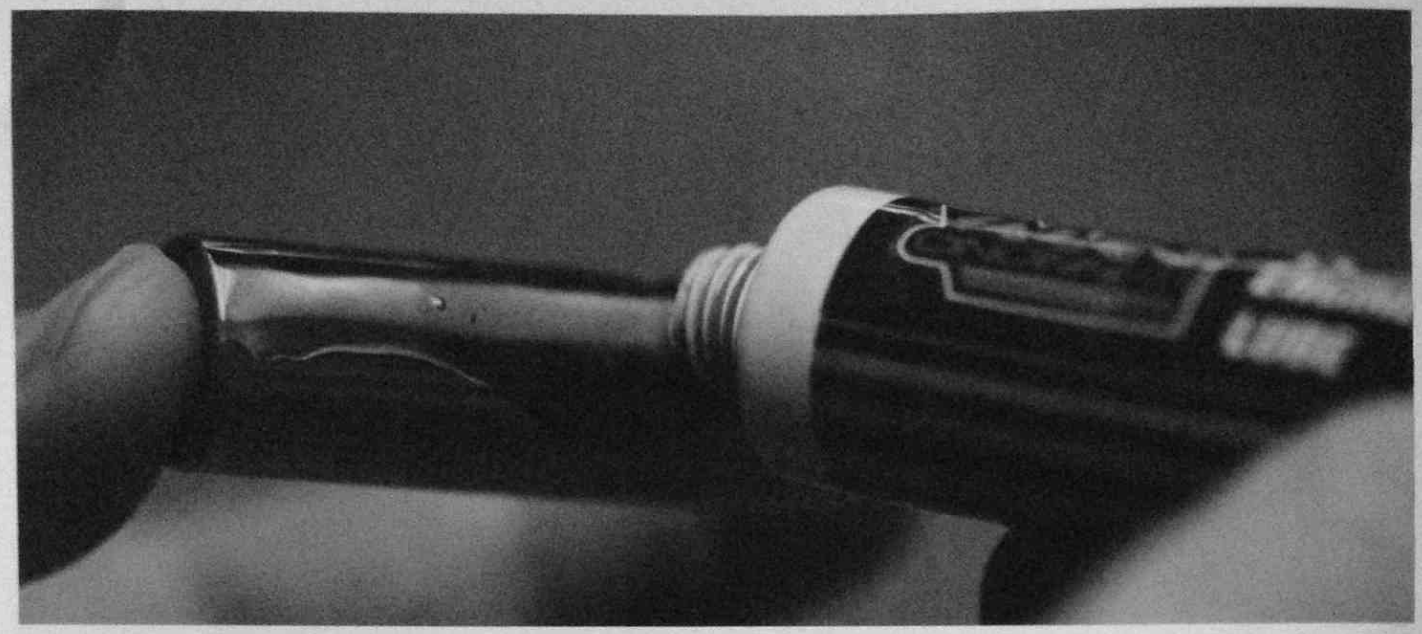
Modern ring makers like Hastings recommend a maximum of 220 grit stones when preparing a cylinder for use with their grey cast iron rings. Triumph used 150 grit stones rarely available at most shops doing cylinder preparation today. So it's important to know your rings and use the proper finish to prepare cylinder. Don't rely on your retailer or mechanic. If you have questions, refer to the ring manufacturer.

For our grey cast iron rings 150 to 220 grit is rough enough to remove some of your fingernail when it is rubbed against the surface. The Triumph workers were trained to check the cylinder finish with a self-striking match. If you could not light the match the surface was too smooth to seat the ring.

But this is not the message that I want to share! I was talking to a customer recently who was telling me that he took the advice of a well-meaning guru to assemble the rings in his Vincent, dry. He described assembling the cylinder, piston and rings with absolutely no oil. Now I have used these same words describing cylinder assembly, but the guru left out some important details in how I describe "dry" assembly. I am not the first one who recommended dry assembly, but I have been using and recommending this procedure for nearly 20 years.

Let me go back to the mid-1970s. We did a lot of service and street performance work in our shop. One of these jobs was making the popular Honda 750 Four into an 836cc mild street performance engine. This was done by boring out the cylinder and installing Honda 350 cc pistons. One popular supplier of these performance kits at the time was Ken Tippton of MTC Engineering.

I had just finished one of these installations, and to get the motor off to a fresh start, I changed the oil with Cas- >



**Use a decent assembly lube on the piston-to-connecting rod assembly**

<trol's latest offering 20/50 SAE SD. Upon starting the motor the shop filled with an enormous cloud of white smoke to the point we were gagging. Knowing this wasn't going to fly we decided it must be the guides and removed the motor from the frame again and took the head off. Yes, you had to take the motor out of the frame to remove the cylinder.

Careful examination proved the guides were good, but we replaced them and installed valve guide seals on the intakes. To shorten the story the engine came in and out of the frame several more times, re-rung it a couple of times and changed everything but the headlight bulb, and the motor still smoked. I think the damn thing would have filled Madison Square Garden in New York with smoke if it were given the chance. This is when I finally gave up and called Ken at MTC.

. . . when someone mentions that you should use dry assembly he really means ***drier*** assembly

Ken explained that this seemed to be a common problem at the time with the current crop of motor oils and that I should assemble the motor dry. This is what he meant by dry.

You do all of your cylinder work and when you are ready to install the cylinder you wash it in hot soapy water. DO NOT WASH IT IN SOLVENT! Then using a wet lint free WHITE rag with a small amount of motor oil on it (one good squirt from a oil can will do – some shops use automatic transmission oil) and wipe the bore of the cylinder until the rag comes out just as white as before you put it in the cylinder. The cylinder is now clean and free from any honing debris, but also coated with a very thin coating of oil. It is not dry as such, but significantly drier than typical assembly techniques used at the time. It is important that you use motor oil to do this and not any STP type products or assembly lube.

You offer the piston to the connecting rod using a decent assembly lube, like Torco MPZ, on the rod bushing, wrist pin boss in the piston and wrist pin. You do put a sparing amount of oil on the thrust surfaces of the piston and oil ring grooves before offering the rings. When the rings are offered, the faces are left free of oil.

Remember you oiled the cylinder so you will not have a dry cast iron ring running dry against cast iron cylinder. If you did this you could scuff the face of the rings, the cylinder or both and that would cause its own problems.

So when someone mentions to you that you should use dry assembly he really means drier assembly: The cylinder has been aggressively cleaned of honing debris using hot soapy water and left with a very thin coating of motor oil.

The piston thrust faces and ring grooves also have a very, very thin coating of motor oil, but the faces of the rings are left dry.

Avoid the old habit of squirting oil in the spark plug hole before starting the bike.

MTC Engineering is still in business.

www.mtceng.com/technical-information/piston-kit-installation.

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They have switched to using automatic transmission oil instead of engine oil on the white rag. Either will work with our rings. □