

An Oldie but a Goodie

J.B. “Bernie Nicholson’s Modern Motorcycle Mechanics

By Mike Brown

If I were allowed to keep only one of what’s now hundreds of technical manuals, books, and publications that sit grease-stained and tattered in my home library, I’d put a death-grip on J.B. Nicholson’s Modern Motorcycle Mechanics. While still the product of human hands and consequently imperfect as all earthly products must be, no one on the planet has ever done a better job covering mechanical repair in such a broad scope of what’s now considered classic motorcycles. Last updated in 1974, MMM as I will henceforth refer to it has been called “the motorcyclist’s bible” for good reason. From BSA to Yamaha, Nicholson has something for everyone.

Unlike many technical publications that simply organize, illustrate, and regurgitate mechanical knowledge, MMM is the product of extensive hands on experience, refined over decades. Nicholson began selling and servic-



Here is the complete story from Dec. 08 Tip of the Month

Don’t pitch your Lucas rotor if the insert is a little loose because you might be able to fix it. If the rotor is demagnetized, however, it’s time for a new one.



Punch-locking involves the use of a punch as shown. Work around the outside border of the insert, almost but not quite touching the insert. The indentations made by the punch often secure the insert.

ing motorcycles in Saskatoon, Canada in 1933. Over this time he

MONTHLY FEATURES

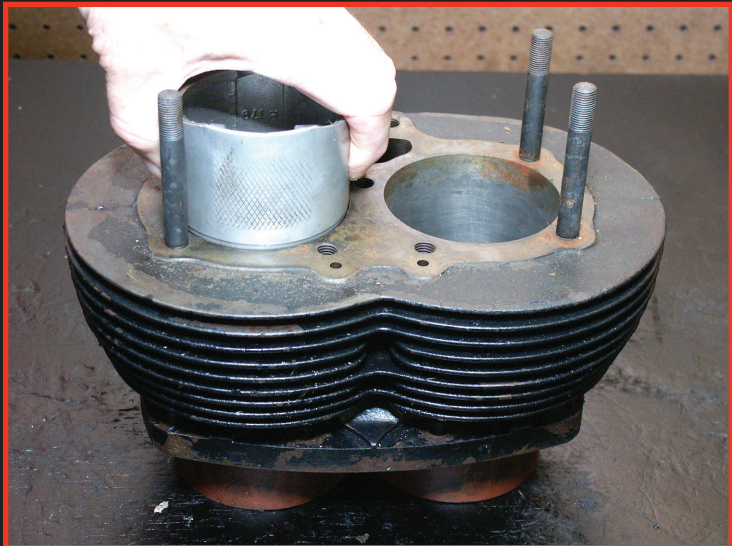
bought, sold and serviced A.J.S., Ariel, B.S.A., Matchless, Norton, Royal Enfield, Panther, Sunbeam, Triumph, Villiers, and Indian motorcycles. During WW II he served in the Canadian military where his engineering and motorcycle skills were further honed and expanded to include extensive contact with Harley Davidson motorcycles, also well represented in MMM. Nicholson continued to operate a mail-order parts business until he retired in 1993 and finally passed on in December, 2001. Every reference I've read or heard about Nicholson always includes "gentleman" and many included "genius." Perhaps the greatest gift Nicholson possessed was the ability to translate technical processes into simple procedures, a gift one can really appreciate if he's ever tried to figure out a typical owner's manual. Nicholson also produced hard data where too many others simply said things like "replace if worn" and for this reason alone MMM is worth owning as a reference source.

MMM is long out of print and often goes for ridiculous prices on EBay. As of this writing, copies are

MOTORCYCLE TIPS



If you can get a spark to jump with the ignition on but the engine not running, the diode is leaking and must be replaced.



To measure bore wear, use the old piston and the top ring. Remove the ring and position it using the piston in the top of the cylinder, just slightly below the upper most point the ring travels under operation. This is where you'll usually find the most wear.

still available at British Cycle Supply and if readers know of other sources, I'll gladly pass this information on. Quite frankly, anyone who likes to turn wrenches on old motorcycles should try to get a copy while the last ones are still available. In the mean-

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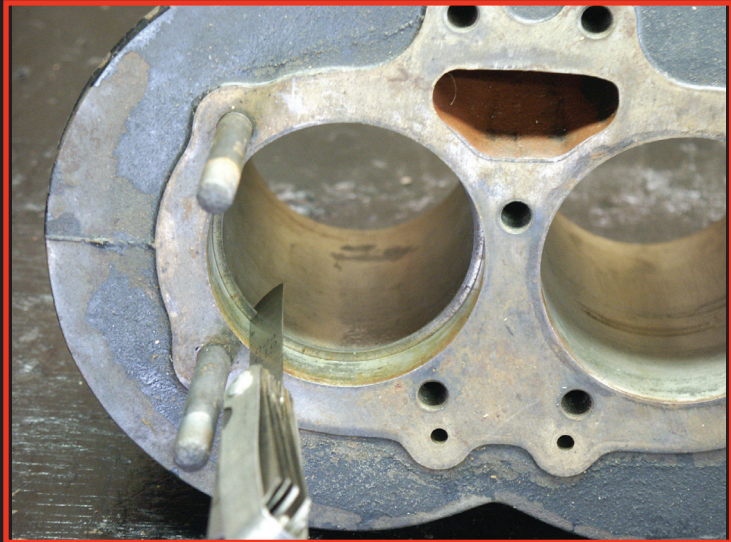
time, I'll try my hand at evangelizing Nicholson's wisdom starting with a few of the many neat tips, tricks, and technical data he imparted over 763 pages. I'll also try to supply clear photographs, the one big flaw in Nicholson's work and most likely caused by tenth generation reproductions and a lack of space for photography. I don't know how many times I'll dip into this deep well, but here's the first bucketful.

Bernie's Brilliance Part I

Lucas alternator rotors are very durable items if they aren't demagnetized by connecting the battery cables backwards or by reverse current caused by a faulty rectifier. However, they do frequently suffer from a mechanical failure when the steel insert loosens up inside of the alloy rotor housing. At one time, I'd just pitch the rotor, but according to the Nicholson, this isn't always necessary: "Just a trace of backlash between the rotor and its hub does not necessitate replacement. This can sometimes be overcome by punch-locking." (See photos for full details.)

Nicholson also has a super easy test for the zener diode that does not require a single bit of test equipment. To test, simply turn the ignition on

MOTORCYCLE TIPS



Measure the ring gap with a feeler gauge near the top of the cylinder and record measurement.

and remove the connector to the diode. If bringing the connector close to the diode causes a spark when the motor isn't running, the diode is leaking and must be replaced. Nicholson also recommends using Loctite on the diode threads because only 2 ft. lbs of torque should be used on the attaching nut. In absence of a tiny torque wrench, something Nicholson recognized as likely, he recommended using a very small wrench and only light pressure.

For the Algebra Impaired

Some older shop manuals used to include an algebraic formula for bore wear. Only an old piston ring and a set of feeler gauges are needed for tools. Nicholson, as he does throughout his book on many procedures, simplifies the math considerably and

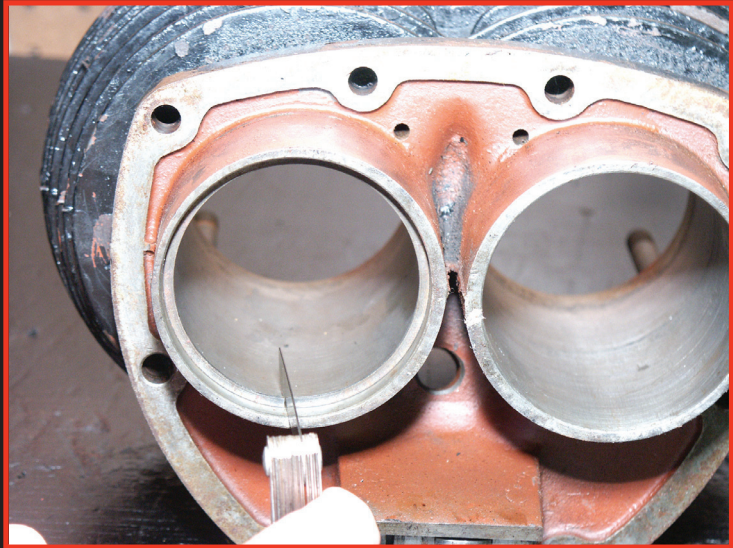
MONTHLY FEATURES

provides a reliable means of easy measurement.

“Cylinder wear can be fairly accurately determined without micrometer equipment by placing a piston ring in the unworn end of a cylinder, measuring the gap with a feeler gauge and then shoving ring with piston to the top end of the ring travel in the cylinder and measuring the gap at these two positions. The difference measured at these two positions will represent approximately three times the cylinder diameter wear.” This translates into simple math. For example, a difference of .030 indicates bore wear of .010, beyond the maximum Nicholson allows, .008, so it’s off the machine shop for a rebore.

If you run this test on a motor teardown and find the bore wear within tolerances, Nicholson also has another money and time saver when it comes to deciding whether or not to reuse the old rings. Nicholson says, “Remove the top ring from each piston, place squarely in the lower end of the cylinder bore and check for gap. If in excess of .030, ring replacement is advisable. If gap is less, there is nothing to be gained by replacing the

MOTORCYCLE TIPS



Second bore measurement is taken at the very bottom of the cylinder, where the piston rings never reach and consequently where the bore is unworn.



Check the clearance between the ring and piston groove with a feeler gauge as shown. If the clearance is .007 or more, the piston is shot and must be replaced. This one is at .004 and could be reused if otherwise undamaged.

rings and the remaining rings need not be disturbed.”

So far, we’ve barely scratched the surface of Nicholson’s vast wisdom. More to come in future installments.