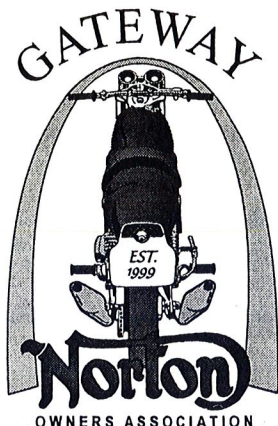


# Gateway Norton Owners News #6



"To Promote the  
Use and Pride of  
Norton Motorcycle Ownership"

Compiled by J. Jump  
November 2000



## EDITORIAL

Hope all yoos guys had a good summer riding season-now we're into the heart of the beautiful fall season and we've been pretty lucky with warm dry weather.

Since the last newsletter we did get together for our first annual "Rocky Top" ride & campout, which I would call a real success, but that's about it as far as club activities are concerned. I do stay in contact with a few of you on a regular basis, and we get together here and there for quick ride, a bull session, or perhaps a cold one. But the majority of you I never see or hear from. I don't take it personally, I just figure you're too busy tryin' to keep *SWMBO* \*off your back. But whenever I get a Kitchen Pass, I'm saddlin up and headin out to see my buds. I hope that I can get a chance to spend some more time with you other guys in the future. Don't be a stranger-give me a call, or give someone else in the club a call. No matter what for, if it's a bit of advice you need, wanna meet for a beer, or go for a ride, give someone else in the club a call and let us know.

No one has stepped forward to take on the job of ram-roddin a club banner. Still waiting for someone to take on that challenge.

We have 2 new members in our ranks; Jim Hughes and Steve I Can't remember your last name. Both these guys have Commandos and want to hook up with us to hang around other poor souls like themselves. Welcome aboard guys.

I think 2 people has bothered to send in there dues. What does that tell you?

Once again, I've been asked when are we going to have a meeting. Short answer is whenever you put it together. Seriously though I think it's time we get together for a meeting. There are some things we need to discuss, and perhaps with a little bit of interest, we can get this club to take shape. My problem is the same as everyone else's-too little time. I am asking for a member to find us a venue for a meeting. Please contact me either by phone or e-mail through the club web page. I have these nifty post cards that I will mail out with the time and location of the meeting.

One last thing I need someone to do-how about hosting a fall ride? I know it's getting late but we usually have nice days in November. Let's get together sometime soon and go for a ride to close out the season. We can get the word out by phone calls and I'm sure it could be a fine time. Give me a call and I'll help!

\* acronym for She Who Must Be Obeyed, pronounced "swimbo"

## THE FATBACK REPORT

*Editors's note: This is a new section in the newsletter where I will ramble about the condition of my Norton, a 1970 Fastback, and the fixes I've incorporated. Send me your tips and I'll print them here!*

The Fatback has put in a good year-finishin' off my 2<sup>nd</sup> rear tire and not a lick of trouble. I have been changing my oil every 1000 miles (its cheap), but recently I've slacked off-I'm approaching 2k on this oil change. I just can't stay off it long enough to change the oil! I'm happy to report that I haven't had to add any oil during that 2 K miles, so I guess I found the oil burning problem when I changed the rings in Sept. '99. I started adding 8 oz. of STP at each oil change, and now my oil pressure gauge will show 10 psi on the interstate at 4000rpm instead of zero, so I feel it was an improvement. I did install one of Dave Comeau's clutch rod seals about 2000 miles ago. All seems well, although I haven't torn it apart to inspect the clutch since. My gas mileage has improved from around 39-40 mpg to 44-45 since the Rocky Top trip-guess I blew out some cobwebs. I have 17,000 miles on the sleeved Amals & Tom Mitchell says it's the best idling Norton he's heard. One thing I've noticed is that it will come off the interstate running rich; the idle will slow down, and it wants to die. If I slightly crack the throttle for a few moments at the traffic light, it will lean out to where the idle comes back to normal. I think they are due for some new needle jets and perhaps float needles and bowl gaskets. I once had a problem with the right carb running rich, and at certain rpms (around 3000) gas would spew out of the tickler. Turned out to be the float bowl gasket. Evidently engine vibration would shake the float and pivot pin around enough to wear an indent into the bowl gasket, allowing the float to raise and also the fuel level in the bowl. I pinched the bowl so it held the pin in place and replaced the gasket-took care of the problem! I'll be looking for that again this teardown.

In the next issue I'll report on the carb rebuild and a few other repairs I need to make-gearbox output shaft seal, oil tank mounting tab repair, and Isolastics tune-up.

## RUMOR CONTROL

Mike French completed work on his Café Combat Bitsa, and by all accounts it's a Sweetie! Lovingly referred to as "The Bride", short for the Bride of Frankenstein, it has been the attention-getter wherever she is parked. Mike was kind enough to let me ride his bride on the Rocky Top outing and I would like to say it was great! Oh, and by the way, his bike runs good too! Looking forward to my next ride on John Wuebbeling's Big Smoothie!

By now most of us have heard of Ted Hoyer's and Bill Henderson's unsuccessful completion of the Iron Butt Rally. The Dazzling Duo, entered in the two up class, had made up for lost time in New Mexico only to have to throw in the towel at the Grand Canyon. Seems that Ted asked Bill for some aspirin to relieve his sore neck muscles, but Bill accidentally slipped him some of the pain relievers he had acquired from a friend at the last stop, and they proved too strong for Ted. Ted is recovering nicely from a broken collar bone and a punctured lung, but his bike has been sitting neglected since the unsuccessful attempt at jumping the canyon.

## FRESH MEAT

*Editor's Note: Here is an E-mail I received from our newest member*

Hi Joe,

Thanks for the email. I'm looking forward to receiving the newsletter. Unfortunately, I already have plans for this weekend (invite to Rocky Top) but maybe next time. Like most everyone else, I have a Commando. Bought it back in about 1980. It started life as a 74 Hi-Rider that I have converted to a Roadster. It has about 12k miles on it and is in



pretty good shape. I am reasonably handy with tools but I am a long way from being a good mechanic. One of the main reasons I am interested in the club is the opportunity to get and give advice about the maintenance and repair of the beast and to exchange information about parts, services and accessories. I've been riding since I was a kid but most of my friends have become responsible and given up motorcycles. I am interested in meeting some folks who still enjoy riding and bench racing. I like riding back roads but I don't understand the purpose of riding a Goldwing 500 miles/day down an interstate. Thanks for the welcome. I'm looking forward to getting together with everyone.

Jim Hughes

## LETTERS FROM THE MEMBERSHIP

### **MID OHIO REPORT**

Submitted by Cholly O

I attended the vintage races this year & had a great time. The weather was very good. The Norton stuff at the swap meet was mostly being sold by "regular" swap meet suppliers, such as British Parts/Chicago. Everyone must be hoarding their stuff in the used parts supply pipeline. Slim pickings.

There was a '69 Commando for sale for \$5500. Pretty decent shape. It was an early unit, as it still had gussetted frame. I don't know if it sold.

One item of interest at the auction tent was a '69 Commando that had a write-up taped to it. They had it listed as being #715<sup>th</sup> Commando ever built. The motor # was well after my 20M3 Commando, so mine may be even earlier built than first thought.

The Ohio Norton Clubs had a "Norton Corral" area on the infield, so I went to check it out. Some nice rides were present. A ride was scheduled for Saturday afternoon, but most folks decided to stay at the track. Six of us went out for a nice 1 1/2-hour ride around the Ohio countryside.

One of the Ohio Norton chapters put together a nice production type racer for sale, equipped with a Combat engine, Dunstall glass (painted metalflake blue), clip-ons & rear sets, alloy wheels, etc. It was a club project bike, which was for sale to generate income for the treasury. It was tagged at \$3600 OBO, which seemed pretty reasonable for an uncommon Commando.

I pulled out of Mid-Ohio about 5:30 PM Saturday evening, and got back to Cuba about 4 in the morning, after napping in a rest area for around 2 hours. I look forward to going again sometime.

## TECHNICAL

### **A DESCRIPTION OF NORTON CAMS**

*Taken from Norton Owner's Club Web Page*

The stock Commando cam is of the same form as the Dominator SS cam of 1961. This cam was good enough to win the Thruxton 500 mile race in that and the following year, and also the 1000 kilometers race at Silverstone. So, the general notion that a stock cam cannot be any good rather depends on what you want it to do. This cam is fine for street use as it has a nice flat torque curve, however the hardness of the metal often leaves something to be desired and a lot of them could do with some heat

treatment to reduce the wear. It is rumored that the wrong treatment (nitriding?) was originally used on some of them, which actually made them softer.

It is worth checking the timing of this cam because at Woolwich it seems they had some trouble with the old cam grinder, which had come down from Birmingham. While the cam lobes came out fairly accurately in relation to each other, they were not at all accurate in relation to the driving keyway. The timing is checked at 0.013" valve lift: set the clearance to 0.016", then the opening/closing position is when a 3 thou. Feeler gauge can just be pulled out from between the valve stem and the rocker adjusting screw.

The crucial figure with these cams seems to be the 8 deg. lead of inlet lobe over exhaust lobe. To achieve this lead, the timing can be advanced or retarded in 5 deg. stages as follows. One tooth on the camshaft sprocket represents 40 deg on the crank, and one tooth on the intermediate gear in relation to the half time pinion equals 15 deg. on the crank. Therefore, to retard the timing by 5 deg, rotate the cam sprocket one tooth anticlockwise, which advances the cam 40 deg., then rotate the intermediate gear three teeth clockwise, retarding the cam 45 deg., giving a net retard of 5 deg. To advance by 5 deg., rotate the cam sprocket one tooth clockwise and turn the intermediate gear three teeth anticlockwise.

Because the timing mark on the intermediate gear is a marked space between teeth, it is obscured when the timing chain is in position, so it is an advantage to mark the tooth on either side of the dot with white paint. At the same time, mark the teeth three spaces away on one side of the dot with red paint, and the ones on the other side with yellow; then it is much easier to see what you are doing when assembling chains and sprockets.

### **Combat**

Just to cause confusion, another SS cam, henceforth known as the 2S, was introduced for the 750cc Combat engine. This cam had more lift and duration and virtually equal overlap, i.e. no lead. The result was more power at the top end at the expense of bottom end torque. The 2S was also recommended for 850cc Stage 1 tuning, i.e. fast road work. There was another grind known as the 3S which had the same timing as the 2S but more acceleration, and 0.016" ramps instead of 0.010". The 2S and 3S cams may be advanced up to 3 deg. to restore some lead and presumably result in a less peaky power curve. Advance by 5 deg. as above, then file a tiny step on the camshaft key to turn the sprocket 1 deg. anticlockwise. The net advance is then 3 deg.

### **Other Sports Cams**

The 4S has advanced inlet timing compared with the 2S, while the exhaust timing remains the same. This yields more midrange power than the 2S. It was recommended for 850cc Stage 2 tuning, i.e. road racing, but it might be better than the 2S for sports road use as well. Other cams you might come across from the olden days are the Dunstalls. The Dunstall race cam had a pressure oil feed to the lobes and usually ran in needle rollers.

### **Modern Developments**

The PW3 was a Peter Williams design developed from the works John Player cams of 1973/74. Mick Hemmings says he won the race on his first outing with this cam and it is the best he has used. There is also a cam known as the 7S, but we have no information on this one.

### **American Cams**

The Axtell #3 is the legendary grind developed for flat track racing in the U.S.A. The particular torque characteristics make it very suitable for road use as well. C.R. Axtell stopped making them years ago and apparently refuses now to make Norton cams. However, we have it on good authority that the Norris SS/Megacycle 560-NSS grind is equivalent. This cam has less lift, longer duration, and no lead compared with the traditional British performance grinds. It is best in 850cc and larger motors and gives power throughout the rev range. Other Norris grinds now available from Megacycle include the R (all round performance for a 750, with strong low and midrange power) and the D+ and 480 (top end power for road racing and drag strip use). Megacycle's own cams include the 560-00 which is good all round, but needs radiused tappets.

The standard Commando rocker ratio is 113% for intake and 100% for exhaust.



*Editor's Note: In typical British fashion, this article leaves the reader with more questions than answers! What is meant by lead, overlap, and why doesn't it give the specs for checking??? I have been doing some research on this and will follow up with a more in-depth description of cam timing in the next issue.*

### Crankcase Breathers

*Editor's Note: I found this on the Brit Iron mailing list a few years back and found it very interesting. Thought you might enjoy it too!*

From: michael\_moore@usa.pipeline.com (Michael A. Moore)  
Date: Tue, 16 Apr 1996 23:56:10 GMT  
Subject: Crankcase breathers and exhaust suckers

Various inquiring minds wrote:

Hi Michael,

I wonder if you could explain the situation with breathers and loss of power. I've never considered that angle, and I'm not even sure what factors come into play. I guess I really should read those books asap, eh.

Cheers,

Stan

\*\*\*\*\*

Are you suggesting a pvc valve or something like that? I've heard of people adding another one on the clutch side (*must be a Triumph guy?*). What the heck is an 'exhaust sucker'? I'm having a hard time picturing how a crank breather is supposed to work.

..Andy

\*\*\*\*\*

How specifically does one install one of these spring loaded check valves and how is the 'exhaust sucker' implemented?

Cheers

RAndy

//////////

There I go again, letting out all the hot engine building secrets. Oh well, now that the cat is out of the bag I guess I'll have to tell you about breathers and suckers. To start, you must realize that your engine is an air pump, and the piston(s) pump air on both sides of the piston crown. If you have a single, the piston is pumping 6-800cc of air in and out of the crankcase breather. Pumping air expends energy. If you are pumping air in and out of the engine through a tiny little breather it takes even more energy, because the small hole is more restrictive. If you build up the crankcase pressure by the air not being able to easily escape, it will try to escape wherever it can. This is the cause of many of the small oil leaks - oil isn't seeping out of the engine, it is being forced out. The internal air also tends to have a lot of oil in it, and oil suspended in the air isn't being pumped by the oil pump.

If you install a check valve on the engine breather(s) the air that is pushed out by the falling piston can't be sucked back in through the breather. It has to come in past the oil seals/gaskets/rings. The amount of air that come from these places should be much smaller than the amount the piston can force out past the check valve, resulting in a reduction of air in the cases after a few revolutions of the crank. The car guys found out that if they ran the breather hose from the check valve to the exhaust pipe, the exhaust rushing by the attached hose would help to pull the air out past the check valve, adding an additional extractor effect to the check valve. Exhaust sucker sounds so much more entertaining than an exhaust extractor, eh what?

I use a Standard Motor Products AV13 check valve. This is a metal bodied, spring loaded rubber diaphragm automotive PC valve. The engine side has a hose barb of about 7/8" OD, and the exhaust side has a big heavy nut brazed to the body. You could screw a pipe fitting into the nut, but I cut them off and make a lighter hose barb and weld it to the valve body. This must be done carefully as you don't want to melt the rubber seal. I set the valve in a bowl of water and make a bunch of short TIG welds, allowing everything to cool down between welds. The exhaust pipe attachment is a

bit of steel tubing of a size to match your hose barb. Weld this to the head pipe near the manifold/collector and drill a .125" hole through the pipe. Melting of the hose doesn't seem to be a problem. The car folks found that you can overdo things here, as with larger sucker pipes pointing "downstream" in the exhaust they were able to get enough of an extra suck to where they started to pull oil from the engine.

The car guys have reported this type of system developing 4-5 inches of mercury vacuum. When Bill Jenkins wrote about this in 1976 in "The Chevrolet Racing Engine" he said that the only thing stopping them from pulling more vacuum was the lack of a better main seal. Sometimes engines require the seals to be reversed, as the problem is keeping air from coming into the engine, not keeping oil from going out! (Yes Stan, you should have bought the book and read it - then you could represent yourself as an engine guru by passing along someone else's hard won information).

I figure that even if this just breaks even on power, it is worth the time to reduce the likelihood of the pesky oil leaks. My TT500 road racer once developed enough internal pressure at Sears Point to where it pushed the countershaft seal out, liberally lubricating the left side of the rear tire going through Turn 1. My friend Craig also thinks it is worthwhile to eliminate rocker cover breathers, and use just a crankcase breather. He theorizes that air rushing to get out of the rocker cover breather may slow the return of oil from the head to the crankcase. We don't have any proof of this, but it sounds reasonable, and if you run the valve/sucker you will only need one breather outlet anyway.

I hope this answered your questions.

Cheers,  
Michael Moore  
Euro Spares, SF CA  
AFM/AHRMA #364

-----  
*I was intrigued enough by this posting that I installed a PCV Valve in my breather hose on the Fatback prior to roll out. Now, 17,000 miles later I'm happy to report that engine oil leaks have never surfaced on my bike, but I can't attribute any performance gains to it. I've seen similar devices on other bikes too! My '74 Ducai twin has a flapper valve on it's breather, like a reed valve, and my Moto Guzzi uses a check valve in it's breather box. I didn't have to do any cutting or welding to adapt a PCV Valve to my bike-I found one at Auto Zone with 3/8" hose barbs on each end. It should be noted that my engine uses the old style timed breather located on the L/H side of the camshaft, but I wouldn't think it makes a difference. Perhaps the later breathers would work better, allowing more airflow through their 1/2" breather hoses. It would be interesting to instrument the breather hose between the PCV Valve and the engine to see if it really does create a low-pressure area in the crankcase!*

## TREASURY REPORT

Not much to report this quarter-not much taken in and the only expense is for publication/postage of the last newsletter.

Balance(11/02/00)	\$ 190.68
Money taken in	(+) \$ 30.00
Money Spent	(-) \$ 18.00
Total	\$ 202.68



## THIS ISSUE'S HISTORY LESSON

### Why BMW Engines Are Called "Boxers"

The name comes from the fact that all BMW bikes (until recently) use shaft drive to transfer power to the rear wheel. How does this imply the name "Boxer", you ask? Well, the very first shaft drive bike was of course the Spagthorpe Boxer, an experimental design from the early years of the company, and that motorcycle has quite the history!

It was not yet common knowledge around the British motorcycle industry that if you were to use longitudinal crankshafts with shaft drive turning in the same direction, that the motorcycle would be quite wheelie-prone. That is, strong application of counter-steering along with the requisite throttle roll-on would produce an uncontrollably violent wheelie (the physics of this phenomenon is quite complicated-suffice to say that the waffle cone had not been invented yet). The Spagthorpe models of the time all were opposed triples utilizing two crankshafts and shaft drive, and it wasn't until testing began on the experimental B-13 model, with its high output engine, that the phenomenon was first noticed.

Spagthorpe's owner, Lord Julian Swagthorpe, and his trusty team of engineers knew a seductive challenge when they saw one, and rose to the occasion. They designed a wheelie bar similar to those used nowadays, except with an added feature. It consisted of a bicycle wheel mounted aft of the bike on pivoting, spring-loaded struts, but it incorporated a linkage hooked directly to the clutch, such that when a wheelie occurred, the upward pivoting of the wheelie bar would proportionally disengage the clutch, thereby smoothly maintaining wheelie-equilibrium. (Note: this design was so unquestionably effective that you still see it utilized at automotive testing grounds today.) This wheelie stopping system was necessary because it could respond instantaneously to counteract the incredibly instant loops that were experienced during testing of the B-13.

The first test of the B-13 equipped with the wheelie bar took place at the secret Scroddum - Scratttche Proving Grounds on April 31, 1913. The engine was started (utilizing the Proving Ground's water turbine) and with a staccato bark, the machine took off, piloted by the factory test rider (name lost in history). On the first turn of the 2.86-mile dirt oval, the pilot applied a strong counter steer, rolled on the throttle, and promptly crashed. The pilot didn't have a clear picture of what happened, or for that matter, a clear picture of much of anything. He was bruised and bleeding, but only in the facial area. Naturally the filming crew was on hand and had captured the whole event on film. Not until after careful viewing of the film the next day in slow motion was the mystery revealed. It seemed that the wheelie device worked admirably, except for a little feedback oscillation problem; the front wheel popped up and just before the bike looped, the clutch disengaged and the bike came back down to the ground. Unfortunately the pilot couldn't quite get out of the way of the rising triple clamp/handlebar attachment, receiving a solid thwack right in the face. Of course he was still holding the throttle open and applying the counter-steering force, so as soon as the front end came down and the clutch engaged, WHAP, and again, WHAP, and WHAP, and WHAP, WHAP, WHAP! Faster than the eye could see, the pilot was beaten about the head and face until unconscious, losing control of the machine and crashing.

Coincidentally at that time, the Spagthorpe Test Riding Union went on strike. Still needing to test his concept, Lord Julian went to the local college and recruited the toughest young men they had to offer: their amateur boxing club. On them, the facial bruises and lacerations were not even a concern, and Lord Julian was able to soon find the correct feedback settings, and finish the research testing. From that time forward, in honor of the valiant college men who came through in a pinch, the Experimental Model B-13 was called the "Spagthorpe Boxer".

A supercharged version of the Boxer showed up for a much touted race on a quaint little island just offshore, but unfortunately the entire race bike and equipment wagon was stolen just before the race started.



The culprit was never found. Lord Julian doggedly put the ugly incident behind him and went to work on his next project; the famous and highly successful Spagthorpe Rottweiler.

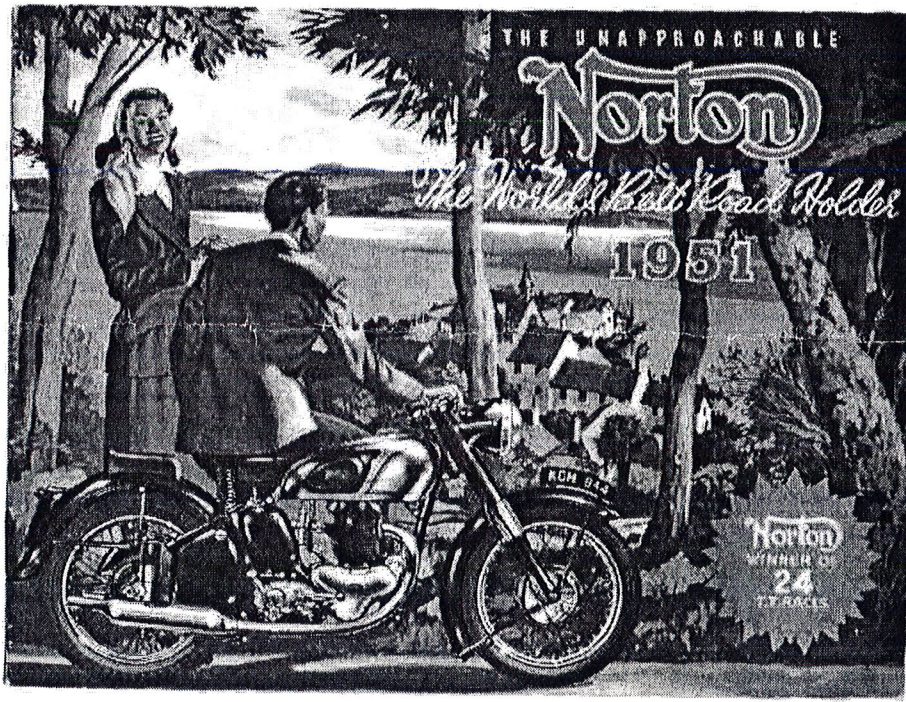
Incidentally, rumor has it that one of the striking test riders was at that time dating a young woman, a lovely German girl who reportedly came from a family of aviation pioneers. Now, I certainly would not want to accuse a fine German company of anything untoward, but coincidentally, a few years after the unfortunate incident on the Isle, an upstart company in Germany began manufacturing their own version of the "Boxer". They carefully limited the engine output and frame design, such that it was impossible to counter-steer, thus eliminating the danger of wheelies, at the same time relegating acceleration and turning performance to somewhat lackluster proportions in the process. To this day these design compromises have made all shaft driven motorcycles impervious to counter-steering or wheelies, and has radically limited the performance of these machines, even though a compromise is completely unnecessary on transversely mounted engines. It's a gray area in motorcycle design, you see, and no modern company is willing to do such testing, as they do not have the commitment, determination, or sheer gall of Lord Julian Spagthorpe.

## UPCOMING EVENTS

A fall ride TBA

A club meeting TBA

## FLEA MARKET    No entries at this time



***Judging by the height of her knees relative to the pillion pad,  
this Amazon must be 9 feet tall!!!***