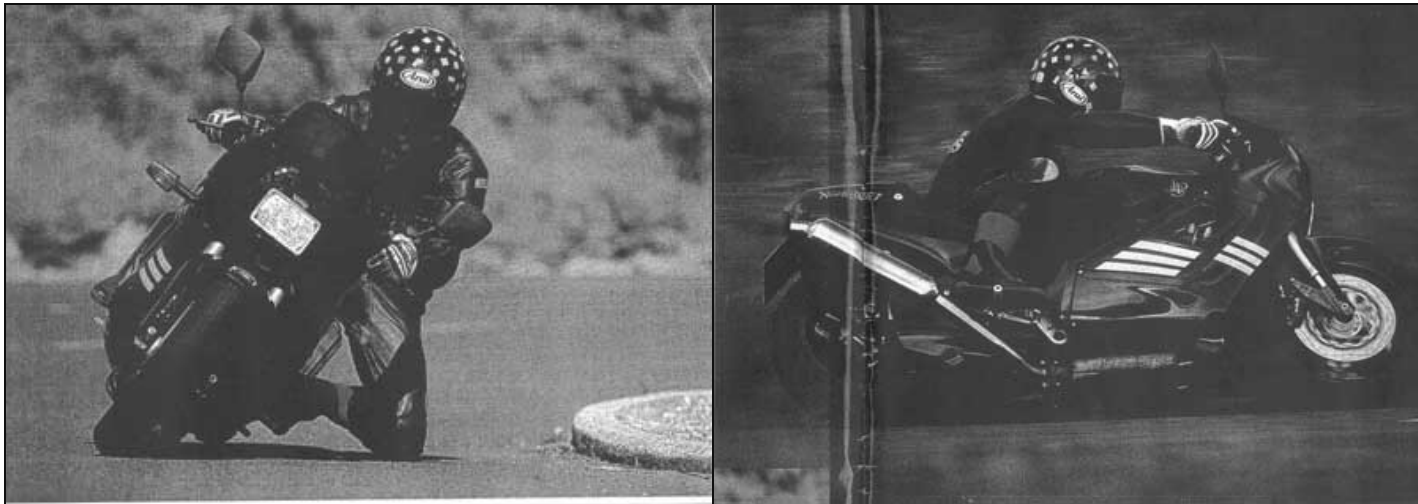


# RIP VAN WANKEL

*Ladies and gentlemen. The Norton Fl.*

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It starts instantly, a steady whirr from the rotary motor contrasting with the soft, low pulsing of the smoky exhaust gas as it belches out of the silencers. A cold start always needs choke to offset the lean low speed carburetion - essential to minimize the twin rotor's inherent instability at idle or on the overrun.



Ticking over on the side stand the bike throbs gently forwards and backwards but as first gear snicks silently in and the sharp, juddery clutch takes up the drive even this barely perceptible movement disappears. The engine smoothes like the surface of a lake when the wind drops.

It warms slowly and needs more choke than most. From a standing start, 100mph is 12 seconds and two gear changes away. The motor pulls hard from 5,000rpm, responding like a big two stroke as the revs rise to 8,000. The owner's manual marks out anything above 9,500 as forbidden territory but as the needle hits the redline there's a final stab of power and an adrenalizing howl of six firing-pulses-per-twin-rotor-cycle sound which flashes images of black blurs of speed, hunchbacked riders and bolts or orange flame on the exit to Goddards.

The change into top comes at 130mph. By the time the lights come into view the bike has been galloping flat out for nearly a mile. There's masses of room to stop but the brakes offer such power it's irresistible to use them as hard as the tyre can bear, crashing down the gears in a series of throttle blips while glorious chords of swirling sound - half familiar, half alien - percolate the rider's helmet. So if you were worrying, stop now. Norton's new motorbike has got balls.

It's got lots of other things, too, including an engine design with only two moving parts and a reputation almost 20 years in the making (for this is how long the concept of the bike has been floating around the British Bike Industry). It attracts so much comment and interest wherever it's parked that it's infuriating. It's so far out of reach of the average biker that it's almost irrelevant. Most of all, it is so completely devoid of any yardstick of comparison that it's hard to know what to think. It is a new species. A creature hitherto unknown to science. more or less.

Asked if it was any good I was initially tempted to reply that it depends if you think it's a 600, a 1200 or a 1.8. After two weeks I don't think the engine capacity is relevant any more than it is for an RC30, a KR-i or any Bimota.





However, the following are indisputable: the F1 weighs 470lb dry, sits in a very posh rolling chassis, makes 77.5bhp at the rear wheel and does just over 140, consuming fuel at an average of 32mpg and oil at an average of 250 miles per pint in the process. The handling's brilliant, braking ditto and even a casual inspection will tell you the bike's beautifully made. One of the most noticeable things about the engine is its tendency, at 4,000rpm, to make a noise like several ball bearings whizzing round a roulette wheel.

Despite the name, the F1's motor is different from the championship-winning racer's. The JPS missiles Nation and Spray get their kicks on most earlier Police bike engine which has a separate gearbox and duplex primary drive. The F1 has a unit construction and because its

FZR1000 gear cluster only has two shafts, the motor turns in the opposite direction. There's also a twin chain primary drive which is much more resistant to the factory are gleefully anticipating the day when they take their 200th F1 order and the new engine becomes fair game for racing, for on that day they will have a primary drive which is truly Nation-proof.

The nearest thing I can liken the F1 motor to is an FZ750 with two stroke overtones. It'll top but between 4 and 10,000rpm is a more typical range. It's 'kin lively, but elastic with it; to thrash it you have to open the throttle wider than necessary, then close it as you reach your desired speed. Paradoxically, a lightly slower pace will reel in miles of sweeping, deserted roads with only minor Engine braking is similar to say an RG500 and running between 4 and 8,000 flings the bike out of corners as hard as any Japanese 750. Below 6,000rpm the Norton makes more power even than Honda's VFR750L.

At the top end the Norton engine behaves more like a 600; 77.5bhp is enough to wheel spin at 120 in the wet and beats an FZR600 but succumbs (just) to a CBR's 79 and a ZZ-R's 81 horse.

At this point it is usually necessary to shut the throttle. Initially the rotary behaves normally on the overrun but as the engine speed drops the twin rotors start hunting. It starts at around 50mph in top gear (or 20mph in first) a juddering, snatching motion that increases the longer you do nothing about it. It clatters the chain and gearbox in a manner that can do little for the long life of the transmission.

Faced with the Wankel's peculiar kargaroolity, the rider has three options: accelerate (problem disappears); change down (symptoms deferred for a few seconds); or pull in the clutch and coast (not permitted for more than a minute at a time, according to the manual, in the interests of the clutch release bearing).

Obviously this is only a low speed problem and it's easy for a fresh rider to ride round it. But after a full day's riding, or when stuck in endless slow-moving traffic, this biggest rotary bug-bear becomes a pain. The bike'll hold 30mph smoothly in any gear if you concentrate hard enough but as the motor feels happiest under load the speed tends to creep up gradually, to the intense delight of policemen hiding in the shrubbery.

Clutch action is harsh. There's a short distance of take-up and the bike shudders at the halfway stage enough to shake the console. There is little progression and this can sometimes catch you out, the bike lurching forward unexpectedly if, for example, you attempt a parking maneuver whilst your attention is occupied by a member of the opposite sex.

The gearbox is not good.

Designed for a 1,000cc FZR giving 30bhp more than the Norton it is afflicted by huge gaps between first, second and third gears. This means that getting a hard drive out of some low speed (sub-50mph) corners can be



difficult as there is no ideal ratio. Stay in the high gear and you're out of the 8 -10,000rpm zone. Change down and the back wheel can lock temporarily despite the motor's featherweight flywheel, and anyway, the motor will almost be overrevving. Above third gear there is no problem. All this is illustrated by the rpm at 50mph through the gears:

1st	8,200
2nd	5,800
3rd	4,300
4th	3,600
5th	3,100

A six speed box would be better.

The shift action itself is clunky, not particularly precise and only really works smoothly on mid rpm upchanges with little or no use of the clutch. In dawdle mode or flat out the gear change is, I regret to say, clunking dismal. FI owners will inevitably become obsessed with correct chain tension in an attempt to make the best of it.

The frame (manufactured by Spondon to Norton's spec) is loosely based on the race bike but calmed down a bit for the road with more trail and a longer wheelbase. For those who are interested, or who wish to keep the collector box off the floor, it

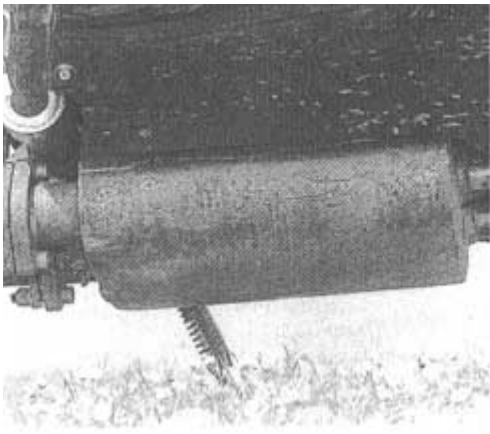
is possible to get close to racing steering geometry again using a jolly convenient ride height adjuster under the seat. In this condition, and with all the damping suitably adjusted, the FI is into the GSX-R750L or RC30 standard of stuffing into corners on the brakes and laying on its side as hard as possible. It feels very good to do this. The steering really is superb, and almost totally unaffected by braking.

Norton quote rake/trail figures of 25deg/99mm, presumably on standard settings, but the quality of the White Power suspension (both ends) means the bike stays stable even when the rear end is jacked up as high as it will go. All damping adjusters are easy to reach (except rear rebound when the exhaust is hot) but should allow softer settings than they do, especially at the rear. (Our favourites: rear rebound three clicks from- softest setting, rear compression softest setting, front rebound five clicks from softest, front compression one click from softest. Ride height maximum).

The only stock tyres available so far are Michelin Radials, though it'd be interesting to try some more modern alternatives like the latest Metzellers. The bike's great in the wet and feels secure ridden hard but it's got a bouncy feel, especially at the front, and is imprecise when cornered half-heartedly, as if uncertain about what angle of lean to settle at.

The half Japanese, half Italian brake setup provides all the stopping power any sane person could ask for despite the rattly old floating Brembo discs which wear their rotor pins extremely quickly. Disc warpage, or radial free play, or both, contribute to a slight vibration on the brakes as speed decreases. This is confirmed at 20mph when gentle, steady pressure at the lever gives uneven braking force at the disc. Japanese floating brakes do not do this. Combined with the crotchety gearbox and unstable engine characteristics on the overrun it simply acts as a deterrent to riding the FI in traffic.

Long distance the FI feels great. Ridden without constraint, it's comfortable for the entire 110-130 mile tank range. Going slowly hurts your bottom after little more than an hour. The only luggage option is a rucksack, the



Left: collector box on the bike in your local Norton shop will be polished stainless, but it'll still be this shape. Above: rare shot of cooling fan not moving.

mirrors are outstandingly good and the flip-up screen provides the prone rider with total insulation from wind pressure.

Even cynical old toad Leon Moss was impressed with the FI's build quality. All screws are stainless steel, as is the exhaust (has to be, in fact, as the rotary runs so hot). The colour impregnated bodywork fits flawlessly. There are no datum marks on the swing arm but adjusting the chain is so exact an operation that after an initial alignment check it will never go adrift. The seat fits

properly. Footrest hangers, suspension linkage, yokes and clip-on clamps are milled from solid.

Yamaha make the clocks, switchgear, mirrors, foot levers, master cylinders (all three) lights and indicators. The loom is made at Norton, painstakingly laid out and wound by hand on a large wiring map next to the production conveyor belt. There is more thought in each of these things than in most of Ducati's net production.

There is sod all steering lock.

All sorts of people are buying the FI, their only common characteristic being extreme wealth. At £12,700 it's not a rip-off. This is what it costs to build a high quality motorcycle in the UK - engine development and all from the ground up. Value for money is another question. The collector box could be reshaped to form a belly pan. And the PVM wheels are by no means the lightest available. All that trick suspension would work so much better if it had wheels to match.

At the moment the Norton racers are making 145bhp, according to race boss Brian Crichton. The road bike makes a little over half that which suggests either that the rotary works brilliantly as a racing engine, or that it can only realise about half its potential in noise and emission-regulated form. Apparently an FI fitted with the racing 'ejector' exhaust would hit 110-115bhp right away. Unfortunately, there is no way to silence this device.

There are other possibilities for the future. Fuel injection, alloy rotors (current ones are cast iron), more cc, twin plugs (as used in Norton's aero engines), ceramic/teflon coating of various engine parts, six gears. The most exciting possibility would be to supply the carbs with fresh, cool air. At the moment they breathe the oil-laden air used to cool (and lubricate) the rotors. If the factory could develop an oil separator small enough to fit the bike they could recycle the engine oil and fan-cool the rotors instead, with huge power gains due to increased volumetric efficiency.

In its favour the rotary Norton is smooth, guaranteed for three years, compact, flexible and gives good power for a 600. Against: it's unstable on the overrun, has a combustion chamber shaped like a banana, and compared with a Japanese engine realises relatively little power in street legal form. It's a fuel guzzler too - at 10,000rpm it's using enough petrol to take an OWO1 to 110bhp. It would have been a lot more impressive in 1980 it just hasn't got the crispness of a modern four. Finally, the Wankel is not a clean engine, though as motorcycles are spared the stringent pollution controls of cars this doesn't matter. Yet.

What is amazing is that puny little Norton with their tiny R&D budget can, in a world dominated by Japan's megabucks, produce a finished motorcycle this good.

# TEST SPECIFICATION

## Norton F1

Price	£12,700
Warranty	12 months, unlimited mileage (36 months, unlimited mileage on engine. Excludes transmission and gearbox).
Manufacturer	Norton Motors Ltd, Lyon Lane, Shenstone, Lichfield, Staffs WS14 0EA (0543 480101)

## Engine

Type	liquid cooled Norton rotary twin
Displacement	588cc
Compression ratio	9:1
Fuel system	two 34mm Mikuni BDS34 downdraught
Ignition	transistorised, multiple spark

## Transmission

Primary drive, ratio	two roller chain, hydraulic tensioner, 1.781
Final drive, ratio	a 110g chain, 17/43
Gear ratios	2.571, 1.770, 1.381, 1.174, 1.037

## Electrics

Headlight	12V 60/55W
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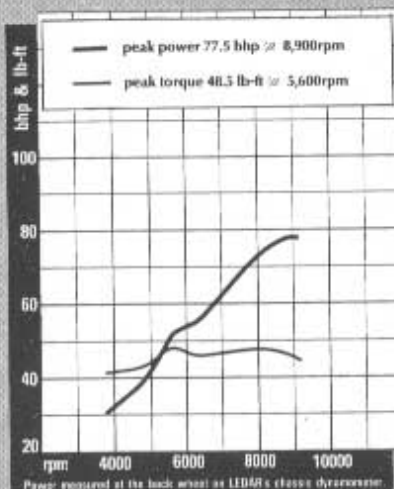
## Chassis

Front tyre	120/70 ZR17 Michelin AS9X
Rear tyre	170/60 ZR17 Michelin M59X
Front brake	two 320mm Brembo discs, opposed four piston calipers
Rear brake	230mm Brembo disc, opposed two piston caliper
Front suspension	White Power upside down forks, oil, rebound and compression damping
Rear suspension	single White Power shock and linkage, oil, preload, rebound and compression damping
Castor/trail	25deg/99mm (3.9in)

## Performance

<b>Maximum speed</b>	
prone	144.5mph
upright	129.0mph
SS 1/4 mile	12.47s (at 112.0mph)
<b>Fuel consumption</b>	
best	34.6mpg
worst	30.0mpg
average	32.1mpg
<b>Tank range</b>	120 miles

(All performance figures achieved in dry conditions)



Power measured at the back wheel on LEDAR's classic dynamometer. Torque bump at 5,500 coincides with the best specific fuel consumption and is followed by a gradual richening. Rolling the throttle off a fraction at 4,000rpm on the dynamometer actually increased power. Some room for improvement in the carburation, perhaps.

## Dimensions

Wheelbase	1440mm (56.7in)
Seat height	750mm (29.5in)
Dry weight	192kg (423.4lb)
Fuel capacity	20 litre (4.4gal)

## Servicing

First service	1000 miles
Engine	every 6000 miles
Rear suspension linkage	every 12000 miles

## Spares prices

Bodywork complete, excl. mudguard	£1280.43
Clutch lever	£11.45
Fork leg	£425.50
Mirror	£20.12
Front wheel	£294.40
Chain	£77.28

## Tester's verdict

Good points	steering, build quality, uniqueness
Bad points	clutch, gearchange, gear ratios, engine on overrun
Performance	if it's a 600 it's pretty good
Economy	hopeless
Comfort	best ridden fast
Braking	high speed: stupendous, low speed: rough
Handling	good: could be improved even more
Value	understandably expensive

## Quick comparison

bike	av. mpg	top spd	SS 1/4	price	issue
F1	32	145	12.5/112	12700	June 89
KC20	40	158	12.2/119	10599	June 89
DWQ1	—	158	—	13700	July 89
Dorco 851 kit	—	160	11.4/127	10195	Aug 88
KR-15	36	135	13.0/108	3549	Apr 90
Mazda RX-7 turbo	18	145	14.8/96	22599	—