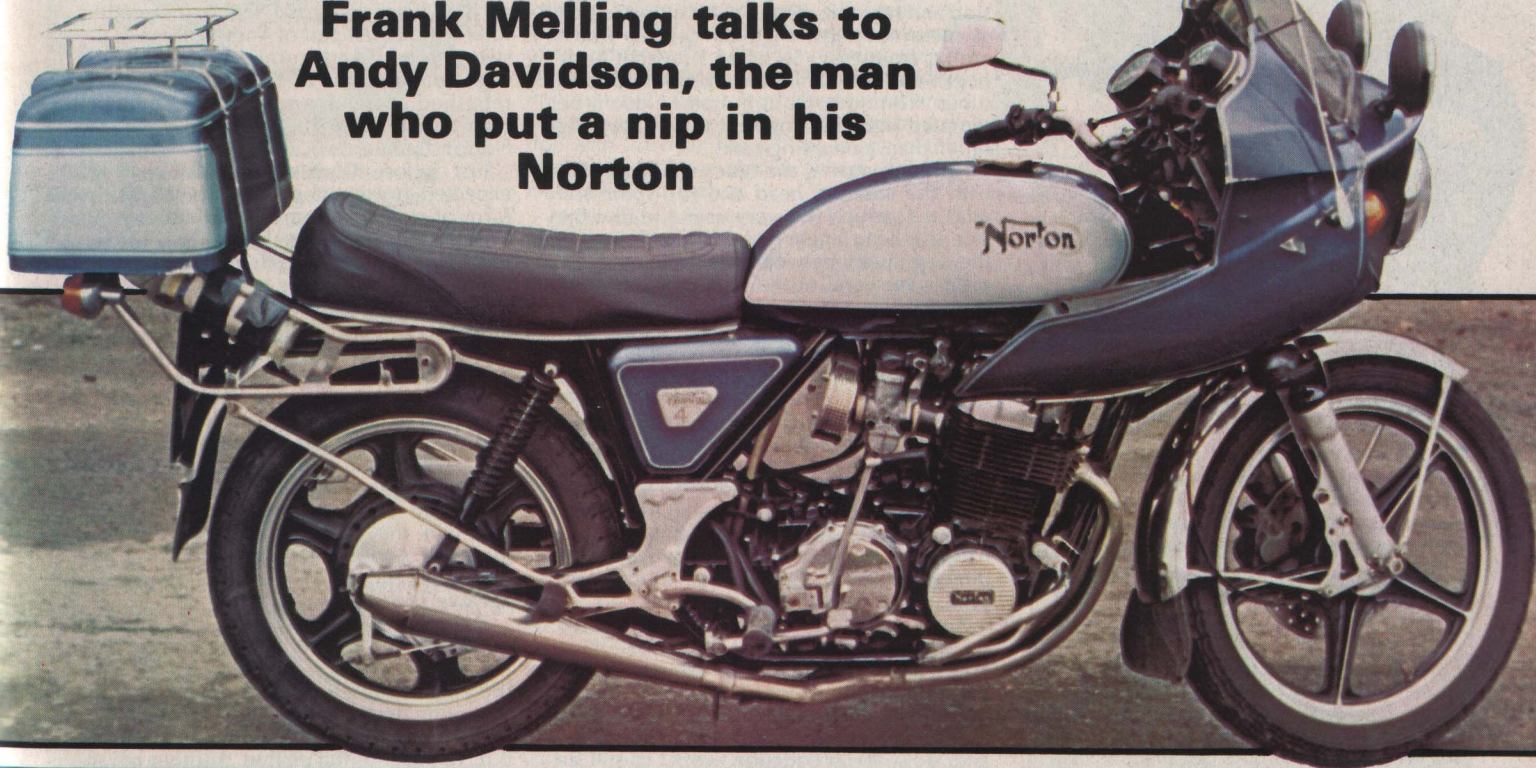


COMMANDO 4

**Frank Melling talks to
Andy Davidson, the man
who put a nip in his
Norton**



TO MEET Andy Davidson is a refreshing experience. An experienced rider with a genuine love of bikes which comes across very strongly, Andy is as forthright and outspoken an individual as you could hope to meet, with a no-holds-barred set of ideas as to the correct ingredients for making an ideal roadster. Unlike most of us, Andy also has the engineering skills to turn his creation into metal and so could transform his ideas into a living, breathing motorcycle — and a very interesting one at that!

Andy's "Norton 4" began after he had perused a number of the better specials around. For example, at the MCM Racing Show last year, Andy studied the Imp-engined bike we had on our stand and summed it up in one word — "Rubbish!" Not that Andy had anything against the engineering, which he agreed was very clever, but the Imp, in common with all other specials on the road, had one massive fault and that was that they all looked like specials. Andy wanted to build a bike which looked like a normal production machine of high quality.

Although now less chauvinistic, British bikes held Andy's loyalty very strongly in May 1976 when he first began the project. He had owned a number of Commandos and liked the Norton frame for its light weight and rigidity, but was less than enamoured with the plodding Norton engine. At this point, it must be mentioned

COMMANDO 4



The BMW-Avon fairing has been modified with moulded-in side boxes. It also carries a radio, oil temperature gauge, voltmeter, oil pressure gauge and ignition switch.

TECH SPEC

Engine: Honda 750 with Dunstall 812cc big-bore kit. Flowed head, KI camshaft, otherwise standard. Painted in Rockhard high temperature stoving enamel.

Frame: Duplex cradle type based on Norton Commando 2 1/4 in top spine. Box section swing arm with bronze bushes. Polyurethane painted.

Suspension: Girling rear dampers. Norton forks and yokes. Modified springing and damper, repositioned caliper mountings.

Wheels: CMA alloy, 19in front, 18in rear. Honda rear hub. Painted in satin black stove enamel. Dunlop Red Arrow tyres.

Brakes: Lockheed front caliper and hydraulics. Drilled cast iron disc. Honda rear brake.

Exhaust: Prefabricated 4-1 system in stainless steel. Straight through absorption type.

Mudguards: Stainless steel.

Tank and seat: Based on Norton with modified bases and fastenings.

Fairing: BMW Avon shell with moulded on storage boxes and slide muffs. Bolts direct to mountings on frame.

Electrics: 240 watt alternator. Halogen headlight and two halogen driving lights. Electric oil pressure gauge, oil temperature gauge, voltmeter, ammeter, radio and jack sockets to helmet ear pieces, live jack output socket. Fiamm electric horns. Three relays and eight fuses in circuits.

Rear drive: Fully enclosed rear chain.

Dimensions: Overall length 88in; overall width 35in; handlebar height 42in; handlebar width 30in; seat height 32in; ground clearance 5in; wheelbase 57 1/2 in; weight 510lb with one gallon fuel and oil; weight distribution 260lb rear, 250lb front; oil capacity: 8 pints; fuel capacity: 5.5 gallons.

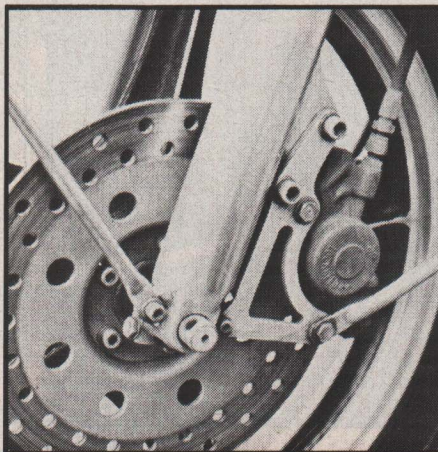
that Andy is an aircraft technician by profession and has a disarming habit of tossing off as mere nothings, engineering feats which are far from easy. So when I say that Andy began the project by removing the duplex tubes from the Norton frame, don't be tempted into thinking that this is anything other than a daunting task.

Having removed the tubes, Andy was left with the steering head and top spine still attached, which was very useful in that the steering head angle was still fixed, as was the alignment between the head and the main spine, one of the most difficult of all the variables to fix when building a frame. He then got a large piece of board and marked out the bends the new cradle would take in order to take the 750cc Honda engine which Andy had chosen as the power plant for his Special. Having decided on the layout, he bent the tubing — Reynolds T45 x 16 gauge, obtained from Precision Tubes of Blackburn — until it fitted and then bronze welded it into place. Which is very easy to write, but infinitely harder to achieve since the bends are 3-dimensional, curving two ways at the same time.

Any prospective Special builders would be wise to copy Andy's choice of tubing since T45 has virtually all the strength of the famous Reynolds 531 tubing, but is much less sensitive to the vagaries of welding. Bronze welding, whilst now too clumsy and slow for production work, is still an excellent method of joining thin wall CDS tubing and cannot be faulted for either strength or resistance to vibration. The headstock was stiffened at the same time with plate, and two pairs of tubes were added running up from the front duplex tubes to the spine and from the rear of the engine cradle to the spine, to help deal with the extra power the new motor was expected to produce.

The new engine cradle meant that the

To stop pad sticking troubles the Lockheed caliper is carried in a specially fabricated "chassis". The standard disc has been skimmed by 25 thou, then drilled and hard chromed.



Honda engine snuggled into the frame just as if it were designed to go there, thus fulfilling the first part of Andy's plan. For the swinging-arm, Andy turned to Honda and it was found that a 1970 unit, suitably rebushed and with a spindle turned from a high tensile bar, fitted perfectly into the Norton frame.

Just before Christmas of 1976, an unexpected present for Andy arrived in the form of a slight misunderstanding with his Commando which resulted in two broken feet. Not the sort of gift everyone would welcome, but the time spent convalescing meant that the Norton 4 project really got under way.

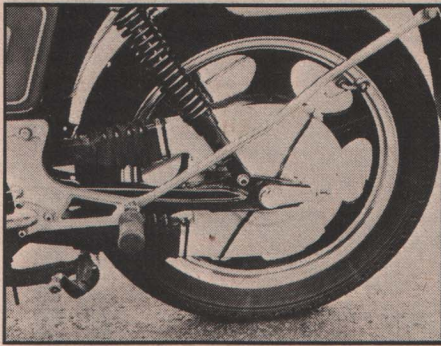
A K2 engine was acquired for £100, given a thorough check over with new bearings throughout and finally the barrel was bored out to 900cc with the Dunstall big bore kit and the head was gas-flowed by Andy himself. The standard carburetors were retained in the interests of economy and low-speed urge, as was the valve size, for although the aim was to build a potent machine, Andy wanted a fast tourer in the Gran Turismo style, rather than an unmanageable road-burner.

The engine was now ready to drop into the frame and to save weight and increase the neatness, no front plates were used, the engine slotted directly into the integral mounting brackets. Two dural engine plates at the rear provide extra stiffness and permit q.d. removal of the engine. Another advantage of the design is that the cylinder head can be removed with the engine in situ, which is a great labour saving feature. All the engine bolts are high tensile and plated and of UNF thread "because I'm British and don't go for all this metric stuff!"

In addition to making the engine mountings integral with the frame, Andy also included the coil fixture and the fairing mounting points on the frame, for the bike was designed to have a fairing as an essential part — not as an appendage added as an after-thought. Likewise, the petrol tank, carrier and pannier mountings were all built in the new chassis.

Because the Norton was to be a Grand Tourer, it had to have a petrol tank large enough to give a good cruising range. The five-gallon Interstate tank fitted the bill perfectly but had to have the bottom removed and a new one fabricated, in order to clear the additional stiffening tubes of the frame. It bolts directly on to the frame through rubber bushes and even with its capacity slightly reduced, it still provides a range well in excess of 200 miles.

Norton also provided the new front forks but Andy was dissatisfied with the standard unit and envious of the plush ride the BMW fork suspension offered. He lengthened the damper rod and this gave him 7in of movement instead of the original 5in. At the same time he reduced the size of the damping holes and fitted new and stiffer springs. The result is a pleasant front fork which although not up to BMW standards, is certainly better than the Norton.



Made from 16 gauge aluminium the full enclosure chaincase has been cleverly designed to give access to sprocket and chain. The rubber gaiters came off an MZ.

The fork legs also came in for some clever treatment when the caliper mounting lug for the Lockheed brake was modified by argon arc welding a special carrier to the front forks. This was done to overcome the problem of the posts sticking in their shoes. The cast iron disc was skimmed by 25thou and then drilled and hard chromed. This gives a disc that Andy claims to be perfect under any conditions, fast or slow, wet or dry.

Both wheels are from CMA and have been on several bikes, giving excellent service throughout. The rear brake is Honda but the leverage has been reduced in order to give the "dead" feeling which Andy likes. Both wheels are shod with Red Arrows and although the front is still in sound condition, the rear is becoming somewhat jaded after 5,500 miles.

So much for the basic bike but the thing that makes the project really Special is the care which went into the ancillary equipment. The most important modification, as far as I am concerned, is the rear chain enclosure. The rear fairing was fabricated from 16 gauge aluminium and is in two pieces for quick access to the sprocket whilst the rubber gaiters are from an MZ. At the front, pick-up flanges have been welded to the Honda's engine case leaving only a small gap which is practical to bridge without too much trouble. Andy says that everywhere he goes, riders ask for replicas of the system but he can't build them at an economic price. However, if you think that you could save £80 in chain wear, he just might be tempted.

Both the carrier and silencer are fabricated in stainless steel since Andy has a liking for working in this difficult material. The carrier is patterned on the Craven and displays impeccable welds throughout whilst the silencer is an absorption megaphone with glass fibre as the dampening medium. When I rode the bike, the packing was getting rather tired but the noise was not unpleasant, although rather on the crisp side.

The fairing is Avon, originally designed for a BMW but with side boxes moulded into the shell. Within the fairing is an impressive array of instruments including an electric oil temperature gauge, ammeter, voltmeter and oil pressure gauge. There is also a radio which was suffering from the stresses of vibration when I came to ride the bike. The most interesting instru-

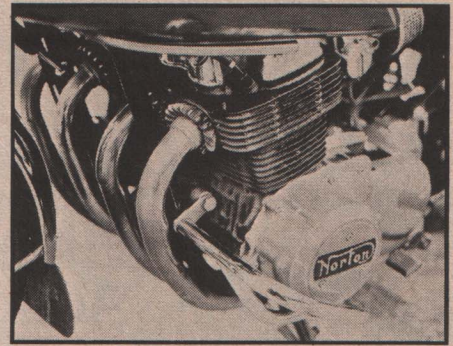
ment was the oil temperature gauge which showed that the six points of oil contained in the converted Norton tank got hot very quickly and then stayed so hot that the instrument just gave a guess as to its temperature.

Speedometer and tachometer are both Honda instruments and the handlebar switches were pirated from a Kawasaki. A quick jab at the horn button produces a wall of sound from the twin Fiamm horns which would do justice to a Ferrari. Equally impressive are the quartz halogen headlamp and two spotlamps which come into operation with the main beam. This is one of the few bikes I have ridden where lighting matches performance.

Andy describes wiring the bike as "difficult", which must mean that it was horrific. Much of the problem lay in his insistence that everything should nestle neatly on one plate behind the engine, but things cannot be helped by having three separate relays and eight independent fuses so that the failure of any one component had no effect on any of the others.

Finally a word about the painting, which is superb, being strikingly attractive and at the same time, modest and tasteful — a difficult compromise to achieve. Andy originally obtained the uranium blue at the Lotus car factory where he saw it being used on a special order. It looked good on the car and he managed to buy some but when he got home, he thought the colour too dark for the bike. Undeterred, a Ford silver was chosen but that idea was dashed after a rash of manufacturers produced silver bikes. After all, there is little use in having a special painted the same colour as everyone else's machine. So a compromise was reached, with a nicely judged blend of the blue and silver producing an outstanding finish. The frame is equally attractive in a true, hard black which was achieved by using a two-part industrial polyurethane paint baked on at 180 degrees.

After providing me with a mountain of information for this article, and another mountain of motorcycling anecdotes, Andy was kind enough to let me loose on his



Mods made to the Norton frame allow the big-bore Honda engine to sit in the chassis without the need for front engine plates. Carbs are standard and so are valve sizes.

beloved beast for a test run. It would be nice to report that all his skill and effort had resulted in an outstanding, or even pleasant bike but for an all round machine, the Norton 4 was sadly lacking.

To be fair, Andy had set the bike up for himself and since he is six or seven inches taller than me, I had difficulty reaching the bars from the large saddle. At 5' 10½", I am no midget but obviously a six-foot-and-a-bit more rider would be better suited to appreciate the layout. Also, Andy's idea of good motorcycling is high-speed motorway burning, mine is scratching round corners on the limit. The Norton is quite good on the fast straight bits, but less happy on corners. The core of the problem is pretty violent head-shaking whenever the rider's hands are removed from the bars. I foolishly tried to adjust my goggles at 50 mph and in three seconds, the bars were quite literally from lock to lock.

Even though the bike is a superb example of craftsmanship, Andy is no longer satisfied with it. Now eyes are being cast upon the Gold Wing and Yamaha's 750. It will certainly be interesting to see what Andy's talented hands can do with one of these new generation superbikes.

