Tight fit!

Ever wanted to build the ultimate special? Ever thought about the vast amount of time, energy and skill you'll need? Now read Tim Kirker's tale of his epic venture in shoehorning a Vincent engine into a Seeley frame, and *then* decide whether you're cut out to be a specials builder

'THINK very carefully — it sounds like a big job.' Peter Bickerstaff, technical services officer of the Vincent HRD club, was replying in March 1977 to a letter I had written to him about building a Vincent-powered special. Nearly nine years later I cannot fault his advice, but at the time I confidently expected to have the V-twin engine mounted in the Seeley Mk III frame within about six months!

PHOTOGRAPHY PATRICK GOSLING

The project started as a means of providing my brother, Peter, with fast, economical transport between Belfast and London, which would appreciate rather than depreciate in value. He provided the capital, and I supplied the labour. But it became a team effort when fellow members of the East Midlands section of the VOC pitched in to help graft the Black Shadow engine and AMC gearbox into a racing chassis more used to housing overhead-cam singles.

The downtubes on the Seeley frame were just wide enough apart to allow the rear cylinder barrel to fit between them, but the head would have to be attached before the engine was installed in the chassis. If a rear carburettor was to be fitted, however, the bracing linking the toptubes to the downtubes would have to go. And there was so little clearance between the rear barrel and the frame tubes that the barrel had to be placed centrally in the frame. This meant the engine centreline would be offset about ½in to the left; there might be problems with the rear chain-line, but there wasn't much we could do about it.

Whoever had chopped the gearbox from the engine we acquired had also sawn through the primary-drive casing, which is integral with the crankcase on a twin. I had toyed with the idea of having something welded to the crankcase, but I was worried about distortion; what about trying to use a Norton primary-drive case? But Adrian Cattell, a section member who gave a lot of help with the project, suggested using the casing from a Vincent Comet, which is a separate item bolted to the crankcase on the single-cylinder engine.

The cause of all the heartache, photographed in its 1985 form. The aim was to build a single-seater capable of blung off big journeys at high average speeds

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The cover would then be substantial enough to support a crankshaft alternator mounting (sawing the gearbox off a twin also removes the dynamo mounting point). One slight worry was that fitting the Comet case would move the clutch about ¼in to the left. In turn this would pull the rear chain line even further in the same direction, as I did not want to increase the distance between the clutch and gearbox, which might put excessive bending loads on the clutch shaft.

Thus, towards the end of 1977, a few ideas were beginning to gel. We would fit a Comet primary-drive case and attempt to mount a crankshaft alternator in it. Drive would be via an AMC box, and I had bought a secondhand Norton Commando clutch, which just fitted inside the Comet crankcase.

Tim Kirker in action on his creation. Indicators and rear-view mirrors allow the bike to cope easily with modern traffic conditions

It was now necessary to look in detail at the layout of the major components. To do this I drew full-scale sketches of the frame, engine, gearbox and primary-drive case on transparent paper, showing all the fixing points. I then laid the engine on top of the frame, putting the front cylinder in line with the top frame mounting point and juggling the engine around until I got the rear pot at right angles to the frame downtube — for aesthetic reasons I wanted the rear fins parallel to this tube. That effectively fixed the engine, and put the crankshaft at about the same height as the swinging-arm pivot.

The primary-drive case was centred on the crankshaft and rotated to find the optimum position — I wanted to keep the clutch centre in line with the crankshaft and swinging-arm centres, in order not to exacerbate the expected chain-line problem. Finally, the gearbox: this was conveniently located with the box pivoting about the ½in hole already present in the bottom of the Comet chaincase.

I was not in a position to design the engine plates — three in all, two to carry the gearbox and one encircling the gearbox to link the engine unit to the frame and the box. Drawings were dispatched to the Jolly Thresher Garage in Lymm, Cheshire, where Jane and Dave Greaves were in the process of setting up the VOC Spares Company, and a few weeks later dural engine plates, spacers and stainless engine bolts were delivered. Would it all fit? With a certain amount of fettling and only a modest-sized crowbar, everything did.

Fixing an alternator on the crankshaft, outboard of the engine shock-absorber, would need a rather special chaincase cover. This meant welding an alternator housing onto an existing cover or having a special cover cast and machined; I decided on the latter, as welding would produce excessive distortion.

I hacked a hole in an old chaincase cover, built up an alternator housing in glass fibre and took the resulting pattern round to Seymour's Foundry on the Derby ringroad. Should it be built up to allow for shrinkage? They reckoned they could manage by wobbling the pattern in the sand and enlarging the mould, but this still produced a casting which was ⅛in short. With hindsight, I should have had another cast from a built-up pattern, but to the Jolly Thresher's credit, they produced a successful cover incorporating the alternator.

Collecting the primary drive case, together with the crankcases and gearbox, was one of the many highspots on the way to completing the project — that mutilated twin motor was beginning to look like a power unit again. Using the Comet chain-case had paid off, as it didn't look incongruous grafted to the twin's crankcase. The alternator was wired up to a light bulb, and simply cranking the rods up and down put the light on — magic.

BACK in Derby came the next nerve-racking test. Would the engine fit in the frame? Without the heads and barrels the power unit went in quite well, but tying the front head bracket to the frame lugs required a rather bigger crowbar than I had been using until then. After a great deal of head-scratching I eventually traced the problem. The front mounting lugs in the frame were not symmetrical — the centre lines of the two tapped holes were not even in the same straight line. The solution was to tailor the front head lug to suit.

It was now time to sort out the petrol tank. The front inlet valve-spring cap projected above the frame, and the bottom of the tank would need relieving. In addition, the petrol tap needed moving to clear the rear cylinder head, and at some time the tank had been down the road, leaving it badly dented and scratched. A superb job was done by Ray Pettet in Nottingham.

What about carburettors? I planned to use Amal Mk II Concentrics, but mounting the front carb in its normal position was clearly out of the question, for the frame downtube would have to pass through the middle of it. There was no option but to move the carb back beside the rear cylinder and to use an inlet tract around 10in long! In order to balance things, the rear carb would have to be similarly mounted.

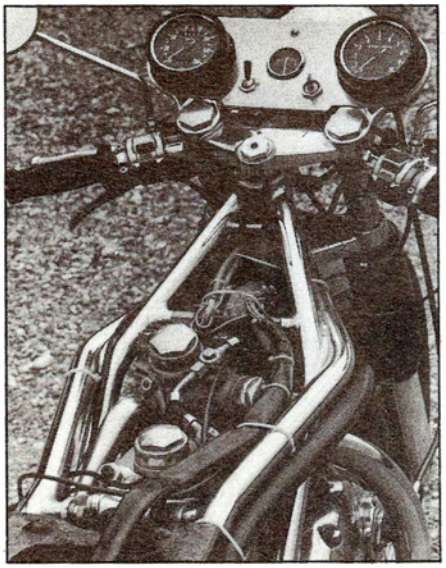
Discussions with various people suggested this would not harm engine performance, and might even improve it. Because of the length of the inlet tracts I decided to suspend the carburettors from the frame: retaining the Amal rubber mountings and hanging the carbs in reinforced rubber allowed for engine expansion when hot. The inlet tracts, and many other bits, were made by Pete Athey, a work colleague.

It was about this time that we spotted an ominous problem. The position of the clutch cable abutment on the AMC gearbox cover was pointing the cable straight at an engine bolt, and even if this was cleared the cable would have to pass through the outer engine plate. The only solution was to move the abutment, but to keep the cable clear of the engine plate meant changing the angle at which the cable pulled on the clutch-lifting lever. A new clutch-lifting lever was therefore required, and hacked from solid by Pete Athey. As well as solving the problem, the new lever produces a much lighter clutch action.

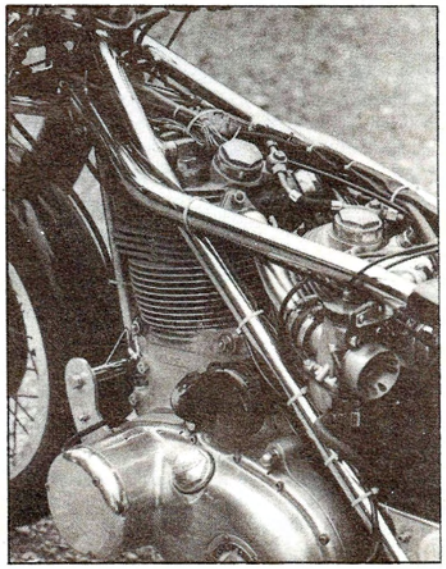
Reaching this advanced stage in the project had taken somewhat longer than I had originally planned — it was now 1981. My brother was beginning to have doubts about the completion date while I was growing attached to the amazing machine which was taking shape, so we agreed that I would buy him out over the next year. The bike was then all mine.

Now that the engine was mounted in the frame, it was apparent that the Black Shadow unit was rather bigger and heavier than the engines the frame had been designed for. In particular, we were concerned that where the toptubes crossed the downtubes, the frame had no depth to resist bending under the weight of the motor. I had heard that cracking in this area was not unheard of, even with lighter engines, so it was decided to fit a bracing tube between the steering head and the crankcase, via two extended front engine plates. As mentioned earlier, frame rigidity had been weakened by the need to remove the linking beam from the top- and downtubes, but now, in another modification, the massive Vincent engine was used to restore strength by fixing the rear cylinder head to the frame toptubes.

We now had a complete list of the frame mods which would be required: lugs for the extra downtube; lugs for the rear head fixing; brackets to carry carburettor fixings; various lugs and brackets to carry the rear mudguard, seat and chainguard, etc. The brazing was carried out by VOC member Eddie Hunt.



Clearance between the rear cylinder head and the frame tubes is critical



Inlet tracts 10in long may be the cause of a carburation flat spot at low speed

Tight fit!

WE WERE now in a position to start building for real. The plan was to assemble the bike in a rough state and ride it for a few hundred miles to check whether we had got things right. It would then be stripped, painted, plated, polished and rebuilt.

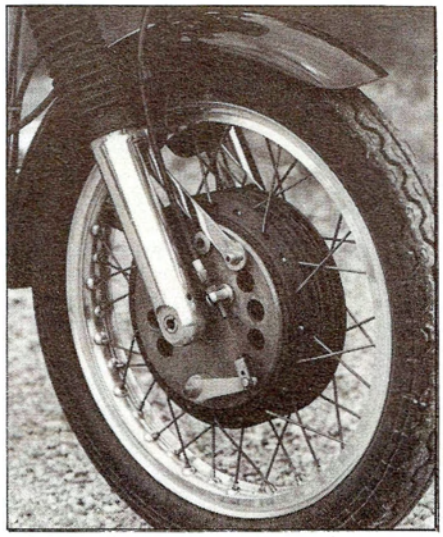
It was at this stage, of course, that all those problems we had put off, hoping they would go away, became unavoidable. Access to the rear pushrod tube nuts was severely limited by the frame downtube passing across both pushrod tubes, just below the nuts. Special nuts were made, each with eight slots rather than the usual four, and by cutting the normal spanner in half and using one half to tighten and the other to loosen, it was just possible to adjust the nuts.

The seat unit had to carry the battery and tools, and a number plate and rear light had to hang from it; ready access to the oil tank (under the seat) was necessary; the seat could carry one person, and must be comfortable. Copious supplies of fibreglass, resin and gel coat were procured, and away we went. The main shape of the unit was obtained by making a mould from the rear of the petrol tank, with an extension to carry the light and number plate. The seat itself was made by VOC members Ken and Marje Colver, in two pieces, each easily removable to allow access to the battery and tools, and the oil tank.

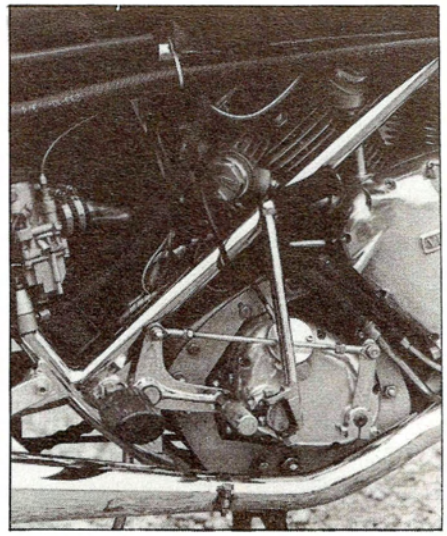
A folding footrest was required to accommodate the kickstart pedal. But when parked, the normal Norton-style pedal would poke through the rider's right shin. The solution was to fit a folding pedal from a Triumph triple, which meant machining the starter shaft to take a cotter-pin fixing rather than Norton splines.

That left the gear pedal and linkage. The pedal had to be rearset, but simply reversing the normal pedal was not on, as it would result in an 'upside down' change action compared to my Rapide — a sure recipe for broken gear pinions. Also, the pedal could not pivot on the footrest, because this had to fold. Now, in designing the frame, Colin Seeley had had the forethought to leave a hole just in front of the footrest where a gear-lever pivot could be mounted if someone was fool enough to put a Vincent engine in the frame.

This still left the pedal itself, which had to stick out far enough to reach the rider's big toe, but must not foul the starter pedal. After much head scratching, we decided the only way round the problem was to make the pedal itself telescopic. The finishing touch was supplied by section member Bob Stafford, who called in one day to see why we wanted all these



Twin-sided Seeley front brake not only looks good but is powerful and progressive



Clever touches include a telescopic gear pedal to permit unimpeded use of the kickstarter

weird and wonderful bits he was knocking out in his garage.

He suggested a rather neat bayonet fixing to hold the pedal compressed against a spring while the starter pedal was operated — a deft flick of the toe, and the pedal would dart out. A few weeks later we had all the bits to assemble — the folding footrest, the collapsible gear pedal, the folding starter pedal. It all worked with a few thou to spare. We always knew it would...

BY NOW most of the engineering problems had been overcome and we were getting on with some of the formalities — new tyres, forks reconditioned, brakes re-lined (and what brakes — a Seeley 8½in double-sided front drum, *a là* Vincent), new wheel bearings, a few hours' work fitting and bending oil pipes. Adrian brought all his electrical kit round, and the bike was wired in a couple of evenings.

We had always thought there wouldn't be many standard parts left on the bike, but we hadn't reckoned on non-original spark plugs. The front plug needed about ¼in taking off the top of the threaded stub in order to fit it under the front head bracket. Reams have been written about Vincent crankcase breathers: we decided to use large-bore pipe from the normal timed breather, taking the pipe up over the engine to the back of the bike.

At around 5pm on Saturday, September 24, 1983, the engine cracked into life, and after what seemed like about half-an-hour, the oil return pipe started dribbling lubricant back into the tank. The temptation to take it for a quick spin was irresistible, and after a couple of miles each, Adrian and I agreed that there wasn't much wrong with the handling. It seemed that all those years, working on what was always something of a gamble, may not have been wasted. It was time to smarten the bike up...

The engine came out of the frame rather more easily than we had expected, given that it had taken six years to put it in! But before dismantling the bike completely, two outstanding items had to be dealt with — a centre stand and a pannier frame. A stand, pivoting on one of the bottom engine bolts, was soon knocked up, but the pannier frame was a bit trickier. I wanted to be able to carry two Craven panniers, but the bike was not overburdened with places from which to hang them. Eventually we moulded a fibre-glass 'trap' to fit over the top of the seat fairing, and into this was bonded a steel frame, making a neat little rack with lugs to carry the panniers. When removed, the rack doubles as a camping stool.

Frame parts were delivered to Derby Plating Services to be nickelled, while the tanks, mudguards, seat unit and carrier frame went to Howarth Motorcycle Paint Specialists. They made a superb job of the tank, picking out a gold line analagous to the line on a standard Vincent tank.

A new set of unchromed Vincent exhaust pipes was bought and Pete Athey bent them to suit, using as a pattern a brazed-up test set we had been running.

The finished Seeley-Vincent was wheeled out at 7pm on Saturday, July 21, 1984 — seven and a half years after I had started the project. I can't remember ever enjoying a bike run quite as much as I enjoyed riding through the Eifel mountains a month later, past the Nurburgring, on my way to the Vincent club's German rally. Glorious weather, superb roads, not too much traffic, marvellous scenery, and the bike, eager for some fun.

The finishing touch was supplied a week later when the bike was judged the best special at the club's annual rally, which prompts me to pay tribute once again to the help and encouragement I have received from members. Without that, and the excellent service provided by the VOC Spares Co, I would still be looking at a pile of bits on the garage floor.

Aftermath

WITH nearly 3,000 miles on the clock, I experimented with the carburettor main jets, which had been set at 200 in line with what is generally recommended for Amal Mk IIs on a Vincent. Covering the range from 180 to 230 gave no noticeable difference in performance, the top speed never getting much above 95mph. The symptoms seemed to suggest fuel starvation: opening the throttle above the three-quarter mark gave no benefit, and if anything made things worse, the power seeming to come and go.

This is not uncommon on a standard Vin if only one petrol tap is used, and on the Seeley there was only one. There being little or no room to fit an extra tap to the tank, and to avoid cutting another hole in it, I attached a rather crude junction block to the tank and fixed two taps to it. This gave a definite improvement — at least I was up over the ton when it did it again. It was as if someone had thrown an anchor off the back. I eased right off and limped back home. There was now no option — the engine had to come apart.

The front cylinder was the guilty party. The barrel was badly scored with a good deal of piston deposited on it, and there was a lot of metal missing from the piston. It is an interesting fact that most Vincent twin seizures occur on the front pot, despite its better cooling. Perhaps the temperature, although higher, is more uniform around the rear cylinder, leading to less distortion. A contributory element in this case may have been the fact that the aluminium cylinder muff supplied with the engine had had the cooling fins cut off one side, presumably because of installation problems in some earlier incarnation.

I've now covered more than 6,000 miles on the machine, and have encountered no other major problems. Cruising speed is 80-90mph, although this may improve when I complete the fine-tuning of the carburettors. Although I've not yet been able to explore the bike's full potential, I have enough experience of it to compare it with two other Vincents I know well, my standard(ish) Rapide, and the Norvin I used to own.

The fact that the Seeley's engine is from a Black Shadow is probably not significant. Initially, the difference between a Shadow and a Rap was mainly down to selective assembly and polishing. With all the parts which have been replaced in these machines in the past decades, it is now not uncommon to find a Rapide performing to Shadow spec, and vice versa. Gearing on the Seeley has been chosen to give roughly the same theoretical maximum speed as a standard Vincent, i.e. around 130mph at 6,000rpm. With its weight advantage — 370lb to a Rapide's 460lb — the Seeley should get a bit closer to that figure than the Rap.

On the simple criterion of riding enjoyment, the Seeley comes out top, with the Norvin bottom and the Rapide somewhere in between. Whatever the road conditions, I like to feel comfortable, which I rarely did with the Norvin. The combination of a broad seat, necessitated by the Norton wideline frame, and rear-set footrests led to severe cramp in my thighs after an hour or so.

Higher, wider bars made the Rapide much easier to hold and balance whilst starting, and it is more manoeuvrable in traffic. The seat is wide, but this causes no problem as the footrests (adjustable) are high and forward, making the riding position very square and upright. It seems to make little or no difference to the Rap whether there's a pillion passenger or luggage — or both.

At low speeds the Seeley comes somewhere in the middle. The rider's weight is on his hands but, because the bike is so small, the length he has to reach is less than on the Norvin. It is less manageable than the Rapide around town, but this is offset by the Seeley being lighter. Starting the Seeley is much easier than the Norvin as a result of it being less bulky and having the Triumph pedal, which is lower than on a standard Vincent.

It's on the open road that the Seeley comes into its own — the handling is superior to any bike I've ridden. It manages to combine a lightness of touch with a rock-solid feeling of stability, and I find myself cranking it over much further than I would any other machine.

In the braking stakes, the Seeley is the clear winner. Its double front drum gives progressive stopping, with plenty of power if you really grab a handful. It requires more force than the Rapide's twin front brake, because the lever pulls two independent cables operating in parallel, whereas on the Vincent a single cable controls a balance beam which transfers the load to each of the drums.

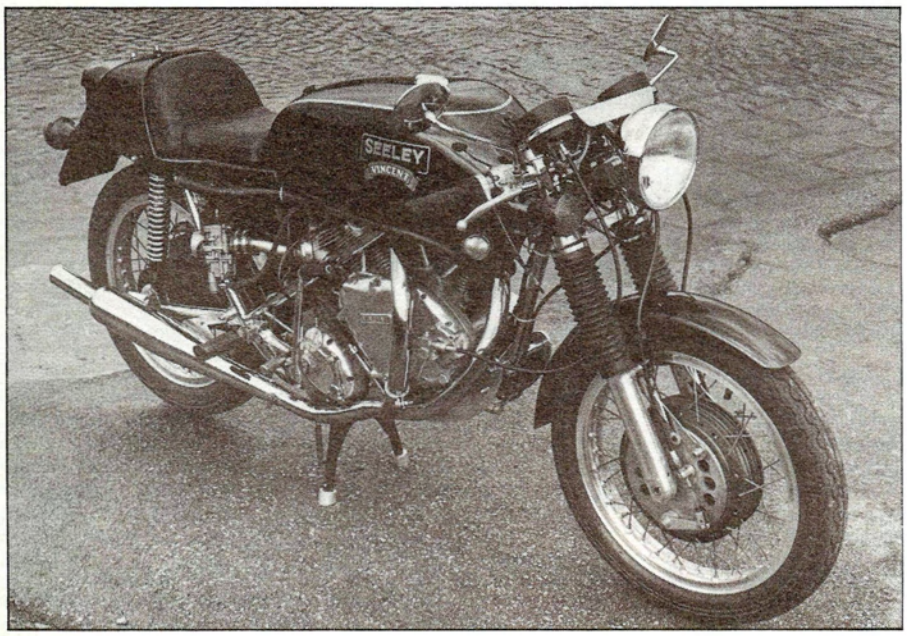
A corollary of this latter mechanism is that the Vincent's lever has to be pulled approximately twice as far as the Seeley's to apply the same cable tension at the drums, making the brake seem a bit spongy to the uninitiated.

Gear-changing with the Seeley's AMC box is quick and effortless compared with the slow, deliberate action on the Vincent. A look inside the latter's gearbox explains why — the gear cluster is, quite simply, massive, which is why so many of them are still operating perfectly after at least 30 years of use. Vincents were definitely built to last.

Another factor which makes the Seeley more 'comfortable' to ride is the electrics. The Lucas three-phase alternator pushes out ample wattage to drive a Cibie QH headlamp as well as the electronic ignition. This is a huge improvement over the Lucas and Miller dynamos usually fitted to a Vincent, even when they are converted to 12-volt operation.

One small snag remains with the Seeley. There is a nasty flat spot between 1,500 and 2,000rpm, presumably arising from the carburation. A higher slide cutaway (say 4 or 4½) helps, but I've been as high as 5 without removing the problem altogether, and I wonder if the real culprit is the length of the inlet tracts. Any suggestions on how to alleviate the problem would be welcome, but remember that I can't shorten the tracts without cutting lumps from the petrol and oil tanks and the frame!

People frequently ask me whether the project was worth the trouble, and whether I would do it again. Well, knowing what I know now, I don't think I would start a similar task faced with as many unknowns. But building the world's first Seeley-Vincent has been a great source of enjoyment, frustration, satisfaction and achievement. The fun of riding the bike makes the whole exercise seem justified.



The machine weighs 370lb — 90lb lighter than a standard Vincent twin

PARTS AND SERVICES

Fuel tank renovation — Pettet Sheet Metal Fabrications, Unit 6, Churchfield Court, Bewcastle Rd, Top Valley, Nottingham; **Engine plates and bolts, engine machining** — Greaves Engineering (formerly the Jolly Thresher Garage), The Service Station, Cwmduad, nr Carmarthen, Dyfed SA33 6XJ; **General spares** — VOC Spares Co Ltd, The Wharf, Burford Lane, Lymm, Cheshire, and Wilemans Motors, 99 Siddals Rd, Derby; **Chaincase cover** — Seymours' Castwell Foundry Ltd, Raynesway, Spondon, Derby; **Frame nickelling** — Derby Plating Services Ltd, Abbey St, Derby DE3 3FS; **Paint** — Howarth Motorcycle Paint Specialists, 25 Melbourne St, Derby; **Cylinder heads** — Dave Lindsley, Elton Vale Works, Elton Vale Rd, Bury, Lancs.