

## **Bill** and the **V8**

*There has been renewed interest in the Moto Guzzi V8, with classic demonstrations and replicas manufactured. As the main development rider for this remarkable machine, **Bill Lomas** explains what it was like to be there at the time.*

**M**y involvement with Moto-Guzzi, which continues to this day, began at the 1955 TT when they invited me to ride and I won the Junior. I continued riding for them in the 350cc and 500cc classes. At Mandello I met Carlo Guzzi and Dr Parodi, the owners of Moto-Guzzi; likewise Ing Carcano, Umberto Todero and Enrico Cantoni – who became a particular friend. A look round the race shop was like heaven, for I had long been interested in engine development. I had made a competitive double knocker conversion for my 250cc Royal Enfield and, later, I was involved with works bikes from Velocette, Enfield, AJS, Matchless, NSU, Benelli and MV. During that time I had learned a great deal. Moreover, my father worked at Rolls Royce and was involved with Reg Parnell's racing cars.

It seemed to me that Moto-Guzzi were leaders of motorcycle design and engine development and to have this involvement with them was tremendous. The racing department was huge when compared to any other except NSU, which had an enormous, self-contained place. The race shop had nine raised work benches for assembly. In one corner was a small raised office with a view of the department. This was for Signor Moretto, Guzzi's first race mechanic from the 20s. He became chief race mechanic and held the job until the 50s. He was retired when I met him

but visited the race department as he pleased to keep abreast of things. He was lionised by everyone. He never interfered but was always there to offer advice.

On the first bench was a dismantled V8 engine, which looked so small and neat. The cylinder blocks had integral heads – a good idea for water-cooled engines as a cylinder head joint is prone to leaks. Guzzi had done it very cleverly: the liners were screwed into the block and had sealing rings at the top and bottom, the lower ones acting as seals on the crankcase, thus achieving maximum cooling due to free flow of the coolant. On cold days we had to blank off part of the radiator to get the engine temperature up.

The valves were opened by the cams bearing directly on the valve top collars, which were flat. This system was used in the 20s by Peugeot, which may have been fine in low-revving engines but I would have been surprised if it worked at high rpm.

The valves were removed from the non-detachable cylinder heads by unscrewing the cylinder liners and extracting the two-piece, split valve guides. This split alloy-bronze valve guide system had been used on the singles. They were tapered into the cylinder head and never came loose.

There were no valve inserts in the combustion chambers. Ing Carcano

**LEFT:** 1957 rear view and...

**TOP:** Front view show the V8 was hardly any wider than a single.



told me they ran the valves directly on the alloy cylinder heads – a great idea to keep the valves running cool, but I suspected it would eventually wear the head away. He assured me they had no problems up to that point but I still thought a good thrashing might tell a different story.

To me, the most important part of any racing engine is the durability of the crankcase, crankshaft, gearbox and clutch. I had seen the problems Velocette had with main bearings, clutch and bevel gears, and I recalled my own problems with the Enfield when the plain bearing big end would not stand 7000-plus rpm. I had a crankpin made the same size as a KTT Velocette and used the same bearings and cage. After that it would reach 9000 rpm without problems.

The Guzzi set-up amazed me: a one-piece Crankshaft with crowded needle-roller main bearings and split con-rods and crowded needle-roller big ends. I knew they had problems with this on their early racing singles, so to do the same on a brand new design surprised me.

By mid-1955, V8 development had slowed owing to crankshaft and valve operating problems. I told ing Carcano how I lost the German

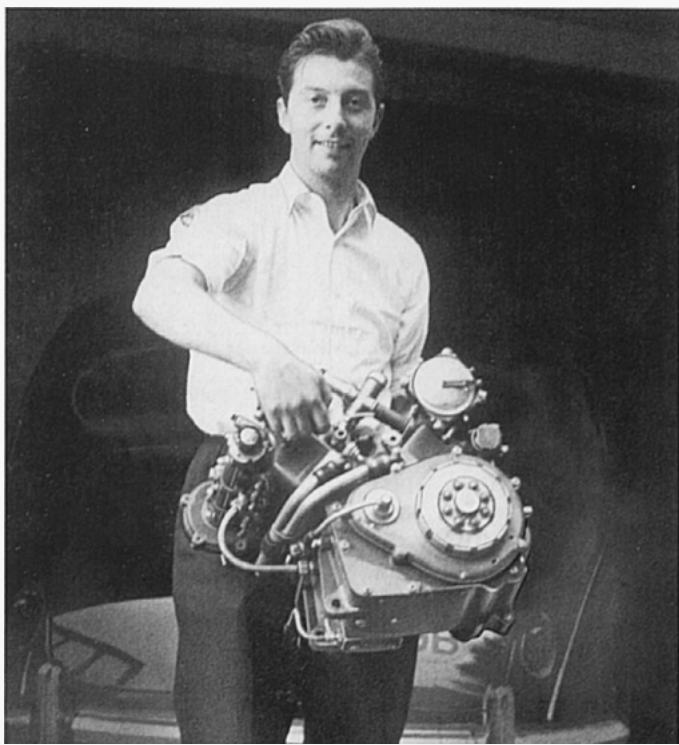
250cc GP when the works 250 NSU crank seized on the last lap. Following comprehensive testing, NSU used Hirth, a German engineering concern, to make new crankshaft assemblies, which proved unbreakable. They used caged needle roller bearings.

I then mentioned that MV and Giiera used similar cranks on their 125s and 500cc fours. The four cylinder cranks were pressed up in a tubular jig and when released were perfectly true. Carcano asked Brianti, the foreman, if he could make a V8 crank on those lines. Two weeks later a complete pressed-up, caged needle roller bearing crank was ready to fit. New cylinder heads with bucket tappets to open the valves had also been made. From then on the V8 was reliable and ran safely up to 12,000 rpm with an increase in power to 70 plus bhp.

The six-speed gearbox was well designed and could be changed to four- or five speed as required. The air-cooled clutch could transmit the power produced, when fully developed. The gear drive to the camshafts had one large gear running off the crank to the cam drive gears. This obviated a train of small gears which all absorb power and increase backlash.

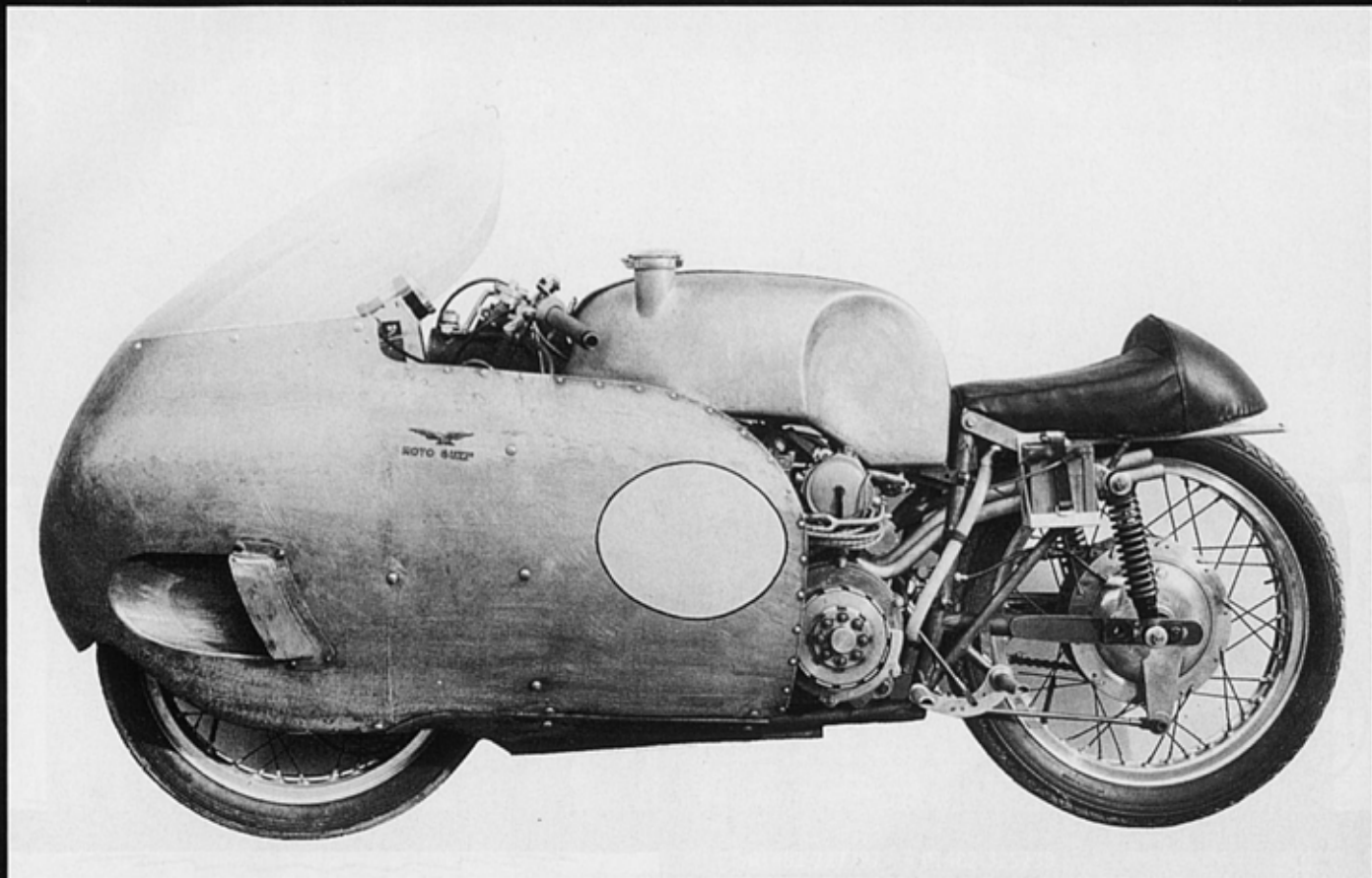
The frame had the latest layout. A large diameter top tube acted as the steering head and oil tank. The main difference from previously was that the rear swinging arm was attached to a lug at the rear of the crankcase, making a rigid fixing. A small, light alloy radiator was used, made by Delaney Galley, of Edgware, London. I collected two new ones from them, a small head tank and a radiator filler unit built into the front of the top frame tube. The front forks were similar to those on the singles. I liked this type of front suspension although it had to be set up for individual riding styles.

The frame was very rigid although the handling was initially poor. I had set the front swinging arm legs at 12 degrees above horizontal. This makes the trail alter only one way, as on a telescopic fork. If they are pointing below horizontal, the wheelbase is lengthened, then shortened, and the trail angle alters two ways. I discovered this at NSU and it transformed front end stability.



**TOP:** Crowds swarm around the sensational machine at a show.

**LEFT:** Eight cylinders, eight carburettors et al, yet still compact enough to carry around. Bill shows how.



The fuel tank (25 litres) was a work of art, shaped to fit riders' arm and legs. The front cylinders had the exhausts facing forward, the rear block faced rearwards, which allowed the eight carburetors to lie in the centre of the engine and a simple but ingenious lever system operated them in unison.

I found a short saddle kept my weight forward and helped stability. It handled well enough for me to put it on pole position at Assen, Solitude, Monza, and Imola. In October 1956 I took a V8, fitted with the new Hirth crankshaft, to test at Montlhéry for a week. I used half the banked circuit to complete a lap. I then went to Oulton Park for a further week's testing and had a 20lb weight made from plumber's lead to move weight distribution about the bike. It was more stable with the weight on the front of the dolphin fairing, the type of streamlining we were to use on the Island.

I wondered if the engine could be moved forward, then realised this would make no difference as the rear swinging arm was fastened to the engine. However Ing. Carcano overcame this by lengthening the swinging arm to get the weight distribution we required. We were running up to 14,500rpm, knocking a second off the lap times and I realised that, if the crank would stand this, it would make a great deal of difference everywhere for the power band was from 7000 to 14,500.

The V8 had done about 700 test miles. The oil, drained out daily, was clean with no metal particles and, when dismantled at Mandello, everything was fine including the Hirth crank. Carcano showed me the valves – the inlet was worn so thin that the head could be broken away with fingers. The alloy head had been wearing the valves away. The exhaust valve was little better but the general condition of the engine boded well for 1957.

In the early spring I used the V8 to break the world 10 km record on the Appian Way, a narrow old Roman road, south of Rome. I was timed over the last km at 176mph with the engine revving at 12,500. The actual speed of the bike would have been 183 mph.

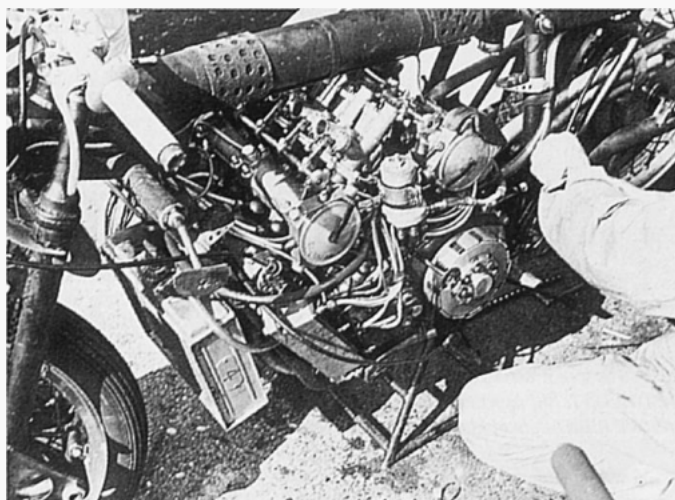
At the end of that year the Italian factories agreed to stop racing for

one year so that the FIM could produce a new road racing formula for the 125, 250, 350 and 500 classes. The idea was to get more manufacturers interested in racing to a new standard formula – 125cc (one cylinder), 250cc and 350cc (two cylinders) and the 500cc (three cylinders). There were to be other controls on streamlining etc.

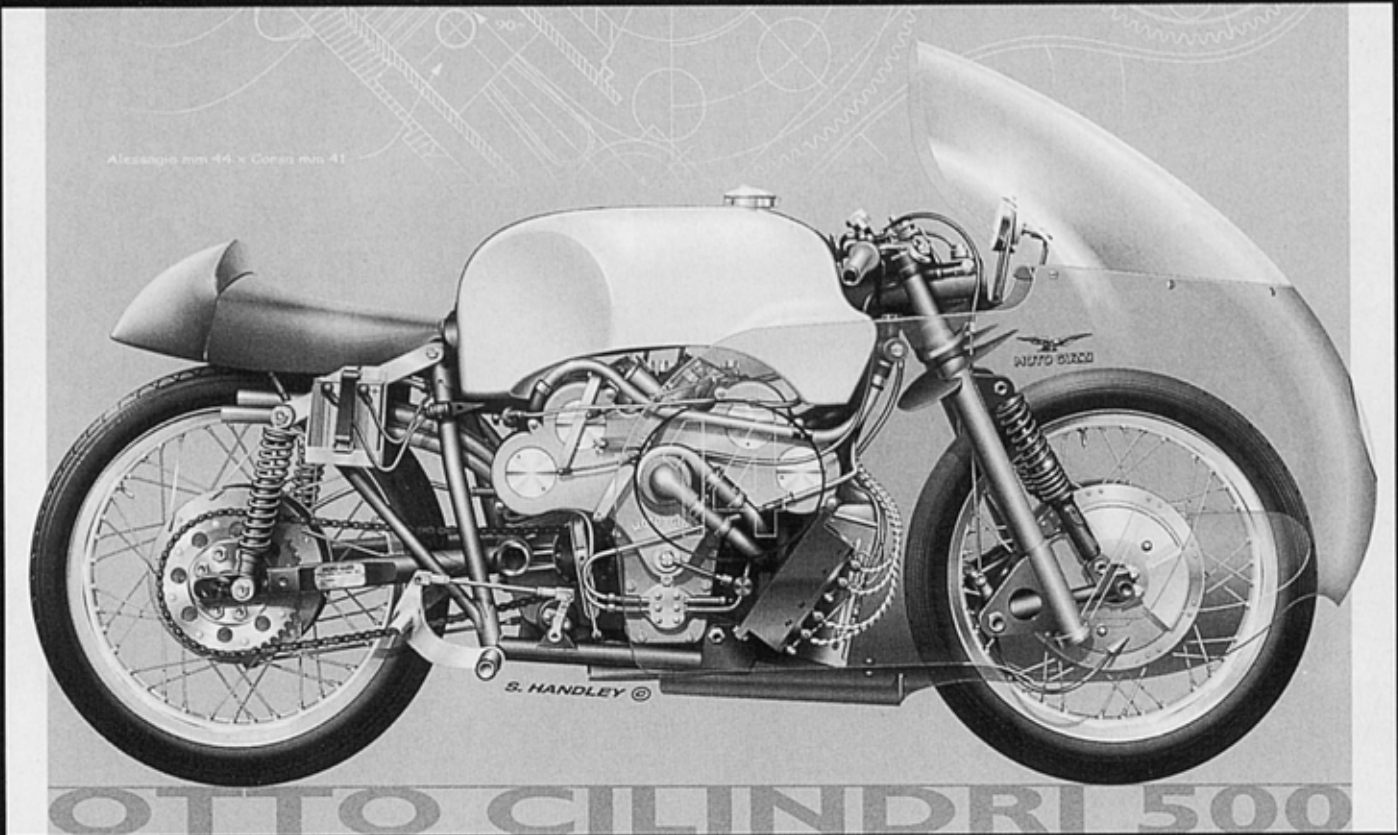
MV reneged on this agreement, arguing they had a new six-cylinder 500 to use. I saw it being tried at Monza and it must have weighed a ton. It looked like a grand piano coming down the straight and I don't think it was ever used, but MV now had the publicity gained from many years of racing without any opposition. Many people complained, so they changed the name to 'Privat' MV.

Guzzi had the use of the production test department with two Heenan and Froude dynamometers. One was for testing the single engines, the other, a new one, was exclusively for the V8. They did the power tests after the factory had ceased work when the water temperature and pressure were more constant. They took all power readings directly from the final drive sprocket with a chain drive to the dynamometer, in other words at the rear wheel.

With the V8, maximum power tests were carried out with the lights off so the colour of each exhaust pipe could be noted. Too red indicated a larger jet needed, not red enough needed a smaller jet. What a thrill to see and hear a V8 engine at 12,000rpm in a dark room with all eight



**TOP:** The V8 look somehow right in the dustbin fairing.  
**RIGHT:** Problems in the paddock, somewhere sunny in 1957.



exhaust pipes glowing. It explained to me why we never took plug tests.

The original V8 was given to the Rimini Museum in 1956 For display However, Prof Farnetti asked if the bike could be made to run, so the engine was sent up to Mandello.

The problems of making it run properly were the obsolete direct cam-to-valve operation, cylinder blocks and the one-piece crankshaft with split con-rods and crowded roller big end bearings. There were no latest-type blocks available. However, Todero thought of a way to get round this. He had valve guides made with cylindrical tops so that the bucket tappets could operate in them as on the latest cylinder blocks.

A pressed-up crank was made to complete the engine conversion to the latest set-up. The engine ran perfectly. It was rebuilt in the framewith the latest suspension setting and a new fairing made. It then compared to a 1957 bike. Sammy Miller has a V8 with full fairing but he is encountering trouble with it smoking – so much so, it won't run on all

eight cylinders. He managed just one lap when I saw him at Monthéry in 2003. I wonder if it has the original modified engine?

My friend Marcellino, from Bastia, near Torino, is a brilliant engineer and has now made three completely new Guzzi V8s. He has sold two – one to Spain, one to America. These are the latest type and indistinguishable from the 1957 models. They are beautifully made and go as well as the works ones did.

He has also made a 1957 Guzzi 500cc single and a Lightweight 1957 type 350. Now he is making a new V8 engine with a one-piece plain-bearing crankshaft with split plain-bearing con-rods and a plain bearing crankshaft for the 350, with a bore of either 82 or 85mm. The V8 and 350 will probably rev at least 20-25 per cent higher than the originals, and safely. I wait with excitement to see if i am right.

Words by Bill LOMAS



TOP: Ghosted drawing of the V8. Eagle eyes may spot the firing order on the coil block.

ABOVE LEFT: Bill psyches himself up in preparation for a successful attempt at the world 10km standing start speed record.

ABOVE RIGHT: Isle of Man 1996. Bill worms up the V8 like it was 1957 all over again.