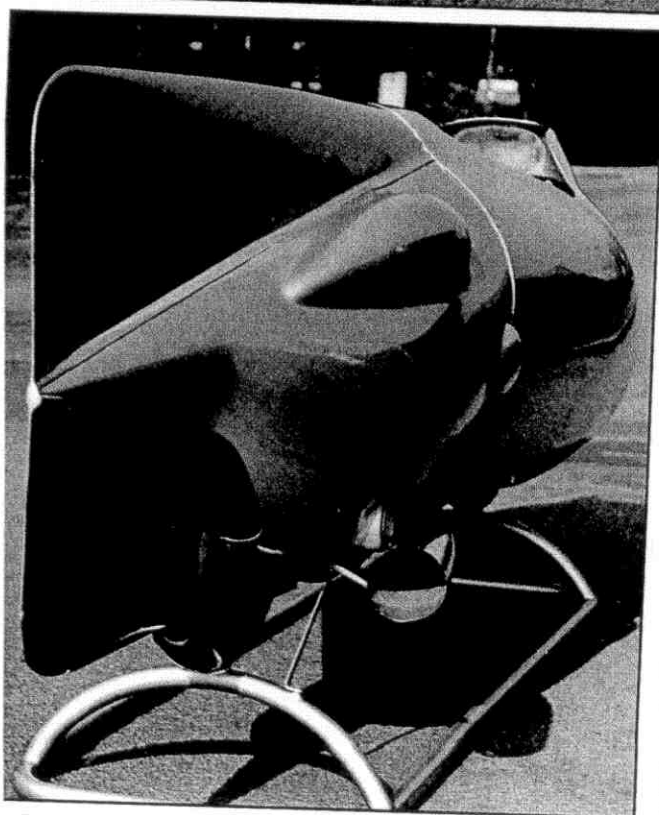
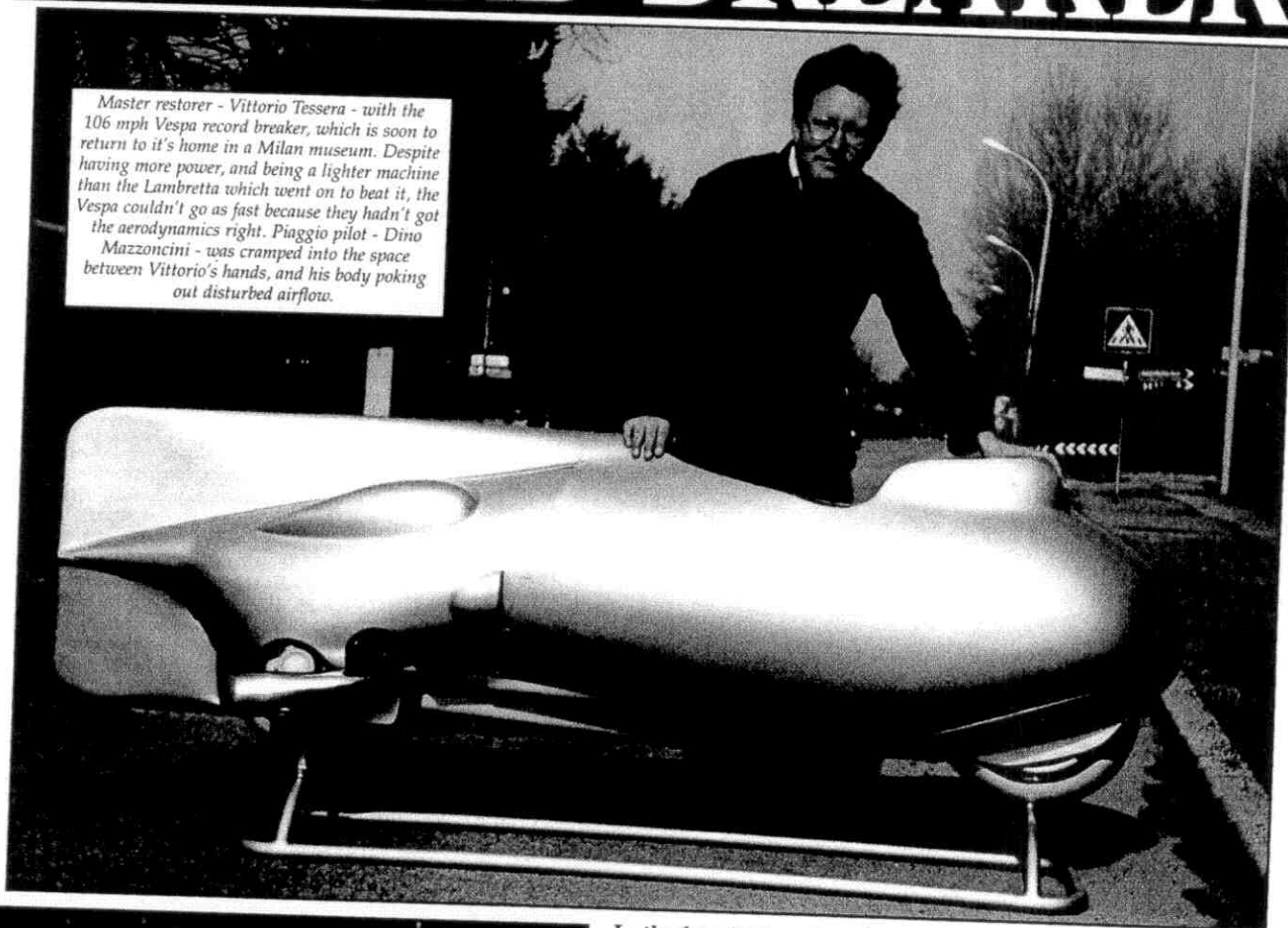


THE VESPA WORLD RECORD BREAKER

Master restorer - Vittorio Tessera - with the 106 mph Vespa record breaker, which is soon to return to it's home in a Milan museum. Despite having more power, and being a lighter machine than the Lambretta which went on to beat it, the Vespa couldn't go as fast because they hadn't got the aerodynamics right. Piaggio pilot - Dino Mazzoncini - was cramped into the space between Vittorio's hands, and his body poking out disturbed airflow.



Tiny plexiglass screen was put into the bodywork for Dino to look through, but he ended up peering above it.

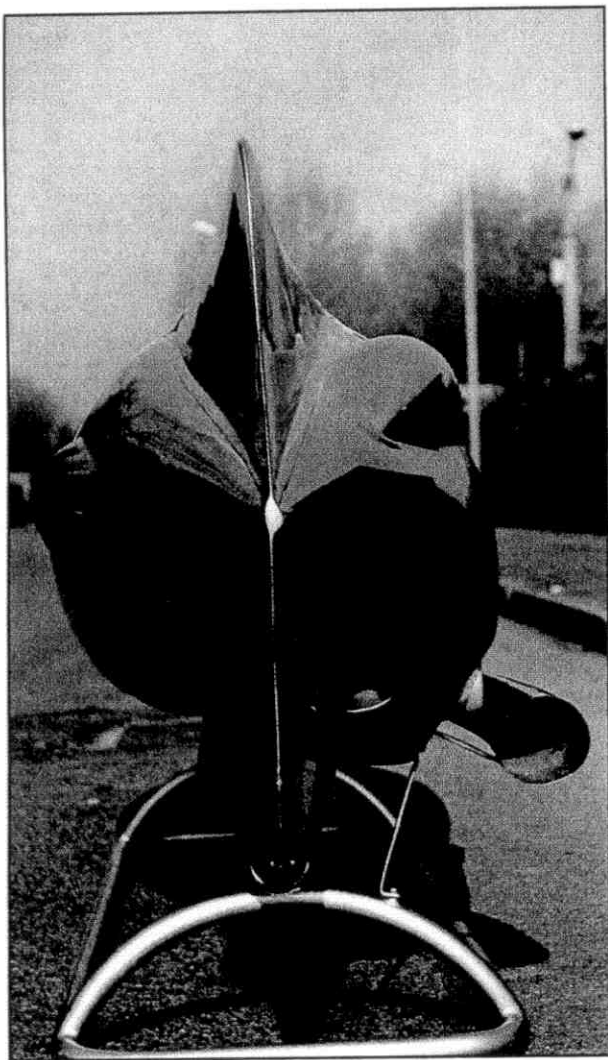
In the late '40's and early '50's both Piaggio and Innocenti realised that there was potentially a lot of good publicity to be had, if they could make their Vespa and Lambretta scooters break motorcycle speed records. Through 1949 and 1950 they successively broke first the motorcycle, and then each others, average speed records over distances from 10 km to 2,000 km, using ever more exotic machines. Even this wasn't enough to silence the scooters' critics.

The development of these endurance machines eventually saw the rival teams near the world 125cc motorcycle speed record, which at the time was held by a four stroke FB Mondial bike with a speed of 161 kmph (100 mph). When they both realised that the world record was within reach, each manufacturer set about building streamlined scooters to break the world record. Vespa got there first.

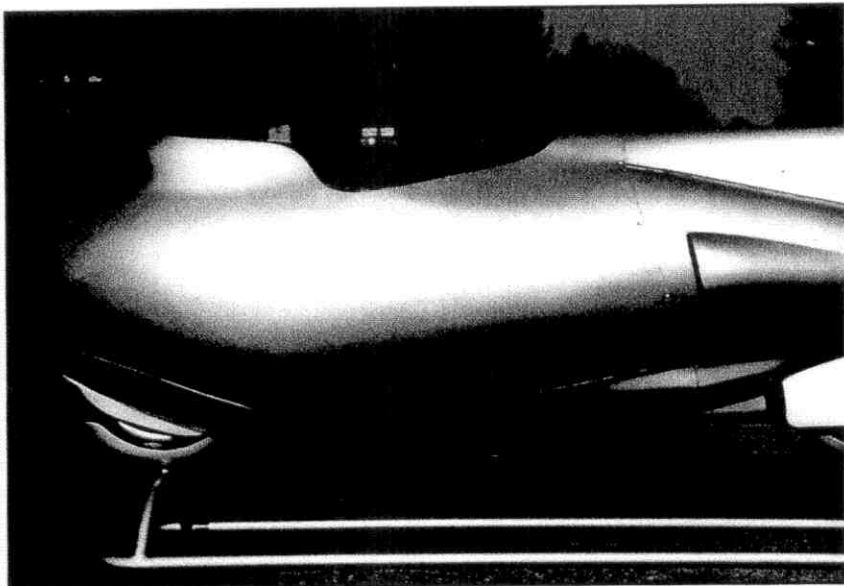
The engine for the Vespa "cigar" record machine was originally designed by Corradino d'Ascanio - the father of the Vespa - using an idea taken from a 1925 Fiat racing car. Something special had to be done in order to make enough power to exceed the speed record with only a 125cc scooter engine. The Piaggio engineers considered using compressors (superchargers or turbochargers) to fill the engine with more fuel mixture, but decided that course of action took the engine too far away from what the public would buy. This is doubly ironic really, because not only was the engine they ended up developing, much further removed from standard than the Innocenti one, but the Lambretta that finally topped them was also supercharged. Piaggio have all the luck of a Welsh sheep-shagger who could only pull the ugly ones.

The Vespa engine ended up being an opposed piston unit, with two crankshafts, and two pistons, which face each other down a shared single cylinder barrel. Whatever the complexities of the engine, the results were very good. Vittorio Casini, the engineer who took over the project from d'Ascanio, ended up watercooling the barrel to cure reliability problems. The result was around 20 hp at the crankshaft, revving to 9,000 rpm. Some going for a 125cc scooter engine in 1950.

Quite unsurprisingly, there isn't a massive amount of Vespa left in the machine, which has recently been restored by Vittorio Tessera. At that period in time, both marques were still using 8 inch wheels on their road scooters, but the Vespa sprinter uses 10 inch. The front part of the frame is vaguely Vespa, using a single sided fork with a shortened headstock and dropped handlebars. Cable gearchange for the 3 speed engine is all still typical Vespa.



With no rear suspension, hardly any steering movement, and a cramped rider, it was very important to have a tailfin to keep the scooter upright. The wide Vespa engine is far from ideal for this job, since it hangs out into the airflow.



Hand beaten aluminium sheet metal bodywork is as light as a feather. A complete work of art.

From the rider back things get very different. What may have once been a fairly standard looking engine is now covered in a vast number of additional aluminium casings. There is a bulkhead between rider and engine, and the motor is solidly mounted into the chassis with a weird array of non standard brackets and tubes.

Covering the whole machine is a hand-beaten streamlined aluminium "cigar" that weighs virtually nothing, and offers about the same, by way of protection for the rider in the event of a crash. Various slots and vents are made in the bodywork to take air for the carbs, water-cooling radiator, and to provide an exit for the single chrome megaphone exhaust. Remember, these are the days before the two-stroke expansion chamber was invented.

Despite all the streamlining of the bodywork, the Piaggio mechanics never got the drag coefficient down as low as they might, because they didn't leave enough room for the rider. The whole of his tightly tucked head, shoulders and back stuck out of the top of the bodywork, disrupting airflow. The solution they came up with was to equip the rider with a streamlined helmet which had a point at the back, making the pilot look like a Pterodactyl when he got out of the machine. The idea for the helmet came from pre-war German racing motorcyclists, and it still in use with today's speed skiers.

TIME FOR A GUINNESS

A world record attempt not only required the presence of officials from the FIM (Federation of International Motorcyclists), but also a bloody long bit of tarmac. Piaggio managed to pull some strings to get a stretch of the Italian motorway from Rome to Ostia closed for two hours on the 9th of February 1951. Pilot for the record attempt was to be Dino Mazzoncini.

TECH SPEC - THE VESPA RECORD BUILDER

The engine layout of the sprinter is ingenious. The basics start with what is still a lot like a standard Vespa engine, which are represented on the diagram by everything to the left of the spark plugs.

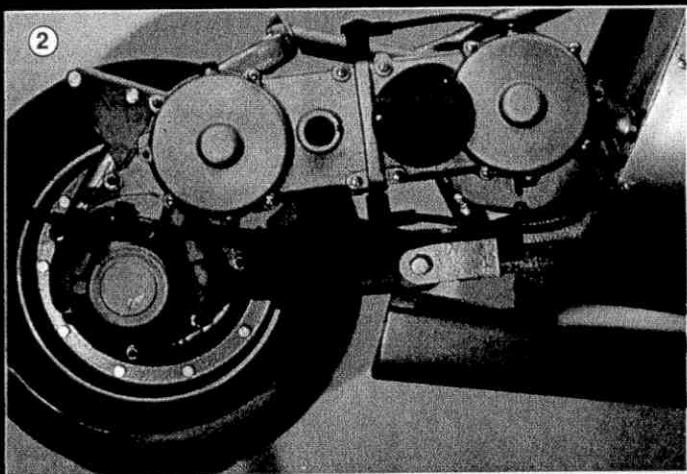
If the spark plugs, and everything to the right of them were replaced by a conventional cylinder head and single plug, then you would be back in the realms of a standard Vespa engine; which had a piston controlled inlet port at the time. Instead of

that, there is a mirror image of the original piston, carb and crankshaft; which runs in a smaller secondary crankcase. The whole lot is bolted to the original engine by extra long cylinder studs.

Not shown on the diagram, but visible in photos 1 and 2 is another long casing which bolts onto the flywheel end of the original crank, and contains two idler gears which make both cranks run together at the same speed.

The idea is that the two pistons and crankcases -

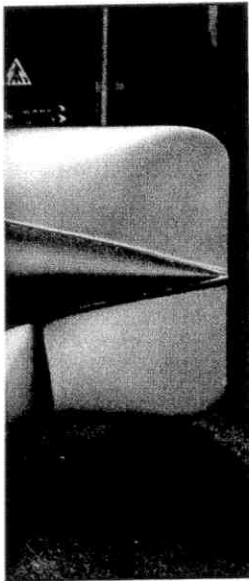
which are each fed by a separate carb - both fill with fuel at the same time. This double fuel mixture is then transferred to the single combustion chamber formed between the crowns of the two opposed pistons. Only one exhaust port is needed since there is only one combustion chamber, and this limits the amount of mixture coming from the transfer ports, which is lost out of the exhaust port. This has always been the key to obtaining good power from a two stroke engine.



The fact that this is based on a Vespa engine is reasonably clear from the side. Note the twin spark plugs top and bottom of the barrel. Sadly, important elements such as the carbs, pistons and geartrain are missing, so the engine can never be restored to working condition.



The alloy castings that make up the world record engine. For an independent person to try and undertake all this casting and machining would cost a fortune, but when you've got the resources of a massive engineering company with it's own foundry, it must be quite a fun way to pass the time. Note the extra long studs that bolt the barrel, and secondary crankcase to the main one.



Dino recalls that the worst problem on the day was the state of the tarmac, which seemed very bumpy at over 100 mph on 10 inch wheels, and with no rear suspension. Halfway down the course was a huge bump which caused the "cigar" to take off. By this time he was already travelling at around 90 mph, and it was several meters before the scooter landed, by which time it had lost quite a bit of speed. All the time it was a battle to keep the machine straight, and on course. The engine though, was an absolute gem. One of the benefits of the opposed piston design was that it still produced excellent power at low revs, and Dino remembers being able to pull away on it, as if it was a standard machine.

Best speed on the day was 174 kmph (108 mph), but when averaged out by the run in the opposite direction, the record was given at 171.102 kmph (106.2 mph), which broke both the 125cc and 175cc world speed records. Dino was certain they could have gone faster, particularly on a smoother surface, but with the motorway only shut for 2 hours there was no time to better what they had achieved, so they went back to Pontedera happy.

OBLITERATED

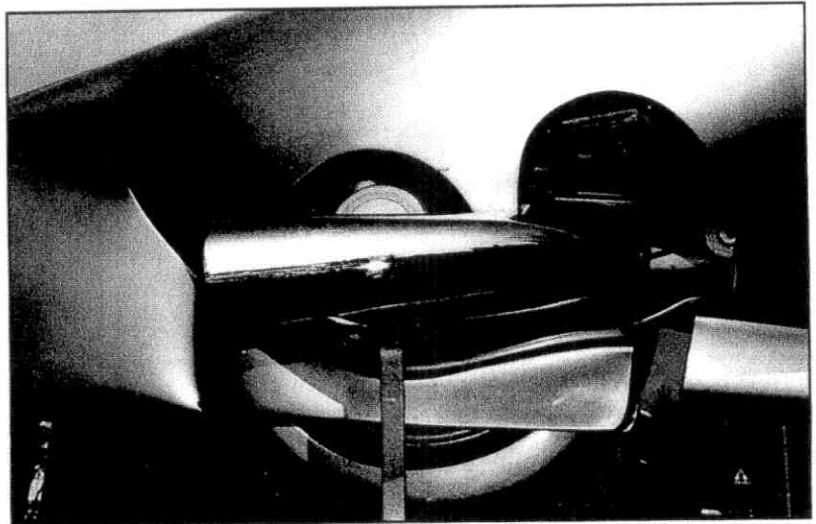
The glee at the Vespa factory was short lived. By April the Lambretta cigar had unofficially taken the record to 190 kmph. On the 8th of August, on a stretch of motorway in Germany, the Lambretta streamliner, piloted by Romolo Ferri, reached over 200 kmph (124 mph). The supercharged Lambretta actually made less power than the Vespa, but their designer - another aero-engineer called Pierluigi Torre - made a much better job of the streamlining.

The Piaggio technicians started on development of a rotary disc valve version of the engine (the original has piston ported inlets), but a crash which resulted in the death of Renato Magi, who was testing a new MV Augusta record attempt machine, persuaded Piaggio that enough was enough. The records projects using both Vespa and Lambretta were abandoned.

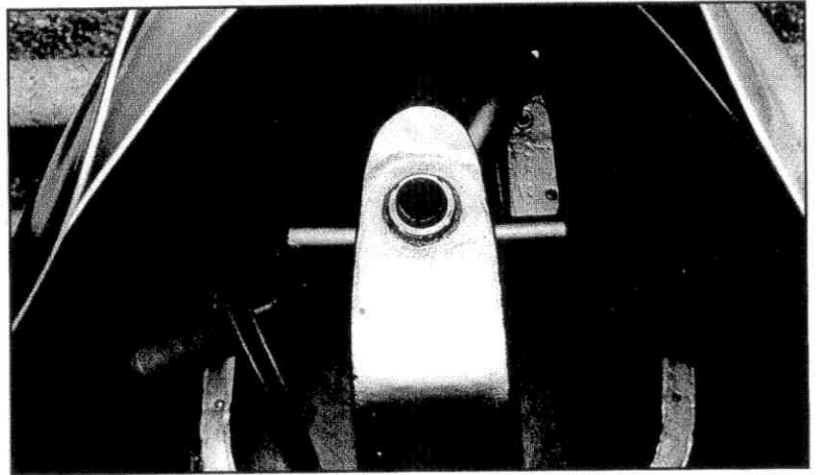
Piaggio still couldn't have been that upset. They had done what they set out to achieve. They had broken the world record, silenced their critics and given the Piaggio publicity department something to carp about. The only thing they hadn't done, was put the record out of reach of their rivals from Innocenti.

Sticky

Thanks to Vittorio Tessera and Dean Orton for help with this article.



Exhaust gasses are scavenged from the shared barrel by a totally unsilenced megaphone exhaust. It must have made a fearsome noise at 9,000 rpm.



Rider cockpit is spartan with a familiar hand gearchange for the 3 speed Vespa engine. Single sided Vespa fork now holds a 10 inch wheel with a Pirelli wheelbarrow style tyre. And where's the front brake?

AKER ENGINE AND HOW IT WORKS

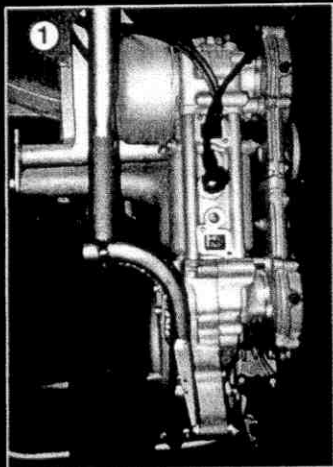
Once the fuel mixture is trapped between the two pistons, it is highly compressed, and then ignited by the twin spark plugs either side of the barrel. The generator for the ignition system runs from the spare end of crankshaft number 2 (see the alloy dome in photo no. 1)

D'Ascanio's original design for the engine was

aircooled, but Vittorio Casini's development work led him to water-cool the barrel to prevent it from overheating. The power output of 20 hp at 9,000 rpm is very impressive, but was almost certainly achieved using higher octane fuel than commercial pump petrol.

Vittorio Tessera has not been able to fully rebuild

the engine to the condition in which it ran, because vital components such as the pistons, carburettors, and idler gears are all missing. Nevertheless, both the layout and execution of the design still form a lasting memorial to some very innovative engineering.



A top view of the Piaggio record breaker engine. The watercooled barrel in the middle sits between two cranks, and visible are the two inlet ports. To the right, where the normal flywheel would sit, is a bolt-on alloy casing containing the geartrain which connects the two crankshafts.

