TECHNICAL

(The following was translated and submitted by Joe Borghese. Article appeared in a recent issue of "MOTOCICLISMO")

NOTES AND COMMENTS ON THE TURBO PANTAH

'What the Italian Technicians Say'

The observations, and criticisms of Fabio Taglioni and Franco Lambertini, the noted designers of Ducati and Morini, the two Bolognese firms which are the first in the world to now initiate experiments with turbo-compressors.

The engineer Franco Lambertini specified, "The turbo-compressor is the most sure road for technical progress and for improving the power without having to necessarily turn to sophistications like the excessive fractionalization of the displacement (cylinder multiplication) or the addition to the head of four or more valves, solutions quite costly and always leading to an increase in the weight of the motor.

"Displacement compressors do not attain efficiencies better than 50-60%, besides absorbing from the motor in which it operates a quantity of energy which grows with the cube of the pressure rise.

"Centrifical compressors have efficiencies of 70-80%, and turbo-compressors also have the advantage of the traditional centrifical compressors, that is, they do not absorb energy, in as much as they use some that otherwise would be dispersed. The slight subtraction of power, due to the increase of the counterpressure of the exhaust, comes in part balanced by the push the compressed air exercises on the pistons. (This is also the case in displacement compressors and traditional centrifical compressors.)

One of the most difficult problems to resolve when wanting to convert a normally aspirated engine to 'turbo' is the positioning of the carburettor, it may be 'blown' i.e., arranged between the compressor and the motor, as opposed to 'breathing', i.e. placed before the compressor. For reasons of simplicity and construction (in the case of a 'blown' carburettor it is necessary to also add a fuel pump and a fuel pressure regulating valve) we have chosen the solution of a 'breathing' carburettor, also because we were able to notice that, in this case, the air and fuel emerge better mixed. We then also thought that the lack of the pump and valve, besides lowering production costs, represent a noticable contribution to simplicity of maintenance, a qualification not to under value when speaking of a production motorcycle.

Other parts to study accurately in the prevision of a 'turbo' are the pistons, and the division and gasketing of the head, while the exhaust pipes must no longer be thought of as common pipe, but as conduits of energy.

Limited to a production facility such as ours, with production in small numbers, the adoption of the turbo permits us to have another model, without having to develop a new motor. We will construct a 500 with the performance of a 900 and the consumption of a 650.

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From his side the engineer Fabio Taglioni said to us, "There is still some distance between the turbo and the motorcycle. The principle motive is for us to research the slight adaptability of the models actually in found in the market, with respect to the particular demand in that sector of motorcycling.

"With the Pantah we have experimented with two turbos: the German KKK and the American Rajay. In the first case we had to mount the carburettor 'blown', since, if we had mounted the carburettor 'breathing', and not been successful to assure the holding of the lubrication oil on the pivot, the motor would have been fed a mixture of air, gas and oil. In the second case we were able to eliminate the pump and regulator, mounting the carburettor 'breathing'. The Rajay turbo is very much smaller than the KKK, and better lends itself to a motorcycling application, still, also with this the results have been inferior to expectations. With the production Pantah 500 we already have 60 HP at the wheel. We made this test: the Pantah was prepared for the mounting of the turbo, but without having mounted it we placed the motor on the test bench, and the power verified in this condition was 48 HP. The turbo was then mounted, the motor turned out 80 HP without any problems, a tangible increment, but as one can see well away from the percent increments to support the turbo at any cost. In effect I think that 80 HP can also be attained from pushing the Pantah with classical modifications, without having to confront all the complications of the turbo.

"The fact is that without adopting some particular cunning, like an intercooler or water injection to cool the air-fuel mixture that is introduced into the combustion chamber, it is not possible to better, maintaining a minimum of trustworthiness in the motor, a boost pressure of 0.4 to 0.5 atmospheres.

"During the tests we also had to mount a pressure limiting valve on the intake manifold, and notwithstanding its presence, the explosions in the manifold due to backfiring, were of such violence to deform that same manifold.

"In the course of the last test on the bench, the waste gate valve suddenly was blocked. We braked 126 HP, for half a second...

SMALL EMPTY SPACE

I was sitting here looking at this layout before it went to the printers and found this little empty space at the end of this article and I just thought I'd better fill it in with something so it wouldn't just be a "small empty space". A lot of times I come upon these little situations and usually I can figure out something to put here, like a small notice or request for postage stamps or maybe a mortgage payment on my house, or a weekend for two, all expenses paid in Rio de Janeiro or Hawaii, but I'll skip all that and just fill in this space with something intelligent and creative that will stimulate your thoughts, make you smile and cause you to forget that the weekend is over. But I don't think I'm gonna make it. I'm outta room in this small empty space.

DUCATI 750 SUPER SPORT, '74 FOR SALE

I am in the regrettful situation of having to sell my 1974 Desmo Super Sport, and would like to advertise through the Owner's Club in order to find the most suitable home for this "thing of beauty." My bike was featured in CYCLE magazine in September 1978 under "California Specials." The specs are as follows:

1974 Desmo Super Sport - less than 5000 miles
Mechanically perfect - Immaculate!

Engine Box stock, less than 5000 miles; has used 50 wt Kendall GT-1 oil since new; 500 mi oil change intervals; no oil consumption; valve guides perfect.

Exhaust Imola high pipe headers with one-off megaphones.

Brakes Lockheeds X 3; braided steel lines & fittings.
Front: Custom plasma sprayed aluminum discs (from solid billet to my specs) Yamaha master cylinder.
Rear: Lockheed perforated cast iron.

Wheels Front: Morris magnesium WM 4.
Rear: Morris magnesium WM 6.

Tires Front: Goodyear rain slick.
Rear: Michilin PV-11

Chain Tsubaki

Body Standard pieces except for camber faring-(same as stock only no headlight hole.

Paint India red imron with gold striping on middle of fender, tank, seat. Hand painted Ducati logo.

This bike has not been raced. I've owned it since new.
Price: $7500 FIRM

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