

Turbo Yamahas are coming your way

TECHNICS

This prototype XS1100 turbo is a clue to Yamaha's next sport bikes

By Larry Tate

The Yamaha 1,110 cc turbo we told you about in the February Short Strokes won't be available in 1981 but may well enter as a 1982 model. The pictures and diagrams shown here are of course prototypes, but the basic system will be retained for production.

Unlike aftermarket bolt-on turbos, the Yamaha system has been designed as a package with three related systems working together. Along with the turbo is an electronic fuel injection system and YICS, the Yamaha Induction Control System introduced in 1981 on the 550 and 750 fours.

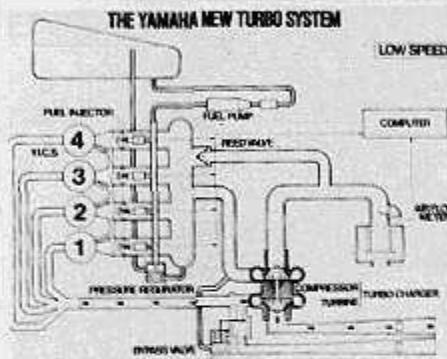
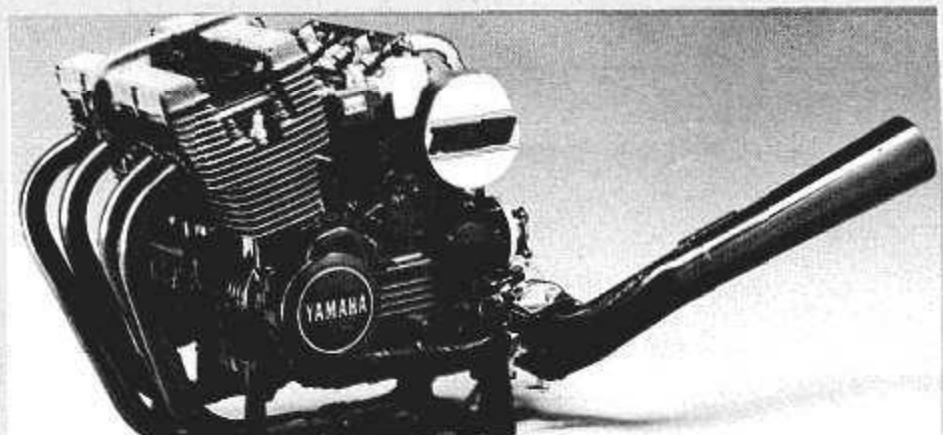
YICS is described in the Yamaha/Kawasaki comparison test starting on page 48. It consists of a series of passages drilled and cast into the head and cylinder to allow open intake passages to draw mixture from the intake tracts leading to closed cylinders. This promotes more efficient combustion and increased fuel economy.

The injection system is likely similar in concept to the Kawasaki system described in the GPz1100 test beginning on page 32, but the hardware looks different and the injectors are mounted farther upstream from the cylinders.

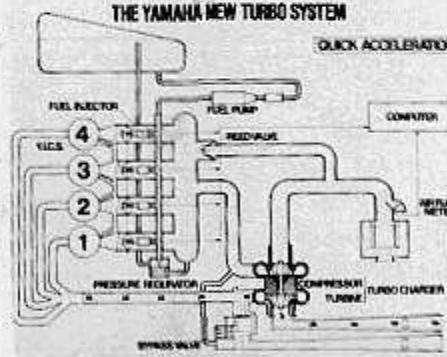
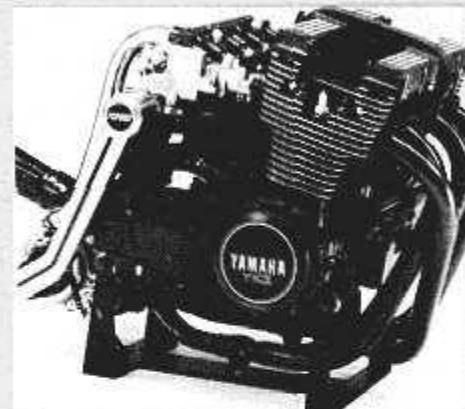
The turbocharger, of course, makes more power by ramming more air into the cylinders so that more fuel can be burned. Yamaha claims that the benefits of the YICS and fuel injection systems, combined with a reed valve built into the air system, allow the turbo to make its power without the fuel economy penalty that is usually extracted by such high performance motors.

The reed valve allows extra air to be drawn into the intake manifold when increased boost caused by heavy throttle application creates enough of a pressure differential to open the valve. It only comes into play during acceleration, since once boost has built up, the pressures will equalize. Yamaha says this helps to eliminate a turbo's throttle lag and provides sharper acceleration performance.

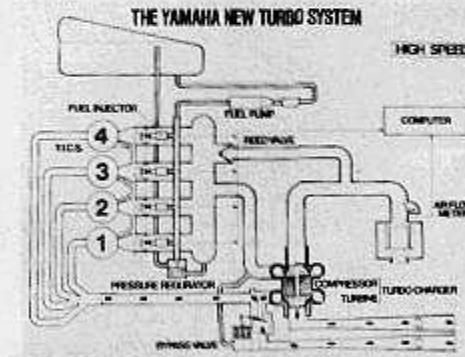
At low speeds and throttle openings the engine runs without boost, allowing the YICS system to maximize fuel economy, while even at high speeds and large openings it is claimed to show great improve-



In low-speed operation reed valve and bypass valve (waste gate) are closed.



Acceleration opens up the reed valve for crisper response under boost.



High speeds show the reed valve closed and waste gate releasing excess boost.

ment in fuel consumption over conventional turbo systems.

Something else new to the Yamaha system is the placement of the turbo and its plumbing low and behind the engine, under the swingarm pivot. This is designed to move the turbo's heat away from the rider's left leg—a problem with the turbo CBX we tested in the September

1980 issue—and thereby providing safer and more comfortable riding.

In all the talk about safety, efficiency and fuel economy Yamaha neglects to mention horsepower. The stock XS1100 motor produces a solid 95 hp, however, so if you guessed at something like 130 hp with a reasonable seven pounds of boost you'd likely be close. □