

a CAR *of* **HIGH CALIBRE**

Anthony Curtis drives the new Vauxhall Calibra Turbo 4x4 - and enjoys it



There are few cars which can claim to be more heavily endowed with advanced engineering than the Vauxhall Calibra Turbo 4x4. For with not merely a turbocharger, but a new low-lag (the makers claim no-lag) turbocharger added to a 16v engine, plus four-wheel drive and a six-speed gearbox in a wind-cheating body the new model is about as loaded with technology as it is possible for a car to be.

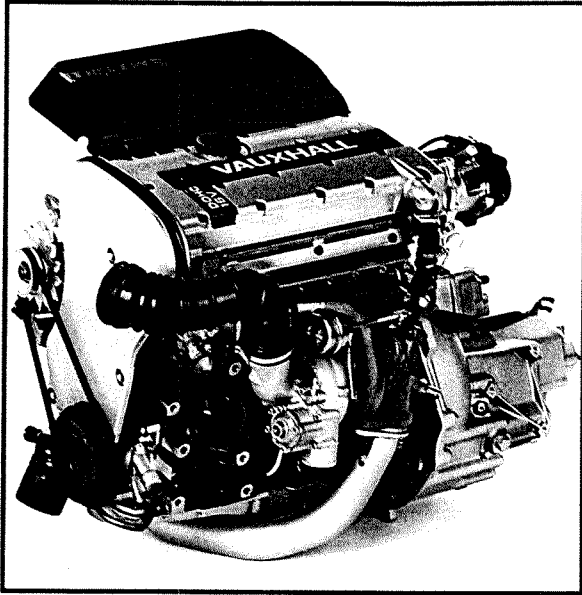
It is built around the current twin pinnacles of Opel/Vauxhall's engineering achievement, the first being the Calibra body already mentioned. Endowed with grace and elegance, it has played a major part in the success of this coupe version of the Cavalier and is notable for its exceptionally low drag coefficient - Vauxhall are claiming 0.29 for the Calibra in Turbo form, but 0.26 was the figure mentioned originally.

The second pinnacle of achievement is, of course, Opel's four-cylinder 16v engine which is widely admired for its combination of power and fuel economy. As discussed elsewhere in this issue (see page 62) it is to this engine that an unusual new turbocharger installation has been added, one in which the turbine housing has been integrated into the exhaust manifold. In this way turbine and exhaust valve have been brought as close together as possible, minimising the volume of gas between them so that lag is all but eliminated. Weight is saved, too. With the help of an intercooler, sequential fuel injection and a host of clever design details, the 1998cc engine develops 204 (DIN) bhp at 5,600rpm and 206.5lb ft of torque at 2,400rpm on a compression ratio of 9:1.

This very healthy output is controlled by an extremely sophisticated Bosch Motronic engine management system, integrated into the fuel

injection, in which a key control parameter, naturally, is turbo boost. It is regulated by a wastegate valve executing oscillations around 30Hz in each of which the ratio of time spent admitting exhaust gas to the turbine to the time spent diverting it is continually varied. Apart from responding to such irregularities as knock, the system allows a 10 per cent overboost condition for up to 4 seconds during rapid acceleration, but also inhibits boost slightly in first gear to prolong the life of the viscous coupling (more about that later).

The engine drives through a six-speed manual gearbox built by Getrag, the first developed for a transverse power unit and the same as the longitudinally-oriented gearbox fitted to the Chevrolet Corvette and Lotus Carlton. It also differs from that gearbox in having close ratios and a relatively low (25.3mph/1,000rpm) sixth gear rather than



Powerplant - the integration of the turbocharger into the exhaust manifold is clearly visible on this photograph



The Calibra Turbo displays admirable poise in corners

with a super-high overdrive ratio, giving, say, 40mph/1,000rpm. The Opel engineers argue that this arrangement allows a lowish first gear which they feel is to be preferred for a turbocharged engine (though the premise displays a certain lack of confidence in the absence of lag) and a more practical top gear in which the maximum speed can be attained.

The front wheels are driven directly through this gearbox, but, as for Vauxhall's existing 4x4 system already available for the Calibra and Cavalier, the rear wheels are driven only through a viscous coupling, somewhat in the manner of the Golf Synchron. However, a small front/rear difference in final drive ratios creates a low rotational speed between the two halves of the viscous coupling so that a small torque is applied to the rear wheels which are thus permanently driven. As for the Golf Synchron, though, the principal action of the viscous coupling is to transfer torque to the rear wheels when the front wheels start to spin. Neither the front nor the rear differentials, however, have any limited slip action. Under braking an electrically controlled hydraulic clutch disengages the drive to the rear wheels and allows them independence for the proper functioning of the ABS system which is a standard fitting.

Like existing Vauxhall 4x4 models the Calibra Turbo has MacPherson strut front suspension and semi-trailing arm rear suspension with anti-roll bars at both ends. And like all Calibras the Turbo has as standard power steering, discs all round, central door locking, electric front windows, sunroof and door mirrors as well as the ABS already mentioned. But the Turbo gets uprated discs and bigger alloy wheels which are fitted with 205/50 low-profile tyres. Inside, the extras include leather upholstery, electrically heated front seats and a trip computer - in all, you get a lot of motorcar at the very competitive price of £20,950.

In the South of France where the press were

let loose with the car a number of impressions quickly emerged. The first was that the Calibra Turbo is a formidably quick car which subjectively behaves fully in accordance with its claimed performance figures, including the 0-60mph acceleration time of 6.4sec. We weren't prepared to flout French motorway limits sufficiently to check the claimed maximum speed of 152mph, but a few surreptitious squirts up to more than 100mph suggested that it wouldn't be a problem.

Vauxhall's claims about the lack of turbo lag were substantiated, too. Naturally there was a certain hesitation after flooring the throttle at 1,000rpm in sixth, but for all practical purposes no lag was observed, and the smooth, controllable way in which the power could be brought in and maintained in bends was particularly commendable. In fact when using - for the sake of peace - second instead of first on the tight hairpins of the mountain roads, the way in which the engine would pick up from under 2,000rpm was especially impressive.

Powerful the engine might be, but refined it isn't. Although it will run willingly to its 7,000rpm limit, it emits a loud and rather harsh noise and throbs protestingly at high rpm; a faint turbocharger scream could be heard at times, too, but this was not objectionable. In most other respects, though, the refinement was good: wind noise was low at high speed and road noise seldom obtrusive on the (admittedly rather smooth) surfaces generally encountered on the roads near Cannes.

With a light, unobstructive change and a four-plane shift pattern (one for reverse; three for the forward gears) in which 6th is located to the rear of the conventionally-sited fifth, changing gear was no chore. And nobody could object to the closely-stacked intermediate ratios, their utility enhanced by the ample low-speed torque. As to the value of six gears in general and the sixth gear in particular, however, the verdict must remain not proven

for the time being. On the twisting mountain roads of Southern France the car was selected out of second and third, leaving the higher ratios largely unexplored, so our experience of top gear was limited to a brief period on motorway.

But power without handling and traction is a bad bargain so the big test was to discover how well the Calibra Turbo could pour its horsepower to the road. It emerged with distinction, or whole.

Initial understeer was the basic characteristic; in tight bends taken in a low gear with a lot of throttle this could be strong, but never excessive. And once settled into a bend the car could be powered round at high cornering speeds with no deviation from the chosen line or hint of instability. Even in soaking wet conditions which prevailed on the first day of the test which involved big puddles and miniature rivers running across the road, the traction was impressive and the car seldom lost its aplomb.

We were never conscious of the rear wheels catching up with the front wheels as the viscous coupling did its work, but torque reaction could sometimes be felt through the steering when putting down the power at the entrance to a corner. The value of the four-wheel drive system was brought home to us when we briefly drove a car in which it had been deactivated. The scrabbling for grip at the front and the fight through the steering in tight bends was very noticeable.

In addition to all this the new model has other virtues. Although headroom in the rear isn't wonderful, for example, legroom is excellent because the car is based on a standard Cavalier platform. And beneath the tailgate is a sizable luggage compartment. The rear interior, too, is luxurious, comfortable and attractive. At £20,950 the Calibra Turbo is a powerful new force in the market for coupes.