



High-speed traction line-up

Gas turbines:

BOTH SNCF AND BR have placed experimental trains on the rails in the last six months powered by gas turbines. Their high power/weight ratios, compared with diesel traction, make gas turbines a natural choice for 250 km/h and above on non-electrified lines, and SNCF has built the *Turbotrain* (above right), for 300 km/h on entirely new routes so that the expense of electrification can be avoided. Motive power for the *Turbotrain* is four Turmo III G gas turbines of 5 000 hp in total. All axles in the experimental five-car set are driven by electric motors.

In contrast, BR's Advanced Passenger Train (above left) is the product of a decade of fundamental research into guidance and suspension problems, the aim being to use existing track and signalling unaltered to carry trains at speeds around 50 per cent higher than conventional locomotive-hauled stock. Powered tilting of the bodies up to 9° on curves to allow higher speeds without passenger discomfort is a feature of the experimental APT-E, though the *Turbotrain* has also been designed for powered tilting to be incorporated later. The four-car APT-E is powered by eight Leyland gas turbines with 2 400 hp in total available for traction;

two more gas turbines provide power for auxiliaries. Both trains are articulated, but on APT-E only four out of the ten axles are driven, again through an electric transmission.

The *Turbotrain* is designed to achieve 300 km/h although the present experimental train will probably not exceed 280 km/h on trials now in progress; more powerful engines are to be fitted later. APT-E is now ready for an extensive programme of track tests and is designed to reach 250 km/h. However, it is considered that APT has the stretch capability to reach speeds of 300 to 400 km/h, possibly with linear motor drive on new routes.

Electric traction:

pleted by MLW (opposite page); coaches

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Poised for assault on journey times, 1970s are impressive high performance sets using diesel and power for

type (lower right) ways' high speed

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