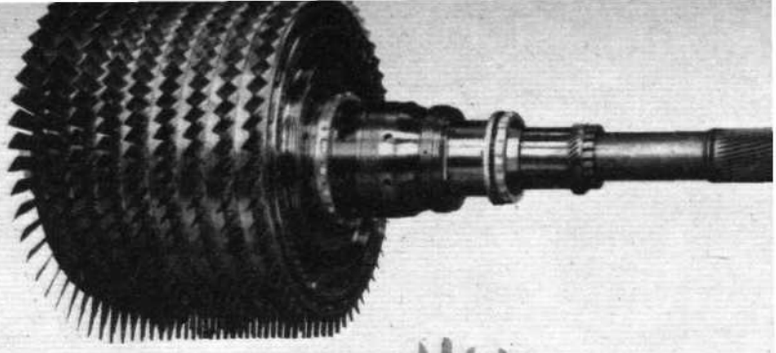
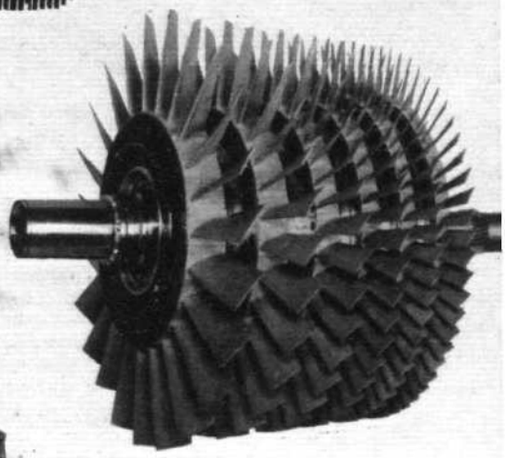
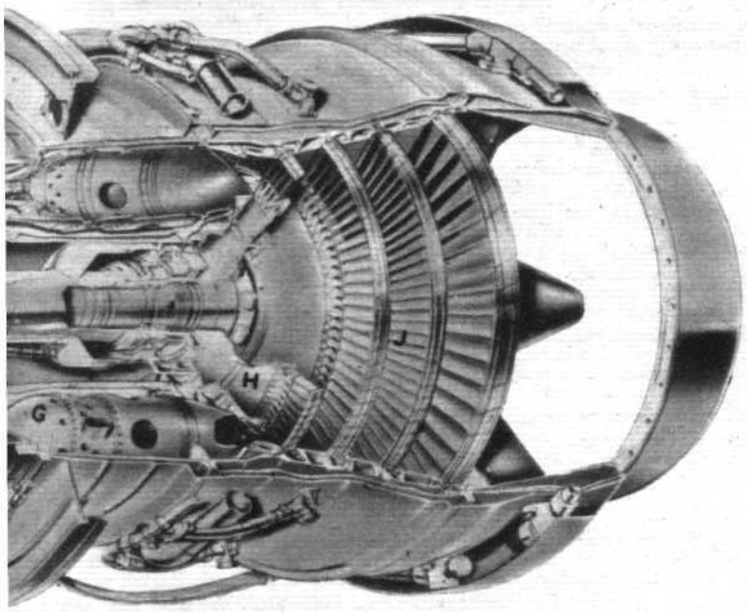
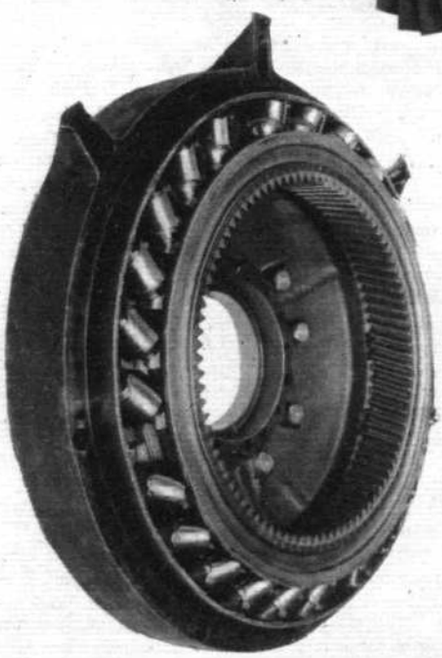


A, magnesium-alloy intake casing; B, fixed intake guide vanes heated by compressor bleed air; C, low-pressure compressor; D, intermediate casing; E, high-pressure compressor; F, delivery casing; G, flame tubes; H, high-pressure turbine; J, three-stage low-pressure turbine; K, propeller shaft; L, covers over axial ADLS cylinders; M, reduction gear; N, peripheral oil tank; O, anti-vibration mounting (one of four); P, sliding gate-valve (in flight-idling this bleeds excess low-pressure air to atmosphere, while maintaining high r.p.m.); Q, beta-range linkage; R, grouped accessories, including either electric or low-pressure air starter



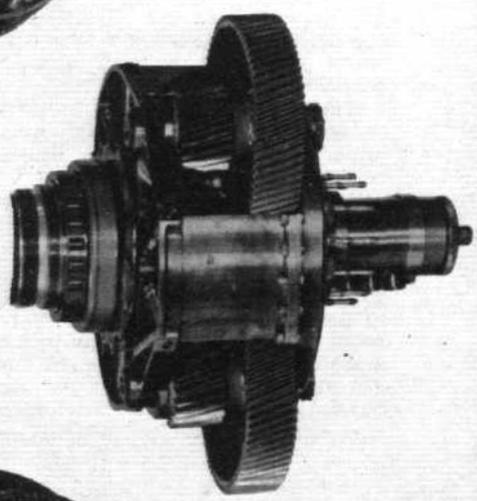
Perhaps the most critical single component of a gas turbine is its compressor. Above is the Tyne's nine-stage h-p. spool, and the six-stage l-p. compressor is pictured on the right





Housed within a casing of magnesium alloy, the reduction gear annulus is surrounded by 24 torquemeter dashpot cylinders. The operation of the torquemeter, and of the automatic drag-limiting system, is described on page 566

The large drawing above was prepared by a Rolls-Royce artist in Derby. It shows well the principal features of a standard production RTy.1 engine. All Tynes so far ordered will be equipped with propellers by de Havilland Propellers Ltd, although this important component is not pictorially evident in these pages. For the Rotodyne, of course, the complete basic turboprop will also drive at the rear, through a hydraulic clutch, to an auxiliary compressor



The drawing at the foot of page 566 clarifies the geometry of the epicyclic reduction gear. The three planetary gears (right) are carried in a neat and rigid spider attached to the rear of the propeller shaft

ROLLS-ROYCE TYNE

Configuration Two-spool turboprop with six-stage low-pressure compressor, nine-stage high-pressure compressor, ten combustion chambers in annular casing, single-stage high-pressure turbine and three-stage low-pressure turbine. External diameter over intake, 35.3in; overall installational envelope diameter, 40.5in; overall length, 110.15in; dry weight, 2,070 to 2,150lb, depending on mark.

Performance RB.109, sea-level static: mass flow, 41.4lb/sec; l-p. ratio 3.2; h-p. ratio, 3.77; overall ratio, 12.05; maximum power, 4,000 s.h.p. (4,430 e.h.p.) with s.f.c. of 0.535 (0.485). RB.109 at 30,000ft, cruising at 425 m.p.h.: mass flow, 14.9lb/sec; l-p. ratio, 2.38; h-p. ratio 4.68; overall ratio, 11.15; power, 1,880 s.h.p. (2,088 e.h.p.) with s.f.c. of 0.437 (0.393).

RTy.1 Mk 506, sea-level static: mass flow, 46.6lb/sec; l-p. ratio 3.35; h-p. ratio, 4.08; overall ratio, 13.67; maximum power, 4,500 s.h.p. (4,985 e.h.p.) with s.f.c. of 0.539 (0.487). RTy.1 Mk 506 at 30,000ft, cruising at 425 m.p.h.: mass flow, 16.8lb/sec; l-p. ratio 2.55; h-p. ratio, 4.87; overall ratio, 12.45; power, 2,095 s.h.p. (2,320 e.h.p.) with s.f.c. of 0.442 (0.399).

RTy.11 Mk 512: as above except maximum power, 5,050 s.h.p. (5,545 e.h.p.) with s.f.c. in the cruising condition of 0.396.

RTy.12 Mk 515: as above except maximum power, 5,300 s.h.p. (5,730 e.h.p.) with s.f.c. in the cruising condition of 0.394.

RTy.20: as above except maximum power, 5,665 s.h.p. (6,100 e.h.p.) with s.f.c. in the cruising condition of 0.391. In the sea-level static condition the s.f.c. is 0.472 (0.439 on an e.h.p. basis).

Towards the end of the opposite page it is pointed out that the h-p. compressor stators are carried in steel rings lying inside the stress-carrying outer shell. Both shell and rings are here evident