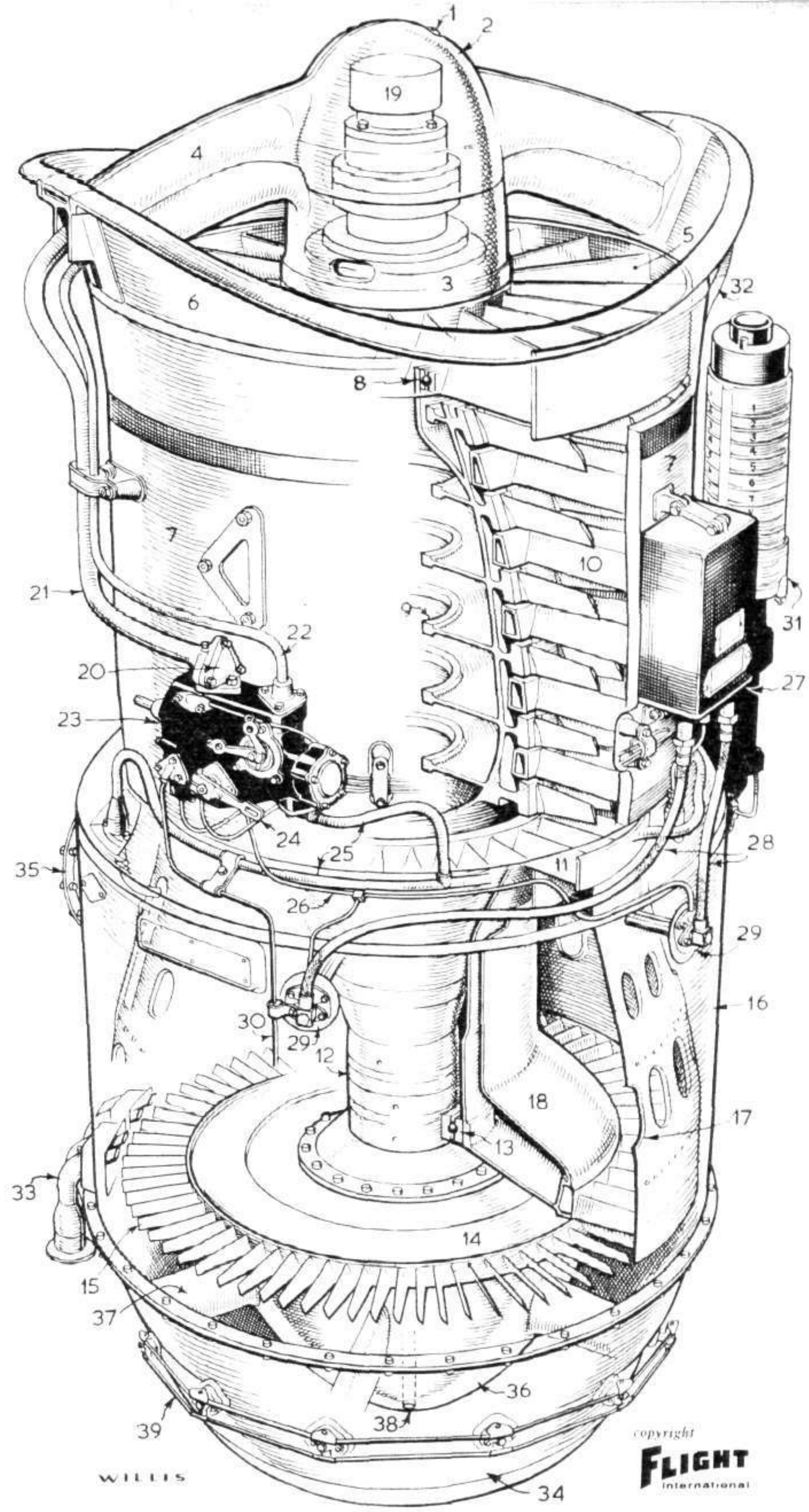
*The accompanying drawing has been prepared by one of our artists from illustrations of the RB.162 which have recently been cleared for publication. In certain areas details of the design remain protected*




**1** Lifting eyes (used during installation or removal of vertically mounted lift units)
**2** Upper nose bullet (moulded glass-reinforced plastics)
**3** Lower nose bullet (plastics)
**4** Upper and lower intake struts (plastics)
**5** Fixed inlet guide vanes (plastics)
**6** Peripheral intake ring (plastics, moulded complete with inlet guide vanes)
**7** Compressor casing (plastics, two half-shells)
**8** Front bearing
**9** Compressor rotor (entirely of aluminium alloy, with blades mounted on discs and spacers welded together to form a single unit)
**10** Compressor stator blades (plastics)
**11** Fixed diffuser vanes (plastics)
**12** Compressor shaft (thin-walled steel tube with bolting flanges at each end)
**13** Rear bearing
**14** Turbine disc (titanium)
**15** Turbine blades (solid Nimonic)
**16** Combustion-chamber casing (welded steel sheet)
**17** Outer flame tube (continuous Nimonic drum, with perforations for secondary air)
**18** Inner flame tube (continuous Nimonic drum, without perforations)
**19** Fuel filter and pump group in nose bullet (main body cast in magnesium)
**20** Fuel blanking plate
**21** Low-pressure fuel to nose bullet
**22** High-pressure return pipe
**23** Throttle and flow-control unit (main body cast in magnesium)
**24** Connection to throttle linkage
**25** Fuel delivery manifold (rigid pipe) leading to injection pipes spaced at 180°
**26** Starting fuel (rigid pipe)
**27** Igniter box
**28** Two igniter connections (braided cable)
**29** Combined igniters and starting-fuel jets
**30** Fuel drain
**31** Oil bottle with visual level scale
**32** Oil feed to front bearing
**33** Two bifurcated starting-air impingement jets
**34** Jetpipe and nozzle
**35** Main bleed face (connection to manifold supplying aircraft control nozzles)
**36** Tailcone
**37** Six radial struts
**38** Drain from rear bearing
**39** Instrumentation manifold (jetpipe pressure and/or temperature)



ficient, and the installation was able to draw heavily upon both SC.1 and Rolls-Royce experience, the four pairs of lift engines being very similar to the groups fitted to the British aircraft. Rolls-Royce carried out a great deal of basic design and installation development at Hucknall, undertook tunnel testing of the complete installation and assisted in the mating of the lift engines to the aircraft.

Tethered hovering trials of the Balzac V 001 began last October 12, at Melun; and six days later M René Bigand began free-flight development which on the 17th flight included a complete transition. The trouble-free flight performance of the Balzac has to a high degree been due to the spadework undertaken at Derby and Hucknall. In particular, the eight RB.108 engines have required no re-calibration and have, say Dassault, been installed and flown exactly as received.

With the satisfactory experience of the RB.108 as a lightweight lift/propulsion engine, further thought was given to a more advanced engine designed to have the best possible thrust/weight ratio for lift purposes only. An advanced engine design was put forward in the summer of 1959 as a research project to be sponsored partly by the Ministry of Aviation and partly by Rolls-Royce to produce a low-cost, ultra-lightweight lift jet with a thrust weight ratio of 16.

This project was discussed with aircraft industries in Britain and other European countries. Considerable interest was shown in the possibility of using such a unit in V/STOL strike and transport aircraft, both of which were called for by the NATO competitions then being initiated (NBMR-3 and NBMR-4, respectively). The research programme was changed into a firm tripartite development programme in 1960, supported by the British, French and German Governments with the object of producing a full flight standard of engine in a shorter time-scale than in the research programme.

The British Ministry of Aviation was interested in the engine primarily for transport aircraft, and the French wanted it for the Mirage IIIV type of strike aircraft. German interests through EWR-Süd, Dornier and Focke-Wulf covered both light strike and transport aircraft. During 1961 and 1962 a number of projects using the RB.162 were submitted in the NBMR-3 and -4 competi-