CHAPTER

5

ALIGHTING GEAR

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General

1. The alighting gear comprises a tricycle undercarriage, with two main undercarriage units (one under each wing), and a fully castoring nose wheel unit incorporating a self-centring mechanism. The nose wheel unit retracts backwards and the main units retract outwards under hydraulic power, and are enclosed automatically by doors which are linked to the struts. For principle of operation and further details see A.P. 1803C, Vol. I.

Main wheel unit (airdraulic strut)

2. The airdraulic strut comprises a plunger tube which is free to move in a cylinder. At the lower end of the plunger tube is fitted a hollow axle which is pinned to the tube. The axle is drilled and tapped to receive an inflation valve, and a drilling from the bore of the axle communicates with the air chamber in the plunger tube. The upper end of the plunger tube is threaded to receive a piston which is locked by a grub screw. The piston wall is formed with a groove and a hole is drilled through the piston into the groove, allowing a a passage for the fluid to a space between the plunger tube and cylinder tube. The piston head accommodates a flutter plate and spring, and also has ten holes, six of which are covered and uncovered by the flutter plate while four are outside the range of the plate. Inside the plunger tube and below the piston is a sealed floating separator which isolates the fluid and air.

3. The cylinder tube is a casting, incorporating at its upper end four lugs to which another casting is bolted to receive the eyebolt of the lower link. Bosses are cast in the lower end of the tube for accommodation of the torque links, the lower ends of which are located on the axle fitting.

Nose wheel unit

4. The construction and operation of the nose wheel shock-absorber unit is similar to that of the main strut, with the exception of a spring-loaded self-centring cam located internally at the top of the unit. The self-centring device, while allowing a castoring action during taxying, also ensures that the wheel is in the correct position for retraction.

Radius rod assembly

5. The radius rod unit (*see Sect.* 4, *Chap.* 3, *fig.* 10). comprises an upper link which is free to rotate on a tube located in end bearings, and a lug for the jack attachment incorporated in the lock-plate assembly. The fork end of the upper link receives the lock link, at the top of which a stop bolt is located, and should coincide with the face of a similar bolt in the upper link. The lower end of the lock-plate is drilled to receive a roller which is free to move in the kidney-shaped slot of the lock link. The lock link incorporates an adjustable eye bolt for attachment to the strut.

Radius rod locking mechanism

6. The *down* and *up* positions are held by a mechanical latch. The initial movement of the jack moves the lock-plate against the action of the spring until the lock-plate is in line with the upper and lower links. With the unit in the unlocked position, movement of the jack ram now causes the radius rod to hinge and retract the unit, when the spring snaps the lock-plate into the locked position (*see Sect.* 4, *Chap.* 3, *fig.* 10).

Undercarriage DOWN indicator switch

7. Movement of the lock-plate assembly is imparted to the micro switch through a spigot M which is in contact with a leaf spring K (*see Sect.* 4, *Chap.* 3, *fig.* 10). It will be noted that the micro switch is in circuit at the locked *down* and locked *up* positions, and only changes over when the leg is unlocked; this attitude is indicated by a red light in the undercarriage visual indicator.

Undercarriage UP indicator switch

8. Two micro switches located above the retracting gear are brought into circuit by full retraction of the unit, which depresses an adjustable button impinging on the micro switch leaf springs, and extinguishing the red lights in the cockpit, indicating that the alighting gear is in the locked *up* position. A throttle lever micro switch is in circuit with the *up* switch, and is brought into operation when the undercarriage is retracted and the throttle retarded. A red light appears on the undercarriage visual indicator, warning the pilot that the undercarriage is in an unsafe position for landing.

Undercarriage lever lock

9. Inadvertent operation of the undercarriage is impossible while the weight of the aircraft is on the struts. The undercarriage selector lever is locked by a solenoid-operated plunger, which is in circuit with a micro switch operated by the port strut torque links. Due to the weight of the aircraft, the torque links assume an acute angle, depressing the micro switch leaf spring, so breaking the circuit and forcing the plunger to lock the selector lever. As soon as weight is removed from the struts the torque links open, so relieving pressure on the micro switch, and at the same time energising the solenoid which withdraws the plunger, thereby allowing the selector lever to be operated.

Landing wheel assembly (main wheels)

10. The wheels are Dunlop, Type A.H. 8218, mounted on ball and roller bearings on a tubular steel axle.

Nose wheel assembly

11. The nose wheel, a Dunlop Type A.H. 017219/1X, is mounted in a similar manner to the main wheels, but the axle tube is supported at either end in a fork-shaped forging, which is pivotally mounted on the lower end of the shock-absorber unit. The axle end fittings are located by end caps which are connected by a tie rod.

Brakes

12. For the pneumatic system employed for operating the brakes refer to Sect. 9.

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