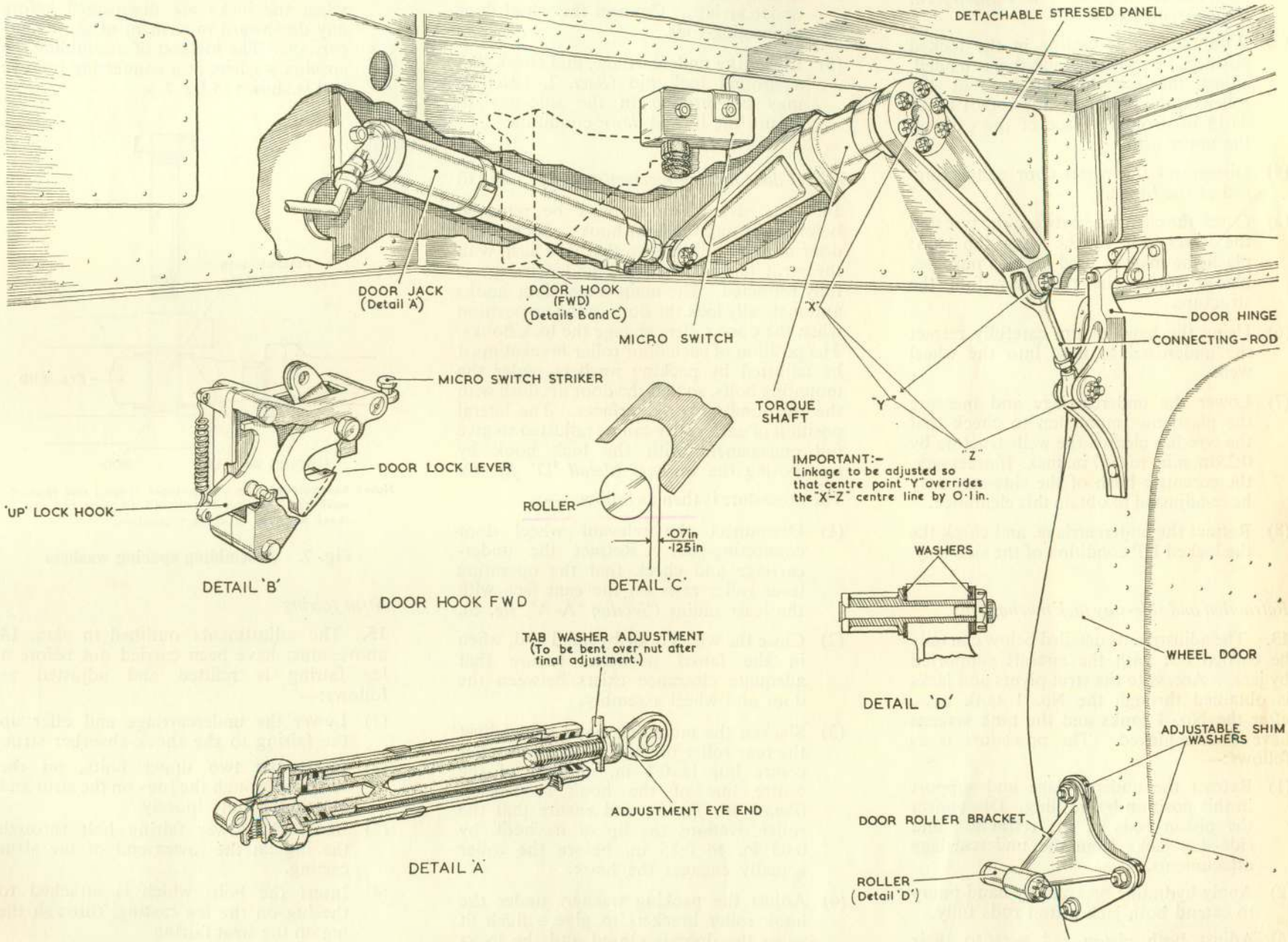


Fig. 6. Main wheel door mechanism (starboard)

◄ **Note . . .**

This adjustment can be carried out only when the side-stay has been removed from the undercarriage. ►

(3) With the bridge casting in the locked position, i.e., with the side-stay extended, adjust the eccentric-pin so that the roller on the bridge casting is 0·01 in. to 0·015 in. from the face of the cam on the upper arm.

◄ (4) Disconnect the wheel door connecting-rod at the hinge.

(5) Check the clearance between the tyre and the lower side of the wing top skin; plasticine may be used for this purpose, placed where the tyre may foul the structure.

(6) Using the hand pump, carefully retract the undercarriage hard into the wheel well.

(7) Lower the undercarriage and measure the plasticine impression to check that the tyre has cleared the well structure by 0·25 in. min. to 0·57 in. max. If necessary, the eccentric bush of the side-stay may be re-adjusted to obtain this clearance.

(8) Retract the undercarriage, and check the the locked UP condition of the side-stay.

Retraction and side-stay jack mechanisms

13. The adjustments detailed below can only be carried out with the aircraft supported by jacks. Access to the strut pivots and jacks is obtained through the No. 1 tank bays, after the No. 1 tanks and the tank screens have been removed. The procedure is as follows:—

(1) Retract the undercarriage and support in this position by trestling. Disconnect the piston rods of the retraction and side-stay jacks from the undercarriage attachments.

(2) Apply hydraulic pressure by hand pump to extend both jack piston rods fully.

(3) Adjust both piston rod eyes to their normal attachment points on the undercarriage while the jacks are still extended.

(4) Screw out both piston rod eyes two turns each, lock, then retract the pistons slightly and re-attach both eyes to the undercarriage. Connect the wheel door connecting-rods.

(5) Lower the undercarriage, and check that a ground lock pin (*Sect.* 2, *Chap.* 1) may be inserted in the side-stay to ensure the locked *down* condition.

Wheel door locking mechanism (*fig.* 5 *and* 6)

14. The strut fairings must be removed before adjusting the door hooks. Each wheel door must be adjusted so that it is flush with the strut fairing when the undercarriage is fully retracted. The main wheel door hooks automatically lock the door in the *up* position when the door rollers engage the lock hooks. The position of each door roller bracket must be adjusted by packing washers under the mounting bolts, so that the door fits flush with the surrounding wing surfaces. The lateral position of each roller can be adjusted to give full engagement with the lock hook by transposing the washers (*detail* 'D' *fig.* 6).

The procedure is then as follows:—

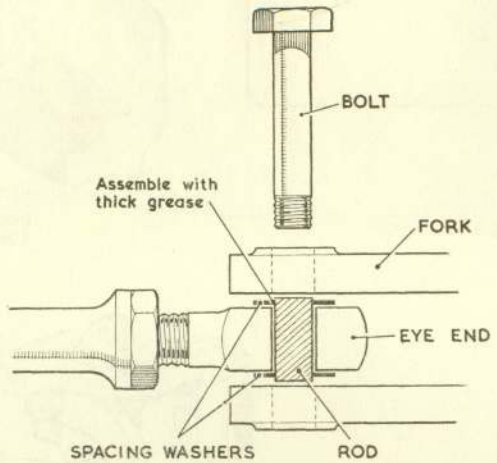
(1) Disconnect the relevant wheel door connecting-rod. Retract the undercarriage and check that the operating lever roller rests on the cam face with the least radius (*Section* 'A–A', *fig.* 5).

(2) Close the wheel door by hand and, when in the faired position, ensure that adequate clearance exists between the door and wheel assembly.

(3) Slacken the mounting bolts, and adjust the rear roller bracket so that the roller centre line is 0·1 in. inboard of the centre line of the hook suspension (*detail* 'B', *fig.* 5), and ensure that the roller overlaps the lip of its hook by 0·05 in. to 0·15 in. before the roller actually engages the hook.

(4) Adjust the packing washers under the hook roller brackets to give a flush fit when the door is closed and the locks are engaged. Check the depth of lock engagement by inserting plasticine.

(5) Adjust the door lock connecting-rods to give a positive lock to the rollers in the hooks, ensuring a very free release when the locks are disengaged before any downward movement of the undercarriage. The method of assembling the spacing washers at a connecting-rod eye end is shown in fig. 7. ►



Note: Assemble rod (cut to suitable length) and spacing washers. Insertion of bolt will displace rod and leave washers in correct position.

Fig. 7. Assembling spacing washers

Strut fairing

15. The adjustments outlined in para. 14 above must have been carried out before a leg fairing is refitted and adjusted as follows:—

(1) Lower the undercarriage and offer up the fairing to the shock-absorber strut.

(2) Insert the two upper bolts, on the fairing, through the lugs on the strut and attach the nuts loosely.

(3) Insert the lower fairing bolt through the lug on the lower end of the strut casting.

(4) Insert the bolt, which is attached to the lug on the leg casting, through the lug on the strut fairing.

(5) Attach the nuts to the two lower bolts and tighten the four nuts finger-tight.

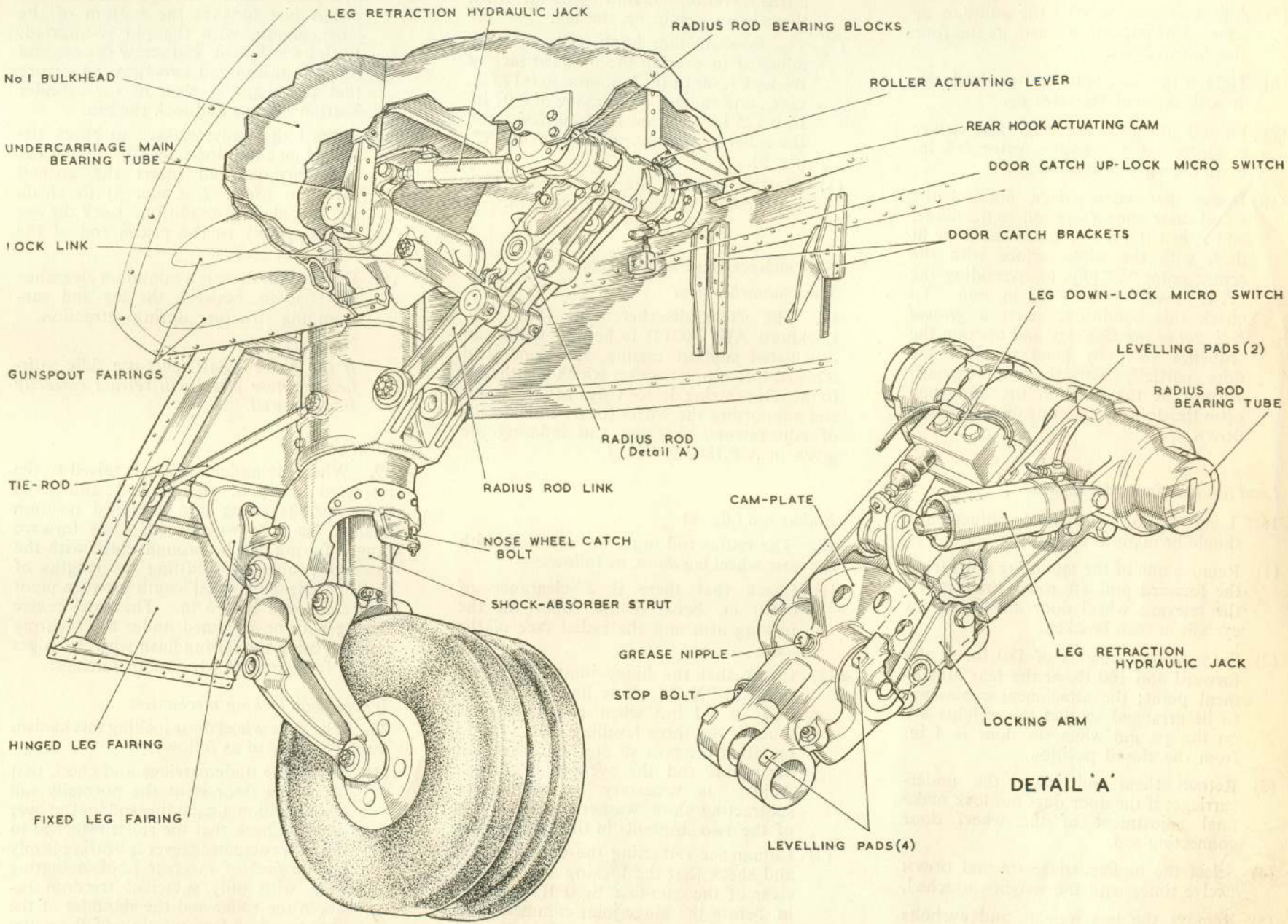


Fig. 8. Nose undercarriage

(6) Retract the undercarriage, observe the fitting of the strut fairing to the wheel door and the surrounding wing surface.

(7) Adjust as necessary by the addition or removal of packing washers at the four attachment bolts.

(8) Tighten the four bolts and re-check the fit with the undercarriage *up*.

(9) Fit and adjust the sequence valve striker to depress the sequence valve 0·3 in. when the leg is *up* and locked.

◄ (10) Lower the undercarriage, connect the wheel door connecting-rod to the hinge, and adjust the rod to make the door fit flush with the wing surface with the centre point "Y" (*fig.* 6). overriding the "X-Z" centre line by 0·1 in. min. To check this condition, insert a *ground lock pin in the side-stay* and operate the sequence valve by hand to close the door partially with the undercarriage selector at the position UP, and then open the door by selecting undercarriage DOWN.

Load test and final adjustments

16. Load testing and final adjustments should be made as follows:—

(1) Remove one of the mounting bolts from the forward and aft roller brackets of the relevant wheel door and insert an eyebolt in each bracket.

(2) Suspend test weights of 180 lb. at the forward and 160 lb. at the rear attachment point; the attachment cables are to be arranged so that the weights are on the ground when the door is 4 in. from the closed position.

(3) Retract them and lower the undercarriage; if the door does not lock make final adjustment of the wheel door connecting-rod.

(4) Select the undercarriage UP and DOWN twelve times with the weights attached.

(5) Remove the test weights and eyebolts and replace the original mounting bolts and lock by peening.

(6) When the wheel door lock adjustments and retraction tests have been completed, re-adjust the leg shortening strut to allow a free travel of 0·03 in. to 0·05 in. when there is no weight on the leg.

(7) The forward door hook roller must be adjusted to overlap the forward face of the lock lever by 0·12 in. min. to 0·175 in. max., and to have a clearance of 0·07 in. to 0·125 in. between the lock lever and the roller as the door closes. (*detail* 'C', *fig.* 6).

(8) Finally, recheck the wheel door lock adjustments as detailed in para. 14. ►

Nose undercarriage adjustments

Shock-absorber strut

17. The shock-absorber strut (Part No. Lockheed AIR 70212) is housed within an articulated support casting, the upper end screwed into a pivot socket which is attached to the self-centring device (*fig.* 12), the lower end supporting the wheel fork. Full details of adjustments, charging and inflating are given in A.P.1803C, Vol. 1.

Radius rod (*fig.* 8)

18. The radius rod must be adjusted, with the nose wheel leg *down*, as follows:—

(1) Check that there is a clearance of 0·010 in. between the roller on the locking arm and the radial face of the cam.

◄ (2) Check that the hinge joint "Y" overrides the "X–Z" centre line (*fig.* 10) by 0·08 to 0·1 in.; when a straight-edge touches the three levelling pads (*fig.* 8) on either the port or starboard arms of the radius rod the override is correct. ► Adjust as necessary by adding or subtracting shim washers at the heads of the two stopbolts in the lower arms.

(3) Commence retracting the undercarriage and check that the locking arm roller is clear of the cam-face by 0·015 to 0·020 in. before the hinge joint commences to break. Adjust the eccentric roller by slackening roller to obtain this clearance.

(4) Reset the radius rod mechanism in the wheel *down* position and remove the piston rod eye and pin from the retraction jack. Adjust the eye end until the piston just touches the bottom of the jack cylinder with the pin re-inserted. Withdraw the pin, and screw the eye end into the piston rod two turns to ensure that the piston is clear of the cylinder bottom. Insert and lock the pin.

(5) Retract the undercarriage to check the locked *up* condition (*fig.* 10). Lower the undercarriage and insert the ground lock pin (*Sect.* 2, *Chap.* 4) to check the locked *down* condition. Lock the eye end assembly to the piston rod of the retraction jack.

(6) Ensure that there is a minimum clearance of 0·050 in. between the leg and surrounding structure during retraction.

Note . . .

If the above adjustments are fully satisfied the nose wheel will retract correctly into the well.

Strut fairings

19. When the undercarriage is raised to the retracted position, the hinged and fixed strut fairings swing into a closed position against the nose wheel well. The forward hinged fairing can be brought flush with the fuselage profile by adjusting the lengths of the tie rods; the normal length between pivot centres should be 9·5 in. The fixed centre fairing may be shimmed under the securing bolts to bring the fairing flush with the edges of the forward and wheel door fairings.

Wheel door locking mechanism

20. The nose wheel door locking mechanism must be adjusted as follows:—

(1) Lower the undercarriage and check that the wheel door is at the normally full open position, i.e., radius rod locked over centre. Check that the roller attached to the roller actuating lever is bearing firmly on the face of the rear hook actuating cam, with only sufficient freedom between the roller and the shoulder of the cam to allow free rotation of the roller when it is just lifted from the shoulder.

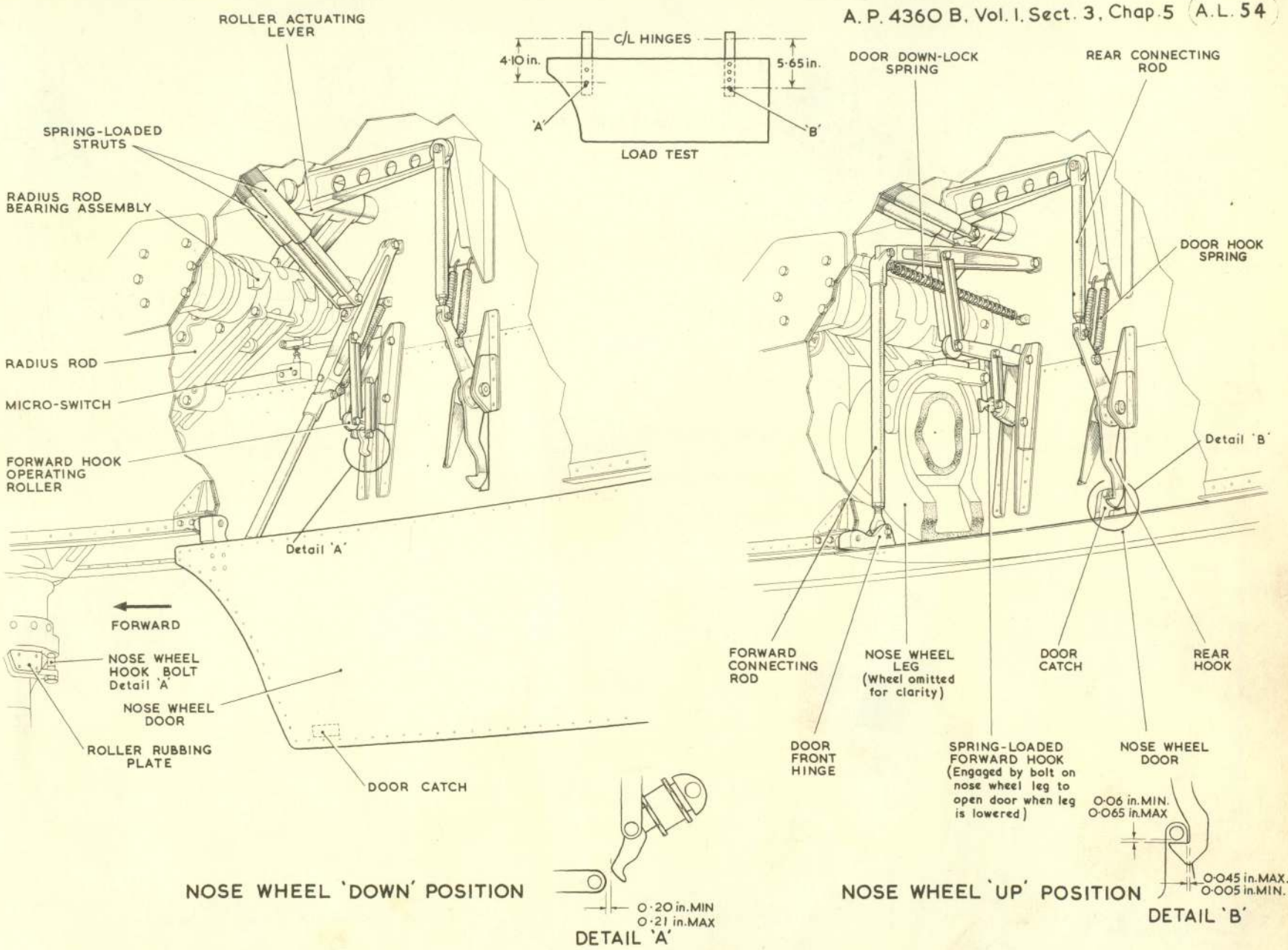


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Fig. 9 Nose wheel door mechanism

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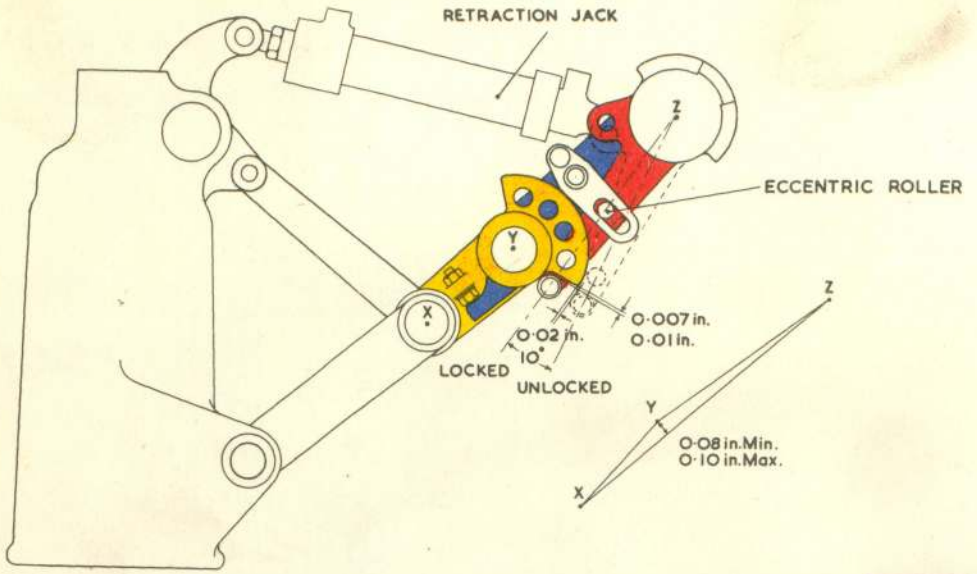
155.5

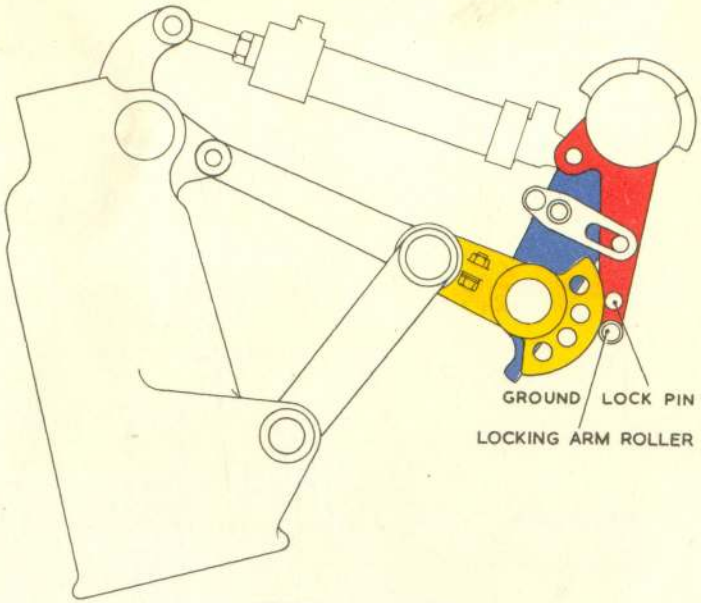


LEG FULLY DOWN
(Jack extends 0·05 in. to break lock)

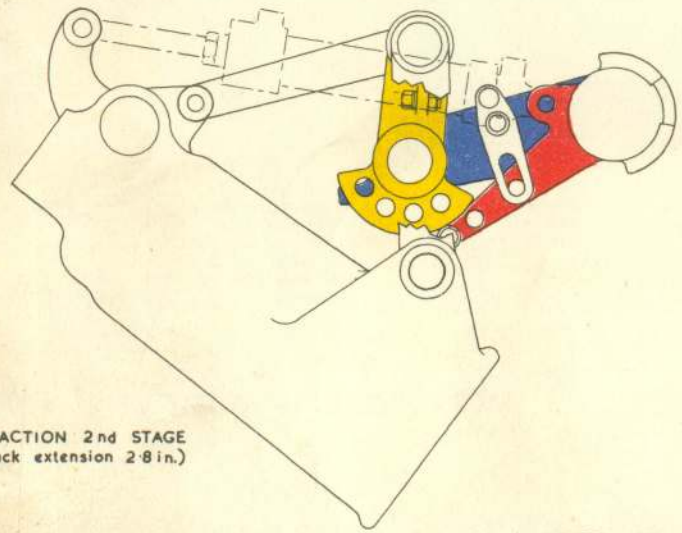
UPPER RADIUS ROD

LOCKING ARM

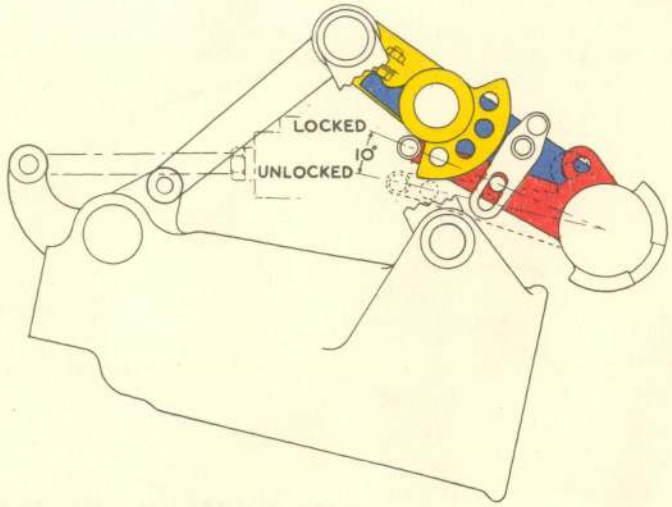
LOWER RADIUS ROD



RETRACTION 1st STAGE
(Jack extension 1·5 in.)



RETRACTION 2nd STAGE
(Jack extension 2·8 in.)



LEG FULLY RETRACTED
(Jack extension 5·15 in. radius rod locked)

Fig. 10 Nose wheel retraction movement

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To ensure the correct locking sequence of the wheel door, the actuating cam is provided with a vernier adjustment to set the cam relative to the position of the radius rod bearing.

(2) Adjust the length of the rear connecting-rod to engage the rear hook under the wheel door catch roller, leaving a gap of 0·005 to 0·045 in. between the outboard edge of the roller and the inboard edge of the hook (*detail* "B", *fig.* 9).

(3) Adjust the shims under the door catch bracket to enable the door catch roller to touch the engaging face of the rear hook with the door fitting flush to the fuselage.

(4) Adjust the eye end of the forward connecting-rod to enable the door catch roller to lift 0·06 to 0·065 in. above the engaging face of the rear hook (*detail* "B", *fig.* 9) when the undercarriage is retracted and the wheel door closed.

(5) Retract the undercarriage until the roller rubbing plate is just in contact with the forward hook operating roller. Adjust the spring-loaded forward hook until it has a vertical clearance of 0·20 to 0·21 in. with the nose wheel hook roller (*detail* "A", *fig.* 9); the shank of a No. 4 drill may be used to check this clearance.

Note . . .

(1) *To make the adjustments detailed in sub-para.* (2) *to* (5), *the undercarriage will have to be raised and lowered as necessary to enable the adjustments to be made.*

(2) *To check the rear hook adjustments detailed in sub-para.* (2) *and* (4) *a piece of wire of suitable gauge may be used to insert through the rear hook slot in the wall of the nose wheel tunnel from the outboard side, as no visual check can be made when the door is closed.*

(3) *The door locking mechanism adjustments are dependent upon each other, and re-checking of hook clearances will be necessary.*

(4) *The method of assembling the spacing washers at the connecting-rod eye end is shown in fig.* 7.

Load test

21. The nose wheel door must be load-tested as follows:—

(1) Jack up the aircraft, and ensure that the door and fairings are correctly adjusted.

(2) Replace the nut and bolt, 'A' and 'B' respectively, with an eyebolt on both the forward and aft hinges as indicated in fig. 9.

(3) Attach a 242 lb. weight to the forward hinge eyebolt and a 65 lb. weight to the aft hinge eyebolt.

(4) Adjust the weights so that they hang freely when the door is in any position between 1·5 in. open and fully closed.

(5) Remove the weights and eyebolts and replace the original nuts and bolts.

Self-centring mechanism

22. The aircraft should be jacked up, the alighting gear lowered, the nose wheel turned to an angle of 90 deg. to the fore-and-aft centre line of the aircraft, and a check made to ensure that it returns to dead centre in a maximum time of one second.

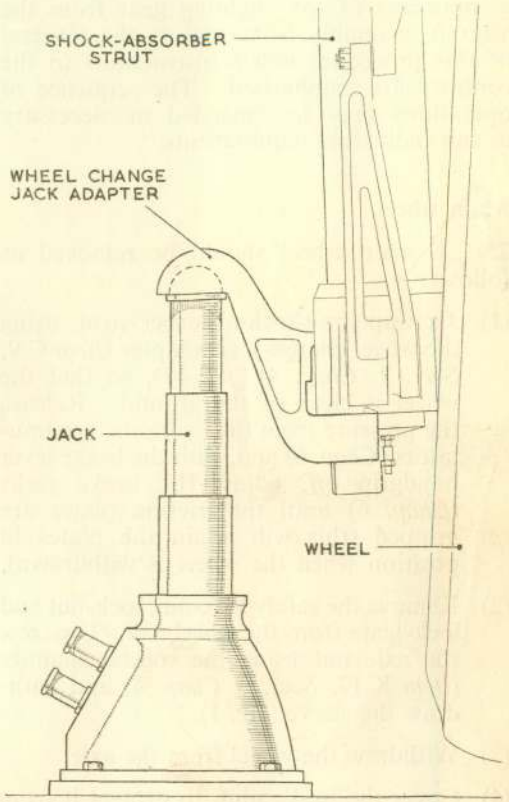


Fig. 11. Wheel change jack adapter

Arresting hook

23. All moving parts of the assembly should be kept clean and lubricated (*Sect.* 2, *Chap.* 4). The arresting hook should be lowered and a check made to ensure that the warning light remains *on* during the entire downward travel and that the micro switch cam-plate is free from distortion. Details of the micro switches are given in Sect. 5, Chap. 1.

General

24. The following paragraphs outline the procedure for the removal of the major components of the alighting gear from the aircraft, assembly being mainly the reversal of this procedure unless instructions to the contrary are emphasised. The sequence of operations may be amended as necessary to suit individual requirements.

Main wheel

25. A main wheel should be removed as follows:—

(1) Jack up the shock-absorber strut, using the wheel change jack adapter (*item* C.9, *Sect.* 2, *Chap.* 4) (*fig.* 11), so that the wheel is clear of the ground. Release the pressure from the hydraulic accumulators (*Chap.* 6) and, with the brake lever handgrip *off*, adjust the brake jacks (*Chap.* 6) until the friction plates are gripped (this will retain the plates in position when the wheel is withdrawn).

(2) Remove the safety lock-pin, lock-nut and lock-plate from the wheel axle. Unscrew the axle nut using the special spanner (*item* K.17, *Sect.* 2, *Chap.* 4) and withdraw the sleeve (*fig.* 1).

(3) Withdraw the wheel from the axle.

(4) Cover the brake unit, to protect it from grease and dirt, if the wheel is not being replaced immediately.

Warning . . .

During re-assembly it is essential that the following check should be carried out to ensure that the sleeve is engaged with the stub axle tongues, otherwise the wheel may be insecure even after subsequent locking.

(a) *Replace the wheel and the sleeve, ensuring that the sleeve is correctly engaged with the axle tongues. Tighten the axle nut carefully with the special spanner while spinning the wheel by hand, until the wheel commences to seize.*

(b) *Remove the axle nut, and check that the gap between the sleeve and the base of the axle tongues is* 0·105 *in. to* 0·135 in.

(c) *Re-assemble the nut as described in sub-para.* (a), *and unscrew the nut to the nearest locking slot, locking with lock-plate, nut and pin.*

(d) *Check that the end float of the wheel is* 0·003 *in. to* 0·011 *in.*

(e) *Adjust the brake jacks in accordance with the directions given in Sect.* 3, *Chap.* 6.

Note . . .

*Inner tubes and tyres must be fitted to the main wheels in accordance with the instructions contained in A.P.*2337, *Vol.* 1, *Book* 2, *Sect.* 2, *Chap.* 4, *App.* 3; ◄ *adjustment of the brake units is given in Sect.* 3, *Chap.* 2 *and App.* 21 *of that Volume. Adjustment information for the Maxaret units is given in A.P.*1803*S*, *Vol.* 1, *Book* 2, *Sect.* 8, *Chap.* 5. ►

Main undercarriage shock-absorber

26. A main undercarriage shock-absorber strut should be removed as follows:—

(1) Release the hydraulic pressure from the accumulators and the air pressure from the pneumatic system, and trestle the aircraft clear of the ground (*Sect.* 2, *Chap.* 4).

Note . . .

The lifting jacks must be positioned so that the strut may swing inboard as required by sub-para. (5).

(2) Disconnect the pneumatic hose at the union on the rear diaphragm above the strut, and uncouple the electrical leads from the micro switches on the strut shortening rod and upper torque link.

(3) Remove the wheel (*para.* 25), the fixed fairing from the shock-absorber strut and the forward tail boom fairing from the undersurface of the wing.

(4) Disconnect the lower end of the side-stay from the lug at the top of the shock-absorber strut and the upper end of the strut shortening crank-rod.

(5) Disconnect the door lock and main retraction jacks from their attachment points on the strut, swinging the strut inboard to give clearance for the withdrawal of the bolts.

(6) Support the strut, withdraw the square-headed bolts from each pivot bearing block and lower the strut from the wing.

Note . . .

(1) *Should the pin securing the main undercarriage lock-jack at its lower end require replacement, the thread may be shortened if necessary, by* 0·05 *in. to avoid the pin fouling the structure.*

(2) *Filling and testing instructions are given in A.P.*1803*P*, *Vol.* 1.

Main undercarriage side-stay

27. A side-stay may be removed independently of the shock-absorber. After releasing the hydraulic and pneumatic pressures, proceed as follows:—

(1) Disconnect the door lock jacks from the bridge casting and allow the jack to swing down to clear the assembly.

(2) Disconnect the eccentric bush of the side-stay from the lug on the shock-absorber strut.

(3) Uncouple the electrical leads from the lock plate micro switch.

(4) Disconnect the bearing blocks from the diaphragms and lift out the side-stay.

Nose wheel

28. The nose wheel should be removed as follows:—

(1) Trestle the aircraft (*Sect.* 2, *Chap.* 4) so that the nose wheel is clear of the ground.

(2) Remove the end plugs and tie-rod from the axle tube.

(3) Support the wheel and tap out the axle tube.

Nose wheel strut (*fig.* 8)

29. If necessary, the nose wheel should have been removed first as indicated in para. 28. Then proceed as follows:—

(1) Release all pressure from the hydraulic accumulators.

(2) Remove the side access panels and open the radome fully.

(3) Withdraw the bolt from the lock link, radius rod attachment and fairing tie-rods.

(4) Withdraw the bolt from the strut lever arm and lower the hydraulic jack on to the shock-absorber strut.

(5) Withdraw the split pins, nuts and bolts from the side mounting brackets.

(6) Support the strut and tap out the pivot bearing tube.

◀ **Note . . .**

When refitting the nose undercarriage bearing tube, it is important to eliminate end float by inserting spacers of equal thickness between both ends of the bearing tube bushes and the attachments brackets, to avoid the possibility of nose wheel shimming. Ensure that the undercarriage sways freely and then clamp up the attachment brackets.

Nose wheel shock-absorber renewal (*fig.* 12)

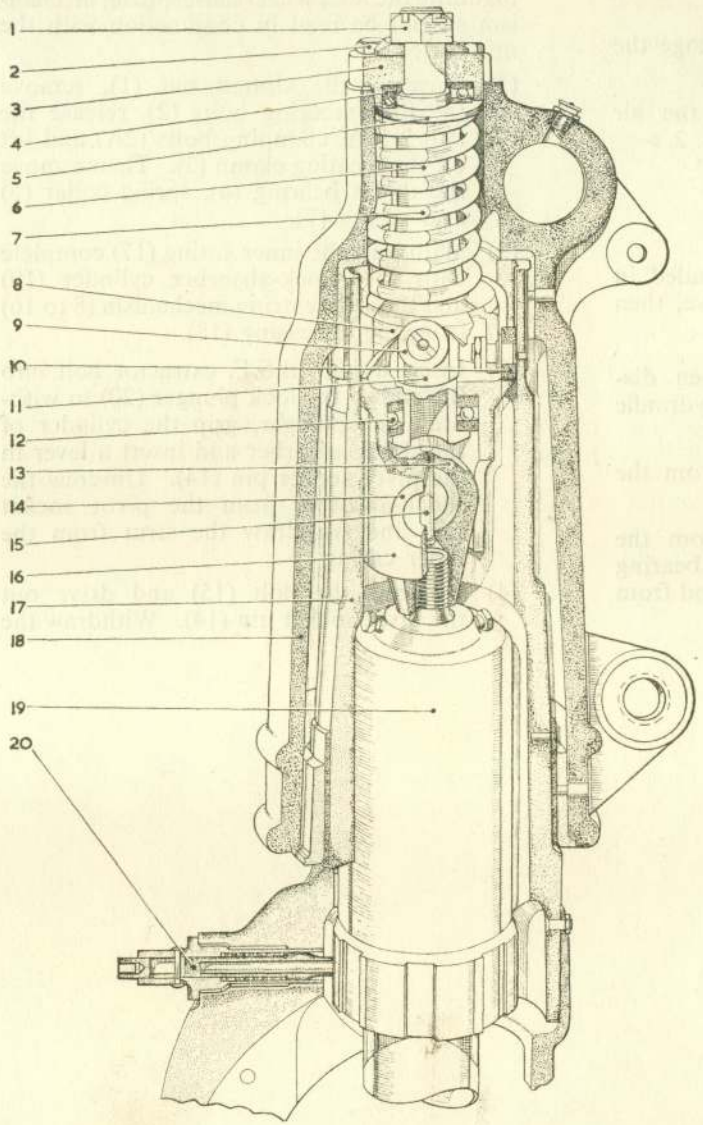
30.

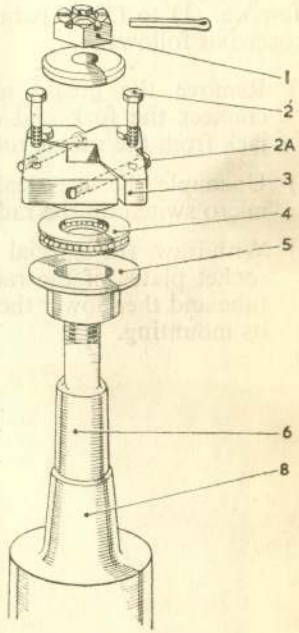
(1) Support the aircraft on jacks and insert the nose undercarriage ground lock pins (*Sect.* 2, *Chap.* 4).

(2) Withdraw the lock plunger from the inner casing (*para.* 32 (3)).

(3) Release the lower end of the shock-absorber by withdrawing the lower grease nipple bolt.

(4) Unscrew the shock-absorber bodily from the top attachment, using the special spanner, (*Sect.* 2, *Chap.* 4) to engage the splines (*para.* 32 (3)).





DETAIL OF ASSEMBLY BOLT

Fig. 12. Self-centring mechanism

(5) Screw in the new shock-absorber using the tool as in sub-para. 4 above.

Note . . .

It is essential to maintain a dimension of 32·25 in. between the centres of the pivot bearing and axle tubes, and it is permissible to unscrew the shock-absorber to a maximum of four turns as required. ▶

◄ (6) Secure the lower end of the shock-absorber by refitting the grease nipple bolt.

(7) Replace the lock plunger to engage the splines.

(8) Inflate the shock-absorber to the air pressure quoted in Sect. 2, Chap. 2. ►

Nose undercarriage radius rod

31. Carry out the instructions detailed in sub-para. (1) to (3) of para. 29 above, then proceed as follows:—

(1) Remove the grease nipple, then disconnect the fork end of the hydraulic jack from the radius rod lug.

(2) Uncouple the electrical leads from the micro switch on the radius rod.

(3) Withdraw the special bolts from the socket plates of the radius rod bearing tube and then lower the radius rod from its mounting.

Self-centring mechanism (*fig.* 12)

32. The following instructions for dismantling the nose wheel self-centring mechanism should be read in conjunction with the illustration.

(1) Unscrew the slotted nut (1), remove the four securing bolts (2), release the two 2 B.A. clamping bolts (2A) and lift off the locating clamp (3). Then remove the thrust bearing (4), spring collar (5) and spring (7).

(2) Withdraw the inner casing (17) complete with the shock-absorber cylinder (19) and the self-centring mechanism (8 to 16) from the leg casing (18).

(3) Insert a $\frac{1}{4}$ in. B.S.F. extractor bolt into the end of the lock plunger (20) to withdraw the plunger, grip the cylinder of the shock-absorber and insert a lever in the pivot socket pin (14). Unscrew the shock-absorber from the pivot socket (13) and withdraw the strut from the inner casing.

(4) Unscrew the bolt (15) and drive out the pivot socket pin (14). Withdraw the self-centring mechanism and the pivot socket (13) from the inner casing.

(5) Withdraw the self-centring cam (8) from the assembly bolt (6); this enables the slipper (10) to be removed.

(6) Remove the two rollers (9) and the support collar (11), then withdraw the assembly bolt (6) and thrust race (12) from the thrust head (16).

Note . . .

When reassembling the locating clamp (3), *it is important to assemble first, the three bolts* (2) *which secure the larger portion of the clamp, then to tighten the slotted nut* (1) *to ensure a free fit on the assembly bolt* (6). *Ease the nut* (1) *and tighten the three securing bolts* (2) *evenly. Tighten the two* 2 *B.A. clamping bolts* (2A) *evenly, then finally assemble and tighten the fourth corner bolt* (2).

Arresting hook

33. Removal and assembly of the arresting hook are straightforward operations; the attachment points are shown in fig. 13.

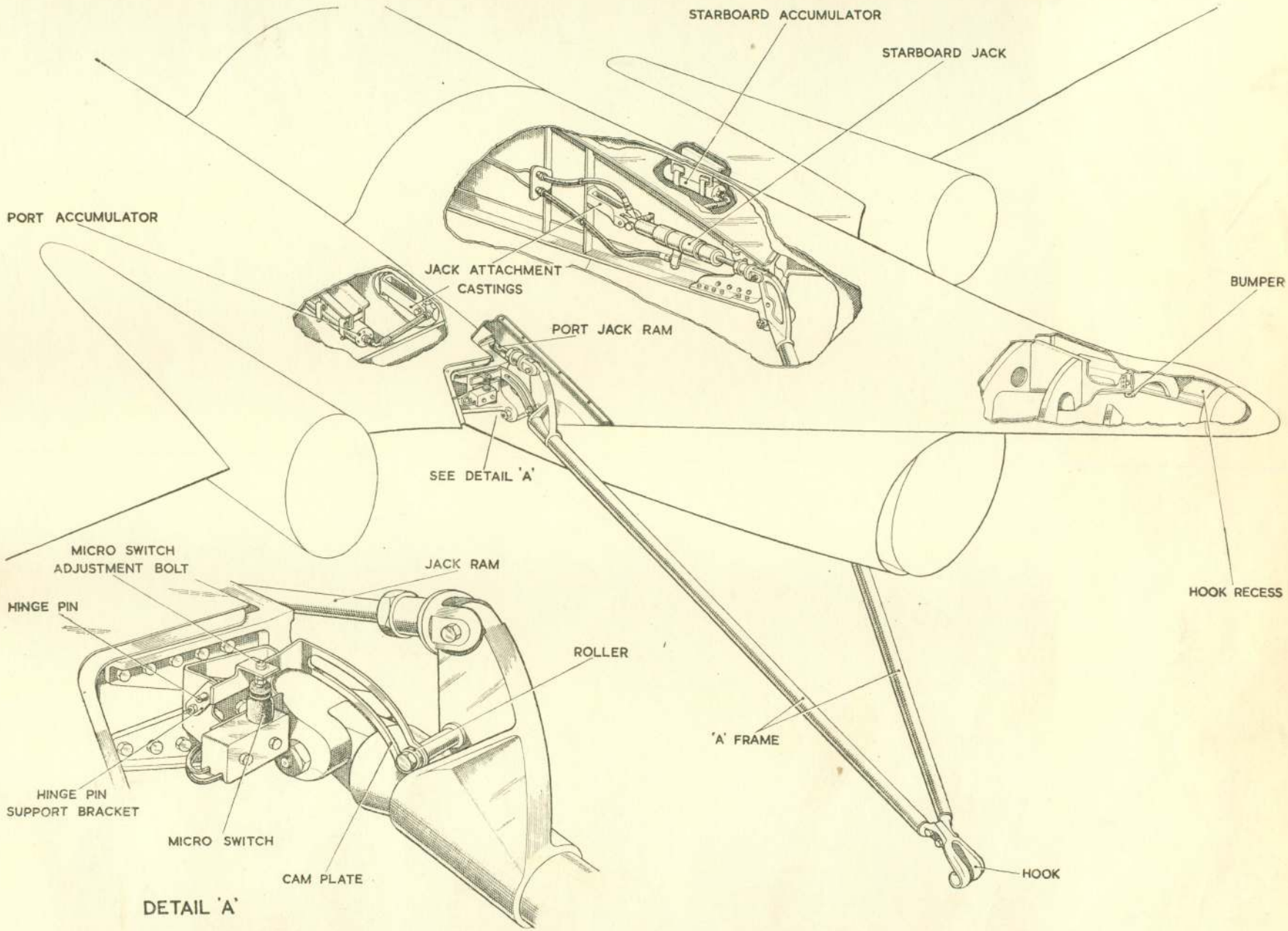


Fig. 13. Arresting hook