

Chapter 35

MAIN UNDERCARRIAGE JACKS

Type No. 1.01108.001
1.01108.002

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Introduction

1. These jacks are identical, but handed from each other by the location of a transfer connection to the end fitting. Each unit pivots on a spindle which is housed in the end fitting and carries the fluid pipe lines.

DESCRIPTION

General

2. The cylinder is closed at one end by an end fitting and at the other end carries a gland housing. Each part is located over a flange formed on the cylinder and secured by a locking ring which clamps two half rings against the shoulder of the flange. Sealing rings at the ends of the cylinder are retained by the end fitting and gland housing.

3. The spindle is retained in the end fitting by circlips and washers where the end fitting is machined from solid or by circlips only where a forged end fitting is used. Blind fluid ducts from each end of the spindle are intersected by radial ducts which align with annular grooves to provide fluid passages to the jack. Two gland rings and a sealing ring isolate the radial drillings from each other and prevent external leakage.

4. Each end of the spindle is tapped for the mounting of the pipe connections. A pipe adapter at one end provides the connection for fluid for extending the jack and fluid passes directly into the cylinder through a hole in the end fitting. The opposite end

receives a banjo bolt which secures a banjo union. The annular groove at this end is intersected by a tapping for a banjo type transfer connection, which is linked by a pipe assembly to a similar banjo union bolted to the gland housing, thus providing the connection for fluid to close the jack.

5. A gland ring and a spacer are fitted into the gland housing and retained by a gland nut which is followed into position by a wiper ring and a retaining washer. These items are secured by a circlip.

6. The piston assembly consists of a tubular piston rod and a piston head. The head is screwed into the rod and retained by a pin

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and locking ring, which also secures a travel stop. A sealing ring is fitted to the screwed shank of the piston head.

7. The piston rod is tapped at its outer end to receive an eye-bolt, by which the dimension between pin centres is adjusted on installation. The eye-bolt is locked by a nut and tightened against a spanner grip, which engages slots in the end of the rod.

SERVICING

Leakage

8. External leakage will indicate a faulty seal which must be renewed. Internal leakage past the sealing rings of the piston head and spindle will be shown by sluggish action of the jack in service or loss of pressure under test. Renew the appropriate seal.

Dismantling

9. (1) Remove the banjo bolts and the pipe assembly.
- (2) Remove the connections 1 and 2 from the ends of the spindle.
- (3) Unscrew the locking ring at the rod end of the jack to free the half rings. Withdraw the complete piston assembly and gland housing. Remove the sealing ring from the end of the cylinder.
- (4) Unscrew the lock-nut and remove the eyebolt and spanner grip. Withdraw the piston rod from the gland housing. Remove the sealing ring and supporting piston rings from the piston head.
- (5) Remove the locking ring and withdraw the locking pin. Slide the travel stop from the piston and unscrew the piston head.
- (6) Remove the sealing ring from the shank of the piston head.
- (7) Remove the circlip, the retaining washer and the wiper ring from the gland housing.

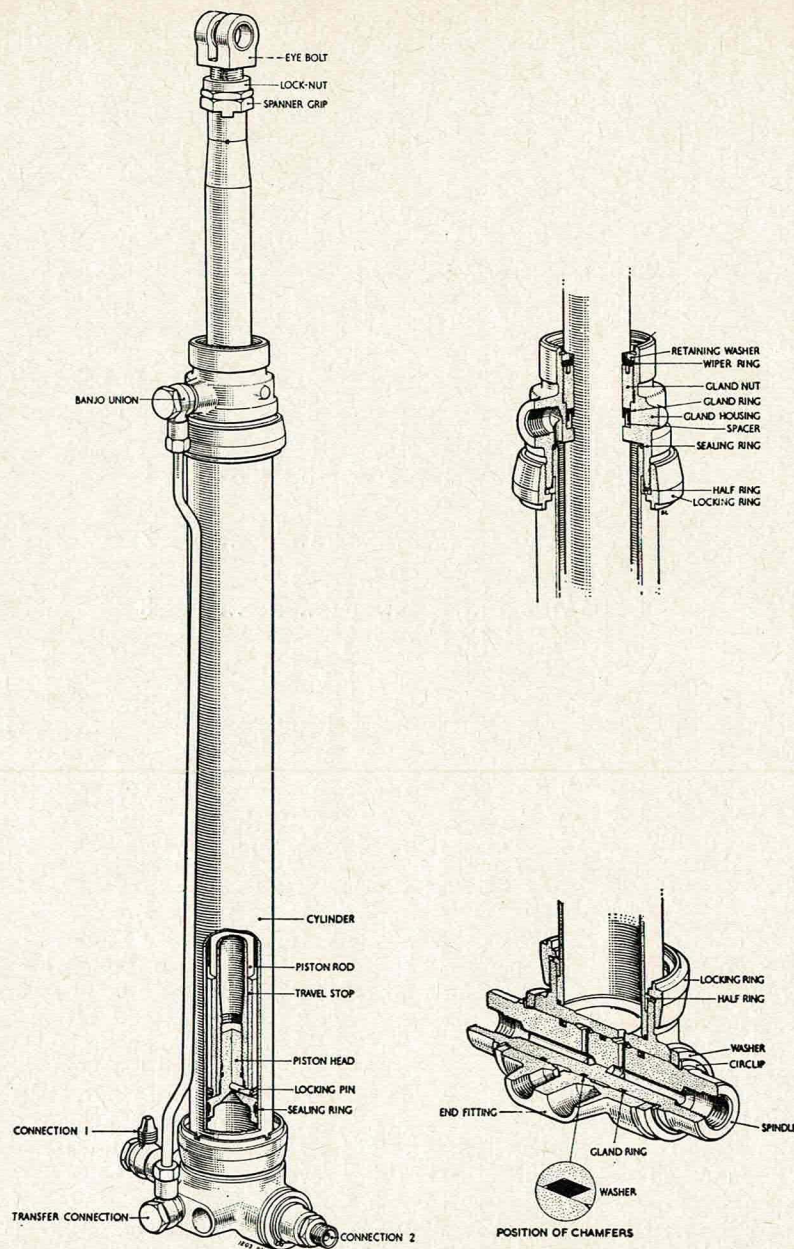


Fig. 1. Main undercarriage jack

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TABLE 1
Special tools

Ref.	Part No.	Description
27Q/7019	S.T.801	"C" key spanner for locking rings
27Q/10183	S.T.947/A	Circlip pliers (Type S.I.S.)
27Q/	S.T.947/C	Circlip pliers (Type S.E.S.)
27Q/11099	S.T.1213	Apkaway hub spanner for piston rod end fitting
27Q/12290	S.T.1215	Vice clamp } for holding piston rod
27Q/13529	S.T.1215/4	Collet }
27Q/11101	S.T.1286	Sleeve for insertion of gland ring
27Q/11106	S.T.1291	Tubular peg spanner for gland nut
27Q/11092	S.T.111/28	Tommy bar for S.T.1291
27Q/11107	S.T.1292	"C" key spanner for piston head
27Q/13531	S.T.1518	Assembly post for sealing ring of piston head
27Q/13488	S.T.1903	Drift bar for use with S.T.2040 Mk. 6
27Q/13530	Mk. 2	
	S.T.2040	
	Mk. 6	Drift for bush of eyebolt

(8) Unscrew the gland nut and withdraw the gland ring and the spacer.

(9) Remove the circlip and the washer (if the latter is fitted) from each end of the spindle. Carefully tap out the spindle and remove the three seals.

(10) Unscrew the locking ring to free the half rings and remove the end fitting. Remove the sealing ring from the end of the cylinder.

Assembling

10. All sealing rings are to be lightly coated with Grease XG-315 (34B/9100519) before being assembled in the unit.

(1) Fit a sealing ring to the end of the cylinder. Slide a locking ring over the cylinder and position the half rings. Locate the end fitting over the cylinder and screw the locking ring tightly onto the end fitting.

(2) Position the chamfered sealing ring in the middle groove of the spindle. The chamfers are to be located as shown in fig. 1.

(3) Fit the gland rings in the outer grooves of the spindle, with the lips of the rings innermost.

(4) Insert the spindle, so that the chamfers on the sealing ring are remote from the fluid passage in the base of the end fitting and secure it with the washers (if required) and the circlips.

(5) Fit a sealing ring to the screwed shank of the piston head and screw the head into the piston rod. Align the holes for the locking pin. Locate the travel stop over the piston rod and align the hole in the stop with those in the rod and the piston head. Fit the locking pin and locking ring.

(6) Fit the sealing ring and the piston rings to the piston head. If new piston rings are fitted they are to be gapped 0.009 to 0.012 in. on assembly and the sharp edges at the gap, on the flat faces only, removed up to a maximum radius $\frac{1}{32}$ in.

(7) Insert the piston assembly in the cylinder.

(8) Fit a sealing ring to the other end of the cylinder. Slide the locking ring over the cylinder and position the half rings. Place the gland housing over the piston rod and engage the locking ring with the gland housing. With the external locating stubs of the gland housing in the same plane as the spindle, ensure that the tapping for the banjo assembly is on a centre line passing midway between the two holes of the end fitting. Screw the locking ring tightly onto the gland housing.

(9) Insert the spacer and gland ring into the gland housing and screw in the gland nut.

(10) Position the wiper ring and retaining washer and secure them with the circlip.

(11) Screw the lock-nut to the eyebolt. Engage the spanner grip with the piston rod and screw in the eyebolt.

(12) Fit a bonded seal to each side of the banjo union for connection 1 and secure the union to the spindle with a banjo bolt.

(13) Fit a bonded seal to the pipe adapter for connection 2 and screw the adapter into the other end of the spindle.

(14) Fit a bonded seal on each side of the banjo unions for the pipe assembly and secure the assembly to the end fitting and the gland housing with the banjo bolts.

(15) After final assembly and test, wire-lock the banjo bolts to the banjo unions.

Installation

11. When installing the jack, the eye-bolt must be adjusted to suit the pick-up points on the aircraft. With the jack fully closed, the pin centre dimension must be within the limits of 37.8/38.2 in. For checking purposes,

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the jack travel dimension is 20-77/20-83 in. After adjustment, tighten the lock-nut against the spanner grip and wire-lock the parts together.

Testing

12. A static hydraulic test rig and a power pump rig fitted with a pump capable of delivering 3-45 gal/min are required. The pipe lines between the rig and the unit are to $\frac{3}{8}$ in. outside diameter for metal pipes and $\frac{3}{8}$ in. nominal for flexible hose. The jack is to be hydraulically operated six times in each direction before testing, to expel all air.

(1) Connect the supply line of the static hydraulic test rig to connection 1 and

gradually apply a pressure of 300 lb/in² to close the jack. Increase this pressure to 4,050 lb/in². Leakage is not permissible.

(2) Maintain the pressure of 4,050 lb/in² for a period of one minute. During this time, the spindle must be rotated steadily through an angle of 90 deg. and back at least five times. Leakage is not permissible. Release the pressure and disconnect the supply line.

(3) Connect the supply line to the adapter for connection 2 and gradually apply a pressure of 300 lb/in² to extend the jack. Increase this pressure to 4,050 lb/in². Leakage is not permissible.

(4) Maintain the pressure of 4,050 lb/in² for a period of one minute. During the time, the spindle must be rotated steadily through an angle of 90 deg. and back at least five times. Leakage is not permissible. Release the pressure and disconnect the supply line.

(5) Connect the jack to the power rig and operate it in each direction. During the extending stroke, the pressure must not exceed 90 lb/in² and the stroke is to be completed within 20 seconds. During the compression stroke, the pressure must not exceed 90 lb/in² and the stroke is to be completed within 20 seconds. Release the pressure and disconnect the supply line.

AIRCRAFT HYDRAULIC EQUIPMENT - DOWTY ROTOL

ADVANCE INFORMATION LEAFLET No. 2/66

Insert this leaflet in A.P.1803U, Vol.1, Book 5, Sect.11, Chap.35, to face Para.12

Para. 12, sub-paras. (2) and (4)

These sub-paras. should read as follows:-

“Reduce the pressure to 2000 lb/in and maintain for a period of one minute. During this time the spindle must be rotated steadily through an angle of 45 deg. and back at least five times. Leakage is not permissible. Release the pressure and disconnect the supply line”.

Notes

- (1) The information contained in this leaflet will be incorporated by normal amendment action in due course.
- (2) If, after receipt of this leaflet, an amendment list with a prior date and conflicting information is received, the information in this leaflet is to take precedence.

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