# Chapter 21

# SWIVEL COUPLING UNIT

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## ILLUSTRATIONS



### ◀Introduction

**1.** This unit provides sealed swivel joints between rigid hydraulic pipe lines of the air frame and the steering motor of a specific nose undercarriage. A basic type is described in the chapter and the variants are given in appendices.▶

### Description

**2.** The unit consists of three triple pipe sub-assemblies which provide fluidways A, B and C for centring the undercarriage and steering to port and to starboard respectively. A swivel coupling is fitted at the upper end for attachment to the airframe and two banjo unions and a pipe coupling at the lower end for connecting to the steering motor. The pipes of the centre sub-assembly are spigoted and soldered at each end into swivel coupling banjos, each pipe communicating with an annular groove in the bore of the coupling. Additional annular grooves in the coupling are fitted with rubber sealing rings and leather anti-extrusion rings to seal off the three fluidways from each other.

**3.** Both ends of the upper pipe sub-assembly and the inner end of the lower pipe sub-assembly are spigoted and soldered in the end blocks of swivel posts. Each pipe communicates with a separate annular groove on the post via a longitudinal and a radial drilling. The end of each longitudinal drilling is blanked by a screwed plug, locked and sealed by solder.

**4.** Each swivel post is free to rotate and is retained in its swivel coupling by a collar and a split pin. The annular grooves of the ports coincide with the corresponding grooves in the bores of the couplings and are separated by the sealing and anti-extrusion rings to provide the three flow paths. The fixed swivel coupling is formed with lugs for attachment to the airframe and is tapped for three connection adapters screwed in against bonded seals.

## SERVICING

### Leakage

**5.** Leakage past the sealing rings will be indicated externally or by loss of pressure during test. The appropriate sealing ring must be renewed.

### Dismantling

**6.** (1) Remove the split pins and collars to separate the three pipe sub-assemblies and the swivel coupling.

(2) Remove the sealing rings and the anti-extrusion rings from the centre sub-assembly and from the swivel coupling.

(3) Remove the connection adapters and bonded seals from the swivel coupling.

### Assembling

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

(1) Fit the sealing rings and anti-extrusion rings to the bores of the swivel coupling and the swivel coupling banjos of the centre pipe assembly.

**Note . . .**

*A sealing ring supported by two anti-extrusion rings are to be fitted to each of the two inner grooves of the bores and a sealing ring with one anti-extrusion ring is to be fitted to the outer grooves, with the anti-extrusion ring outermost. The rough faces of the anti-extrusion rings are to be adjacent to the sealing rings.*

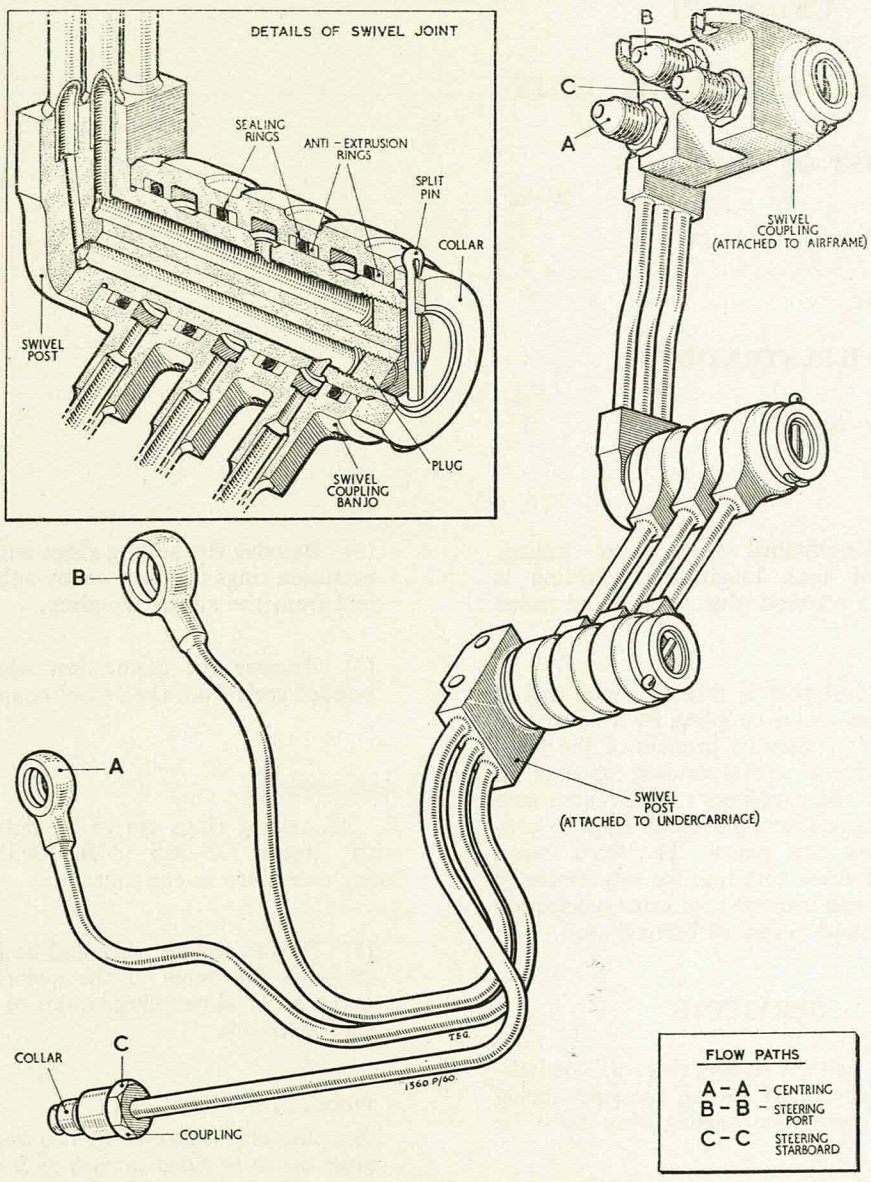


**Fig. 1 Swivel coupling unit**

(2) Insert the posts of the upper pipe assembly in the bores of the fixed swivel coupling and the swivel banjos of the centre pipe assembly and secure them with the collars and split pins.

(3) Insert the post of the lower pipe assembly in the bore of the swivel banjos of the centre pipe assembly and secure it with the collar and a split pin.

(4) Fit a bonded seal to each of the three connection adapters and screw them tightly into the tappings of the swivel coupling. Apply a torque load between 100 and 110 lb. in. to each adapter in turn.

(5) After final assembly and test, re-check the torque loading of the adapters and wire-lock the adapters together.

**Testing**

**8.** A static hydraulic test rig is required.

(1) Connect the test rig supply line to connection A (*fig.* 1) and operate the rig. Fluid should flow freely from the banjo A.

(2) Blank off the banjo A and gradually apply pressure up to 5000 lb/in² with the unit remaining static. Leakage is not permissible. Release the pressure.

(3) Repeat the tests (1) and (2) for the pipe lines B—B and C—C.

(4) Carry out the following test for each pipe line separately.

(5) Blank off one end of the pipe line and gradually apply pressure at the opposite end up to 3,300 lb/in². Rotate each swivel joint through 360 deg. (or as far as possible) in a clockwise direction and then in an anti-clockwise direction. Repeat this operation several times. Check that the torque required to rotate each swivel joint at 3,300 lb/in² does not exceed 55 lb. in. Leakage is not permissible.

(6) Release the pressure, disconnect the supply line and remove the blank.

## Appendix 1

## SWIVEL COUPLING UNIT

**TYPE No. 1.00516.001**

**1.** This unit is identical to the type described and illustrated in the chapter.

## Appendix 2

## SWIVEL COUPLING UNIT

**TYPE No. 11877YA01**

**1.** This unit is identical to the type described and illustrated in the chapter except for the attachment slots of the fixed swivel coupling.



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