

**CF-105 SERVICE DATA**

**Utility Hydraulics System**

**Wheel Brakes Circuit**

**CONFIDENTIAL**

**UNCLASSIFIED**

CONFIDENTIAL

# CF-105 SERVICE DATA

UNLIMITED

section 7

## UTILITY HYDRAULICS SYSTEM

### WHEEL BRAKES CIRCUIT

#### TABLE OF CONTENTS

TITLE	PAGE
SYSTEM SERVICE DATA	
DESCRIPTION AND OPERATION	
General .....	3
Brake Control Valves .....	3
Shuttle Valves .....	4
Brake Units .....	4
FUNCTION TESTING (To be issued later)	
INSPECTION (To be issued later)	
COMPONENT SERVICE DATA	
Valve- Brake Control .....	5
Valve - Shuttle .....	7
Unit - Brake .....	9
Assembly - Swivel .....	11
Fitting - Trombone .....	13

#### LIST OF ILLUSTRATIONS

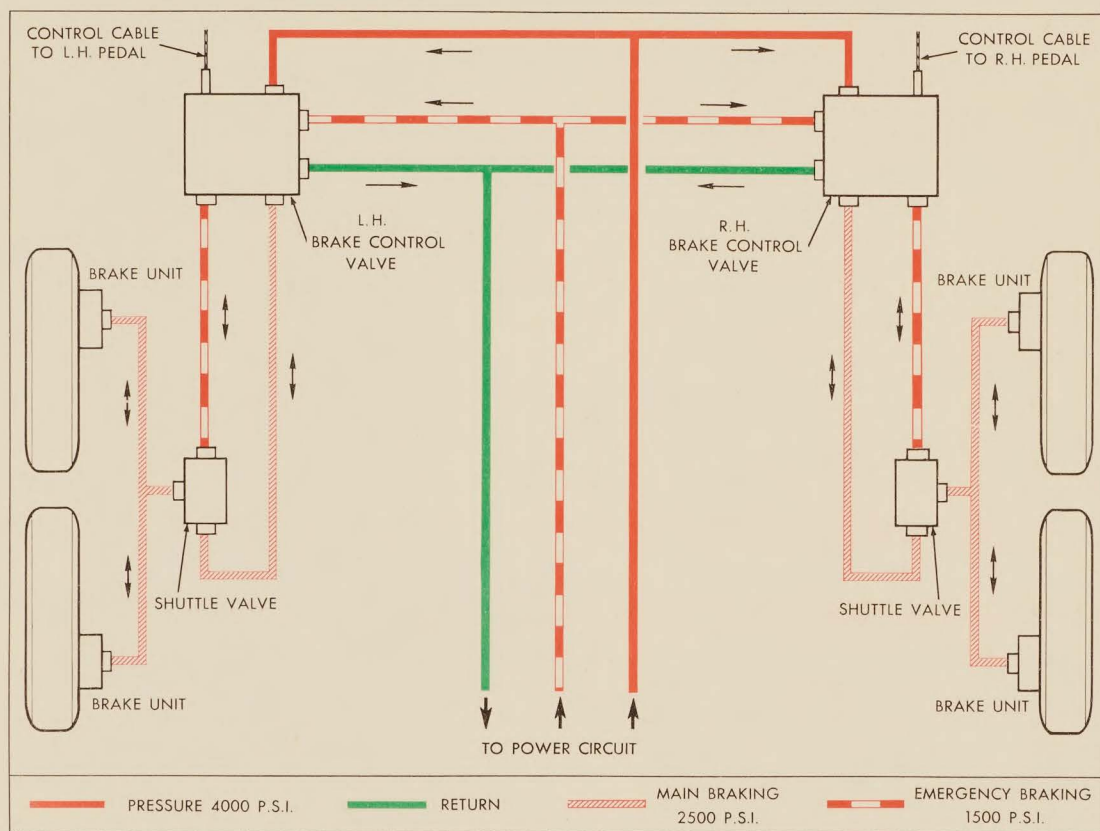
FIGURE	TITLE	PAGE
1	Wheel Brakes - Schematic .....	2

Classification cancelled/changed to \_\_\_\_\_  
by authority of \_\_\_\_\_ (date) \_\_\_\_\_  
Signature \_\_\_\_\_ Rank \_\_\_\_\_

UNCLASSIFIED

UNCLASSIFIED  
CONFIDENTIAL

# CF-105 SERVICE DATA



7M1-2201-1

FIG. 1 WHEEL BRAKES - SCHEMATIC

7M1-3613-2-2



UNCLASSIFIED  
CONFIDENTIAL

# CF-105 SERVICE DATA

## SYSTEM DATA SHEET

SYSTEM	SUB-SYSTEM	AIRCRAFT EFFTY	REF. NO.
UTILITY HYDRAULICS	WHEEL BRAKES	25201	19-3
<p>DESCRIPTION</p> <p>General</p> <p>1. The wheel brakes circuit consists of a normal braking system and an emergency braking system. The emergency system takes over automatically from the normal system whenever the pressure to the normal system drops below 1000 psi. The brakes are automatically applied during retraction of the landing gear.</p> <p>2. Each pair of brake units on the main landing gear is operated independently by control valves in the armament bay. Differential and proportional braking is obtained by foot pressure on a brake pedal on each of the pilot's rudder pedals. The brake pedals are mechanically connected to the control valves by cable runs. For parking, the brake pedals can be held in the on position by depressing the brake pedals, pulling a handle on the instrument panel marked PARKING, and releasing the brake pedals before releasing the parking brake handle.</p> <p>3. Two warning lights on the pilot's right hand console are operated by pressure switches in the power circuit. One, marked UTIL HYD, warns the pilot that the emergency braking system is coming into operation and the other, marked EMERG BRAKE HYD, warns the pilot that the emergency brake pressure has failed or has been exhausted. A limited number of brake applications can be obtained after the engines have been shut down, from the charge in the accumulators in the power circuit.</p> <p>4. Steel pipelines incorporating swivel and expanding joints are used to allow movement of the landing gear.</p> <p>Brake Control Valves</p> <p>5. Fluid from the power circuit main pressure line at pressures up to 4000 psi and from the power circuit reduced pressure line at pressures up to 1500 psi is delivered to each of the two brake control valves.</p> <p>6. Two spring operated spool valves, one for normal braking and one for emergency braking are contained in each control valve. A pressure operated spring-loaded spool valve is also installed in each control valve to automatically change over from normal to emergency, or from emergency to normal, according to the pressure of the fluid in the power circuit.</p> <p>7. When the pressure in the power circuit is above 1000 psi the change-over valve is held by fluid pressure in the normal braking position, allowing pressure fluid from the main pressure line in the power circuit to be delivered to the normal brake valve. From the normal brake valve pressure fluid at pressures up to 2500 psi is delivered into the main brake pipeline.</p> <p>8. If the pressure in the main pressure line of the power circuit falls below 1000 psi, the pressure operated change-over valve is moved by spring pressure to the emergency braking position, allowing pressure fluid from the reduced pressure line in</p>			
ISSUE	1		
DATE	8 Dec 56		

(U)-3413-7-3

UNCLASSIFIED  
CONFIDENTIAL

the power circuit to be delivered to the emergency brake valve. From the emergency brake valve, fluid at pressures up to 1500 psi is delivered into the emergency brake pipeline.

9. A solenoid valve, operated by a micro-switch on the main landing gear, is also installed in each control valve to operate the main braking system when the landing gear is being retracted. When the solenoid valve is energised, pressure fluid operates the main brake valve and applies the wheel brakes.

#### Shuttle Valves

10. From each control valve a main brake pipeline and an emergency brake pipeline is led to a shuttle valve on the rear brake torque rod of each main landing gear. The shuttle valve prevents fluid in the operative system from entering the non-operative system.

#### Brake Units

11. From the shuttle valves, brake pressure fluid is delivered to triple cylinder, multiple disc, brake units. Pressure is applied by pistons having a spring loaded return to overcome the pressure of the return fluid when braking pressure is released.

ISSUE	1							
DATE	8 Dec 56							

101-3013-2-0

# CF-105 SERVICE DATA

## COMPONENT DATA SHEET

SYSTEM UTILITY HYDRAULICS		SUB-SYSTEM WHEEL BRAKES		COMPONENT Valve - Brake Control	REF. NO. 19-3-1
AVRO PART NO. 7-1954-11		MANUFACTURER Hydra-Power	MAN'FR'S PART NO. HP 402100		AIRCRAFT EFFECTIVITY 25201
OVERHAUL LIFE:      KNOWN-                                  ESTIMATED-    500 hours					
FUNCTION  To apply hydraulic pressure to the wheel brakes.					
LOCATION  In the armament bay, station 469.					
ACCESS  Unobstructed when missile pack is removed.					MEN X MINUTES
REPLACEMENT PROCEDURE  Install with four attachment bolts. Connect the electrical cable. Connect the cable from the rudder pedal. Connect the six hydraulic pipelines. Prime the system.					MEN X MINUTES

**UNCLASSIFIED**  
CONFIDENTIAL

INSPECTION          Check for security, damage, cracks, corrosion and leaks.						MEN X MINUTES			
FUNCTIONAL CHECKS						MEN X MINUTES			
GROUND HANDLING AND GROUND TEST EQUIPMENT  Hydraulic ground test rig. Electrical ground power circuit.									
SPECIAL TOOLS TO REMOVE OR SERVICE									
REMARKS									
ISSUE	1								
DATE	8 Dec 56								

741-3913-2-6

CONFIDENTIAL

## CF-105 SERVICE DATA

### COMPONENT DATA SHEET

SYSTEM UTILITY HYDRAULICS		SUB-SYSTEM WHEEL BRAKES		COMPONENT Valve - Shuttle		REF. NO. 19-3-2	
AVRO PART NO. 7-1992-107		MANUFACTURER Hydra-Power		MAN'FR'S PART NO. HP 51800		AIRCRAFT EFFECTIVITY 25201	
OVERHAUL LIFE :      KNOWN-                                  ESTIMATED-      1500 hours							
FUNCTION  To supply emergency pressure to the brakes on failure of the normal system.							
LOCATION  Rear brake torque rod.							
ACCESS  Unobstructed.						MEN X MINUTES	
REPLACEMENT PROCEDURE  Install with two bolts. Connect three hydraulic lines.						MEN X MINUTES	



CONFIDENTIAL  
UNCLASSIFIED

INSPECTION  Check for security, damage, cracks, corrosion and leaks.								MEN X MINUTES	
FUNCTIONAL CHECKS								MEN X MINUTES	
GROUND HANDLING AND GROUND TEST EQUIPMENT  Hydraulic ground test rig.									
SPECIAL TOOLS TO REMOVE OR SERVICE									
REMARKS									
ISSUE	1								
DATE	8 Dec 56								

741-3413-2-4

UNCLASSIFIED  
CONFIDENTIALCF-105 SERVICE DATA  
COMPONENT DATA SHEET

SYSTEM UTILITY HYDRAULICS		SUB-SYSTEM WHEEL BRAKES		COMPONENT Unit - Brake		REF. NO. 19-3-3	
AVRO PART NO. 7-1092-15		MANUFACTURER Goodyear		MAN'FR'S PART NO. PD 732		AIRCRAFT EFFECTIVITY 25201	
OVERHAUL LIFE:      KNOWN-      ESTIMATED-							
FUNCTION  To reduce aircraft speed on the ground.							
LOCATION  On main undercarriage leg.							
ACCESS  Unobstructed when wheels are removed.						MEN X MINUTES	
REPLACEMENT PROCEDURE  Install brake unit on the axle. Connect brake link to the back plate. Replace wheel.						MEN X MINUTES	

TWI-5413-2-1

CONFIDENTIAL

UNCLASSIFIED

INSPECTION		MEN X MINUTES	
<p>Check brakes for leaks, overheating and wear. Check brake clearances.</p>			
FUNCTIONAL CHECKS		MEN X MINUTES	
GROUND HANDLING AND GROUND TEST EQUIPMENT			
<p>Hydraulic ground test rig.</p>			
SPECIAL TOOLS TO REMOVE OR SERVICE			
REMARKS			
ISSUE	1		
DATE	8 Dec 56		

TKI-3513-2-6

CONFIDENTIAL

# CF-105 SERVICE DATA

## COMPONENT DATA SHEET

SYSTEM UTILITY HYDRAULICS		SUB-SYSTEM WHEEL BRAKES		COMPONENT Assembly - Swivel		REF. NO. 19-3-4	
AVRO PART NO. 7-1992-25		MANUFACTURER		MAN'FR'S PART NO.		AIRCRAFT EFFECTIVITY 25201	
OVERHAUL LIFE:      KNOWN-                                  ESTIMATED-    1500 hours							
FUNCTION  To connect hydraulic supply lines on aircraft structure to line on main landing gear leg.							
LOCATION  Upper end main landing gear leg.							
ACCESS  Unobstructed.						MEN X MINUTES	
REPLACEMENT PROCEDURE  Install four bolts securing assembly to brackets on airframe structure and leg. Connect hydraulic pipelines. Prime the system.						MEN X MINUTES	



CONFIDENTIAL

INSPECTION							MEN X MINUTES	
Check for leakage and security.								
FUNCTIONAL CHECKS							MEN X MINUTES	
GROUND HANDLING AND GROUND TEST EQUIPMENT								
Hydraulic ground test rig.								
SPECIAL TOOLS TO REMOVE OR SERVICE								
REMARKS								
ISSUE	1							
DATE	8 Dec 56							

TM-1-241-2-6


# CF-105 SERVICE DATA

## COMPONENT DATA SHEET

SYSTEM UTILITY HYDRAULICS		SUB-SYSTEM WHEEL BRAKES		COMPONENT Fitting - Trombone		REF. NO. 19-3-5	
AVRO PART NO. 7-1992-21		MANUFACTURER Dowty		MAN'FR'S PART NO.		AIRCRAFT EFFECTIVITY 25201	
OVERHAUL LIFE:      KNOWN-      ESTIMATED-      1500 hours							
FUNCTION  Sliding joint in brake hydraulic lines.							
LOCATION  On main landing gear leg.							
ACCESS  Unobstructed.						MEN X MINUTES	
REPLACEMENT PROCEDURE  Connect the fitting to the landing gear leg. Connect four hydraulic lines. Prime the system.						MEN X MINUTES	

TM-3413-2-5

CONFIDENTIAL  
UNCLASSIFIED

INSPECTION		MEN X MINUTES	
Check for damage, wear, security and leakage.			
FUNCTIONAL CHECKS		MEN X MINUTES	
GROUND HANDLING AND GROUND TEST EQUIPMENT			
 <p>National Research Council Canada Canada Institute for Scientific and Technical Information J.H. Parkin Branch</p>		<p>Conseil national de recherches Canada Institut canadien de l'information scientifique et technique Annexe J.H.Parkin</p>	
SPECIAL	Report No.: QEX Avro CF105 S.D. 5-54		
REMARK	<p>Has been: <input type="checkbox"/> Downgraded to: .....</p> <p><input checked="" type="checkbox"/> De-Classified</p> <p>By: (Name) .....          (Dept) .....          Date: JAN 6 96 B.J. Petzinger          Deputy Coordinator          Access to Information and Privacy</p> <p style="text-align: right;">Signature</p>		
ISSUE			
DATE	8 Dec 56		

161-3913-2-4

