GROUND TEST INSTRUCTIONS

SECTION 17

PRESSURE CABIN AND AIR CONDITIONING SYSTEM

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SECTION 17

PRESSURE CABIN AND AIR CONDITIONING SYSTEM

PART 1

PRESSURE CABIN AND AIR CONDITIONING SYSTEM TESTS SINGLE SEAT AIRCRAFT

I.D. INSTRUCTION H.105/2 (Issue 11)

1. PRELIMINARY PRESSURE TESTS OF BASIC CABIN STRUCTURE

The following special equipment is required:—

(a)	Cabin pressure test control panel	SK.19237
(b)	Blanking plates	
(c)	Slave hood	St.1261
(d)	Slave hood rail assembly	
(e)	Hood locking gear	
(f)	Test trolley	4F/1714
(g)	Pressure gauge	524/P.G.

This test on the bare front fuselage structure is required primarily for leak isolation and re-sealing of unsatisfactory joints before any equipment is installed in the cockpit.

From safety considerations, it is recommended that all pressure tests be carried out in a part of the factory clear from the main assembly floor and that all personnel should be in safe positions in case of hood failure.

Test procedure as follows:—

(i) Blank off all structure access holes by means of rubber seal washers with backing plates.

(ii) Using ground equipment to SK.19237, connect up seal inflation line to hood seal, and the pressurising connection ID.228 to the cabin supply pipe on Frame 6.

(iii) Fit slave hood and securely lock it in position.

(iv) Fit external pressure gauge to cabin at connection provided on Frame 6. (Smith's type 524/P.G.).

(v) Connect factory air supply to reducing valve inlet on test panel (SK.19237) and check that hood seal is pressurised to 7½—8½ p.s.i. without leakage.

1. PRELIMINARY PRESSURE TESTS OF BASIC CABIN STRUCTURE (Contd).

(vi) Couple up test trolley 4F/1714 to cabin pressurising connection and set blow off valve in order to obtain a pressure of 2 p.s.i. in the cockpit. This setting should be not more than about 2 p.s.i. above the required cabin pressure of 2 p.s.i. which must not be exceeded. Carry out leak isolation checks and apply sealing compound as required. If in any circumstances, the test pressure exceeds 2 p.s.i. the hood seal must be immediately deflated by operating the emergency lever on the solenoid valve and test trolley shut down.

Note . . .

In the preliminary stages, it may prove possible to eliminate leakages with the cabin empty. However, for detail leak isolation, someone will have to be in the cabin to apply the necessary sealant at structure joints whilst the cabin is pressurised. Such an operator, will have to be of the required medical category and free from a cold.

(vii) Set relief valve on trolley 4F/1714 to 5 p.s.i. start trolley and apply pressure gradually to cabin, until pressure of 4¾—5 p.s.i. is reached. Hold this pressure for 1 minute with compressor running. If pressure in cabin exceeds 5 p.s.i. deflate hood seal and stop trolley.

(viii) When the preparatory work on leak isolation by intermittent pressurising is completed, carry out a final check on the rate of cabin pressure drop. The required rate is for the pressure to drop from 3½ p.s.i. to 1¾ p.s.i. in not less than 65 secs after disconnecting the supply.

Note . . .

Always work to the lowest blower r.p.m. which will give the required cabin differential.

2. FINAL CABIN PRESSURE TESTS ON THE COMPLETED AIRCRAFT.

For this test, electrical feeds are required to the hood motor, extractor valve solenoid and seal solenoid. Also the cable for operating the hood externally should be plugged in. Other equipment needed is:—

(a)	Test trolley	4F/1714
(b)	Canopy seal inflator (incorporating Schrader Valve)	4F/1812
(c)	Connection adaptor for cabin pressure gauge	2 off 4F/1810
(d)	Canopy seal pressure gauge	6A/1582
(e)	Cabin pressure gauge	6A/1582
(f)	Length of rubber hose to suit adaptor ref.4F/1810	—
(g)	Foot pump for seal inflation (car type)	—
(h)	Blank for cabin pressure control valve.	

2. FINAL CABIN PRESSURE TESTS ON THE COMPLETED AIRCRAFT (Contd).

(i) After preliminary adjustments of the canopy seal micro-switch to cut in within the limits laid down, and with the equipment listed above coupled to the aircraft, close the hood by means of the external switch, and gradually apply pressure with the foot pump to the hood seal and extractor valve. Note pressure at which extractor valve closes and continue pumping until seal pressure builds up to 8 p.s.i. Check for leaks in the seal and extractor valve system.

(The cabin pressure switch must be in the 'ON' position).

(ii) Set relief valve on trolley 4F/1714 to 5 p.s.i. start trolley and apply pressure gradually to cabin until pressure of 4¾ – 5 p.s.i. is reached. Hold this pressure for 1 minute with compressor running. If pressure in cabin exceeds 5 p.s.i. deflate hood seal by removing seal pressure gauge and stop trolley.

(iii) Deflate hood seal by removing pressure gauge, re-open cockpit and remove blank from pressure control valve.

(iv) Blank static vent to type 'A' controller and run test trolley with blow off set to produce a pressure of 3½ p.s.i. in cabin. Trolley blow off setting should not be more than about 5 p.s.i. Carry out checks for leakages from various points, particularly the following:–

(a) Cabin and ram non-return valves.

(b) Extractor valve.

(c) Cabin discharge valve.

(d) Access holes for flying controls, Teleflex controls etc.

(v) Operate the various flying controls to make sure that their movement does not increase leakage.

On conclusion of leak isolation, check rate of cabin pressure fall. The required rate is for the pressure to drop from 3½ – 1¾ p.s.i. in not less than 30 secs. after disconnecting the supply, with the seal pressure maintained at 8 p.s.i.

At the end of these tests, disconnect the ground equipment. Unblank type 'A' controller static vent.

3. PRESSURE TESTS AND FUNCTIONAL CHECKS ON SYSTEM

(a) Connect a high pressure air supply, control valve and pressure gauge at the main engine air supply connection.

(b) Disconnect four-way air supply pipe at rear of cockpit, blank outlet of non-return valve and fit 0 – 50 p.s.i. gauge at this point.

(c) Disconnect ¼" dia. control lines on pre-cooler by-pass valve and blank connections on valve.

(d) Blank drain connection on water extractor.

3. PRESSURE TESTS AND FUNCTIONAL CHECKS ON SYSTEM (Contd).

Proceed as follows:—

(i) With air supply valve shut, i.e. cabin pressure switch at 'OFF' and hood open, increase the pressure gradually at the main air supply connection up to the maximum obtainable (120 lb/in^2 if possible).

Check that no leakage occurs from ducts, joints and all components up to the air supply valve. Also note that there is no flow through air supply valve by disconnecting main air outlet and flood outlet. (Small leakage from air supply valve permitted in accordance with Installation Department Instruction H.105/4).

(ii) Shut off supply, unblank control line connections on by-pass valve and reconnect all pipes.

Close the hood and open the air supply valve by selecting cabin pressure 'ON'. Increase the air pressure gradually to 20 lb/in^2 and check that the remainder of the system is free from leakage. (A certain amount of flow from the vents on the cold air unit cannot be avoided).

(iii) With cabin pressure 'OFF' apply pressure in the hood seal line and note that seal inflates to a pressure of 7½—8½ lb/in^2 when line pressure is varied between 15 and 80 lb/in^2.

Quickly reduce the supply pressure to zero and note that pressure in the seal does not fall below 6½ lb/in^2 over a period of 5 minutes.

(iv) With air supply 'OFF' and cabin pressure 'ON', push flood control test switch and notice that pressure warning light comes on, and listen for air supply valve actuator to move to the flood position. Allow flood test switch to return to normal and listen for air supply valve to take up normal open position.

(v) With air supply at 10 p.s.i. and cabin pressure 'ON' select hood open, note that hood seal rapidly deflates, and time the delay before hood begins to open. Also check that air supply valve closes.

(vi) Close hood again in order to check hood jettison gear. Pull hood jettison control and check that hood seal immediately deflates and hood rails become unlocked.

(vii) Blank off the cabin pressure connection on the type 'A' pressure controller by removing the filter nut and fitting an AGS.904/A Union Nut and AGS.1159/A Cone Cap.

(viii) Close hood forward micro-switch and select cabin pressure 'ON' Move flood air switch to 'MANUAL' and check that (a) supply valve and (b) auxiliary discharge valve solenoid, operate.

(ix) Keeping auxiliary discharge valve solenoid energised, apply 2 p.s.i. air pressure through a shut-off cock to the pressure controller static vent in the nosewheel bay. (The shut off cock must be less than one foot away from the static connection). Close cock and check that the pressure does not fall below 1.5 p.s.i. in 10 mins.

3. PRESSURE TESTS AND FUNCTIONAL CHECKS ON SYSTEM (Contd).

(x) Revert flood air switch to 'AUTO' and check that:—

(a) Supply valve operates

(b) Solenoid operates

(c) A small amount of air leaves the solenoid valve cabin pressure tapping on the front face of Frame 14.

(xi) Disconnect pressure supply and attach to cabin pressure tapping on Frame 14. With solenoid de-energised, apply 2 p.s.i. air pressure, close cock and check that no pressure drop has occurred in ten minutes.

(xii) Disconnect air supply, refit pressure control filter nut and free hood forward micro-switch.

Note . . .

Operations (vii) to (xii) only apply to aircraft with Mod.321 embodied.

* For Hunter Mk.10 with radio bay cooling installation embodied (Mod.959). See Appendix 1.

4. CHECK OF TEMPERATURE CONTROLLER

(i) Function temperature controller on the hotter-colder switch, check time for complete actuator travel in both directions, also check that hotter-colder positions of the switch correspond respectively to open and shut positions on temperature control valve.

(ii) With the temperature control switch in auto (hood closed) move the temperature selector slowly from lowest setting until actuator commences movement. Hold the temperature selector at this sensitive position and check the total travel of the actuator to its final rest position. Reverse the movement of the temperature selector slowly, and note that the actuator follows suit. Note the total movement of the temperature selector for the actuator to reverse.

Following completion of these tests the system may be restored to normal by removing blanks and re-making connections.

5. CHECKS TO BE CARRIED OUT ON SYSTEM DURING GROUND RUNNING

These tests are to be carried out with the cockpit unpressurised, care being taken to check that the static vent on the cabin pressure controller is unblanked. A pressure gauge may be fitted to the connection in the nose wheel bay to check cabin pressure.

(i) Run engine at idling r.p.m. close hood and select cabin pressure 'ON'. Note hood seal has inflated correctly and cabin air extraction valve closed.

5. CHECKS TO BE CARRIED OUT ON SYSTEM DURING GROUND RUNNING (Contd).

(ii) Increase r.p.m. from idling to maximum and at several points in the range, select temperature control switch:—
(a) Colder, (b) Hotter, (c) Auto with a mid range setting of the temperature selector. Note that corresponding charges are obtained in the air supply from the cabin sprays. Cabin pressure should not fluctuate or rise above 1.6 p.s.i.

(iii) With engine at 5,000 r.p.m. and cabin temperature control in 'Hotter' select 'Manual' on flood switch, note cabin pressure and then revert to 'Auto'. Observe that cabin pressure changes, if any, occur smoothly and that pressure reverts to previous value.

(iv) Re-select 'Manual' on flood switch and gradually increase engine r.p.m. to maximum checking cabin pressure continuously. This should not exceed 1.2 p.s.i.g. and the change-over from 'Auto' to 'Manual' should be smooth at all engine speeds.

(v) With engine at 5,000 r.p.m. operate flood test switch and note that cabin pressure warning light and audio warning function (unless Mod.327 is fitted). Also note that airflow to the cockpit increases.

(vi) Switch cabin pressure 'OFF', note that air supply ceases and air extraction valve opens. Hood seal should remain inflated until hood open is selected.

SECTION 17

PRESSURE CABIN AND AIR CONDITIONING SYSTEM

PART 2

AIR SUPPLY VALVE TESTS (VALVE PART NOS. B.184642, B.202060, B.220926, B.189398 and B.216337).

I.D. INSTRUCTION H105/4 (Issue 5)

1, APPLICABILITY

All marks of Hunter and Two Seater.

2. TYPE TESTS

AIR SUPPLY VALVE

(i) Pressure Test to 135 p.s.i.

(ii) Mount in a cold chamber at -30^{o}C., allow time to attain this temperature and supply air to inlet connection at 110 p.s.i. Torque to open and close the valve in this condition should not exceed 50 lb.ins.

AIR SUPPLY VALVE AND ACTUATOR

(iii) Connect the valve to the air supply through a reservoir of 0.25 cu.ft. capacity. With the valve closed apply an air pressure of 90 p.s.i., shut off the supply and time the interval to drop to 70 p.s.i. This should not be less than 20 secs.

(iv) Adjust the air inlet pressure to 110 p.s.i. and temperature 200^{o}C. Open and close the valve over its first 70^{o} range by means of the actuator on a 28 volt supply, and repeat this operation 100 times. The period of operation should be about 1 second, and the braking of the actuator quite positive.

Current consumption should be 1.5 to 1.75 amps.

(v) Repeat test (iv) for 10 operations with the voltage at 22, Current consumption should now be 1.4 to 1.6 amps.

(vi) Set the valve in the normal open position, pressurise to 80 p.s.i. by blanking outlet connection and apply 28 volts to actuator. Switch to 'flood' return to normal 'Open' and repeat this operation 50 times.

(vii) Repeat test (vi) for 10 operations with 22 volt supply.

2. TYPE TESTS (Contd).

AIR SUPPLY VALVE AND ACTUATOR

(viii) Open and close the valve with a pressure of 110 p.s.i. applied. Check the leakage after closing and note that this does not exceed 3 cu.ft. of free air per minute.

(ix) Mount in a cold chamber at $-30^{o}C$ and allow time to attain this temperature. Operate from 'shut' to 'open' to 'shut', on 28 volts with no internal pressure. Note time of operation is about 1 second.

3. PRODUCTION TESTS

AIR SUPPLY VALVE

(i) Pressure test to 135 p.s.i.

(ii) With the supply pressure at 110 p.s.i. measure the torque required to open or close the valve. This should not exceed 45 lbs.ins. Repeat with no supply air pressure. The torque should not exceed 5 lbs.ins.

AIR SUPPLY VALVE AND ACTUATOR

(iii) Connect the valve to air supply through a reservoir of 0.25 cu.ft. capacity. With the valve closed apply an air pressure of 90 p.s.i., shut off the supply and time the interval to drop to 70 p.s.i. This should not be less than 20 seconds.

(iv) With the air supply pressure at 110 p.s.i., 'open' and 'close' the valve over its first 70^{o} range by means of the actuator. Carry this out 5 times on 28 volts for which current consumption should be 1.5 to 1.75 amps and 5 times on 22 volts for which current should be 1.4 to 1.6 amps.

The period of operations should be about 1 second and the braking of the actuator quite positive.

(v) Operate the valve by means of the actuator on 28 and 22 volts from the 'open' to 'flood' position and return to 'open'.

(vi) Open and close the valve with a pressure of 110 p.s.i. applied. Check the leakage after closing and note that this does not exceed 3 cu.ft. free air per minute.

SECTION 17

PRESSURE CABIN AND AIR CONDITIONING SYSTEM

PART 3

TEMPERATURE CONTROL VALVE TESTS
(VALVE PART NOS. B.184967 and B.211493).

I.D. INSTRUCTION H.106/5 (Issue 6)

1. APPLICABILITY

All marks of Hunter and Two Seater.

2. TYPE TESTS'

TEMPERATURE CONTROL VALVE

(i) Pressure test to 75 p.s.i.

(ii) Mount in a cold chamber at $-30^{o}C$ and supply air to inlet connection at 60 p.s.i. and $100^{o}C$. Torque to open and close valve should not exceed 35 lb.in.

TEMPERATURE CONTROL VALVE AND ACTUATOR

(iii) Connect the valve to the air supply through a reservoir of 0.25 cu.ft. capacity. With the valve closed apply an air pressure of 75 p.s.i., shut off the supply and time the interval to drop to 55 p.s.i. This should not be less than 20 seconds.

(iv) Mount in a cold chamber at $-30^{o}C$ and supply air to inlet connection at 60 p.s.i. and $100^{o}C$. Open and close the valve by means of the actuator on a 28 volt supply and repeat this operation 50 times.

(v) Repeat test (iv) for 10 operations on 22 volt supply. Period of operation should not exceed 60 seconds, and current consumption not exceed 1.7 amps.

(vi) Open and close the valve with a pressure of 60 p.s.i., applied. Check the leakage after closing and note that this does not exceed 3 cu.ft. free air per minute.

3. PRODUCTION TESTS

TEMPERATURE CONTROL VALVE

(i) Pressure test to 75 p.s.i.

(ii) With the supply pressure at 60 p.s.i. measure the torque required to open and close the valve. This should not exceed 30 lb.in.

3. PRODUCTION TESTS (Contd).

TEMPERATURE CONTROL VALVE

(iii) Assemble the Quadrant Lever Assembly, Quadrant Lever and Spacer Block to the Temperature Control Valve using 'Slave' bolts. With no air pressure, measure the torque required to open or close the valve. This should not exceed 5 lbs.ins.

TEMPERATURE CONTROL VALVE AND ACTUATOR

(iv) Connect the valve to air supply through a reservoir of 0.25 cu.ft., capacity. With the valve closed, apply an air pressure of 75 p.s.i., shut off the supply and time the interval to drop to 55 p.s.i. This should not be less than 20 seconds.

(v) With the air supply pressure at 60 p.s.i., operate the valve from 'shut' to 'open' and return to 'shut'. This to be carried out on 28 volts., for which operating time in one direction should be 23 to 30 seconds and current consumption 1.4 to 1.7 amps., also on 22 volts., for which time should be 30 to 40 seconds and current 1.2 to 1.5 amps.

(vi) Open and close the valve with a pressure of 60 p.s.i. applied. Check the leakage after closing and note that this does not exceed 3 cu.ft., free air per minute.

Note . . .

The actuator should be allowed to rest between operations to avoid overheating.

SECTION 17

PRESSURE CABIN AND AIR CONDITIONING SYSTEM

PART 4

NON–RETURN VALVE (PART NO. B.185327) TESTS

I.D. INSTRUCTION H.105/6 (Issue 3)

(i) Connect the inlet of the valve to the high pressure tank of test rig ST.1103, using the adaptor T.316731 J.D.

(ii) Blank off the outlet of the valve.

(iii) Apply a pressure of 7 p.s.i. to the inlet and note that no leakage occurs at the ring of bolts.

Pressure test by increasing the pressure to 20 p.s.i. and note that leakage is only slight, by checking with soap and water solution.

(iv) Reconnect the valve with the outlet to the high pressure tank and the inlet to the low pressure tank.

(v) Apply a pressure of 7 p.s.i. to the outlet side.

(vi) Starting with the low pressure tank at atmosphere pressure, (i.e. supply valve closed and bleed valve open) close the bleed valve.

(vii) Leakage across the valve seat should now be checked by observing the rise of pressure on the inlet side. This should not be more than 2 p.s.i. in one minute after closing the bleed.

(viii) Remove the adaptor from the outlet of the N.R.V.

(ix) Build up the pressure in the L.P. tank with the cock to the valve closed and adjusting the bleed to atmosphere to maintain 1 p.s.i. in the tank.

(x) The outlet valve on the tank should now be slightly opened to permit flow into the N.R.V. The gauge on the supply line should indicate an opening pressure of $^{1}/_{8}$ p.s.i.

SECTION 17

PRESSURE CABIN AND AIR CONDITIONING SYSTEM

PART 5

PRESSURE LOSS WARNING LIGHT TEST (NORMALAIR TYPE A CONTROLLER 509930)

I.D. INSTRUCTION H.105/7 (Issue 4)

1. APPLICABILITY

All Marks of Hunter and Two Seater.

2. TEST PROCEDURE

(i) Disconnect pipe C.185829/16 (Single Seater A/C) or B.213254/26 (Two Seater A/C) at bulkhead connection on forward face of frame 6. (This pipe leads to the cabin air discharge valve).

(ii) Connect rig SK.20703 to bulkhead connection.

(iii) Connect ground electric supply.

(iv) Set pressure and flood control test switch on port cockpit shelf to 'Test' and check that cabin pressure warning light on starboard instrument panel comes on. If light does not come on check electrics. Return switch to normal position.

(v) Slowly open stop cock on test rig until warning light comes on. The suction should not exceed 4½ p.s.i., and the light should operate below this pressure.

(vi) If light does not come on, type A controller switch is u/s and the controller must be replaced.

(vii) Remove test rig, re-assemble pipe and restore wire locking.

SECTION 17

PRESSURE CABIN AND AIR CONDITIONING SYSTEM

PART 6

FLOW TESTING AND ADJUSTMENT OF VARIABLE ORIFICE VALVE (PART NO. B.209845)

I.D. INSTRUCTION H.105/11 (Issue 1)

(i) Valve is to be initially assembled in accordance with G.A. drawing without wire locking. Adjusting shims to be as called for on the drawing.

(ii) Connect valve up to test rig drawing No.SE.526.

(iii) Carry out preliminary check as follows:— Adjust inlet pressure to about 8, 20 and 50 lb/sq.in. and note corresponding air flow from direct calibration on manometer. Mark on the attached chart (ID.GR.126) the flow corresponding to the above pressures.

(iv) These results should fall within the boundary lines marked on the chart. If above the upper limit adjustment must be made by reducing the adjusting shims. If below the limit increase must be made in the shims.

(v) Having satisfied the above then a full check over the operating range of the valve should be made as follows:—

(vi) Note the air flow corresponding to inlet pressures up to 65 lb/sq.in. in steps of approximately 5 lb/sq.in., making sure that maximum and minimum flows are noted.

(vii) Mark these results on the chart and draw in a curve. This should fall within the limits given, for acceptance of the valve.

Notes . . .

(i) During the above tests gate valve in outlet branch from valve is to be fully open.

(ii) Valves which fail to meet the above requirements should have the valve profile checked by means of the shadowgraph and the spring strength checked.

SECTION 17

PRESSURE CABIN AND AIR CONDITIONING SYSTEM

PART 7

NON–RETURN VALVES (PART NOS. B.211598 and B.213176) TEST

I.D. INSTRUCTION H.105/13 (Issue 2)

1. APPLICABILITY

This instruction is applicable to Hunter Two Seater Mk.T.7 Aircraft.

2. TESTS

(i) Connect the inlet of the valve to the high pressure tank of test rig ST.1103, using a suitable adaptor.

(ii) Blank off the outlet of the valve.

(iii) Apply a pressure of 7 p.s.i. to the inlet and note that no leakage occurs at the ring of bolts.

Pressure test by increasing pressure to 20 p.s.i. and note that leakage is only slight, by checking with soap and water solution.

(iv) Reconnect the valve with the outlet to the high pressure tank and the inlet to the low pressure tank.

(v) Apply a pressure of 7 p.s.i. to the outlet side.

(vi) Starting with the low pressure tank at atmospheric pressure, (i.e. supply valve closed and bleed valve open), close the bleed valve.

(vii) Leakage across the valve seat should now be checked by observing the rise of pressure on the inlet side. This should not be more than 2 p.s.i. in one minute after closing the bleed.

(viii) Remove the adaptor from the outlet of the N.R.V.

(ix) Build up the pressure in the L.P. tank with the cock to the valve closed and adjusting the bleed to atmosphere to maintain 1 p.s.i. in the tank.

(x) The outlet valve on the tank should now be slightly opened to permit flow into the N.R.V. The gauge on the supply line should indicate an opening pressure of less than $^{1}/_{8}$ p.s.i.

SECTION 17

PRESSURE CABIN AND AIR CONDITIONING SYSTEM

PART 8

PRESSURE CABIN AND AIR CONDITIONING SYSTEM TESTS – TWO SEAT AIRCRAFT

I.D. INSTRUCTION H.105/15 (Issue 3)

1. APPLICABILITY

This instruction covers aircraft incorporating modifications H.507 (or 718 or 2373 or 2383 or 2415) and 780.

Note . . .

Always check that cabin pressure is zero before selecting hood open.

2. PRELIMINARY PRESSURE TESTS OF BASIC CABIN STRUCTURE

The following special equipment is required:–

(a)	Cabin pressure test control panel	SK.19237
(b)	Blanking plates	
(c)	Slave hood	St.1261
(d)	Slave hood rail assembly	
(e)	Hood locking gear	
(f)	Test trolley	4F/1714
(g)	Pressure gauge	524/P.G.

This test on the bare front fuselage structure is required primarily for leak isolation and re-sealing of unsatisfactory joints before any equipment is installed in the cockpit.

From safety considerations, it is recommended that all pressure tests be carried out in a part of the factory clear from the main assembly floor and that all personnel should be in safe positions in case of hood failure.

Test procedure as follows:–

(i) Blank off all structure access holes by means of rubber seal washers with backing plates.

(ii) Using ground equipment to SK.19237, connect up seal inflation line to hood seal, and the pressurising connection ID.228 to the cabin supply pipe on Frame 6.

(iii) Fit slave hood and securely lock it in position.

2. PRELIMINARY PRESSURE TESTS OF BASIC CABIN STRUCTURE (Contd).

(iv) Fit external pressure gauge to cabin at connection provided on Frame 6. (Smith's type 524/P.G.).

(v) Connect factory air supply to reducing valve inlet on test panel (SK.19237) and check that hood seal is pressurised to 7½ – 8½ p.s.i. without leakage.

(vi) Couple up test trolley 4F/1714 to cabin pressurising connection and set blow off valve in order to obtain a pressure of 2 p.s.i. in the cockpit. This setting should be not more than about 2 p.s.i. above the required cabin pressure of 2 p.s.i. which must not be exceeded. Carry out leak isolation checks and apply sealing compound as required.

If, in any circumstances, the test pressure exceeds 2 p.s.i. the hood seal must be immediately deflated by operating the emergency lever on the solenoid valve, test trolley shut down and safety valve lifted.

Note . . .

In the preliminary stages, it may prove possible to eliminate leakages with the cabin empty. However, for detail leak isolation, someone will have to be in the cabin to apply the necessary sealant at structure joints whilst the cabin is pressurised. Such an operator will have to be of the required medical category and free from a cold.

(vii) Set relief valve on trolley 4F/1714 to 5 p.s.i., start trolley and apply pressure gradually to cabin, until pressure of 4¾ – 5 p.s.i. is reached. Hold this pressure for 1 min. with compressor running. If pressure in cabin exceeds 5 p.s.i. deflate hood seal, stop trolley and lift safety valve.

(viii) When the preparatory work on leak isolation by intermittent pressurising is completed, carry out a final check on the rate of cabin pressure drop. The required rate is for the pressure to drop from 3½ p.s.i. to 1¾ p.s.i. in not less than 65 secs. after disconnecting the supply. Ensure pressure has dissipated before opening hood.

Note . . .

Always work to the lowest blower r.p.m. which will give the required cabin differential.

3. FINAL CABIN PRESSURE TESTS ON THE COMPLETED AIRCRAFT OR FRONT FUSELAGE.

For these tests the hood hydraulic and electrical circuits should be serviceable with the accumulator correctly charged. A 28 volt electrical supply should be connected to energise the d.c. busbar. A SE.1437 adaptor should be used to connect supply to the aircraft leads.

Other equipment needed is:–

(a) Test trolley 4F/1714

(b) Canopy seal inflator (incorporating Schrader Valve) 4F/1812.

3. FINAL CABIN PRESSURE TESTS ON THE COMPLETED AIRCRAFT OR FRONT FUSELAGE. (Contd).

(c) (c) Connection adaptor for cabin pressure gauge. 2 off — 4F/1810

(d) Canopy seal pressure gauge — 6A/1582

(e) Cabin pressure gauge — 6A/1582

(f) Length of rubber hose to suit adaptor, Ref.4F/1810 — ——

(g) Foot pump for seal inflation (car type) — ——

(h) Blank for cabin air discharge valve.

(i) Connect the above equipment to the aircraft. Check that the hood-operating and locking mechnaisms have been correctly adjusted. With battery and engine master switches OFF and cabin pressure switch ON, close and lock the hood by means of the external switch, and gradually apply pressure with the foot pump to the hood seal, ram air and extractor valve. Note pressure at which valves close and continue pumping until seal pressure builds up to 8 p.s.i. Check for leaks in the seal and valve system.

(ii) Set relief valve on trolley 4F/1714 to 5 p.s.i., start trolley and apply pressure gradually to cabin until pressure of 4¾ – 5 p.s.i. is reached. Hold this pressure for 1 minute with compressor running. If pressure in cabin exceeds 5 p.s.i. deflate hood seal by removing seal pressure gauge, stop trolley and lift safety valve.

(iii) Deflate hood seal by removing pressure gauge; ensure cabin pressure is zero, re-open cockpit and remove blank from discharge valve.

(iv) Blank static vent of type 'A' controller, close and lock hood and run test trolley with blow off set to produce a pressure of 3½ p.s.i. in cabin. Trolley blow off setting should not be more than about 5 p.s.i.

Carry out checks for leakages from various points, particularly the following:–

(a) Cabin non-return valve.

(b) Ram air and extractor valves.

(c) Cabin discharge valve.

(d) Access holes for flying controls, Teleflex controls etc.

(v) Operate the various flying controls to make sure that their movement does not increase leakage.

(vi) On conclusion of leak isolation, check rate of cabin pressure fall. The required rate is for the pressure to drop from 3½ – 1¾ p.s.i. in not less than 30 secs. after disconnecting the supply, with the seal pressure maintained at 8 p.s.i.

At the end of these tests, deflate hood seal and ensure cabin pressure dissipates fully; disconnect the ground equipment. Unblock type 'A' controller static vent.

4. PRESSURE TESTS AND FUNCTIONAL CHECKS ON SYSTEM

With ground supplies as at 2. above.

(a) Connect a high pressure air supply, control valve and pressure gauge at the main engine air supply connection.

(b) Disconnect four-way air supply pipe at rear of cockpit, blank outlet of non-return valve and fit 0 – 50 p.s.i. gauge at this point.

(c) Disconnect ¼" dia. control lines on pre-cooler by-pass valve and blank connections on valve.

(d) Blank drain connection on water extractor.

Proceed as follows:–

(i) With air supply valve shut, i.e. cabin pressure switch at 'OFF' and hood open, increase the pressure gradually at the main air supply connection up to the maximum obtainable (120 lb/in^2 if possible).

Check that no leakage occurs from ducts, joints and all components up to the air supply valve. Also note that there is no flow through air supply valve by disconnecting main air outlet and flood outlet. (Small leakage from air supply valve permitted in accordance with Installations Department Instruction H.105/4).

(ii) Shut off the air supply, unblank control line connections on bypass valve and reconnect all pipes.

Close the hood and open the air supply valve by selecting cabin pressure 'ON'. Increase the air supply gradually to 20 lb/in^2 and check that the remainder of the system is free from leakage. (A certain amount of flow from the vents on the cold air unit cannot be avoided).

(iii) With cabin pressure 'OFF' apply pressure in the hood seal line and note that seal inflates to a pressure of 7½ – 8½ lb/in^2 when line pressure is varied between 15 and 80 lb/in^2.

Quickly reduce the supply pressure to zero and note that pressure in the seal does not fall below 6½ lb/in^2 over a period of 5 mins.

(iv) With air supply off and cabin pressure 'ON', push flood control test switch and note that pressure warning light comes on, and listen for air supply valve actuator to move to the flood position. Allow flood test switch to return to normal and listen for air supply valve to take up normal open position.

(v) With air supply off and cabin pressure 'ON', select 'MANUAL' on flood airflow switch and listen for air supply valve to move to the flood position. Return flood airflow switch to 'AUTO' and listen for air supply valve to take up normal open position.

(vi) Inflate hood seal and extractor valve lines, with cabin pressure ON. With battery master switch OFF, open hood on external switch and check that hood seal deflates and ram air and extractor valves operate immediately switch is moved.

5. CHECK OF TEMPERATURE CONTROLLER

(i) With hood closed, cabin pressure and engine master switches ON, and No.1 inverter running, function temperature controller on the hotter-colder switch; check time for complete actuator travel in both directions, also that hotter-colder positions of the switch correspond respectively to open and shut positions on temperature control valve.

(ii) With the temperature control switch in auto, move the temperature selector slowly from lowest setting until actuator commences movement. Hold the temperature selector at this sensitive position and check the total travel of the actuator to its final rest position. Reverse the movement of the temperature selector slowly, and note that the actuator follows suit. Note the total movement of the temperature selector for the actuator to reverse.

Following completion of these tests the system may be restored to normal by removing blanks and re-making connections.

6. CHECKS TO BE CARRIED OUT ON SYSTEM DURING GROUND RUNNING.

These tests are to be carried out with the cockpit unpressurised, care being taken to check that the static vent on the cabin pressure controller is unblanked. A pressure gauge may be fitted to the connection in the nose wheel bay to check cabin pressure.

(i) Run engine at idling r.p.m., close hood and select cabin pressure 'ON'. Note hood seal has inflated correctly and cabin air extraction and ram air valves have closed.

(ii) Increase r.p.m. from idling to maximum and at several points in the range, select temperature control switch:—
(a) colder, (b) hotter, (c) Auto with a mid range setting of the temperature selector. Note that corresponding changes are obtained in the air supply from the cabin sprays. Cabin pressure should not fluctuate, or rise above 1.6 p.s.i.

(iii) With engine at 5,000 r.p.m. and cabin temperature control in 'Hotter' select 'Manual' on flood switch, note cabin pressure and then revert to 'Auto'. Observe that cabin pressure changes, if any, occur smoothly and that pressure reverts to previous valve.

(iv) Re-select 'Manual' on flood switch and gradually increase engine r.p.m. to maximum, checking cabin pressure continuously. This should not exceed 1.2 p.s.i.g. and the change-over from 'Auto' to 'Manual' should be smooth at all engine speeds.

(v) With engine at 5,000 r.p.m. operate flood test switch and note that cabin pressure warning light functions. Also note that airflow to the cockpit increases.

(vi) Switch cabin pressure 'OFF', note that air supply ceases and air extraction valve opens. Hood seal should remain inflated until hood open is selected.