

Appendix 1

STANDARD SERVICEABILITY TEST for HEIGHT LOCK TRANSDUCER, TYPE A

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Introduction

1. This Appendix describes the serviceability tests to be applied to the height lock transducer Type A (Ref. No. 6A/5935) prior to installation in an aircraft and at any time when the serviceability is suspect. The tolerances specified must not be exceeded.

Test equipment

2. The following test equipment is required:—

- (1) Pitot static test set Mk. 3, Ref. No. 6C/2106.
- (2) Portable precision aneroid barometer, Ref. No. 6C/2154.
- (3) Sylphon bellows, Ref. No. 6C/474.
- (4) Multimeter, Ref. No. F19-6625-99-943-1524.
- (5) Valve voltmeter, Type CT343, Ref. No. F19-6625-99-943-6282 or equivalent.

(6) Variac, Type 60, Ref. No. 6C/1969.

(7) Oscilloscope, Type CT414, Ref. No. 6625-99-943-1632.

3. A locally manufactured test set is also required, details are given in fig. 1.

Power supplies

4. The following power supplies are required:—

- (1) 115V \pm 2V, 400c/s \pm 5c/s 3-phase, phase rotation A-B-C with B phase earthed.
- (2) 27V d.c. tolerance +1V or -0.5V.

Servicing methods

5. (1) All operations are to be carried out in the sequence listed. The operation is to be read through completely before it is carried out.
- (2) Unless otherwise stated all tests are to be carried out with the transducer mounted in the normal position and the dust cover fitted.

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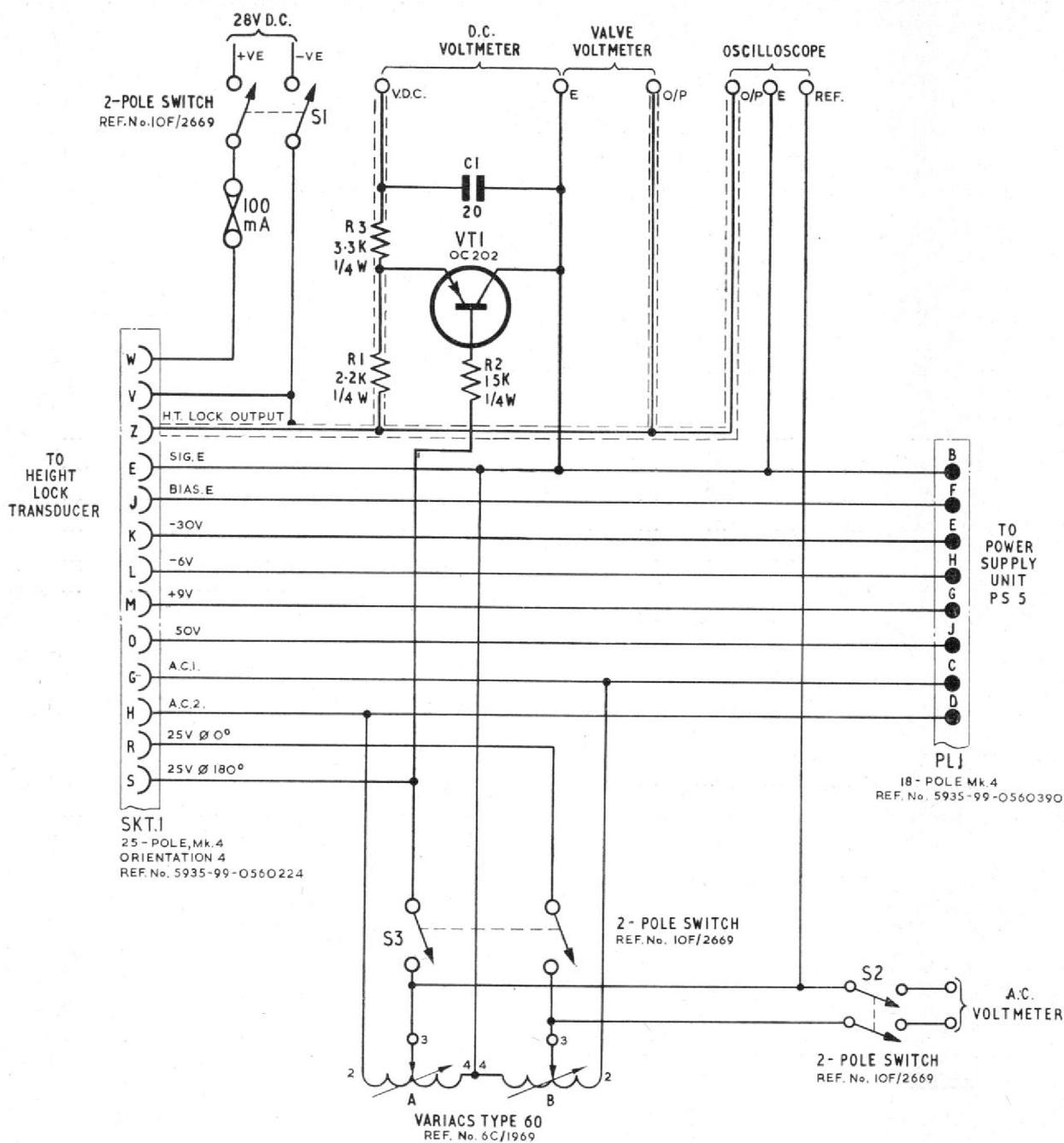


Fig. 1. Height lock transducer, Type A, test set — circuit diagram

(3) To prevent damage to the capsule unit, the pressure deviation from the ambient pressure with the height lock switch S1 in the ON position must not exceed ± 5 mb.

(4) To prevent damage to the capsule unit ensure that the transducer is energized electrically before varying the applied pressure.

(5) Special care must be taken when connecting the variac, as incorrect phasing of the 50V a.c. output will result in the transducer

servo oscillating about the null point instead of settling to a steady null.

Preliminary examination

6. (1) Examine for obvious damage and corrosion paying particular attention to the locating dowels, securing screws and Mk. 4 socket.

(2) Clean the transducer externally using a clean dry rag (Ref. No. 32B/242).

TEST PROCEDURE**Power supply unit, Type B or C**

7. (1) Carry out the standard serviceability test of the power supply unit in accordance with A.P.4685, Vol. 1, Part 2, Sect. 3., Chap. 9, App. 2.

Leak test

8. (1) Prepare pitot-static test set Mk. 3 for use in accordance with A.P.1275T, Vol. 1, Sect. 3, Chap. 38.
- (2) Fit the blanking cap to the test set pitot outlet.
- (3) Connect a length of flexible rubber hose, not exceeding 5ft. in length and of $\frac{5}{16}$ in. internal diameter, to the STATIC outlet and seal the end of the hose.
- (4) Set the pitot-static test set Mk. 3 change-over valve to STATIC INPUT.
- (5) Slowly open the STATIC CONTROL VALVE and actuate the hand pump to reduce the pressure to 300mb.
- (6) Close the STATIC CONTROL VALVE and note any change of reading of the STATIC INDICATOR after 5 min.
- (7) Set PITOT-STATIC CHANGE OVER VALVE to STATIC VENT.

- (8) Slowly open the STATIC CONTROL VALVE and increase to ambient pressure.

9. (1) Connect the unit under test to the transducer test circuit and pitot-static test set Mk. 3 as shown in fig. 2, securing the flexible hose by means of hose clips.
- (2) Switch on the power supplies to the test circuit, set S2 to on position and adjust the variac until the a.c. voltmeter indicates 50V.
- (3) Set S3 to on position and ensure that the transducer settles.
- (4) Set the pitot-static test set Mk. 3 change-over valve to STATIC INPUT.
- (5) Slowly open the STATIC CONTROL VALVE and actuate the hand pump to reduce the pressure to 300mb.
- (6) Close the STATIC CONTROL VALVE and note any change of reading of the STATIC INDICATOR after 5 min. Any change of reading is an indication of transducer capsule unit leakage and should not exceed 1.5mb plus the figure observed in para. 8, sub. para. (6).
- (7) Set the pitot-static test set Mk. 3 change-over valve to STATIC VENT.
- (8) Slowly open the STATIC CONTROL VALVE and increase the pressure to ambient.
- (9) Set S3 to the off position.

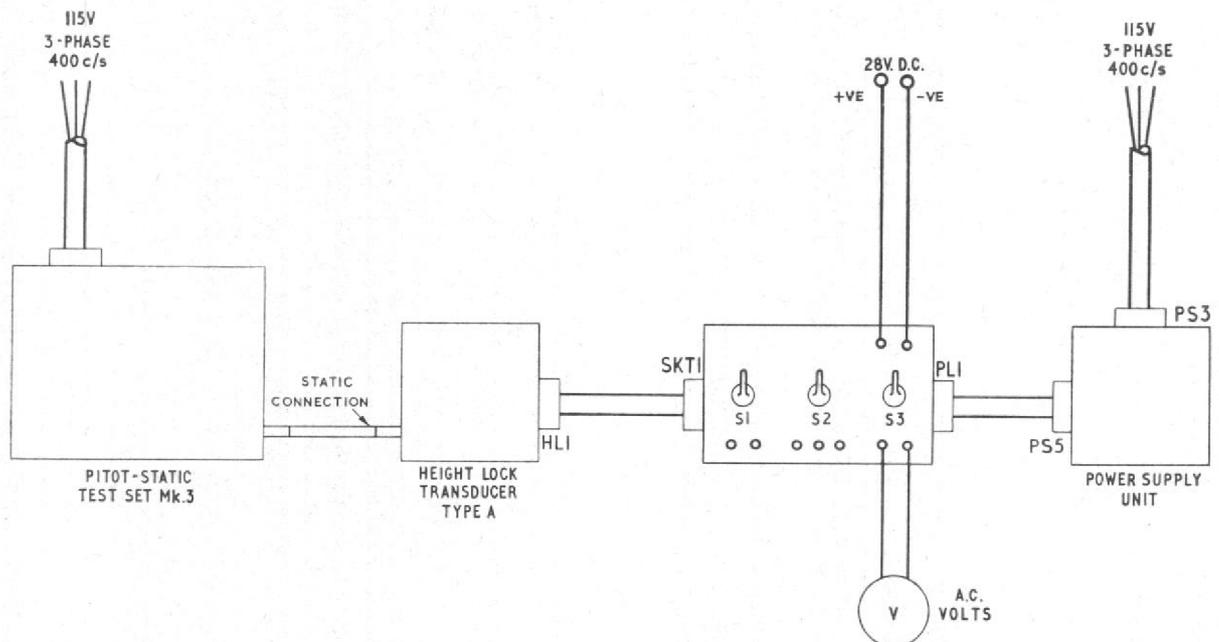


Fig. 2. Connections for leak and ranging test

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Range test

10. (1) Set S3 to the on position.
- (2) Using the pitot-static test set Mk. 3 apply pressure to the transducer to simulate the following heights :

-1000ft	+100 ft
	- 0 ft
ambient pressure	
+20000ft ± 500 ft	
+40000ft	+ 0 ft
	- 1000 ft

Check that the servo system stabilizes at each selected height for increasing and decreasing pressure inputs.

- (3) Return pressure to ambient.
- (4) Set S3 to the off position.
- (5) Switch off power supplies to the test circuit.

Servo follow-up

11. (1) Remove the dust cover from the transducer by removing the two 6B.A. screws at

the rear of the unit and withdrawing the dust cover.

- (2) Mount the unit on the bench so that the gearing is uppermost.

12. (1) Switch on the power supplies to the test set.
- (2) Check the variac setting to ensure that the 50V supply is correct.
- (3) Set S3 to the on position.
- (4) Reduce the applied pressure to 696.8mb to simulate approximately 10 000ft.
- (5) When the servo system has settled switch off the power supplies.
- (6) Increase the applied pressure to 1013.2mb.
- (7) Switch ON the power supplies. The servo system should come to rest with not more than one overshoot and one undershoot in less than 35 seconds.
- (8) Switch OFF the power supplies and re-fit the dust cover.
- (9) Disconnect the transducer from the pitot-static test set Mk. 3.

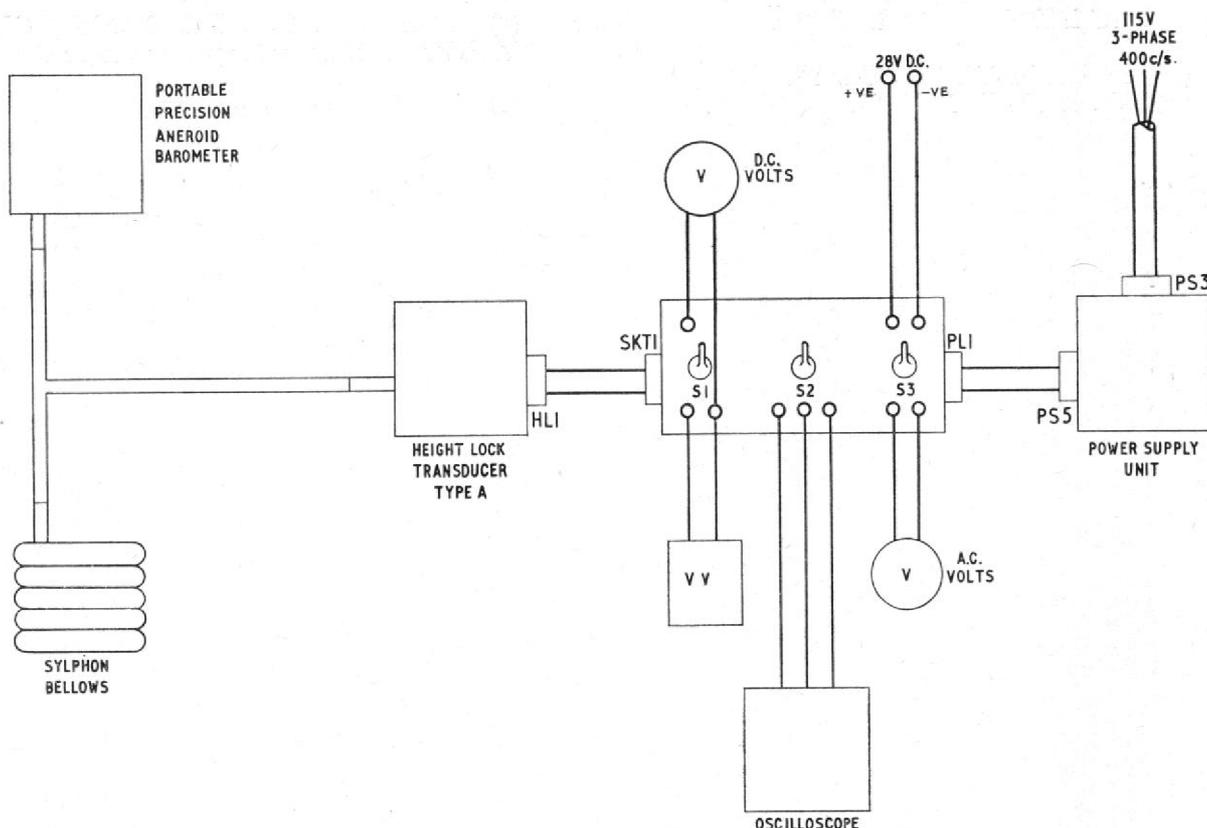


Fig. 3. Connections for checking height lock output

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Height lock output

13. (1) Connect the test set as shown in Fig. 1, but do not connect the oscilloscope.
- (2) With the transducer static connection open to the atmosphere switch on the test circuit power supplies.
- (3) Check the variac setting to ensure that the 50V supply is correct.
- (4) Set S3 to on and allow the transducer to warm up for 3 min.
- (5) Set the height lock switch S1 to ON. The reading on the valve voltmeter should not be greater than 0.25V r.m.s., and the reading on the multimeter should not be greater than 0.05V, d.c.

- (6) Set S1 to the off position.
- (7) Set S3 to the off position.
- (8) Switch off power supplies.

14. (1) Set the sylphon bellows to its mid-range position.
- (2) Set the aneroid barometer to the ambient pressure.
- (3) Interconnect the transducer, sylphon bellows and aneroid barometer as shown in fig. 3.
- (4) Switch on the power supplies.
- (5) Set S3 to the on position.

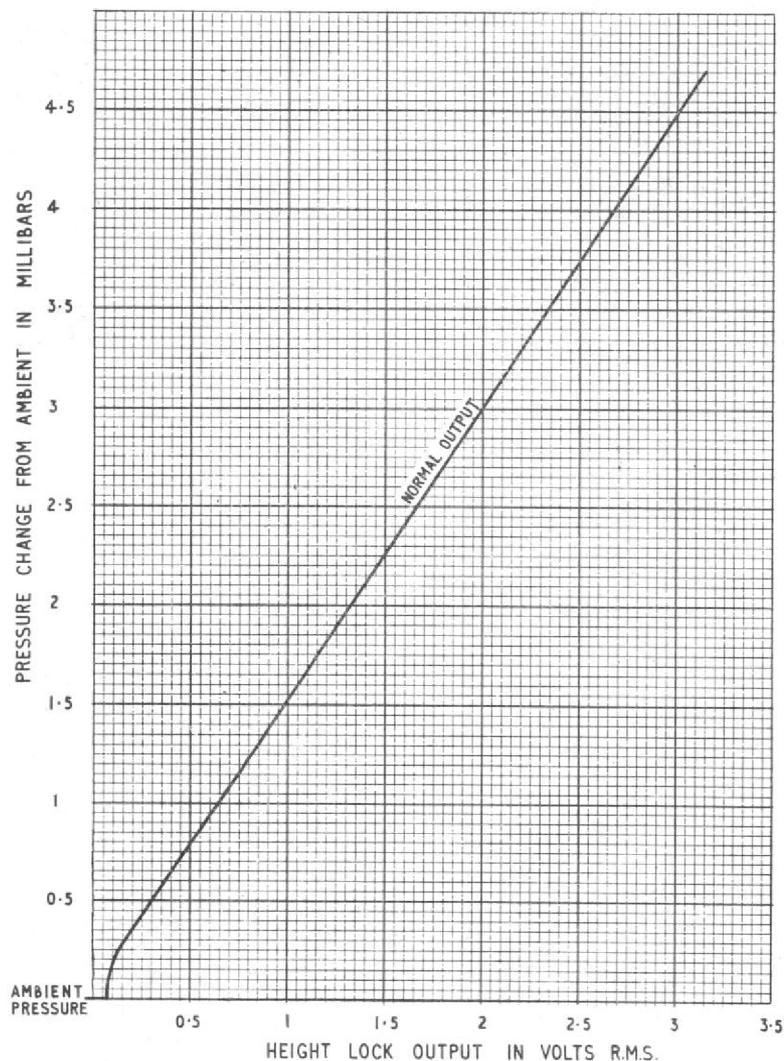


Fig. 4. Height lock transducer, Type A — output graph

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(6) Allow 3 minutes for the transducer to warm up.

(7) Set S1 to the on position.

(8) The readings on the valve voltmeter and the mutimeter should be the same as those obtained in para. 13, sub-para. (5).

(9) Range the transducer in steps of 0.5mb over the range of ± 4.5 mb from the ambient pressure, by increasing or decreasing the barometer reading. Press the operating button and adjust the slyphon bellows until the barometer indicates that the new pressure is correctly set.

(10) Plot the readings obtained on the graph shown in fig. 4. The slope of the graph of the readings should be not less than that of the nominal readings and should be linear within 20%.

15. (1) Connect the test set terminals marked OSCILLOSCOPE to one beam of a twin beam oscilloscope.

(2) Connect the terminal marked REF. to the other beam.

(3) Decrease the pressure applied to the transducer by 5mb. The output should be in phase within 20° with the reference voltage.

(4) Increase the applied pressure to ambient.

(5) Disconnect the oscilloscope.

Hysteresis test

16. (1) Decrease the applied pressure by 2.2mb

(2) Slowly increase the pressure by 1.5mb and note the valve voltmeter reading.

(3) Slowly increase the pressure by a further 1.5mb and then decrease the pressure to that applied in the previous para. Note the valve voltmeter reading. The difference between the two readings should not exceed 0.125V.

(4) Return the applied pressure to ambient.

Discrimination test

17. (1) Slowly decrease the pressure by 1.5mb. Note the valve voltmeter reading.

(2) Decrease the pressure further by 0.1mb. Note the valve voltmeter reading. The difference between the two readings should not be less than 0.02V.

(3) Return the pressure to ambient.

(4) Set S1 and S3 to OFF.

Switching off and disconnecting equipment

18. (1) Switch off the power supplies to the test circuit.

(2) Disconnect transducer from test equipment.

(3) Lightly smear plug threads HLT with silicone compound MS4.

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