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INSPECTION METHODS INSTRUCTION

FOR

BAROSWITCH TESTER T-1

IMI 623.06

Supercedes SC 1759A (CP)

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INSPECTION METHODS INSTRUCTION

FOR

BAROSWITCH TESTER T-1

IMI 623.06

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INSPECTION METHODS INSTRUCTION

FOR

BAROSWITCH TESTER T-1

IMI 623.06

1. EQUIPMENT REQUIRED

1.1. Manometer (Wallace & Tiernan, FA 135) or equivalent.
This equipment is utilized for calibrating the EQUIVALENT ALTITUDE altimeter.

1.2. Production Tester PT-9.
This tester checks voltages, currents, the B SET indicator, and tests for incorrect wiring.

NOTE: Meters on this instrument should be calibrated regularly. Calibration of the A-C voltmeter should be from a power source of 400 cps A-C.

1.3. MC-5 or MC-10.

The baroswitch is to determine whether the B SET indicator is functioning correctly and to properly load the pump during pressure changes.

1.4. Altimeter (Kollsman No. 671CP, or equivalent).

1.5. Hose connections as follows:

1 additional T-1 HOSE
3 Hose assemblies, AN 6270-4-29
2 Valves, Parker 715 FT-4, or equivalent
1 Tee, Parker 40BTXX, or equivalent
1 Tee, Parker 4 RBTXX, or equivalent.

2. POWER SOURCE

2.1. A 28 $\pm$ 1 volt DC, 1000 watt source.

[redacted]

3. DRAWING AND PRODUCTION SPECIFICATIONS

3.1. Units will be inspected in accordance with Gen. Assembly Drawing No. 108555 and its associated Parts List.

3.2. The Production Specification for the T-1 is SC 1760 (SP).

4. TEST PROCEDURE

4.1. Ground Test.

4.1.1. PT-9 switch positions; Circuit-breaker on rear of unit to OFF; DIODE—T-1 to OFF; IND—O, SHORT, 1,2,3,4, and DIODE—TEST switches down. T-1 switch positions; all switches OFF, except B—SELECTOR to either DIODE—TEST position.

4.1.2. Connect the PT-9 to the 28 volt d-c power source with a CT-101 cable.

4.1.3. Connect T-1 to the PT-9 with a CT-101 cable.

4.1.4. PT-9 switch positions: circuit breaker ON; DIODE—T-1 to T-1. Switch T-1 D-C—PWR to ON.

4.1.5. Depress the B—CASE—GND and ELECTRICAL lamps of the T-1.

INDICATION: Both lamps should light.

4.2. First Diode Test.

4.2.1. Turn the T-1 DC-PWR switch OFF.

4.2.2. Disconnect the cable connector P202 from its connector on the solenoid valve behind the T-1 panel.

4.2.3. Connect cable connector P202 of the T-1 to the P5-P6 connector on the PT-9 by means of the PT-9 extension cable.

4.2.4. Turn the PT-9 DIODE—T-1 switch to DIODE position.

4.2.5. Turn the PT-9 DIODE—TEST switch to DIODE—TEST position and hold at that position for approximately 5 seconds, then turn to OFF.

INDICATION: The NEON lamp of the PT-9 should glow briefly as the switch is returned to its OFF position. If the DIODE lamp should light during the 5 seconds, the diode polarity is reversed or shorted.

4.2.6. Reconnect T-1 cable connector P202 to its solenoid connector.

4.3. Second Diode Test.

4.3.1. Repeat 4.2.2 to 4.2.6 for P203 instead of P202.

4.4. Leakage and Pump Tests.

4.4.1. Turn PT-9 DIODE—T-1 switch to T-1.

4.4.2. Connect the HOSE to the hose port. Connect the other end of the hose to a cut-off valve ("C"). With a tee connection connect together the manometer, the baroswitch and the other side of the valve.

4.4.3. Remove the intake tubing from the T-1 dehydrator. Connect an additional T-1 HOSE to this air intake on the dehydrator. Connect the other end of the hose to a tee connection. On the other sides of the tee, connect a separate altimeter, and another cut -off valve ("B"). Leave the other side of the "B" valve open. Open the "B" valve.

4.4.4. Turn the DC-PWR switch ON. Open the "C" cut-off valve. Turn the PUMP-B-SET-PWR switch to PUMP-ON.

4.4.5. Turn the EQUIVALENT-ALTITUDE switch to DESCEND and the ELECTRICAL TEST switch to OVERRIDE. With the adjusting knob set the barometric scale to 29.92. The pressure altitude index should read zero.

4.4.6. With the descend bleeder valve on the right side of the chassis adjust the minimum altitude obtainable to -1,500 feet. Record the PT-9 ammeter current. This should be less than 12 amps.

4.4.7. Turn the EQUIVALENT-ALTITUDE switch to ASCEND. With the "A" set screw on the solenoid valve, adjust the ascend rate to require approximately five seconds to ascend from 25,000 to 30,000 ft.

4.4.8. Return the EQUIVALENT-ALTITUDE meter to 0 feet and stop with the EQUIVALENT-ALTITUDE switch. Close the "C" cut-off valve.

INDICATION: The EQUIVALENT-ALTITUDE meter should show a leakage of less than 100 feet per minute.

4.4.9. Open the "C" valve. Turn the EQUIVALENT-ALTITUDE switch to ASCEND. With the "B" cut-off valve adjust and maintain the external altimeter at approximately -1000 feet.

INDICATION: The pump should be able to reach pressures such that the T-1 EQUIVALENT-ALTITUDE meter reads 42,000 feet while the external altimeter reads -1000 feet or lower.

4.4.10. Turn the EQUIVALENT-ALTITUDE switch OFF. Slowly open the "B" cut-off valve to allow the external altimeter to slowly reach station altitude. Completely open the "B" valve.

4.4.11. Turn the EQUIVALENT-ALTITUDE switch to ASCEND.

4.4.12. With the ascend bleeder valve adjust the maximum obtainable EQUIVALENT-ALTITUDE to 41,500 feet.

4.4.13. Turn the EQUIVALENT-ALTITUDE switch to DESCEND until the EQUIVALENT-ALTITUDE reaches 40,000 feet. Turn the EQUIVALENT-ALTITUDE switch OFF. Close the "C" cut-off valve.

INDICATION: The system should show a leakage of less than 100 feet per minute.

4.4.14. Open the "C" cut-off valve.

4.5. B-Set Test.

4.5.1. Turn the EQUIVALENT-ALTITUDE switch to DESCEND. With the "D" set screw on the solenoid valve adjust the rate of descent to require approximately five seconds to descend from 10,000 to 5,000 feet. Turn the EQUIVALENT-ALTITUDE switch OFF.

NOTE: The manometer should be calibrated and temperature compensated before using in following tests.

4.5.2. Disconnect cable connector P103 from rear of the B-SET Indicator.

4.5.3. Connect the B-SET indicator to connector P-3 of the PT-9 with the PT-9 extension cable. Also, connect cable CT-544 from the T-1 to the PT-9.

4.5.4. Turn the T-1 PUMP-B-SET-PWR switch to B-SET-ON.

INDICATION: Adjust the a-c voltage on the PT-9 to 28/± 1 volt, using R201 on the T-1.

4.5.5. Turn the B-SET-ADJUST switch to INC-B-SET.

INDICATION: The INC-B lamp on the PT-9 should light.

4.5.6. Turn the B-SET-ADJUST switch to DEC-B-SET.

INDICATION: The DEC-B lamp should light.

4.5.7. Turn the PT-9 IND-O switch to IND-O. When the hands of the B-SET indicator have settled at rest, turn the IND-O switch off. Turn the T-1 PUMP-B-SET-PWR switch OFF.

INDICATION: Both hands of the B-SET indicator should settle at 0.

4.6. Altimeter Test.

4.6.1. Disconnect the PT-9 cable from the B-SET indicator and reconnect cable connector P103 to its indicator.

4.6.2. Turn the PUMP-B-SET-PWR switch to PUMP-ON. With the ELECTRICAL-TEST and EQUIVALENT-ALTITUDE switches, cycle the system five times from 0 to 40,000 feet.

SPECIAL NOTE: If more than 10 minutes delay is encountered in making this test (Sec. 4.6 and 4.7), repeat this cycling and this test.

4.6.3. Using the ELECTRICAL-TEST and the EQUIVALENT-ALTITUDE switches, adjust the manometer pressure to approximately 379 mm. Hg. Leave the pressure at this value for 1 to 10 minutes before taking readings.

NOTE: A table of pressure measurements of the manometer, with the corresponding altitude in feet is included in this I.M. Obtaining the exact value of pressure is difficult, so that a near value that falls within the tables given is considered satisfactory. If desired an additional pressure tank and bleed valve may be used to obtain exact values. This addition must, with bleed valve closed, not materially increase the volume of the system.

4.6.4. Read the manometer and the altimeter as accurately as possible. Obtain from the table the corresponding value in feet of altitude for the manometer reading. Record these values.

mm. Hg.	.0	0.2	0.4	0.6	0.8
375	18283	270	257	244	232
376	18219	206	193	180	167
377	18154	141	129	116	103
378	18090	077	065	052	039
379	18026	013	18001	17988	975
380	17962	950	937	924	911
381	17899	886	873	860	848
382	17835	822	810	797	784
383	17772	759	746	734	721
384	17708	696	683	670	658
385	17645	632	620	607	595
442	14245	234	223	211	200
443	14189	178	166	155	144

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mm. Hg.	.0	0.2	0.4	0.6	0.8
444	14132	121	110	099	088
445	14076	065	054	043	031
446	14020	009	13998	987	975
447	13964	953	942	931	920
448	13908	897	886	875	864
449	13853	841	830	819	808
450	13797	786	775	763	752
551	13741	730	719	708	697
518	10226	216	206	196	186
519	10176	167	157	147	137
520	10127	117	107	097	087
521	10078	068	058	048	038
522	10028	018	008	9999	989
523	9979	969	959	949	940
524	9930	920	910	900	890
525	9881	871	861	851	841
526	9831	822	812	802	792
527	9782	773	763	753	743
627	5225	216	208	199	191
628	5182	174	165	157	148
629	5140	132	123	115	106
630	5098	089	081	072	064
631	5055	047	038	030	021
632	5013	005	4996	988	979
633	4971	962	954	945	937
634	4929	920	912	903	895
635	4886	878	870	861	853
636	4844	836	828	819	811
637	4802	794	786	777	769
701	2218	210	203	195	187
702	2179	172	164	156	148
703	2141	133	125	117	110
704	2102	094	086	079	071
705	2063	055	048	040	032
706	2024	017	009	2001	1994
707	1986	978	970	963	955
708	1947	940	932	924	916
709	1909	901	893	886	878
710	1870	863	855	847	840

[redacted]

mm. Hg.	.0	0.2	0.4	0.6	0.8
755	182	175	168	161	153
756	146	139	131	124	117
757	109	102	95	87	80
758	73	66	58	51	44
759	36	29	22	15	7
760	0	-7	-15	-22	-29
761	-36	-44	-51	-58	-65
762	-73	-80	-87	-94	-102
763	-109	116	-124	-131	138
764	-145	-153	-160	-167	-174

4.7. Altimeter Test

4.7.1. Repeat 4.6.3. and 4.6.4. for manometer pressures of 446, 522, 632, 706, and 760 mm. Hg.

INDICATION: Considering the calibration and correction of the manometer, and considering it as a standard, the maximum altimeter error shall be as follows: 18,000 feet ± 275 feet; 14,000 feet, ± 225 feet; 10,000 feet, ± 175 feet; 5000 feet, ± 150 feet; 2,000 feet, ± 100 feet; 0 feet, ± 50 feet.

4.8. Diode Test

4.8.1. Turn PUMP-B-SET-PWR, ELECTRICAL TEST, and EQUIVALENT-ALTITUDE switches OFF. Disconnect P2 and P4 of cable CT-544 from the PT-9 and connect them to the Baroswitch (MC-5 or MC-10).

4.8.2. Turn the PUMP-B-SET-PWR switch to B-SET-ON. Turn the B-SET-ADJUST switch to INC-B-SET until the B-SET indicator registers approximately 6000 feet. Turn the PUMP-B-SET-PWR switch to PUMP-ON.

4.8.3. With the ELECTRICAL-TEST switch turned to OVERRIDE, throw the EQUIVALENT-ALTITUDE switch to ASCEND until the EQUIVALENT-ALTITUDE altimeter registers approximately 40,000 feet. Turn the EQUIVALENT-ALTITUDE and ELECTRICAL-TEST switches OFF.

[redacted]

4.8.4. With the B-SELECTOR switch still at DIODE-TEST position turn the ELECTRICAL-TEST switch to position "1" and then back to its OFF position.

INDICATION: The DIODE neon lamp should glow briefly. No glow probably indicates an open diode circuit. If the red ELECTRICAL lamp should light, it indicates that the DIODE polarity is reversed or the DIODE is shorted.

4.9. Operational Net Test.

4.9.1. Rotate the B-SELECTOR switch to either of its NET positions. Turn the EQUIVALENT-ALTITUDE switch to its DESCEND position.

INDICATION: The EQUIVALENT-ALTITUDE Indicator should drop to approximately 6000 feet and the descent should stop.

NOTE: This test is not considered an indication of the accuracy of the system.

4.10. Lamp Test.

4.10.1. Turn the EQUIVALENT-ALTITUDE switch OFF.

4.10.2. Disconnect connectors P-2 and P-4 of cable CT-544 from the baroswitch and connect to the PT-9. Connect the two clip leads in cable CT-544 together.

INDICATION: The green DC-PWR lamp should light when both clips are connected together.

4.11. "No. 1" Position Test.

4.11.1. Connect the ground clips to either or both GND connectors of the PT-9. Rotate the B-SELECTOR switch to its No. "1" position. Turn the EQUIVALENT-ALTITUDE switch to DESCEND.

WARNING: When checking the following descend operations, do not let the manometer go off scale.

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4.11.2. Turn the No. 1 switch of the PT-9 up.

INDICATION: The altimeter should cease its descend operation.

4.11.3. Turn the PT-9 No. 1 switch down, and the T-1 EQUIVALENT ALTITUDE switch OFF.

4.12. "No. 2, 3, and 4" position Tests.

4.12.1. Repeat 4.11.1. through 4.11.3. in turn for the 2, 3, and 4 positions of the B-SELECTOR switch and the 2, 3, and 4 switches of the PT-9, respectively.

4.13. Rotate the B-SELECTOR switch to either NET position. Repeat 4.11.1 through 4.11.3 using in turn the following PT-9 switch combinations: 1 and 2, 2 and 3, 3 and 4, 4 and 1.

INDICATION: Altimeter should cease its descend operation only when both switches as indicated are turned up.

4.14. Repeat 4.13 for the other NET positions of the B-SELECTOR switch.

4.15. Repeat 4.13 except use the following PT-9 switch combinations: 1 and 3, 2 and 4.

INDICATION: Altimeter should <u>not</u> cease its descend operation.

4.16. Turn the PT-9 SHORT switch to SHORT position. Turn the ELECTRICAL TEST switch to position 1 and 2 in turn.

INDICATION: The ELECTRICAL lamp should light for both positions.

4.17. Turn all switches and the PT-9 circuit breaker OFF.

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TECHNICAL INSPECTION SHEET
FOR
BAROSWITCH TESTER T-1
REF. IMI 623.06 SC 1759 B (CP)

T-1 Ser. #

	Make	Model	Ser. No.
1.1. Barometer			
1.2. PT-9			
1.3. Baroswitch			
1.4. Ext. Altimeter			

3.1. Inspected per Dwg. 108555, and good workmanship ✓
4.4.5. Barometric scale set to 29.92 and altitude index to zero ✓
4.4.6. T-1 current (as read on PT-9 ammeter (18.0 max.) _____ amps.
(4.4.8. and
(4.4.13. System leakage O.K. (100 ft./min., max.) 4.4.8 ✓ 4.4.13 ✓

4.4.9. Pump ability O.K. ✓ EQUIV. ALT. reading _____ (40,000 min.)

EXTERNAL ALT. reading _____ (-1000 or lower)

4.5.7. B - SET indicator read zero ✓
4.6.4. and 4.7.1. Altitude readings were checked as follows:

mm. Hg.	Tabular Rdg. (ft)	Alt. Rdg. (ft)	Error (ft)	Max. Error (ft)
				(18,000) ± 275
				(14,000) ± 225
				(10,000) ± 175
				(5,000) ± 150
				(2,000) ± 100
				(0) ± 50

4.17. All wiring tested correctly ✓

Inspected in accordance with prescribed specifications and procedures and found satisfactory and acceptable.

Inspected in accordance with prescribed procedures and specifications; accepted by AEC.

INSPECTOR DATE AEC-AFSWP INSPECTOR

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