



TASK CARD AMC-Fleet

TaskCard: Cable Rigging and Tension	Date:Feb 2017	Aircraft:Boeing 757
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Description: This is a 4-person team task worth a maximum of 100 points. The time period to complete the task is 30 minutes. The team will work together rig the out of tolerance aileron control tension on a Boeing 757 aircraft.

Area:	Labor Hours:	W/O Phase:
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Skills:

ITEM:	INSTRUCTIONS	MECH:	QC
	<p>OBJECTIVE: Given a 757 aileron mockup, cable tensiometer, tensiometer calibration sheet, needle nose pliers, rigging pins circuit breaker lock out collars and turnbuckle clips. Perform the following with zero assistance from non-team members:</p> <ul style="list-style-type: none"> (1) Determine if aileron cables are within given specifications. (2) If not adjust cable tensions to within given specifications <p>EVALUATION CRITERIA: Each team will be evaluated on the following skills, abilities, and outcomes:</p> <ul style="list-style-type: none"> (1) Correctly follow all safety procedures per the checklist. (2) Correctly select the correct riser for cable size (3) Correctly select proper tension per tensiometer calibration sheet. (4) Correctly select proper tension per Table 1-3 (5) Correctly follow all instruction on checklist (6) Correctly adjust aileron cable tension to within limits (7) Properly safety turnbuckles with turnbuckle lock clips <p>PROCEDURES:</p> <p style="text-align: center;">Aileron Cable Rigging</p> <p>After first flight the aileron cable rig was found to be out of tolerance. Re-rigging is required, use the following instructions to rig the cables.</p>		



ITEM:	INSTRUCTIONS	MECH:	QC
	<p style="text-align: center;">Re-rigging of Cables AA&AB</p> <p><input type="checkbox"/> <u>Notify Judge Aircraft clear for Hydraulics.</u></p> <p style="text-align: center;"><u>Warning: Check and clear aircraft and flight controls before turning on hydraulics.</u></p> <p>1. Turn on both A&B system hydraulic switches, cycle ailerons, check and install the rig pins in the captain's wheel and the Aileron control quadrant</p> <p>2. Turn off and deactivate both A&B systems Hydraulics by pulling the Circuit breaker for A & B system and installing the lock out collars.</p> <p><input type="checkbox"/> <u>Notify Judge that A&B systems off and deactivated</u></p> <p style="text-align: center;"><u>Warning: Hydraulics systems must be deactivated prior to the start of any rigging operations.</u></p> <p>3. Select the correct riser for 3/32" Dia. cable being rigged per the tensiometer calibration sheet. Use the tension values in table 1-3 Cable Rigging Tension page 2 and the tensiometer calibration sheet. Using the cable clamps adjust the cable tension to the correct value +5 / -15 lbs. for 70 F outside ambient temperature.</p> <p style="text-align: center;">Record riser number for the size cable being rigged _____</p> <p style="text-align: center;">Required tension in lbs per table 1-3 _____</p> <p>4. Remove Rig pins and cable clamps</p> <p>5. Reset Circuit breakers for A&B system hydraulics</p> <p style="text-align: center;"><u>Warning: Check and clear aircraft and flight controls before turning on hydraulics.</u></p> <p><input type="checkbox"/> <u>Notify Judge that A&B systems activated Aircraft clear for Hydraulics.</u></p> <p>6. Turn on A&B system hydraulic switches cycle the captain's wheel, 5 times.</p> <p style="text-align: center;">Note: Operate captain's wheel gently and smoothly when cycling and returning to neutral.</p> <p>7. Install Rig pins, Recheck rig load (table 1-3) of each cable and free movement of appropriate rig pins.</p> <p>8. If good turn off hydraulics go to next step, if not return to step 2</p>		

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	<p>9. Using the push/pull rod adjust the aileron to align with the mark, after adjustments are complete, hand tighten jam nuts remove rig pins.</p> <p>10. Safety turnbuckles per Safety Turnbuckle Diagram page 2.</p> <p>11. No more than 3 threads may show beyond turnbuckle body. Align the slit in the barrel with the slot in the cable terminal, insert the straight end of the lock clip into the aperture formed by the aligned slots. Bring hook end of the lock clip over the hole in the center of the turnbuckle barrel and seat the hook loop into the hole by applying pressure to the hook shoulder. Repeat these steps to lock the opposite end of the turnbuckle. Both locking clips may be inserted in the same turnbuckle barrel hole, or they may be inserted in the opposite holes,</p> <p>12. Examine both locking clips for proper engagement of the hook lip by a slight pull in the disengaging direction without the use of any tools and by visual examination to make certain that the hook lip has engaged the interior of the turnbuckle body. Note: Lock clips shall not be reused. The paint on the clips provides a means for determining that the clips have not been previously used.</p> <p>13. Clock does not stop until all tools returned.</p> <p style="text-align: center;">---- END ----</p>		

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Table 1-3. Cable Rigging Tension (lbs)

Temp (F)	AA AB	ABSA ABSB	Cable		
			ACBA ACBB	WSA1, 2 WSB1, 2	SBA SBB
110	158	273	103	91	128
108	157	271	102	90	127
106	156	269	102	90	126
104	155	267	101	89	125
102	155	264	100	89	125
100	154	262	100	88	124
98	153	260	99	88	123
96	152	258	98	87	122
94	151	256	97	87	121
92	150	254	97	86	120
90	150	251	96	86	120
88	149	249	95	85	119
86	148	247	95	85	118
84	147	245	94	84	117
82	146	243	93	84	116
80	145	241	93	83	115
78	145	238	92	83	115
76	144	236	91	82	114
74	143	234	90	82	113
72	142	232	90	81	112
70	141	230	89	81	111
68	140	228	88	80	110
66	140	225	88	80	110
64	139	223	87	79	109
62	138	221	86	79	108
60	137	219	86	78	107
58	136	217	85	78	106
56	135	215	84	77	105
54	134	213	83	77	104
52	134	210	83	76	104
50	133	208	82	76	103
48	132	206	81	75	102
46	131	204	81	75	101
44	130	202	80	74	100
42	129	200	79	74	99
40	129	197	79	73	99
38	128	195	78	73	98
36	127	193	77	72	97

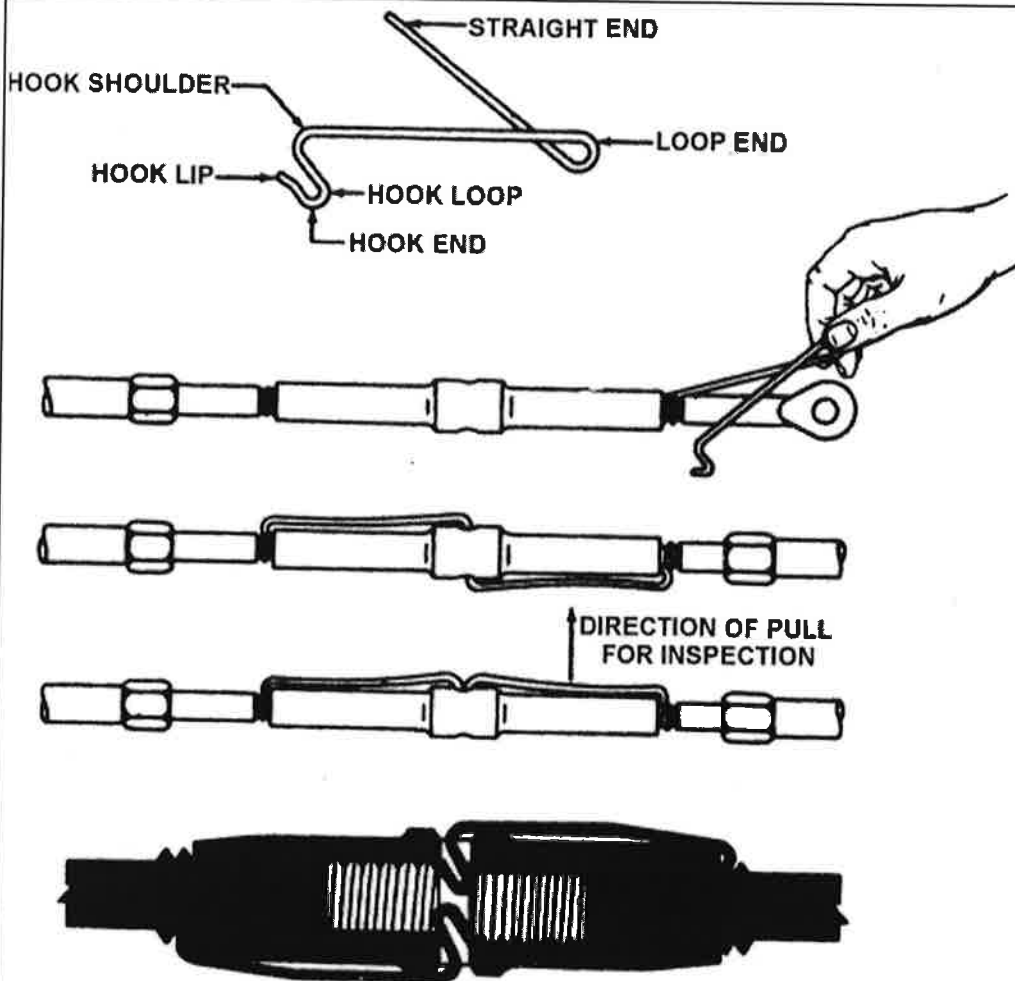
Temp (F)	AA AB	ABSA ABSB
34	126	191
32	125	189
30	124	187
28	124	184
26	123	182
24	122	180
22	121	178
20	120	176
18	119	174
16	119	171
14	118	169
12	117	167
10	116	165
8	115	163
6	114	161
4	113	159
2	113	156
0	112	154
-2	111	152
-4	110	150
-6	109	148
-8	108	146
-10	108	143
-12	107	141
-14	106	139
-16	105	137
-18	104	135
-20	103	133
-22	103	130
-24	102	128
-26	101	126
-28	100	124
-30	99	122
-32	98	120
-34	98	117
-36	97	115
-38	96	113
-40	95	111

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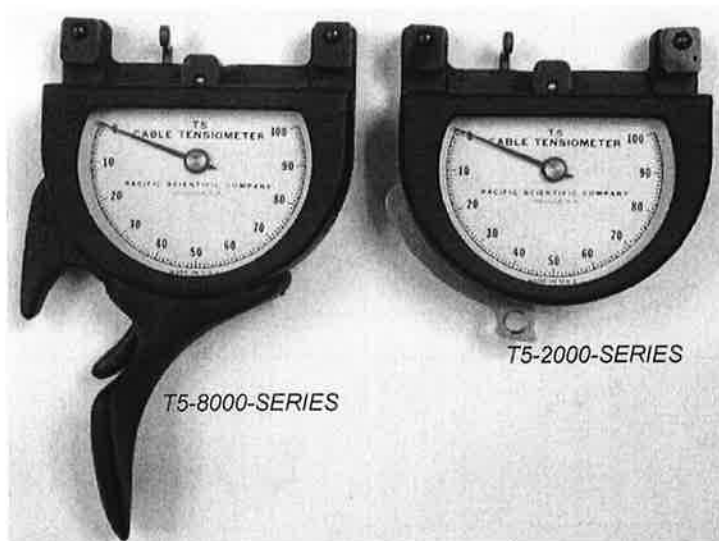
INSTRUCTIONS

MECH:

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INSTRUCTIONS FOR USE OF T5 CABLE TENSIO METER



GENERAL INFORMATION

The removable Risers are to accommodate different sizes of cable. It is through the use of Risers of different height that one instrument is able to measure tensions of various cable sizes (depending on the model). **The correct Riser must be used for the cable size under test; otherwise false readings or damage to the instrument will result.** Consult the Calibration Card (included) for tension range, cable size and proper riser.

The Indicator Dial is an arbitrary scale reading from 0 to 100. The cable tension, which can be measured on different size cables for any given model of the Indicator, are clearly shown on the Calibration Card, attached to the carrying case. This involves the conversion of the dial readings into pounds by means of the Calibration Card, previously mentioned.

Standard preformed Aircraft Cable is used in calibrating, 7 x 7 or 7 x 19 stranding in cables of 1/16" and 3/32", and 7 x 19 stranding in cables 1/8" through 3/8" sizes. The Tensiometer instrument shall be calibrated on the same type of cables on which the Tensiometer instrument will be used (such as coated cables used externally on helicopters). The T5 series cable Tensiometer are standard calibrated on Flexible, wire rope, for aircraft control cables. When using coated cables, select the appropriate size of riser to accommodate the cables increased size. Annotate riser used on the Certification label and/or Calibration Chart. Riser must be sized the cable's outside diameter. Flexible cables, either coated or non-coated, shall conform to MIL-DTL-83420. Most Aircraft systems use the Flexible cable. Some aircraft, (A-10 and F-15), use both Flexible and Non-Flexible cables.

A Tensiometer instrument calibrated on Flexible cable will not give accurate tension readings when measuring Non-Flexible cable. Non-Flexible cables shall conform to MIL-DTL-87161, (Supersedes MIL-W87161 & MIL-W-5693). Again, the Tensiometer instrument shall be calibrated on the same type of cables on which the Tensiometer instrument will be used.

In testing or calibrating the instrument, a dead weight arrangement is always accurate and preferable. However, this may be done in a testing machine against a hydraulic gauge or other measuring device. **In this case it is important that the reading of the check gauge or scale be taken after the test load of the tensiometer is applied.**

The attitude of the Indicator does not affect the readings – i.e., it makes no difference whether the Indicator is in a vertical or horizontal attitude, or at any point between these positions.

WARNING **USE OF TENSIO METER ON CABLE SYSTEMS EQUIPPED WITH CABLE TENSION REGULATORS**

Cable Tensiometer should not be used for adjusting the rig load in a cable system where an automatic cable tension regulator is installed. In all cases, such cable systems should be rigged by adjusting them so that the pointer on the cable tension regulator scale indicates the correct number based on the surrounding temperature, as indicated on the chart provided in the Airplane Service Manual. The Tensiometer may be used to check the tension obtained, but it must be remembered that the actual cable tension will vary from the nominal, depending upon the errors in the instrument itself, manufacturing tolerance of springs in the regulators, rate of the regulator spring, and condition of the control cable. Cable tension readings taken on regulated control systems by means of a Tensiometer could, therefore, be misleading.

TO TAKE READINGS

1. Confirm cable size being tested using the supplied cable diameter gauge.
2. Select the proper Riser No. for the cable size being tested from the top of the Calibration Table, which indicates the Riser number applicable for the different cable sizes. Insert the Riser on the pin located at the upper center of the instrument.
3. Open the Trigger by moving it away from the carrying case and place the instrument on the cable being tested.
4. Close the Trigger; note the reading on the scale. Convert the scale reading into pounds using the supplied Calibration Table. The scale reading is given in the column headed by the cable size being tested and the corresponding pounds is given in the column headed "Cable Tension", reading across.
5. Remove the instrument from the cable by opening the Trigger. This retracts the Riser and releases the instrument, allowing it to slide free from the cable.

Due to the uneven surface of stranded cable, slight variations in reading may occur on the same cable at the same tension. This is particularly true of 5/32" diameter cable and larger. To obtain the greatest possible accuracy, it is recommended that three to five readings be taken at slightly different locations on the cable and these values averaged. This will tend to eliminate the effect of cable variation and obtain the maximum degree of accuracy.

WARNING

Do not overload the instrument – that is, permit the Pointer to go beyond the "100" mark on the Dial. When first applying to a tight cable, close the Trigger slowly and watch the Pointer to be sure it will not go above the "100" mark when the load is fully applied. Permanent damage may be done to the instrument if overloaded.

TO TAKE READINGS WHEN DIAL CANNOT BE SEEN

If the Dial cannot be seen when the instrument is on the cable, the Pointer may be locked at its reading position. **Before** releasing the Trigger, press forward (toward the Dial) on the small lever located at the upper left-hand side of the instrument. After the Pointer has thus been locked in reading position, the Trigger is released. The instrument can now be removed from the cable and the reading taken. The Pointer is then returned to "0" by reversing the movement of the locking mechanism. **Do not set lock before clamping instrument on cable as incorrect reading will result.**

ADJUSTMENT AND REPAIR

If adjustment or repair is necessary, return the instrument to OPTI Manufacturing Corp. or utilize the Service and Parts Catalog which may be obtained from OPTI Manufacturing Corporation. For return units under a warranty claim, please contact us first in order to obtain a *Return Material Authorization* (RMA) number.



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