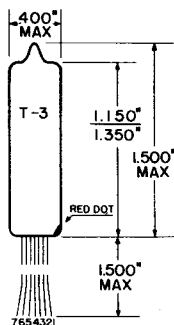


## TUNG-SOL

## PENTODE

## SUBMINIATURE TYPE



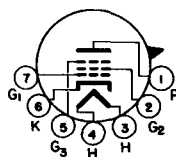
GLASS BULB

OUTLINE DRAWING  
→ JEDEC 3-6

## HEATER

6.3 VOLTS 0.20 AMP.

ANY MOUNTING POSITION



BOTTOM VIEW

0.016" TINNED  
FLEXIBLE LEADS  
0.048" CENTER-TO-CENTER  
IN LINE

THE 5702 WB IS A HEATER-CATHODE TYPE SHARP-CUTOFF PENTODE OF SUBMINIATURE CONSTRUCTION CAPABLE OF OPERATION IN THE VHF REGION. IT IS DESIGNED FOR SERVICE WHERE SEVERE CONDITIONS OF HIGH TEMPERATURE AND MECHANICAL SHOCK OR VIBRATION ARE ENCOUNTERED. A SEPARATE TERMINAL CONNECTION IS PROVIDED FOR GRID #3 WHICH UNDER SELF-BIAS CONDITIONS CAN BE CONNECTED DIRECTLY TO GROUND, PERMITTING THE CATHODE BY-PASS CAPACITOR TO BE OMITTED FOR LOWER GRID LOADING. THE FLEXIBLE TERMINAL LEADS MAY BE SOLDERED OR WELDED DIRECTLY TO THE CIRCUIT COMPONENTS WITHOUT THE USE OF SOCKETS. STANDARD SUBMINIATURE SOCKETS MAY BE USED BY CUTTING THE LEADS TO A SUITABLE LENGTH

## RATINGS

## MECHANICAL

|                                                              |      |    |
|--------------------------------------------------------------|------|----|
| MAXIMUM IMPACT ACCELERATION (SHOCK TEST-NOTE 3)              | 450  | G  |
| MAXIMUM UNIFORM ACCELERATION (CENTRIFUGE TEST-NOTE 4)        | 1000 | G  |
| MAXIMUM VIBRATIONAL ACCELERATION (96HR. FATIGUE TEST-NOTE 5) | 2.5  | G  |
| MAXIMUM BULB TEMPERATURE                                     | 220  | °C |

## RATINGS

## AND NORMAL OPERATION

|                         | MIL-E-1<br>SYMBOL | DES.<br>MAX | NORM.<br>TEST<br>CONDI-<br>TIONS<br>(NOTE 7) | NORM.<br>OPER-<br>ATION<br>(NOTE 6) | DES.<br>MAX | MIL-E-1<br>UNITS |
|-------------------------|-------------------|-------------|----------------------------------------------|-------------------------------------|-------------|------------------|
| HEATER VOLTAGE (NOTE 8) | Ef:               | 5.7         | 6.3                                          | 6.3                                 | 6.9         | V                |
| PLATE VOLTAGE           | Eb:               | ---         | 120                                          | 120                                 | 165         | Vdc              |
| GRID #1 VOLTAGE         | Ec1:              | -55         | 0                                            | 0                                   | ---         | Vdc              |
| GRID #2 VOLTAGE         | Ec2:              | ---         | 120                                          | 120                                 | 155         | Vdc              |
| GRID #3 VOLTAGE         | Ec3:              | ---         | 0                                            | 0                                   | 0           | Vdc              |
| PLATE DISSIPATION       | Pp:               | ---         | ---                                          | 0.9                                 | 1.10        | W                |
| GRID #2 DISSIPATION     | Pg2:              | ---         | ---                                          | 0.3                                 | 0.40        | W                |
| GRID #1 CIRCUIT RES.    | Rg1:              | ---         | ---                                          | 1.0                                 | 1.2         | MEG.             |
| HEATER-CATHODE VOLTAGE  | Ehk:              | -200        | ---                                          | 100                                 | +200        | v                |
| CATHODE CURRENT         | Ik:               | ---         | ---                                          | ---                                 | 16.5        | mAdc             |
| CATHODE RESISTANCE      | Rk:               | ---         | 200                                          | 200                                 | ---         | OHMS             |
| PLATE CURRENT (1)       | Ib(1):            | ---         | ---                                          | 7.5                                 | ---         | mAdc             |
| GRID #2 CURRENT         | Ic2:              | ---         | ---                                          | 2.6                                 | ---         | mAdc             |
| TRANSCONDUCTANCE (1)    | Sm(1):            | ---         | ---                                          | 5000                                | ---         | μMHOS            |
| PLATE RESISTANCE        | rp:               | ---         | ---                                          | 0.34                                | ---         | MEG.             |

## TUNG-SOL

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CHARACTERISTICS AND QUALITY CONTROL TESTS<sup>1</sup> - cont'd.

| TEST                                                                                                                                                                                                                    | AQL<br>% | MIL-E-1<br>SYMBOL                                                                       | MIN.                                   | LAL | BOG                                    | UAL | MAX.                                   | ALD | MIL-E-1<br>UNITS                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------------------------------------------------------------------------------|----------------------------------------|-----|----------------------------------------|-----|----------------------------------------|-----|-----------------------------------------------|
| MEASUREMENTS ACCEPTANCE<br>TESTS PART 1                                                                                                                                                                                 |          |                                                                                         |                                        |     |                                        |     |                                        |     |                                               |
| COMBINED AQL=1.0% EXCLUDING MECHANICAL AND INOPERATIVES                                                                                                                                                                 |          |                                                                                         |                                        |     |                                        |     |                                        |     |                                               |
| HEATER CURRENT:<br>HEATER-CATHODE<br>LEAKAGE: $E_{hk} = -100$ Vdc<br>$E_{hk} = +100$ Vdc                                                                                                                                | 0.65     | If:                                                                                     | 190                                    | --- | 200                                    | --- | 210                                    | --- | mA                                            |
| GRID CURRENT (1):<br>PLATE CURRENT (1):<br>PLATE CURRENT (2):<br>$E_{c1} = -9.0$ Vdc                                                                                                                                    | 0.65     | I <sub>hk</sub> :<br>I <sub>c1</sub> (1):<br>I <sub>b</sub> (1):<br>I <sub>b</sub> (2): | ---                                    | --- | ---                                    | --- | 5<br>-0.1<br>9.5<br>50                 | --- | $\mu$ Adc<br>$\mu$ Adc<br>mAdc<br>$\mu$ Adc   |
| SCREEN CURRENT:<br>TRANSCONDUCTANCE (1):<br>CONTINUITY AND<br>SHORTS<br>(INOPERATIVES):<br>MECHANICAL:<br>ENVELOPE (8-7)                                                                                                | 0.65     | I <sub>c2</sub> :<br>S <sub>m</sub> (1):<br><br><br><br><br><br>0.4                     | 1.7<br>4200<br><br><br><br><br><br>--- | --- | 2.6<br>4775<br><br><br><br><br><br>--- | --- | 3.5<br>5225<br><br><br><br><br><br>--- | --- | mAdc<br>$\mu$ MHOS<br><br><br><br><br><br>--- |
| MEASUREMENTS ACCEPTANCE<br>TEST PART 2                                                                                                                                                                                  |          |                                                                                         |                                        |     |                                        |     |                                        |     |                                               |
| INSULATION OF<br>ELECTRODES:<br>Ef=6.3 V<br>Eg-all=-100 Vdc<br>Ep-all=-300 Vdc                                                                                                                                          |          |                                                                                         |                                        |     |                                        |     |                                        |     |                                               |
| TRANSCONDUCTANCE (2):<br>Ef=5.7 V. (NOTE 9)                                                                                                                                                                             | 2.5      | R <sub>g1</sub> -all:<br>R <sub>p</sub> -all:<br>$\Delta E_f S_m(2)$                    | 250<br>250<br>---                      | --- | ---                                    | --- | ---                                    | --- | MEG.<br>MEG.<br>PERCENT                       |
| GRID EMISSION:<br>Ef=7.5 V; PREHEAT<br>5 MINUTES AT $E_{c1} =$<br>0; TEST AT $E_{c1} =$<br>10 Vdc                                                                                                                       | 6.5      | I <sub>c</sub> (2):                                                                     | ---                                    | --- | ---                                    | --- | -0.5                                   | --- | $\mu$ Adc                                     |
| AF NOISE:<br>E <sub>sig</sub> =70 mVac; E <sub>c2</sub> =<br>25 Vdc; R <sub>g1</sub> =0.1 MEG.;<br>R <sub>g2</sub> =1000 OHMS; R <sub>p</sub> =<br>0.2 MEG; C <sub>k</sub> =1000 $\mu$ f;<br>R <sub>k</sub> =4000 OHMS. | 2.5      | EB:                                                                                     | ---                                    | --- | ---                                    | --- | 17                                     | --- | VU.                                           |
| PLATE RESISTANCE:<br>CAPACITANCE:<br>CAPACITANCE: (NOT 2)<br>CAPACITANCE:                                                                                                                                               | 6.5      | r <sub>p</sub> :<br>C <sub>gp</sub> :<br>C <sub>in</sub> :<br>C <sub>out</sub> :        | 0.15<br>---<br>4.1<br>2.9              | --- | ---                                    | --- | ---                                    | --- | MEG.<br>$\mu$ f<br>$\mu$ f<br>$\mu$ f         |
| LOW PRESSURE<br>VOLTAGE BREAKDOWN:<br>PRESSURE=55 $\pm$ 5mm Hg:<br>VOLTAGE = 300 Vac                                                                                                                                    | 6.5      | ---                                                                                     | ---                                    | --- | ---                                    | --- | ---                                    | --- | ---                                           |
| OPERATION TIME:<br>(NOTE 10)                                                                                                                                                                                            | 4.0      | t:                                                                                      | ---                                    | --- | ---                                    | --- | 20                                     | --- | sec.                                          |

→ INDICATES A CHANGE.

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## TUNG-SOL

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CHARACTERISTICS AND QUALITY CONTROL TESTS<sup>1</sup> - cont'd.

| TEST                                                                                                                              | AQL<br>% | MIL-E-1<br>SYMBOL     | MIN. | LAL | BOG. | UAL | MAX.                   | ALD. | MIL-E-1<br>UNITS |
|-----------------------------------------------------------------------------------------------------------------------------------|----------|-----------------------|------|-----|------|-----|------------------------|------|------------------|
| MEASUREMENTS ACCEPTANCE<br>TEST PART 2 - cont'd.                                                                                  |          |                       |      |     |      |     |                        |      |                  |
| VIBRATION (2):<br>F=40 cps; G=15; Rp=<br>10,000 OHMS                                                                              | 2.5      | Ep:                   | ---  | --- | ---  | --- | 50                     | ---  | mVac             |
| VIBRATION (3):<br>F=30-1000 cps; G=15;<br>Rp =10,000 OHMS; t=3 MIN.;<br>POSITIONS X <sub>1</sub> AND X <sub>2</sub> ONLY          | 4.0      | Ep:                   | ---  | --- | ---  | --- | 240<br>PEAK TO<br>PEAK | ---  | mV               |
| DEGRADATION RATE<br>ACCEPTANCE TESTS                                                                                              |          |                       |      |     |      |     |                        |      |                  |
| SUBMINIATURE LEAD<br>FATIGUE:                                                                                                     | 2.5      | ---                   | 4.0  | --- | ---  | --- | ---                    | ---  | arcs             |
| SHOCK (1):<br>Ehk=+100 Vdc; Rg=0.1 MEG<br>HAMMER ANGLE =30°<br>(NOTE 3)                                                           | 20       | ---                   | ---  | --- | ---  | --- | ---                    | ---  | ---              |
| FATIGUE (1):<br>96 HRS; G=2.5; FIXED<br>FREQUENCY; F=25 MIN.<br>60 MAX. (NOTE 5)                                                  | 6.5      | ---                   | ---  | --- | ---  | --- | ---                    | ---  | ---              |
| FATIGUE (2):<br>6 HOURS; G=10; FIXED<br>FREQUENCY; F=25 MIN,<br>60 MAX. (NOTE 11)                                                 | ---      | ---                   | ---  | --- | ---  | --- | ---                    | ---  | ---              |
| POST SHOCK (1) AND<br>FATIGUE TESTS (1) AND<br>(2) END POINTS:<br>VIBRATION (2):<br>F=40 cps; G=15; Rp =<br>10,000 OHMS           | ---      | Ep:                   | ---  | --- | ---  | --- | 75                     | ---  | mVac             |
| HEATER-CATHODE LEAKAGE:<br>Ehk=+ 100 Vdc Ehk=-100 Vdc                                                                             | ---      | lhk:                  | ---  | --- | ---  | --- | 10                     | ---  | μAdc             |
| CHANGE IN TRANSCONDUCTANCE (1) OF INDIVIDUAL TUBES:<br>Ef = 6.3 V                                                                 | ---      | Δ <sub>t</sub> Sm(1): | ---  | --- | ---  | --- | 10                     | ---  | PERCENT          |
| GRID CURRENT (1):                                                                                                                 | ---      | Ic(1):                | ---  | --- | ---  | --- | -1.0                   | ---  | μAdc             |
| SHOCK (2):<br>Ehk=+100 Vdc; Rg=0.1<br>MEG.; G=75; (HAMMER<br>ANGLE =120°+ RUBBER<br>PAD); t=10 MILLISECONDS<br>DURATION (NOTE 12) | ---      | ---                   | ---  | --- | ---  | --- | ---                    | ---  | ---              |
| POST SHOCK TEST (2)<br>END POINTS:<br>VIBRATION (2):<br>F=40cps; G=15; Rp=<br>10,000 OHMS                                         | ---      | Ep:                   | ---  | --- | ---  | --- | 75                     | ---  | mVac             |

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## TUNG-SOL

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CHARACTERISTICS AND QUALITY CONTROL TESTS<sup>1</sup> - cont'd.

## TEST

| DEGRADATION RATE<br>ACCEPTANCE TESTS -CONT'D.                                                                                                     | AQL<br>%    | MIL-E-1<br>SYMBOL  | MIN. | MAX. | MIL-E-1<br>UNITS |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------------|------|------|------------------|
| HEATER-CATHODE<br>LEAKAGE:<br>Ehk =+100 Vdc Ehk=-100 Vdc                                                                                          | ---         | lhk:               | ---  | 10   | $\mu$ Adc        |
| CHANGE IN TRANSCON-<br>DUCTANCE (1) OF IN-<br>DIVIDUAL TUBES:<br>Ef = 6.3 V                                                                       | ---         | $\Delta_t Sm(1)$ : | ---  | 10   | PERCENT          |
| GRID CURRENT (1):                                                                                                                                 | ---         | lc(1):             | ---  | -1.0 | $\mu$ Adc        |
| GLASS STRAIN (THERMAL SHOCK):                                                                                                                     | 6.5         | ---                | ---  | ---  | ---              |
| ACCEPTANCE LIFE TESTS                                                                                                                             |             |                    |      |      |                  |
| HEATER CYCLE:<br>Ef =7.5 V; Eb=Ec1=Ec2=<br>Ec3=0V; Ehk=140 Vac;<br>1 MIN. ON, 1 MIN. OFF.                                                         | 1.0         | ---                | 2000 | ---  | CYCLES           |
| HEATER CYCLING LIFE<br>TEST END POINTS:<br>HEATER-CATHODE<br>LEAKAGE:<br>Ehk=+ 100 Vdc Ehk=-100 Vdc                                               | ---         | lhk:               | ---  | 20   | $\mu$ Adc        |
| 1 HOUR STABILITY LIFE<br>TEST:<br>TA = ROOM; Ehk=+200 Vdc;<br>Rg1 = 1.0 MEG.                                                                      | ---         | ---                | ---  | ---  | ---              |
| 1 HOUR STABILITY LIFE<br>TEST END POINTS:<br>CHANGE IN TRANSCON-<br>DUCTANCE (1) OF IN-<br>DIVIDUAL TUBES:<br>(TYPICAL SAMPLE SIZE<br>= 50 TUBES) | 1.0         | $\Delta_t Sm(1)$ : | ---  | 10   | PERCENT          |
| 100 HOUR SURVIVAL RATE<br>LIFE TEST:<br>TA = ROOM; Ehk=+200 Vdc;<br>Rg1 =1.0 MEG.                                                                 | ---         | ---                | ---  | ---  | ---              |
| 100 HOUR SURVIVAL RATE<br>LIFE TEST END POINTS:<br>(TYPICAL SAMPLE SIZE =<br>200 TUBES)                                                           | ---         | ---                | ---  | ---  | ---              |
| INOPERATIVES:<br>TRANSCONDUCTANCE (1):                                                                                                            | 0.65<br>1.0 | ---                | ---  | ---  | ---              |
| INTERMITTENT HIGH TEM-<br>PERATURE LIFE TESTS:<br>T BULB = 220° C; Ehk =+200<br>Vdc; Rg1 = 1.0 MEG.                                               | ---         | ---                | ---  | ---  | ---              |
|                                                                                                                                                   | ---         | ---                | ---  | ---  | ---              |

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## TUNG-SOL

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CHARACTERISTICS AND QUALITY CONTROL TESTS<sup>1</sup> - cont'd.

| TEST                                                                  | ALLOWABLE DEF.<br>PER CHARACTER. |                  | AQL<br>% | MIL-E-1<br>SYMBOL          | MIN. | MAX. | MIL-E-1<br>UNITS |
|-----------------------------------------------------------------------|----------------------------------|------------------|----------|----------------------------|------|------|------------------|
|                                                                       | 1st<br>SAMPLE                    | COMB.<br>SAMPLES |          |                            |      |      |                  |
| ACCEPTANCE LIFE<br>TEST - cont'd.                                     |                                  |                  |          |                            |      |      |                  |
| 500 HOUR INTERMITTENT<br>HIGH TEMPERATURE LIFE<br>TEST END POINTS:    |                                  |                  |          |                            |      |      |                  |
| (TYPICAL SAMPLE SIZE =<br>20 TUBES 1st SAMPLE<br>40 TUBES 2nd SAMPLE) |                                  |                  | ---      | ---                        | ---  | ---  | ---              |
| INOPERATIVES:                                                         | 1                                | 3                | ---      | ---                        | ---  | ---  | ---              |
| GRID CURRENT (1):                                                     | 1                                | 3                | ---      | I <sub>c</sub> (1):        | ---  | -0.5 | μAdc             |
| HEATER CURRENT:                                                       | 1                                | 3                | ---      | I <sub>f</sub> :           | 180  | 220  | mA               |
| CHANGE IN TRANSDUC-<br>TANCE (1) INDIVID-<br>UAL TUBES:               | 1                                | 3                | ---      | Δ <sub>t</sub> Sm(1):      | ---  | 20   | PERCENT          |
| TRANSDUCTANCE (2):<br>(NOTE 9)                                        | 2                                | 5                | ---      | Δ <sub>Et</sub> Sm(2):     | ---  | 15   | PERCENT          |
| HEATER-CATHODE<br>LEAKAGE:                                            |                                  |                  |          |                            |      |      |                  |
| E <sub>hk</sub> =+ 100 Vdc E <sub>hk</sub> =-100 Vdc                  | 2                                | 5                | ---      | I <sub>bk</sub> :          | ---  | 10   | μAdc             |
| INSULATION OF ELECTRODES:                                             |                                  |                  |          |                            |      |      |                  |
| g1-all                                                                | 2                                | 5                | ---      | R <sub>g1</sub> -all:      | 50   | ---  | MEG.             |
| p-all                                                                 | 2                                | 5                | ---      | R <sub>p</sub> -all:       | 50   | ---  | MEG.             |
| TRANSDUCTANCE (1):<br>AVERAGE CHANGE:                                 | ---                              | ---              | ---      | Avg. Δ <sub>t</sub> Sm(1): | ---  | 15   | PERCENT          |
| TOTAL DEFECTIVES:                                                     | 4                                | 8                | ---      | ---                        | ---  | ---  | ---              |
| 1000 HOUR INTERMITTENT<br>HIGH TEMPERATURE LIFE<br>TEST ENDPOINTS:    |                                  |                  |          |                            |      |      |                  |
| (TYPICAL SAMPLE SIZE =<br>20 TUBES 1st SAMPLE<br>40 TUBES 2nd SAMPLE) | ---                              | ---              | ---      | ---                        | ---  | ---  | ---              |
| INOPERATIVES:                                                         | 2                                | 5                | ---      | ---                        | ---  | ---  | ---              |
| GRID CURRENT (1):                                                     | 2                                | 5                | ---      | I <sub>c</sub> (1):        | ---  | -1.0 | μAdc             |
| HEATER CURRENT:                                                       | 2                                | 5                | ---      | I <sub>f</sub> :           | 177  | 223  | mA               |
| CHANGE IN TRANSDUC-<br>TANCE (1) OF IN-<br>DIVIDUAL TUBES:            | 2                                | 5                | ---      | Δ <sub>t</sub> Sm(1):      | ---  | 30   | PERCENT          |
| HEATER-CATHODE<br>LEAKAGE:                                            |                                  |                  |          |                            |      |      |                  |
| E <sub>hk</sub> =±100 Vdc                                             | 2                                | 5                | ---      | I <sub>bk</sub> :          | ---  | 15   | μAdc             |
| TOTAL DEFECTIVES                                                      | 5                                | 10               | ---      | ---                        | ---  | ---  | ---              |

## NOTES

NOTE 1: CHARACTERISTICS, QUALITY CONTROL TEST PROCEDURES, AND INSPECTION LEVELS ARE MADE ACCORDING TO THE APPROPRIATE PARAGRAPHS OF MIL-E-1 INSPECTION INSTRUCTIONS FOR ELECTRON TUBES<sup>2</sup> AND MIL-STD-105A.

NOTE 2: WITH A CYLINDRICAL SHIELD (0.405" I.D. - 1 7/8" LONG) CONNECTED TO LEAD 6.

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**TUNG-SOL**

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## NOTES - cont'd.

- NOTE 3: TEST CONDITIONS AND ACCEPTANCE CRITERIA PER SHOCK TEST PROCEDURES OF MIL-E-1 BASIC SPECIFICATION.
- NOTE 4: CENTRIFUGE TEST WITH FORCES IN ANY DIRECTION.
- NOTE 5: TEST CONDITIONS AND ACCEPTANCE CRITERIA PER FATIGUE TEST PROCEDURES OF MIL-E-1 BASIC SPECIFICATION.
- NOTE 6: THESE NORMAL VALUES REPRESENT CONDITIONS AT WHICH CONTROL OF RELIABILITY MAY BE EXPECTED.
- NOTE 7: THESE NORMAL TEST CONDITIONS ARE MADE FOR ALL CHARACTERISTIC TESTS UNLESS OTHERWISE STATED UNDER THE INDIVIDUAL TEST ITEM.
- NOTE 8: FOR MOST APPLICATIONS THE PERFORMANCE WILL NOT BE ADVERSELY AFFECTED BY  $\pm 10\%$  HEATER VOLTAGE VARIATION, BUT WHEN THE APPLICATION CAN PROVIDE A CLOSER CONTROL OF HEATER VOLTAGE, AN IMPROVEMENT IN RELIABILITY WILL BE REALIZED.
- NOTE 9: CHANGE OF TRANSCONDUCTANCE FOR INDIVIDUAL TUBES FROM THAT VALUE MEASURED AT  $E_f=6.3$  V TO THAT VALUE MEASURED AT  $E_f=5.7$  V.
- NOTE 10: OPERATION TIME IS THE TIME IN SECONDS REQUIRED FOR THE PLATE CURRENT TO ATTAIN A VALUE WITHIN PLUS OR MINUS 10 PERCENT OF THE THREE MINUTE PLATE CURRENT (1) VALUE USING A COLD TUBE. NO PREHEATING BEFORE THIS TEST WILL BE ALLOWED.
- NOTE 11: THE TUBES SHALL BE RIGIDLY MOUNTED ON A TABLE VIBRATING WITH SIMPLE HARMONIC MOTION. THE TUBES SHALL BE VIBRATED FOR A TOTAL OF 6 HOURS, 2 HOURS IN EACH OF THREE POSITIONS, X1, X2, AND Y1. ONLY RATED HEATER VOLTAGE SHALL BE APPLIED. TUBES WHICH SHOW ONE OR MORE OF THE FOLLOWING DEFECTS SHALL BE CONSIDERED FAILURES.
- (A) TUBES WHICH SHOW PERMANENT OR TAP SHORTS OR OPEN CIRCUITS FOLLOWING FATIGUE TEST, WHEN TESTED AS SPECIFIED IN 4.7.2 AND 4.7.3.
  - (B) TUBES WHICH DO NOT COMPLY WITH POST FATIGUE LIMITS. THIS IS A DESTRUCTIVE TEST.
- NOTE 12: THE PROVISIONS OF PARAGRAPH 4.9.20.5 OF SPECIFICATION MIL-E-1 SHALL APPLY, EXCEPT FOR TEST CONDITIONS LISTED FOR SHOCK TEST (2).

