Acceptance Test Data Sheets

For

Skyryse Flight OS LEMA TPX 325

|  |  |
| --- | --- |
| LEMA Assembly Part Number | Serial Number |
|  | 12 |

6.1. **Visual Examination of the Product**

UUT conforms to the requirements of paragraph 6.1 Unhandled Type: Void

6.2 **Weight**

UUT weight should not exceed 10 lbs actual weight Unhandled Type: Void lbs

**6.3 Bonding**

Bonding resistance

**<INSERT TABLE>**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Expected** | **Tolerance** | **Simplex** | **Duplex** |
|  | (mOhms) | (mOhms) | (mOhms) | (mOhms) |
| Motor End Cap is ≤ 2.5 milliOhm | 2.500000 mOhms | 0.500000 mOhms | 0.000000 mOhms |  |
| Solenoid housing  is ≤ 2.5 milliOhm | 2.500000 mOhms | 0.500000 mOhms | 0.000000 mOhms |  |
| Encoder cover  is ≤ 2.5 milliOhm | 2.500000 mOhms | 0.500000 mOhms | 0.000000 mOhms |  |

6.4 Resistance and Inductance Test (motor and solenoid)

**<INSERT TABLE>**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Expected** | **Tolerance** | **Connector J1** | **Connector J2** | **Connector J3** |
| Pins | Resistance (Ohms) | Resistance (Ohms) | Resistance (Ohms) | Resistance (Ohms) | Resistance (Ohms) |
| E to F is Ohms | 0.212000 mOhms | 0.021200 mOhms | 0.000000 mOhms | 0.000000 mOhms | 0.000000 mOhms |
| F to G Ohms | 0.212000 mOhms | 0.021200 mOhms | 0.000000 mOhms | 0.000000 mOhms | 0.000000 mOhms |
| G to E | 0.212000 mOhms | 0.021200 mOhms | 0.000000 mOhms | 0.000000 mOhms | 0.000000 mOhms |
| A to L | 6.550000 mOhms | 0.440000 mOhms | 0.000000 mOhms | 0.000000 mOhms | 0.000000 mOhms |
| G,F,E,A,L tied together to chassis grounds. Apply 500VDC | 5000000.000000 mOhms | 0.000000 mOhms | 0.000000 mOhms | 0.000000 mOhms | 0.000000 mOhms |

**<INSERT TABLE>**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Expected** | **Tolerance** | **Connector J1** | **Connector J2** | **Connector J3** |
|  |  |  | Inductance(mH) | Inductance(mH) | Inductance(mH) |
| E to F | 0.155000 mOhms | 0.023250 mOhms | 0.000000 mH | 0.000000 mH | 0.000000 mH |
| F to | 0.155000 mOhms | 0.023250 mOhms | 0.000000 mH | 0.000000 mH | 0.000000 mH |
| G to E | 0.155000 mOhms | 0.023250 mOhms | 0.000000 mH | 0.000000 mH | 0.000000 mH |
| A to L | 22.000000 mOhms | 3.300000 mOhms | 0.000000 mH | 0.000000 mH | 0.000000 mH |

6.5 **Power ON UUT Checks**

Confirm all sensors are reporting nominal values and no faults reported

|  |  |  |
| --- | --- | --- |
| Sensor | Value | Pass/Fail |
| Motor 1 | -0.0001 | Pass |
| Motor 2 | -0.0054 | Pass |
| Motor 3 | 0.0003 | Pass |
| M1 | -429 | Failed |
| M2 | -703 | Failed |
| M3 | -745 | Failed |
| Faults 1 | 0 | Failed |
| Faults 2 | 0 | Failed |
| Faults 3 | 0 | Failed |

6.6 Configure ETC???

6.7 **Functional Check Out**

6.7.1 **MCE1, MCE 2, MCE3 Power Up**

Final?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Description | Ballnut position | Actual Amps | Pass/Fail | |
| MCE 1 reports values for Ballnut position and motor current | -0.0001 | Unhandled Type: Void | Position | Current |
| Pass | Unhandled Type: Void |
| (Simulated) FCC/reports values for M1(QPS) | -429 | Unhandled Type: Void | Failed | Unhandled Type: Void |
| MCE 2 reports values for Ballnut position and motor current | 0 | Unhandled Type: Void | Pass | Unhandled Type: Void |
| (Simulated) FCC/reports values for M2(QPS) | -703 | Unhandled Type: Void | Failed | Unhandled Type: Void |
| MCE 3 reports values for Ballnut position and motor current | -0.001 | Unhandled Type: Void | Pass | Unhandled Type: Void |
| (Simulated) FCC/reports values for M3(QPS) | -745 | Unhandled Type: Void | Failed | Unhandled Type: Void |

6.7.2 **N1 and N2 Extend Mechanical Stops**

**Step 6.7.2.1** **Extend using M1/N1**

|  |  |  |
| --- | --- | --- |
| Description | Value | Pass/Fail |
| N1 extend stop engaged (M1 current saturated) | 0 | Failed |
| MCE 1 Motor Current | 6.0063 Amps | Failed |

**Step 6.7.2.2** **Extend using M2/N2**

|  |  |  |
| --- | --- | --- |
| Description | Value | Pass/Fail |
| N2 extend stop engaged (M2 current saturated) | 0 | Failed |
| MCE2 Motor Current | 6.0063 Amps | Failed |

**Step 6.7.2.3** **Test rig Truth Encoder Position**

|  |  |  |
| --- | --- | --- |
| Description | Actual Ins | Pass/Fail |
| Test Rig Truth Encoder Position | <POSITION> | <RESULTS> |
|  |  |  |

**6.7.2.1.1 N1/N2 Rigging combined with extend**

**Step b**

|  |  |  |
| --- | --- | --- |
| **Description** | **MCE1** | **MCE2** |
| Desired State a | <COMMAND> | <COMMAND> |
| Actual State a | 2 | 2 |
| State a Pass/Fail | Failed | Failed |
| Fault a | 1024 | 1024 |
| Fault a Pass/Fail | Pass | Pass |
| Desired State a | <COMMAND> | <COMMAND> |
| Actual State b | 42 | 2 |
| State b Pass/Fail | Failed | Pass |
| Fault b | 1024 | 0 |
| Fault b Pass/Fail | Pass | Pass |
| Desired State c | <COMMAND> | <COMMAND> |
| Actual State c | 2 | Unhandled Type: Void |
| State c Pass/Fail | Failed | Unhandled Type: Void |
| Fault c | 0 | Unhandled Type: Void |
| Fault c Pass/Fail | Pass | Unhandled Type: Void |

6.7.4 **N1 and N2 Retract Mechanical Stops 6.7.4?**

**Step a Retract using M1/N1**

|  |  |  |
| --- | --- | --- |
| Description | Actual  Amps | Pass/Fail |
| N1 retract stop engaged (M1 current saturated, Motor 1 primary and M1 secondary feedbacks stop changing) | 3.3636 | Pass |
| MCE 1 Motor Current | 6.0063 | Failed |

**Step a** **Retract using M2/N2**

|  |  |  |
| --- | --- | --- |
| Description | Actual  Amps | Pass/Fail |
| N2 retract stop engaged (M2 current saturated, Motor 2 primary and M2 secondary feedbacks stop changing) | 3.2881 | Pass |
| MCE2 Motor Current | 6.004 | Failed |

**Step a** **Test rig Truth Encoder Position**

|  |  |  |
| --- | --- | --- |
| Description | Actual Ins | Pass/Fail |
| Test Rig Truth Encoder Position when N1and N2 are at the retract stop | <INCHES> | <RESULTS> |

**Step a** **Actuator length with external load**

|  |  |  |
| --- | --- | --- |
| Load, lbf | Actuator Length, ins | Pass/Fail |
|  |  |  |

**Step d** **Absolute feedback**

|  |  |  |
| --- | --- | --- |
| Description | Position | Pass/Fail |
| Motor1 position + Motor 2 position = test rig encoder | <INCHES> | <RESULTS> |
| Motor1 position + Motor 3 position = test rig encoder | <INCHES> | <RESULTS> |
| M1 position + M2 position = test rig encoder | <INCHES> | <RESULTS> |
| M1 position + M3 position = test rig encoder | <INCHES> | <RESULTS> |
| Difference between Motor 2 position and Motor 3 position is < TBD ins | <INCHES> | <RESULTS> |
| Difference between M2 position and M3 position is < TBD ins | <INCHES> | <RESULTS> |
| Difference between Motor 1 position and M1 position is < TBD ins | <INCHES> | <RESULTS> |
| Difference between Motor 2 position and M2 position is < TBD ins | <INCHES> | <RESULTS> |
| Difference between Motor 3 position and M3 position is < TBD ins | <INCHES> | <RESULTS> |

6.7.3 **N1 and N2 Stroke Check**

**Step c** - **Extend using M1/N1**

|  |  |  |
| --- | --- | --- |
| Description | Value | Pass/Fail |
| N1 extend stop engaged (M1 current saturated, Motor 1 and M1 positions stop changing) | Unhandled Type: Void | Unhandled Type: Void |
| MCE1 Motor Current prior to contacting the stops | Unhandled Type: Void | Unhandled Type: Void |
| N1 velocity linear and constant within 0.2 ± TBD ins/sec | Unhandled Type: Void | Unhandled Type: Void |
| Delta between Motor 1 and M1 is < TBD ins | Unhandled Type: Void | Unhandled Type: Void |
| Motor 1 and M1 are smooth throughout the stroke | Unhandled Type: Void | Unhandled Type: Void |

**Step f** - **Extend using M2/N2**

|  |  |  |
| --- | --- | --- |
| Description | Actual Amps | Pass/Fail |
| N2 extend stop engaged (M2 current saturated, Motor 2 and M2 positions stop changing) | Unhandled Type: Void | Unhandled Type: Void |
| MCE2 Motor Current prior to contacting the stops | Unhandled Type: Void | Unhandled Type: Void |
| N2 velocity linear and constant within 0.2 ± TBD ins/sec | Unhandled Type: Void | Unhandled Type: Void |
| Delta between Motor 2 and M2 is < TBD ins | Unhandled Type: Void | Unhandled Type: Void |
| Motor 2 and M2 are smooth throughout the stroke | Unhandled Type: Void | Unhandled Type: Void |

**Step g** **Absolute feedback**

|  |  |  |
| --- | --- | --- |
| Description | Position | Pass/Fail |
| Motor1 position + Motor 2 position = test rig encoder | Unhandled Type: Void | Unhandled Type: Void |
| Motor1 position + Motor 3 position = test rig encoder | Unhandled Type: Void | Unhandled Type: Void |
| M1 position + M2 position = test rig encoder | Unhandled Type: Void | Unhandled Type: Void |
| M1 position + M3 position = test rig encoder | Unhandled Type: Void | Unhandled Type: Void |
| Difference between Motor 2 position and Motor 3 position is < TBD ins | Unhandled Type: Void | <RESULTS> |
| Difference between M2 position and M3 position is < TBD ins | Unhandled Type: Void | Unhandled Type: Void |
| Difference between Motor 1 position and M1 position is < TBD ins | Unhandled Type: Void | Unhandled Type: Void |
| Difference between Motor 2 position and M2 position is < TBD ins | Unhandled Type: Void | Unhandled Type: Void |
| Difference between Motor 3 position and M3 position is < TBD ins | Unhandled Type: Void | Unhandled Type: Void |

**Step h** – **Retract using M1/N1**

|  |  |  |
| --- | --- | --- |
| Description | Actual Amps | Pass/Fail |
| N1 retract stop engaged (M1 current saturated, Motor 1 and M1 positions stop changing) | Unhandled Type: Void | Unhandled Type: Void |
| MCE1 Motor Current prior to contacting the stops | Unhandled Type: Void | Unhandled Type: Void |
| N1 velocity linear and constant within 0.2 ± TBD ins/sec | Unhandled Type: Void | Unhandled Type: Void |
| Delta between Motor 1 and M1 is < TBD ins | Unhandled Type: Void | Unhandled Type: Void |
| Motor 1 and M1 are smooth throughout the stroke | Unhandled Type: Void | Unhandled Type: Void |

**Step j** – **Retract using M2/N2**

|  |  |  |
| --- | --- | --- |
| Description | Actual Amps | Pass/Fail |
| N2 retract stop engaged (M2 current saturated, Motor 2 and M2 positions stop changing) | Unhandled Type: Void | Unhandled Type: Void |
| MCE2 Motor Current prior to contacting the stops | Unhandled Type: Void | Unhandled Type: Void |
| N1 velocity linear and constant within 0.2 ± TBD ins/sec | Unhandled Type: Void | Unhandled Type: Void |
| Delta between Motor 2 and M2 is < TBD ins | Unhandled Type: Void | Unhandled Type: Void |
| Motor 2 and M2 are smooth throughout the stroke | Unhandled Type: Void | Unhandled Type: Void |

**Step n** – **Extend using M3/N2**

|  |  |  |
| --- | --- | --- |
| Description | Actual Amps | Pass/Fail |
| N2 extend stop engaged (M3 current saturated, Motor 3 and M3 positions stop changing) |  | Yes No |
| MCE3 Motor Current prior to contacting the stops |  |  |
| N2 velocity linear and constant within 0.2 ± TBD ins/sec |  |  |
| Delta between Motor 3 and M3 is < TBD ins |  |  |
| Motor 3 and M3 are smooth throughout the stroke |  |  |

**Step o**– **Retract using M3/N2**

|  |  |  |
| --- | --- | --- |
| Description | Actual Amps | Pass/Fail |
| N2 retract stop engaged (M3 current saturated, Motor 3 and M3 positions stop changing) |  | Yes No |
| MCE3 Motor Current prior to contacting the stops |  |  |
| N2 velocity linear and constant within 0.2 ± TBD ins/sec |  |  |
| Delta between Motor 3 and M3 is < TBD ins |  |  |
| Motor 3 and M3 are smooth throughout the stroke |  |  |

**6.7.6 Brake Release Test**

**Step d –** LEMA reaches commanded position

|  |  |  |
| --- | --- | --- |
| Description | Position | Pass/Fail |
| MCE1 /Motor 1 +/- TDB inches | <RESULTS> | <RESULTS> |
| MCE2 /Motor 2 | <RESULTS> | <RESULTS> |

**6.7.7 Performance Test – unloaded operation (one channel operation)**

**6.7.7.1.1 MCE 1 - Step Response Test**

**The result for motor one is shown below:**

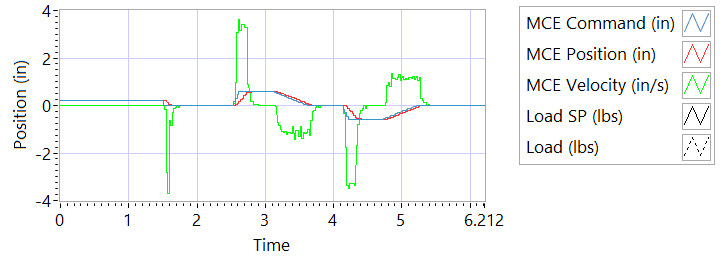
****

Figure - Results for Motor One

**IMAGE**

**Step d Extension**

|  |  |  |
| --- | --- | --- |
| Description | Actual Speed / Time | Pass/Fail |
| No Load speed is 2.7 to 3.3 in/sec | 2.8696 | True |
| Time to achieve 80% of the specified stroke (+ 0.575 ins) is 170+9/-9 ms seconds | 192 | Unhandled Type: Void |

**Step e Retraction**

|  |  |  |
| --- | --- | --- |
| Description | Actual Speed / Time | Pass/Fail |
| No Load speed is 2.7 to 3.3 in/sec | -0.0063 | Failed |
| Time to achieve 80% of the specified stroke (- 0.575 ins) is 170+9/-9 ms seconds | 705 | Failed |

**6.7.7.1.2 MCE 1 - Frequency Response**

**Step d**

**<INSERT TABLE>**

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency** | **Phase** | **Max phase** | **Pass/Fail** |
| 0.10 HZ | 176.440643 | -5.000000 |  |
| 0.50 HZ | -173.071304 | -10.000000 |  |
| 1.00 HZ | 130.698273 | -20.000000 |  |
| 2.00 HZ | 14.450401 | -30.000000 |  |
| 3.00 HZ | 93.690933 | -50.000000 |  |
| 4.00 HZ | -116.529999 | -60.000000 |  |
| 5.00 HZ | -177.369553 | -70.000000 |  |

6.7.7.2.1 **MCE 2 - Step Response Test**

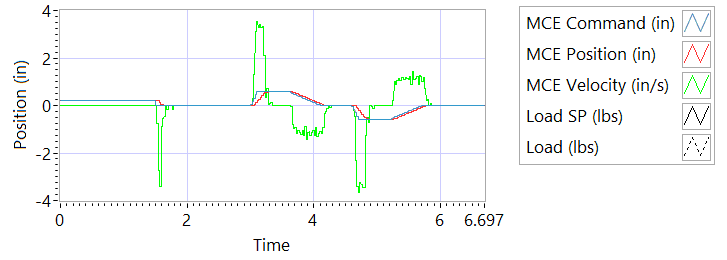
****

Figure - Results for Motor Two

**IMAGE**

**Step d Extension**

|  |  |  |
| --- | --- | --- |
| Description | Actual Speed / Time | Pass/Fail |
| No Load speed is 2.7 to 3.3 in/sec | 2.9501 | True |
| Time to achieve 80% of the specified stroke (+ 0.575 ins) is 170+9/-9 ms seconds | 198 | Failed |

**Step e Retraction**

|  |  |  |
| --- | --- | --- |
| Description | Actual Speed / Time | Pass/Fail |
| No Load speed is 2.7 to 3.3 in/sec | -0.0078 | Failed |
| Time to achieve 80% of the specified stroke (- 0.575 ins) is 170+9/-9 ms seconds | 703 | Failed |

6.7.7.2.2 **MCE 2 - Frequency Response Test**

**Step d**

**<INSERT TABLE>**

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency** | **Phase** | **Max phase** | **Pass/Fail** |
| 0.10 HZ | 177.858948 | -5.000000 |  |
| 0.50 HZ | -172.122192 | -10.000000 |  |
| 1.00 HZ | 132.562256 | -20.000000 |  |
| 2.00 HZ | 13.220928 | -30.000000 |  |
| 3.00 HZ | -93.949722 | -50.000000 |  |
| 4.00 HZ | 98.483665 | -60.000000 |  |
| 5.00 HZ | -88.644630 | -70.000000 |  |

6.7.7.3.1 **MCE 3 – Step Response Test**

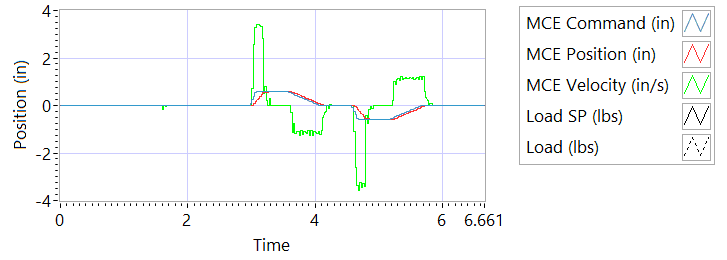
****

Figure - Results for Motor Three

**IMAGE**

**Step d Extension**

|  |  |  |
| --- | --- | --- |
| Description | Actual Speed / Time | Pass/Fail |
| No Load speed is 2.7 to 3.3 in/sec | 3.078 | True |
| Time to achieve 80% of the specified stroke (+ 0.575 ins) is 170+9/-9 ms seconds | 178 | True |

**Step e Retraction**

|  |  |  |
| --- | --- | --- |
| Description | Actual Speed / Time | Pass/Fail |
| No Load speed is 2.7 to 3.3 in/sec | -0.0025 | Failed |
| Time to achieve 80% of the specified stroke (+ 0.575 ins) is 170+9/-9 ms seconds | 705 | RESULTS |

6.7.7.3.2 **MCE 3 Frequency Response Test**

**Step d**

**<INSERT TABLE>**

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency** | **Phase** | **Max phase** | **Pass/Fail** |
| 0.10 HZ | 177.920135 | -5.000000 |  |
| 0.50 HZ | -172.143097 | -10.000000 |  |
| 1.00 HZ | 137.104187 | -20.000000 |  |
| 2.00 HZ | -7.179764 | -30.000000 |  |
| 3.00 HZ | 81.488029 | -50.000000 |  |
| 4.00 HZ | -62.024323 | -60.000000 |  |
| 5.00 HZ | -40.388447 | -70.000000 |  |

6.7.8 **Performance Test – Loaded Operation**

6.7.8.1 **Step and Frequency Response Test - Loaded**

6.7.8.1.1 **MCE1 – Step Response Test**

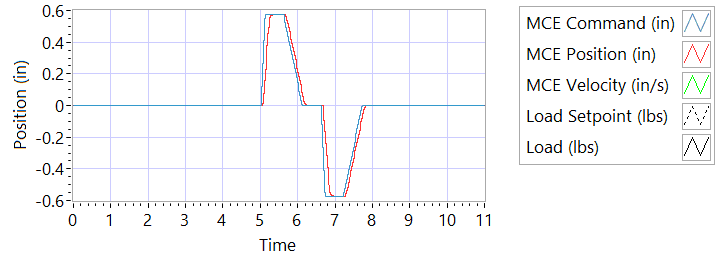


Figure - Results for Motor One Loaded

<IMAGE.STEP.RESPONSE.TEST>

**Step j – 225 lbf tension**

|  |  |  |
| --- | --- | --- |
| Description | Actual Speed | Pass/Fail |
| speed between 2.07 and 2.53 in/sec | 3.2955 | True |
| Time to achieve 80% of the specified stroke (+ 0.575 ins) is 170 +9/-9 ms | 178 | True |

**Step k – 225 lbf tension**

|  |  |  |
| --- | --- | --- |
| Description | Actual Speed | Pass/Fail |
| speed between 2.07 and 2.53 in/sec | -0.0019 | Failed |
| Time to achieve 80% of the specified stroke (- 0.575 ins) is 170 +9/-9 ms | 705 | Failed |

**Step n – 225 lbf compression**

|  |  |  |
| --- | --- | --- |
| Description | Actual Speed | Pass/Fail |
| speed between 2.07 and 2.53 in/sec | 3.0499 | True |
| Time to achieve 80% of the specified stroke (+ 0.575 ins) is 170 +9/-9 ms | 185 | Failed |

**Step o – 225 lbf compression**

|  |  |  |
| --- | --- | --- |
| Description | Actual Speed | Pass/Fail |
| speed between 2.07 and 2.53 in/sec | -0.0032 | Failed |
| Time to achieve 80% of the specified stroke (- 0.575 ins) is 170 +9/-9 ms | 708 | Failed |

6.7.8.1.2 **MCE 1 – Frequency Response Test**

**Step d – 225 lbf Tension**

**<INSERT TABLE>**

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency** | **Phase** | **Max phase** | **Pass/Fail** |
| 0.10 HZ | 178.075897 | -5.000000 |  |
| 0.50 HZ | -166.239670 | -10.000000 |  |
| 1.00 HZ | 136.942215 | -20.000000 |  |
| 2.00 HZ | 119.505028 | -30.000000 |  |
| 3.00 HZ | 97.569443 | -50.000000 |  |
| 4.00 HZ | -93.253853 | -60.000000 |  |
| 5.00 HZ | -69.182701 | -70.000000 |  |

**Step h – 225 lbf Compression**

**<INSERT TABLE>**

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency** | **Phase** | **Max phase** | **Pass/Fail** |
| 0.10 HZ | 170.970459 | -5.000000 |  |
| 0.50 HZ | -159.565018 | -10.000000 |  |
| 1.00 HZ | 125.939346 | -20.000000 |  |
| 2.00 HZ | 104.170769 | -30.000000 |  |
| 3.00 HZ | 83.678444 | -50.000000 |  |
| 4.00 HZ | -111.367210 | -60.000000 |  |
| 5.00 HZ | -153.585632 | -70.000000 |  |

6.7.8.1.3 **MCE 2 – Step Response Test**

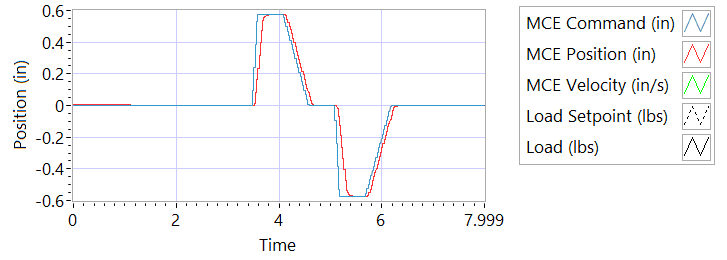


Figure - Results for Motor Two Loaded

<IMAGE.STEP.RESPONSE.TEST\_1>

**Step j – 225 lbf tension**

|  |  |  |
| --- | --- | --- |
| Description | Actual Speed | Pass/Fail |
| speed between 2.07 and 2.53 in/sec | 3.1798 | True |
| Time to achieve 80% of the specified stroke (+ 0.575 ins) is 170 +9/-9 ms | 197 | Failed |

**Step k – 225 lbf tension**

|  |  |  |
| --- | --- | --- |
| Description | Actual Speed | Pass/Fail |
| speed between 2.07 and 2.53 in/sec | -0.0058 | Failed |
| Time to achieve 80% of the specified stroke (- 0.575 ins) is 170 +9/-9 ms | 698 | Failed |

**Step n – 225 lbf compression**

|  |  |  |
| --- | --- | --- |
| Description | Actual Speed | Pass/Fail |
| speed between 2.07 and 2.53 in/sec | 2.938 | True |
| Time to achieve 80% of the specified stroke (+ 0.575 ins) is 170 +9/-9 ms | 204 | Failed |

**Step o – 225 lbf compression**

|  |  |  |
| --- | --- | --- |
| Description | Actual Speed | Pass/Fail |
| speed between 2.07 and 2.53 in/sec | -0.0019 | Failed |
| Time to achieve 80% of the specified stroke (- 0.575 ins) is 170 +9/-9 ms | 681 | Failed |

6.7.8.1.4 **MCE 2 – Frequency response Test**

**Step d – 225 lbf Tension**

**<INSERT TABLE>**

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency** | **Phase** | **Max phase** | **Pass/Fail** |
| 0.10 HZ | 178.028412 | -5.000000 |  |
| 0.50 HZ | -165.848190 | -10.000000 |  |
| 1.00 HZ | 136.814911 | -20.000000 |  |
| 2.00 HZ | 112.700203 | -30.000000 |  |
| 3.00 HZ | -56.343254 | -50.000000 |  |
| 4.00 HZ | -31.765507 | -60.000000 |  |
| 5.00 HZ | -60.180992 | -70.000000 |  |

**Step h – 225 lbf Compression**

**<INSERT TABLE>**

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency** | **Phase** | **Max phase** | **Pass/Fail** |
| 0.10 HZ | 168.893265 | -5.000000 |  |
| 0.50 HZ | -176.855682 | -10.000000 |  |
| 1.00 HZ | 132.686539 | -20.000000 |  |
| 2.00 HZ | 107.795540 | -30.000000 |  |
| 3.00 HZ | 67.269386 | -50.000000 |  |
| 4.00 HZ | -22.984324 | -60.000000 |  |
| 5.00 HZ | -152.875870 | -70.000000 |  |

6.7.8.1.5 **MCE 3 – Step Response Test**

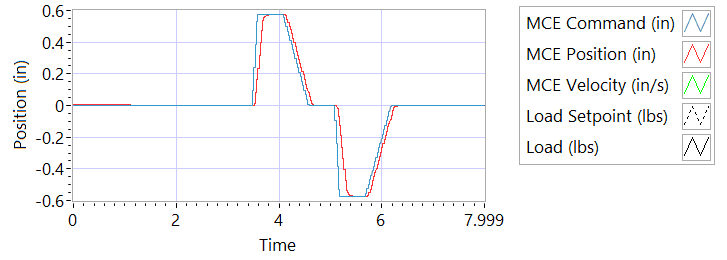


Figure - Results for Motor Three

<IMAGE.STEP.RESPONSE.TEST>

**Step j – 225 lbf tension**

|  |  |  |
| --- | --- | --- |
| Description | Actual Speed | Pass/Fail |
| speed between 2.07 and 2.53 in/sec | 3.2019 | True |
| Time to achieve 80% of the specified stroke (+ 0.575 ins) is 170 +9/-9 ms | 174 | True |

**Step k – 225 lbf tension**

|  |  |  |
| --- | --- | --- |
| Description | Actual Speed | Pass/Fail |
| speed between 2.07 and 2.53 in/sec | -0.009 | Failed |
| Time to achieve 80% of the specified stroke (- 0.575 ins) is 170 +9/-9 ms | 728 | Failed |

**Step n – 225 lbf compression**

|  |  |  |
| --- | --- | --- |
| Description | Actual Speed | Pass/Fail |
| speed between 2.07 and 2.53 in/sec | 2.799 | True |
| Time to achieve 80% of the specified stroke (+ 0.575 ins) is 170 +9/-9 ms | 218 | Failed |

**Step o – 225 lbf compression**

|  |  |  |
| --- | --- | --- |
| Description | Actual Speed | Pass/Fail |
| speed between 2.07 and 2.53 in/sec | -0.0034 | Failed |
| Time to achieve 80% of the specified stroke (- 0.575 ins) is 170 +9/-9 ms | 704 | Failed |

6.7.8.1.6 **MCE 3 – Frequency Response Test**

**Step d – 225 lbf Tension**

**<INSERT TABLE>**

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency** | **Phase** | **Max phase** | **Pass/Fail** |
| 0.10 HZ | 177.922195 | -5.000000 |  |
| 0.50 HZ | -165.641113 | -10.000000 |  |
| 1.00 HZ | 140.227478 | -20.000000 |  |
| 2.00 HZ | 103.939972 | -30.000000 |  |
| 3.00 HZ | 91.721733 | -50.000000 |  |
| 4.00 HZ | -103.205170 | -60.000000 |  |
| 5.00 HZ | -48.668022 | -70.000000 |  |

**Step h – 225 lbf Compression**

**<INSERT TABLE>**

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency** | **Phase** | **Max phase** | **Pass/Fail** |
| 0.10 HZ | 168.886536 | -5.000000 |  |
| 0.50 HZ | -175.806808 | -10.000000 |  |
| 1.00 HZ | 133.606522 | -20.000000 |  |
| 2.00 HZ | 103.457962 | -30.000000 |  |
| 3.00 HZ | 106.158707 | -50.000000 |  |
| 4.00 HZ | -104.091148 | -60.000000 |  |
| 5.00 HZ | -110.248596 | -70.000000 |  |

**6.7.9 Holding Load Test**

6.7.9.1 Brake OFF, LEMA Output Locked

|  |  |  |  |
| --- | --- | --- | --- |
| MCE | Output force, lbf | Output force, Pass/Fail | Position feedback signals (all sensors) Pass/Fail |
| MCE 1, 6.7.8.1.1 step i – extend 0.2 in | FORCE | RESULTS | RESULTS |
| MCE 1, 6.7.8.1.1 step k - retract 0.2 in | FORCE | RESULTS | RESULTS |
| MCE 2, m step i – extend 0.2 in | FORCE | RESULTS | RESULTS |
| MCE 2, m step k - retract 0.2 in | FORCE | RESULTS | RESULTS |
| MCE 3 m step i – extend 0.2 in | FORCE | RESULTS | RESULTS |
| MCE 3 m step k - retract 0.2 in | FORCE | RESULTS | RESULTS |

**6.7.9.2 Brake ON, LEMA Output Free**

|  |  |  |
| --- | --- | --- |
| MCE | 12.6 Amps for 3-5 sec | Position feedback signals (all sensors) |
| MCE 1, 6.7.8.2.1 step I – extend 0.2 in | RESULTS | RESULTS |
| MCE 1, 6.7.8.2.1 step k - retract 0.2 in | RESULTS | RESULTS |
| MCE 2, 6.7.8.2.2 6.7.8.2.3 step i – extend 0.2 in | RESULTS | RESULTS |
| MCE 2, m step k - retract 0.2 in | RESULTS | RESULTS |
| MCE 3 m step i– extend 0.2 in | RESULTS | RESULTS |
| MCE 3 m step k - retract 0.2 in | RESULTS | RESULTS |

**6.7.9.3 Brake Release test**

**Step d –** LEMA reaches commanded position

|  |  |
| --- | --- |
|  | Pass/Fail |
| MCE1 /Motor 1 | RESULTS |
| MCE2 /Motor 2 | RESULTS |

6.7.10 **Backlash**

6.7.10.1 **Simplex Brake 1 – ON; Duplex brake 2 – OFF**

|  |  |  |
| --- | --- | --- |
| Load (lbf) | Backlash (ins) | Pass/Fail |
| Step e +/- 100 lbf (motor 2 and motor 3 ZERO position) | INCHES | RESULTS |
| Step h, Total backlash | INCHES | RESULTS |
| Step f 322 lbf tension followed by 322 lbf compression | INCHES | RESULTS |
| All channels feedback signals (Motor 1, Motor 2, Motor 3, M1, M2 and M3 remain within allowable limits | INCHES | RESULTS |

6.7.10.2 **Simplex Brake 1 – OFF; Duplex Brake 2 – ON**

|  |  |  |
| --- | --- | --- |
| Load (lbf) | Backlash (ins) | Pass/Fail |
| Step e +/- 100 lbf (motor 1 holding ZERO position) | INCHES | RESULTS |
| Step h, Total backlash | INCHES | RESULTS |
| Step f, 322 lbf tension followed by 322 lbf compression | INCHES | RESULTS |
| All channels feedback signals (Motor 1, Motor 2, Motor 3, M1, M2 and M3 remain within allowable limits | INCHES | RESULTS |

6.7.10.3 **Both Brakes OFF**

|  |  |  |
| --- | --- | --- |
| Load (lbf) | Backlash (ins) | Pass/Fail |
| Step e +/- 100 lbf (both motors holding ZERO position) | INCHES | RESULTS |
| Step h, Total backlash | INCHES | RESULTS |
| Step f 322 lbf tension followed by 322 lbf compression | INCHES | RESULTS |
| All channels feedback signals (Motor 1, Motor 2, Motor 3, M1, M2 and M3 remain within allowable limits | INCHES | RESULTS |