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 |  |  |  |  |
| Solenoid housing  is ≤ 2.5 milliOhm |  |  |  |  |
| Encoder cover  is ≤ 2.5 milliOhm |  |  |  |  |

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 |  |  |  |  |  |
| F to G Ohms |  |  |  |  |  |
| G to E |  |  |  |  |  |
| A to L |  |  |  |  |  |
| G,F,E,A,L tied together to chassis grounds. Apply 500VDC |  |  |  |  |  |

**<INSERT TABLE>**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Expected** | **Tolerance** | **Connector J1** | **Connector J2** | **Connector J3** |
|  |  |  | Inductance(mH) | Inductance(mH) | Inductance(mH) |
| E to F |  |  |  |  |  |
| F to |  |  |  |  |  |
| G to E |  |  |  |  |  |
| A to L |  |  |  |  |  |

6.5 **Power ON UUT Checks**

Confirm all sensors are reporting nominal values and no faults reported

|  |  |  |
| --- | --- | --- |
| Sensor | Value | Pass/Fail |
| Motor 1 | VALUE | RESULTS |
| Motor 2 | VALUE | RESULTS |
| Motor 3 | VALUE | RESULTS |
| M1 | VALUE | RESULTS |
| M2 | VALUE | RESULTS |
| M3 | VALUE | RESULTS |
| Faults 1 | VALUE | RESULTS |
| Faults 2 | VALUE | RESULTS |
| Faults 3 | VALUE | RESULTS |

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 | POSITION | VALUE | Position | Current |
| RESULTS | VALUE |
| (Simulated) FCC/reports values for M1(QPS) | POSITION | VALUE | RESULTS | VALUE |
| MCE 2 reports values for Ballnut position and motor current | POSITION | VALUE | RESULTS | VALUE |
| (Simulated) FCC/reports values for M2(QPS) | POSITION | VALUE | RESULTS | VALUE |
| MCE 3 reports values for Ballnut position and motor current | POSITION | VALUE | RESULTS | VALUE |
| (Simulated) FCC/reports values for M3(QPS) | POSITION | VALUE | RESULTS | VALUE |

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) | <CODE> | <RESULTS> |
| MCE 1 Motor Current | <AMPS> Amps | <RESULTS> |

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

|  |  |  |
| --- | --- | --- |
| Description | Value | Pass/Fail |
| N2 extend stop engaged (M2 current saturated) | <CODE> | <RESULTS> |
| MCE2 Motor Current | <AMPS> Amps | <RESULTS> |

**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**

Table

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | **MCE1** | **MCE2** | **MCE3** |
| Desired State a | <COMMAND> | <COMMAND> | <COMMAND> |
| Actual State a | <STATE> | <STATE> | <STATE> |
| State a Pass/Fail | <RESULTS> | <RESULTS> | <RESULTS> |
| Fault a | <FAULT> | <FAULT> | <FAULT> |
| Fault a Pass/Fail | <RESULTS> | <RESULTS> | <RESULTS> |
| Desired State a | <COMMAND> | <COMMAND> | <COMMAND> |
| Actual State b | <STATE> | <STATE> | <STATE> |
| State b Pass/Fail | <RESULTS> | <RESULTS> | <RESULTS> |
| Fault b | <FAULT> | <FAULT> | <FAULT> |
| Fault b Pass/Fail | <RESULTS> | <RESULTS> | <RESULTS> |
| Desired State c | <COMMAND> | <COMMAND> | <COMMAND> |
| Actual State c | <STATE> | <STATE> | <STATE> |
| State c Pass/Fail | <RESULTS> | <RESULTS> | <RESULTS> |
| Fault c | <FAULT> | <FAULT> | <FAULT> |
| Fault c Pass/Fail | <RESULTS> | <RESULTS> | <RESULTS> |

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) | <AMPS> | <RESULTS> |
| MCE 1 Motor Current | <AMPS> | <AMPS> |

**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) | <AMPS> | <RESULTS> |
| MCE2 Motor Current | <AMPS> | <AMPS> |

**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) | <AMPS> | <RESULTS> |
| MCE1 Motor Current prior to contacting the stops | <AMPS> | <RESULTS> |
| N1 velocity linear and constant within 0.2 ± TBD ins/sec | <SPEED> | <RESULTS> |
| Delta between Motor 1 and M1 is < TBD ins | <INCHES> | <RESULTS> |
| Motor 1 and M1 are smooth throughout the stroke | <SMOOTH> | <RESULTS> |

**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) | <AMPS> | <RESULTS> |
| MCE2 Motor Current prior to contacting the stops | <AMPS> | <RESULTS> |
| N2 velocity linear and constant within 0.2 ± TBD ins/sec | <SPEED> | <RESULTS> |
| Delta between Motor 2 and M2 is < TBD ins | <INCHES> | <RESULTS> |
| Motor 2 and M2 are smooth throughout the stroke | <SMOOTH> | <RESULTS> |

**Step g** **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> |

**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) | <AMPS> | <RESULTS> |
| MCE1 Motor Current prior to contacting the stops | <AMPS> | <RESULTS> |
| N1 velocity linear and constant within 0.2 ± TBD ins/sec | <SPEED> | <RESULTS> |
| Delta between Motor 1 and M1 is < TBD ins | <INCHES> | <RESULTS> |
| Motor 1 and M1 are smooth throughout the stroke | <SMOOTH> | <RESULTS> |

**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) | <AMPS> | <RESULTS> |
| MCE2 Motor Current prior to contacting the stops | <AMPS> | <RESULTS> |
| N1 velocity linear and constant within 0.2 ± TBD ins/sec | <SPEED> | <RESULTS> |
| Delta between Motor 2 and M2 is < TBD ins | <INCHES> | <RESULTS> |
| Motor 2 and M2 are smooth throughout the stroke | <SMOOTH> | <RESULTS> |

**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:**

**IMAGE**

**Step d Extension**

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

**Step e Retraction**

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

**6.7.7.1.2 MCE 1 - Frequency Response**

**Step d**

**<INSERT TABLE>**

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency** | **Phase** | **Max phase** | **Pass/Fail** |
| 0.1 Hz |  |  |  |
| 0.5 Hz |  |  |  |
| 1 Hz |  |  |  |
| 2 Hz |  |  |  |
| 3 Hz |  |  |  |
| 4 Hz |  |  |  |
| 5 Hz |  |  |  |

6.7.7.2.1 **MCE 2 - Step Response Test**

**IMAGE**

**Step d Extension**

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

**Step e Retraction**

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

6.7.7.2.2 **MCE 2 - Frequency Response Test**

**Step d**

**<INSERT TABLE>**

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency** | **Phase** | **Max phase** | **Pass/Fail** |
| 0.1 Hz |  |  |  |
| 0.5 Hz |  |  |  |
| 1 Hz |  |  |  |
| 2 Hz |  |  |  |
| 3 Hz |  |  |  |
| 4 Hz |  |  |  |
| 5 Hz |  |  |  |

6.7.7.3.1 **MCE 3 – Step Response Test**

**IMAGE**

**Step d Extension**

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

**Step e Retraction**

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

6.7.7.3.2 **MCE 3 Frequency Response Test**

**Step d**

**<INSERT TABLE>**

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency** | **Phase** | **Max phase** | **Pass/Fail** |
| 0.1 Hz |  |  |  |
| 0.5 Hz |  |  |  |
| 1 Hz |  |  |  |
| 2 Hz |  |  |  |
| 3 Hz |  |  |  |
| 4 Hz |  |  |  |
| 5 Hz |  |  |  |

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**

<IMAGE.STEP.RESPONSE.TEST>

**Step j – 225 lbf tension**

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

**Step k – 225 lbf tension**

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

**Step n – 225 lbf compression**

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

**Step o – 225 lbf compression**

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

6.7.8.1.2 **MCE 1 – Frequency Response Test**

**Step d – 225 lbf Tension**

**<INSERT TABLE>**

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency** | **Phase** | **Max phase** | **Pass/Fail** |
| 0.1 Hz |  |  |  |
| 0.5 Hz |  |  |  |
| 1 Hz |  |  |  |
| 2 Hz |  |  |  |
| 3 Hz |  |  |  |
| 4 Hz |  |  |  |
| 5 Hz |  |  |  |

**Step h – 225 lbf Compression**

**<INSERT TABLE>**

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency** | **Phase** | **Max phase** | **Pass/Fail** |
| 0.1 Hz |  |  |  |
| 0.5 Hz |  |  |  |
| 1 Hz |  |  |  |
| 2 Hz |  |  |  |
| 3 Hz |  |  |  |
| 4 Hz |  |  |  |
| 5 Hz |  |  |  |

6.7.8.1.3 **MCE 2 – Step Response Test**

<IMAGE.STEP.RESPONSE.TEST\_1>

**Step j – 225 lbf tension**

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

**Step k – 225 lbf tension**

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

**Step n – 225 lbf compression**

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

**Step o – 225 lbf compression**

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

6.7.8.1.4 **MCE 2 – Frequency response Test**

**Step d – 225 lbf Tension**

**<INSERT TABLE>**

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency** | **Phase** | **Max phase** | **Pass/Fail** |
| 0.1 Hz |  |  |  |
| 0.5 Hz |  |  |  |
| 1 Hz |  |  |  |
| 2 Hz |  |  |  |
| 3 Hz |  |  |  |
| 4 Hz |  |  |  |
| 5 Hz |  |  |  |

**Step h – 225 lbf Compression**

**<INSERT TABLE>**

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency** | **Phase** | **Max phase** | **Pass/Fail** |
| 0.1 Hz |  |  |  |
| 0.5 Hz |  |  |  |
| 1 Hz |  |  |  |
| 2 Hz |  |  |  |
| 3 Hz |  |  |  |
| 4 Hz |  |  |  |
| 5 Hz |  |  |  |

6.7.8.1.5 **MCE 3 – Step Response Test**

<IMAGE.STEP.RESPONSE.TEST>

**Step j – 225 lbf tension**

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

**Step k – 225 lbf tension**

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

**Step n – 225 lbf compression**

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

**Step o – 225 lbf compression**

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

6.7.8.1.6 **MCE 3 – Frequency Response Test**

**Step d – 225 lbf Tension**

**<INSERT TABLE>**

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency** | **Phase** | **Max phase** | **Pass/Fail** |
| 0.1 Hz |  |  |  |
| 0.5 Hz |  |  |  |
| 1 Hz |  |  |  |
| 2 Hz |  |  |  |
| 3 Hz |  |  |  |
| 4 Hz |  |  |  |
| 5 Hz |  |  |  |

**Step h – 225 lbf Compression**

**<INSERT TABLE>**

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency** | **Phase** | **Max phase** | **Pass/Fail** |
| 0.1 Hz |  |  |  |
| 0.5 Hz |  |  |  |
| 1 Hz |  |  |  |
| 2 Hz |  |  |  |
| 3 Hz |  |  |  |
| 4 Hz |  |  |  |
| 5 Hz |  |  |  |

**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 |