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| Step | Description | Pass / Fail |
| 1 | Startup MATLAB and navigate to the Cycle Master tool folder. | N/A |
| 2 | At the prompt type:  *verifyToolFilePath('CycleMaster.m','CycleMaster\_dependencies.mat')*  Verify that all of the dependent files were identified and located in the proper tool directory (indicated by the work “OK” listed next to them). |  |
| 3 | Run Cycle Master by typing **CycleMaster** at the prompt. Click on the **Get Power Curve** button and navigate to the Test Data 🡪 Input Files directory. Locate the file 130501\_617378\_EW4\_11424\_FLS\_1.csv, select it and click **Open**.  *Temporary Workaround: Will not work right now due to how CycleMaster handles directories. File must be loaded from \\detroit\d\Customer Data\Engine Testing\ISUZU\6W\617378\Data\Test Results\FLS\* |  |
| 4 | Verify the **Power Curve Results** report the following values:  Maximum Power 387.5 kW at 1807.6 RPM  Maximum Torque 2237.4 N.m at 1456.2 RPM  Part 1065 Speed at P\_max 1811 RPM  A Speed 1197 RPM  B Speed 1421 RPM  C Speed 1645 RPM  Measured Idle Speed 902.6 RPM  Average 98% Power Speed 1771 RPM  Intermediate Speed 1485 RPM  Power Curve Duration 321 s  Ramp Rate 3.21 RPM/s  Measured CITT Speed 902.3 RPM  Visually inspect the Power and Torque curves and verify they appear as shown below: |  |
| 5 | In the **Cycle Development** section, select **13M** for the cycle. Verify that the **13M Options** are as follows:  Idle Speed (RPM) 902.6  CITT (N.m) -  A Speed (RPM) 1197.5  B Speed (RPM) 1421.3  C Speed (RPM) 1645.2  Sample per 1% (s) - |  |
| 6 | Click on the **Generate Cycle** button to generate the 13M cycle. You should receive a message box that states “*Cycle generation was unsuccessful. Please check that all necessary data is provided*.” Click “OK” and enter the following values:  Idle Speed (RPM) 850.0  CITT (N.m) -  A Speed (RPM) 1200.0  B Speed (RPM) 1400.0  C Speed (RPM) 1600.0  Sample per 1% (s) 5 |  |
| 7 | Click on the **Generate Cycle** button to generate the 13M cycle. |  |
| 8 | Verify the cycle is created and appears as shown below (*Note: Ignore the fact the Torque axis label is cut-off*): |  |
| 9 | Click on the **Create Playback File** button. Verify that the following files get created in the \\detroit\D\Customer Data\Engine Testing\ISUZU\6W\617378\Engineering\Playbacks directory:  130501\_617378\_EW4\_11424\_FLS\_1\_13M\_PB\_Report.xlsx  130501\_617378\_EW4\_11424\_FLS\_1\_Report.xlsx  130501\_617378\_EW4\_11424\_FLS\_1\_13M\_PB.txt  Move them to the **Test Results** folder in the test area for later analysis. |  |
| 10 | Click on the **Get Power Curve** button and navigate to the Test Data 🡪 Input Files directory. Locate the file 130617\_617378\_EW4\_12388\_FLS\_1.csv, select it and click **Open**. (*Note: This file takes a long time to load*).  *Temporary Workaround: File must be loaded from \\detroit\d\Customer Data\Engine Testing\ISUZU\6W\617378\Data\Test Results\FLS\* |  |
| 11 | Verify the **Power Curve Results** report the following values:  Maximum Power 314.6 kW at 1680.3 RPM  Maximum Torque 2029.4 N.m at 1298.1 RPM  Part 1065 Speed at P\_max 1873 RPM  A Speed 1137 RPM  B Speed 1383 RPM  C Speed 1629 RPM  Measured Idle Speed 900.1 RPM  Average 98% Power Speed 1677 RPM  Intermediate Speed 1317 RPM  Power Curve Duration 321 s  Ramp Rate 3.21 RPM/s  Measured CITT Speed 900.0 RPM  Visually inspect the Power and Torque curves and verify they appear as shown below: |  |
| 12 | In the **Cycle Development** section, select **FTP-Diesel** for the cycle. Verify that the **FTP-Diesel Options** are as follows:  Idle Speed (RPM) 900.1  Declared Speed (RPM) 1873.4  CITT (N.m) -  Max Cycle Speed - |  |
| 13 | Change the above values to those listed below then click on the **Generate Cycle** button to generate the heavy duty FTP-Diesel cycle.  Idle Speed (RPM) 900.1  Declared Speed (RPM) 1850.0  CITT (N.m) 100.0  Max Cycle Speed - |  |
| 14 | Verify the cycle is created and appears as shown below (*Note: Ignore the fact the Torque axis label is cut-off*): |  |
| 15 | Click on the **Create Playback File** button. Verify that the following files get created in the \\detroit\D\Customer Data\Engine Testing\ISUZU\6W\617378\Engineering\Playbacks directory:  130617\_617378\_EW4\_12388\_FLS\_1\_FTP-Diesel\_PB\_Report.xlsx  130617\_617378\_EW4\_12388\_FLS\_1\_Report.xlsx  130617\_617378\_EW4\_12388\_FLS\_1\_FTP-Diesel\_PB.txt  Move them to the **Test Results** folder in the test area for later analysis. |  |
| 16 | With the 130617\_617378\_EW4\_12388\_FLS\_1.csv file still loaded, change the cycle to RMC. Verify that the **RMC Options** are as follows:  Idle Speed (RPM) 900.1  CITT (N.m) -  A Speed (RPM) 1137.5  B Speed (RPM) 1383.3  C Speed (RPM) 1629.2 |  |
| 17 | Click on the **Generate Cycle** button to generate the RMC cycle. |  |
| 18 | Verify the cycle is created and appears as shown below (*Note: Ignore the fact the Torque axis label is cut-off*): |  |
| 19 | Click on the **Create Playback File** button. Verify that the following files get created in the \\detroit\D\Customer Data\Engine Testing\ISUZU\6W\617378\Engineering\Playbacks directory:  130617\_617378\_EW4\_12388\_FLS\_1\_RMC\_PB\_Report.xlsx  130617\_617378\_EW4\_12388\_FLS\_1\_Report.xlsx  130617\_617378\_EW4\_12388\_FLS\_1\_RMC\_PB.txt  Move them to the **Test Results** folder in the test area for later analysis. Note that the 130617\_617378\_EW4\_12388\_FLS\_1\_Report.xlsx will already exist in this directory. Save it as version 2, i.e., 130617\_617378\_EW4\_12388\_FLS\_1\_Report (2).xlsx. |  |
| 20 | Click on the **Get Power Curve** button and navigate to the Test Data 🡪 Input Files directory. Locate the file 131216\_617378\_EW2\_15173\_FLS\_1.csv, select it and click **Open**.  *Temporary Workaround: File must be loaded from \\detroit\d\Customer Data\Engine Testing\ISUZU\6W\617378\Data\Test Results\FLS\* |  |
| 21 | Verify the **Power Curve Results** report the following values:  Maximum Power 328.9 kW at 1840.3 RPM  Maximum Torque 1977.7 N.m at 1451.4 RPM  Part 1065 Speed at P\_max 1840 RPM  A Speed 1163 RPM  B Speed 1398 RPM  C Speed 1633 RPM  Measured Idle Speed 900.1 RPM  Average 98% Power Speed 1798 RPM  Intermediate Speed 1395 RPM  Power Curve Duration 331 s  Ramp Rate 3.17 RPM/s  Measured CITT Speed 900.0 RPM  Visually inspect the Power and Torque curves and verify they appear as shown below: |  |
| 22 | In the **Cycle Development** section, select **RMCNR** for the cycle. Verify that the **RMCNR Options** are as follows:  Idle Speed (RPM) 900.1  CITT (N.m) -  Rated Speed (RPM) 1840.3  Int. Speed (RPM) 1394.8 |  |
| 23 | Click on the **Generate Cycle** button to generate the RMCNR cycle. |  |
| 24 | Verify the cycle is created and appears as shown below (*Note: Ignore the fact the Torque axis label is cut-off*): |  |
| 25 | Click on the **Create Playback File** button. Verify that the following files get created in the \\detroit\D\Customer Data\Engine Testing\ISUZU\6W\617378\Engineering\Playbacks directory:  131216\_617378\_EW2\_15173\_FLS\_1\_RMCNR\_PB\_1\_Report.xlsx  131216\_617378\_EW2\_15173\_FLS\_1\_Report.xlsx  131216\_617378\_EW2\_15173\_FLS\_1\_RMCNR\_PB\_1.txt  Move them to the **Test Results** folder in the test area for later analysis. |  |
| 26 | Click on the **Get Power Curve** button and navigate to the Test Data 🡪 Input Files directory. Locate the file 140408\_617378\_EW2\_16149\_FLS\_1.csv, select it and click **Open**.  *Temporary Workaround: File must be loaded from \\detroit\d\Customer Data\Engine Testing\ISUZU\6W\617378\Data\Test Results\FLS\* |  |
| 27 | Verify the **Power Curve Results** report the following values:  Maximum Power 392.9 kW at 1813.3 RPM  Maximum Torque 2229.3 N.m at 1455.9 RPM  Part 1065 Speed at P\_max 1817 RPM  A Speed 1213 RPM  B Speed 1419 RPM  C Speed 1626 RPM  Measured Idle Speed 900.1 RPM  Average 98% Power Speed 1798 RPM  Intermediate Speed 1479 RPM  Power Curve Duration 329 s  Ramp Rate 3.20 RPM/s  Measured CITT Speed 900.0 RPM  Visually inspect the Power and Torque curves and verify they appear as shown below: |  |
| 28 | In the **Cycle Development** section, select **NRTC** for the cycle. Verify that the **NRTC Options** are as follows:  Use Part 1065 Methodology checked  Idle Speed (RPM) 900.1  Declared Speed (RPM) 1817  CITT (N.m) -  Max Cycle Speed - |  |
| 29 | Click on the **Generate Cycle** button to generate the NRTC cycle. |  |
| 30 | Verify the cycle is created and appears as shown below (*Note: Ignore the fact the Torque axis label is cut-off*): |  |
| 31 | Click on the **Create Playback File** button. Verify that the following files get created in the \\detroit\D\Customer Data\Engine Testing\ISUZU\6W\617378\Engineering\Playbacks directory:  140408\_617378\_EW2\_16149\_FLS\_1\_NRTC\_PB\_1\_Report.xlsx  140408\_617378\_EW2\_16149\_FLS\_1\_Report.xlsx  140408\_617378\_EW2\_16149\_FLS\_1\_NRTC\_PB\_1.txt  Move them to the **Test Results** folder in the test area for later analysis. |  |
| 32 | Using file comparison software (e.g., Beyond Compare, Compare++, etc.) compare the Test Data\Comparison Files directory with the Test Results folder. Verify that:   1. There no meaningful differences between the Excel files. This means that while formatting issues may exist all the relevant numbers should be the same. 2. The playback text files are exactly the same. |  |