**1- Package Content & Revision History**

**VW 1.5L TSI evo Hybrid Concept 4 Engine from 2019 Aachen Paper**

The following is a listing of the contents of this ALPHA Map Data Package along with the suggested citation format and revision history of the material. Use of any NCAT documents listed below, included as part of the complete test data package, should reference the suggested citation provided. Note that SAE Papers included in the package should utilize the designated SAE CITATION format.

**SUGGESTED CITATION:**

*VW 1.5L TSI evo Hybrid Concept 4 Engine from 2019 Aachen Paper – ALPHA Map Package*. Version 2023-09. Ann Arbor, MI: US EPA, National Vehicle and Fuel Emissions Laboratory, National Center for Advanced Technology, 2023.

**TEST PACKAGE CONTENTS:**

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| 1– Package Content & Revision History.docx | Brief overview document listing the contents, revision history & suggested citation format of the package |
| 2– Related NCAT Packages.docx | Listing of related NCAT Test Data and ALPHA Engine Map Packages |
| 3– VW 1.5L TSI evo Hybrid Concept 4 Engine from 2019 Aachen Paper – ALPHA Generation Process.html | NCAT summary report describing the process followed to generate full efficiency and power loss maps |
| 4a– VW 1.5L TSI evo Hybrid Concept 4 Engine from 2019 Aachen Paper – BSFC.pdf | Contour plot of the BSFC results of the mapping over the full operational area using the fuel specifications provided in the paper |
| 4b– VW 1.5L TSI evo Hybrid Concept 4 Engine from 2019 Aachen Paper Octane Modified for Tier 3 Fuel – BSFC.pdf | Contour plot of the BSFC results of the mapping over the full operational area using the Tier 3 Octane Modifier |
| 5a– VW 1.5L TSI evo Hybrid Concept 4 Engine from 2019 Aachen Paper – Efficiency.pdf | Contour plot of the Brake Thermal Efficiency results over the full operational area using the fuel specifications provided in the paper |
| 5b– VW 1.5L TSI evo Hybrid Concept 4 Engine from 2019 Aachen Paper Modified for Tier 3 Fuel – Efficiency.pdf | Contour plot of the Brake Thermal Efficiency results over the full operational area using the Tier 3 Octane Modifier |
| 6a– VW 1.5L TSI evo Hybrid Concept 4 Engine from 2019 Aachen Paper – Fuel Map Data.xlsx | Data derived using the generated map to confirm expected trends in the output fuel map using the fuel specifications provided in the paper |
| 6b– VW 1.5L TSI evo Hybrid Concept 4 Engine from 2019 Aachen Paper Octane Modified for Tier 3 Fuel – Fuel Map Data.xlsx | Data derived using the generated map to confirm expected trends in the output fuel map using the Tier 3 Octane Modifier |
| 7a– engine\_VW\_1L5\_TSI\_evo\_Hybrid\_ Concept4\_paper\_image.m | ALPHA output result text file using the fuel specifications provided in the paper |
| 7b– engine\_VW\_1L5\_TSI\_evo\_Hybrid\_ Concept4\_paper\_image\_OM\_Tier\_3.m | ALPHA output result text file using the Tier 3 Octane Modifier |

**REVISION HISTORY:**

Version 2023-09: Initial release