

2016 Mazda 2.5L Turbo Skyactiv-G Tier 3 Fuel - Test Data Plots

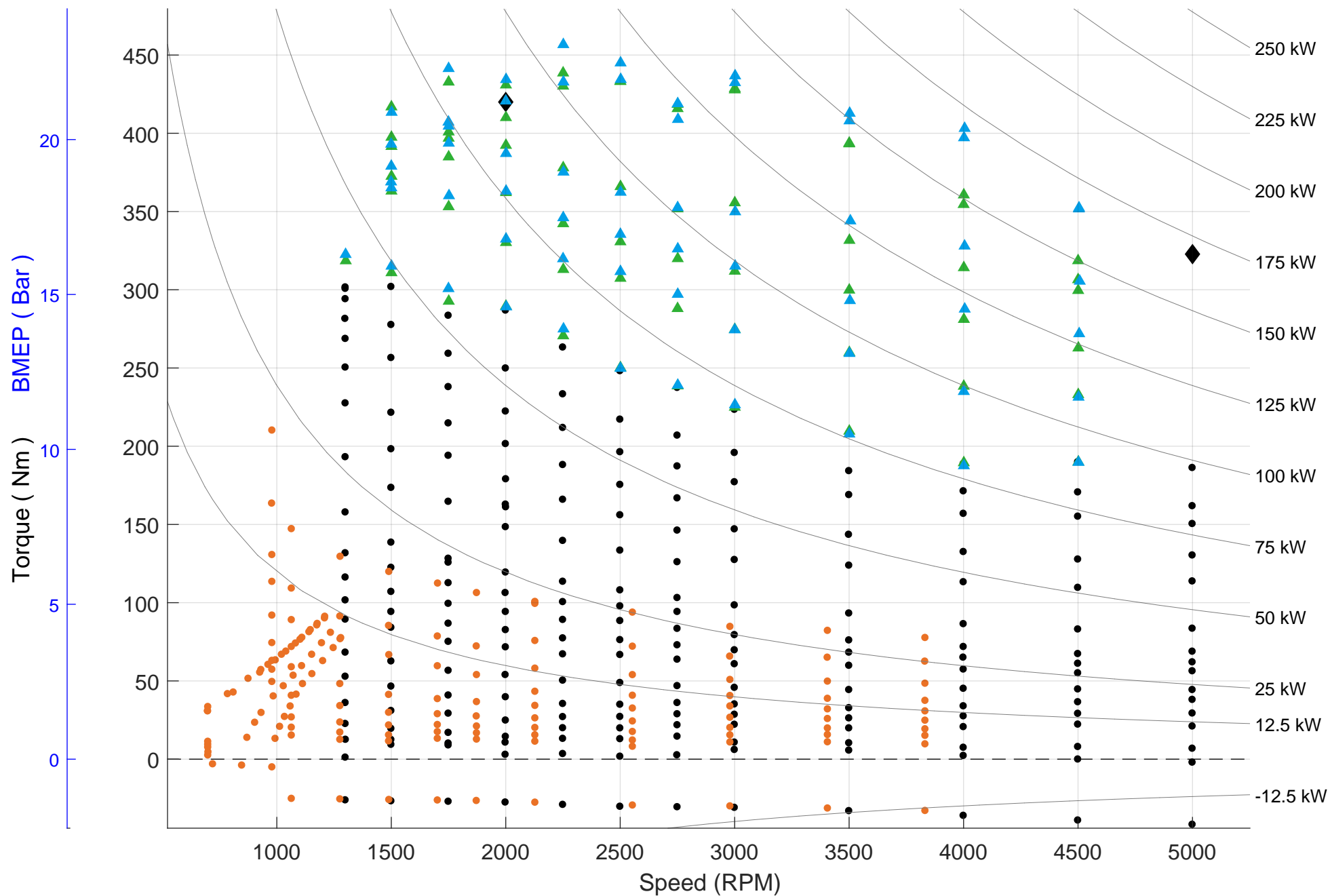
SUGGESTED CITATION: 2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Package. Version 2019-02. Ann Arbor, MI: US EPA, National Vehicle and Fuel Emissions Laboratory, National Center for Advanced Technology, 2019.

- - Dashed line indicates the maximum torque curve from published data
- Black dots indicate speed/load points at which steady state data was acquired
- Orange dots indicate speed/load points at which steady state data was acquired coupled to a transmission
- △ Blue triangles indicate speed/load points at which initial data from the transient high load method was acquired
- ▲ Green triangles indicate speed/load points at which final data from the transient high load method was acquired
- ✗ Red Xs indicate speed/load points where data was not collected or did not meet quality standards

Note: In these contour plots, individual data points may be ignored or removed, using our best engineering judgment, to correct irregularities in the visual presentation of the contour lines; additional details are contained in the test report.

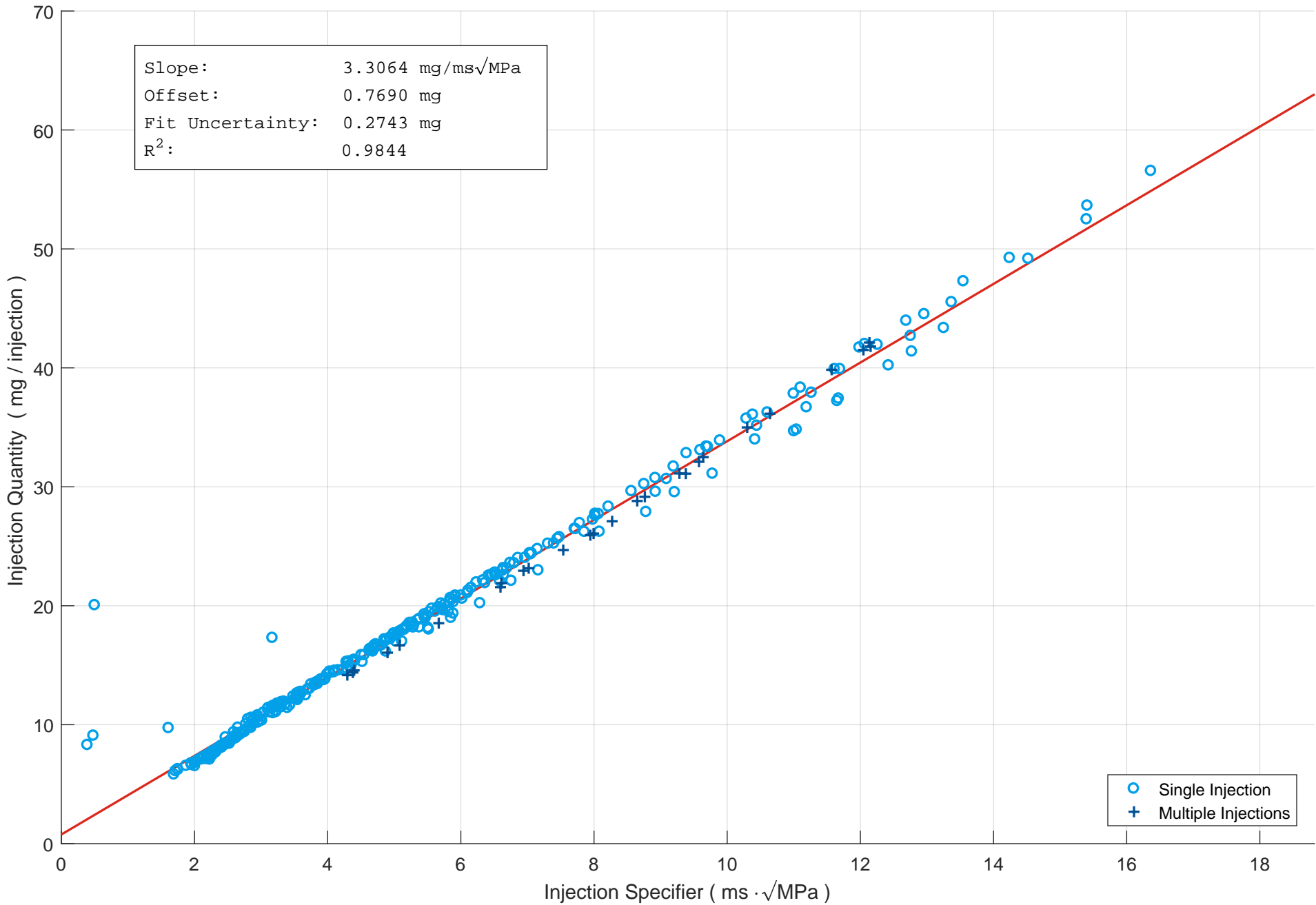
2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots

Test Data Points

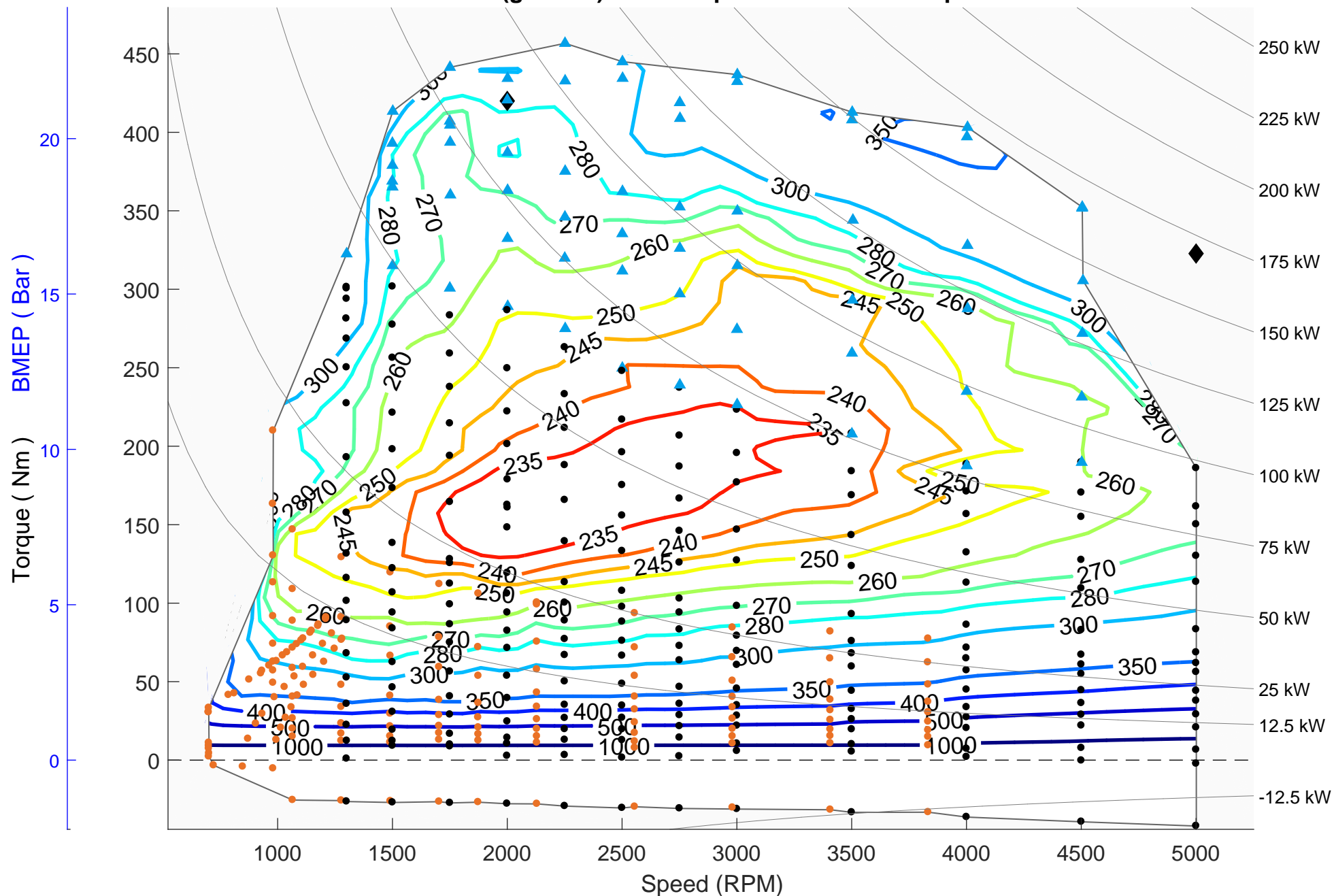


2016 Mazda 2.5L Turbo Skyactiv-G Tier 3 Fuel - Test Data Plots

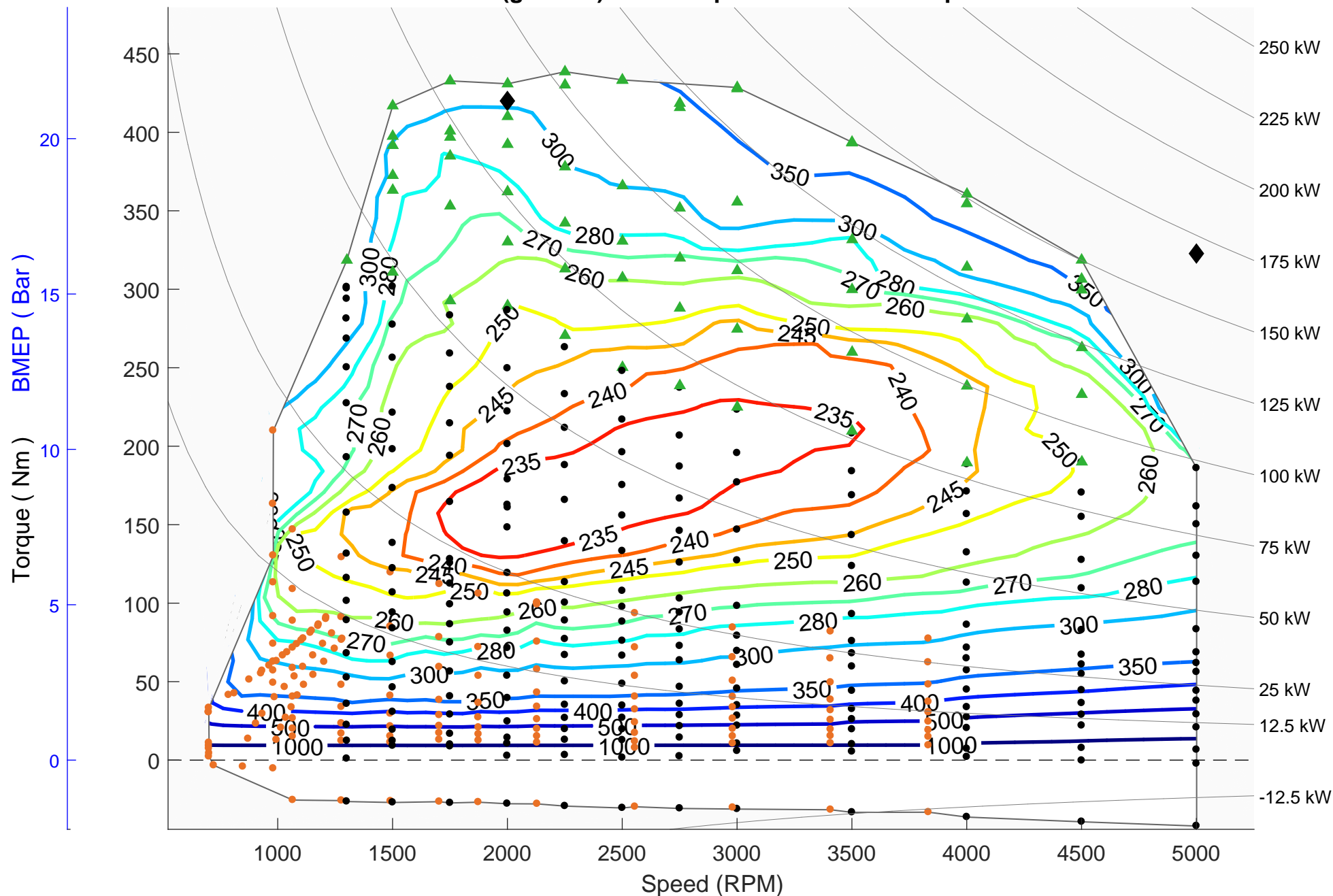
Injector Calibration



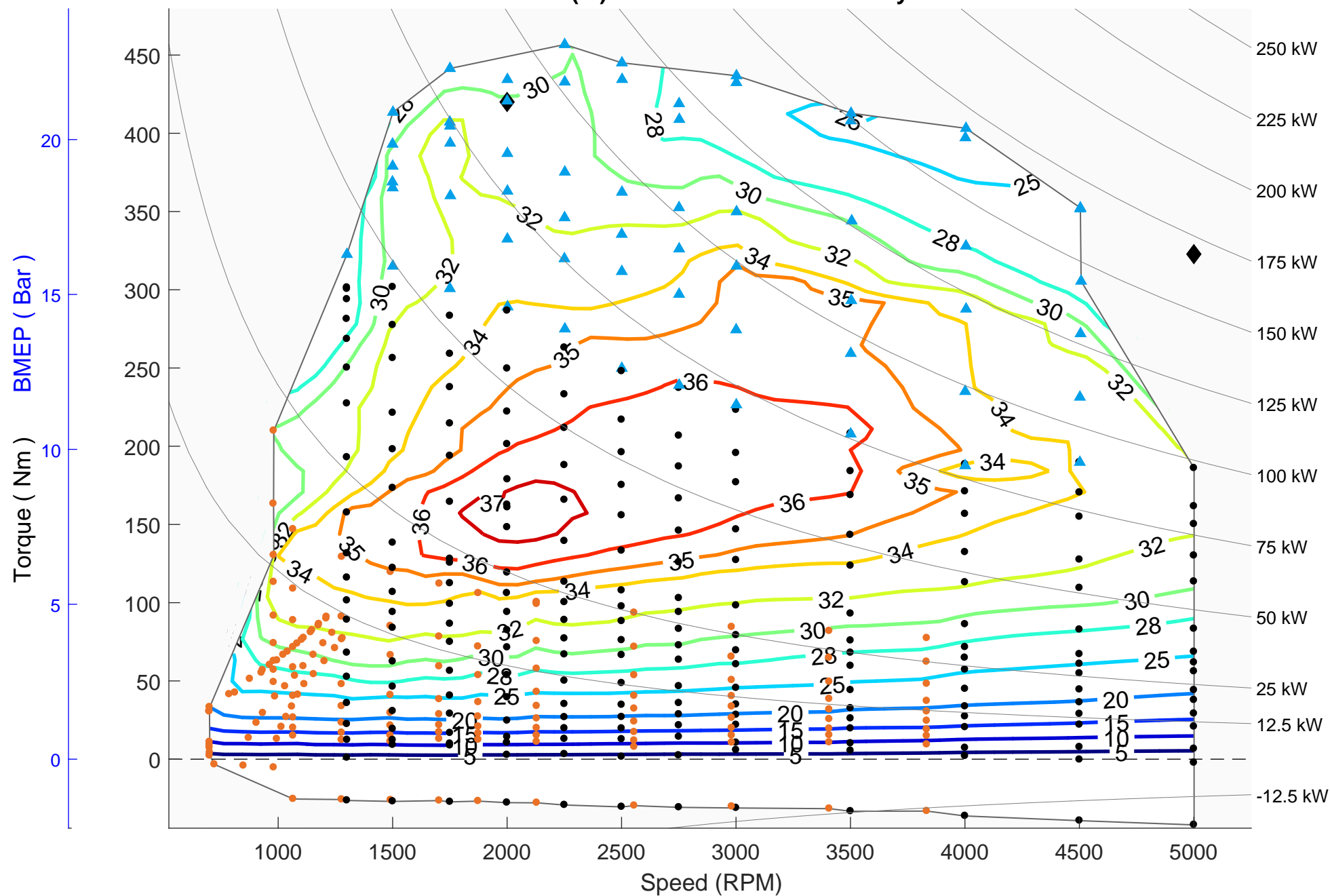
2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Initial
BSFC (g/kW-hr) - Brake Specific Fuel Consumption



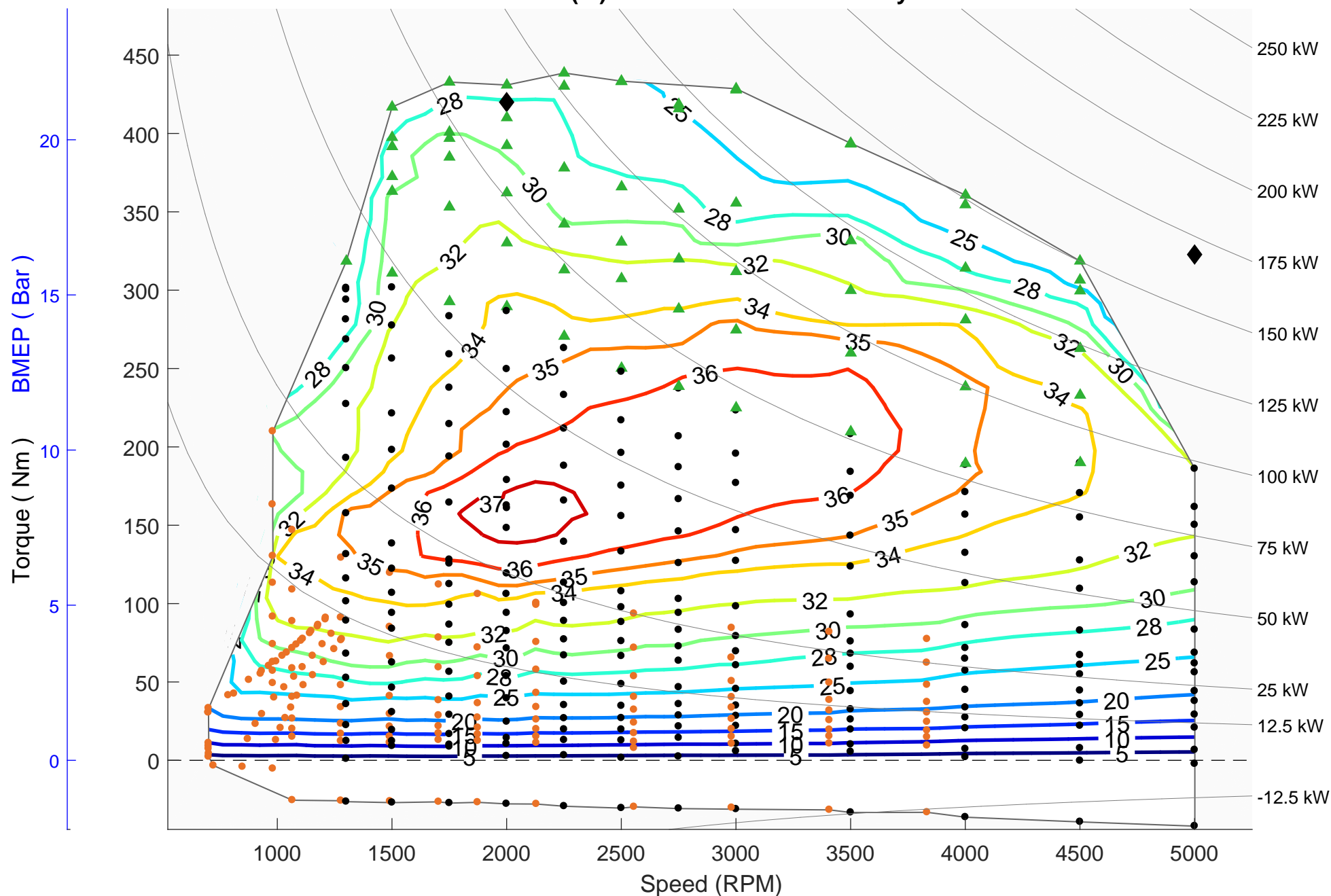
2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Final
BSFC (g/kW-hr) - Brake Specific Fuel Consumption

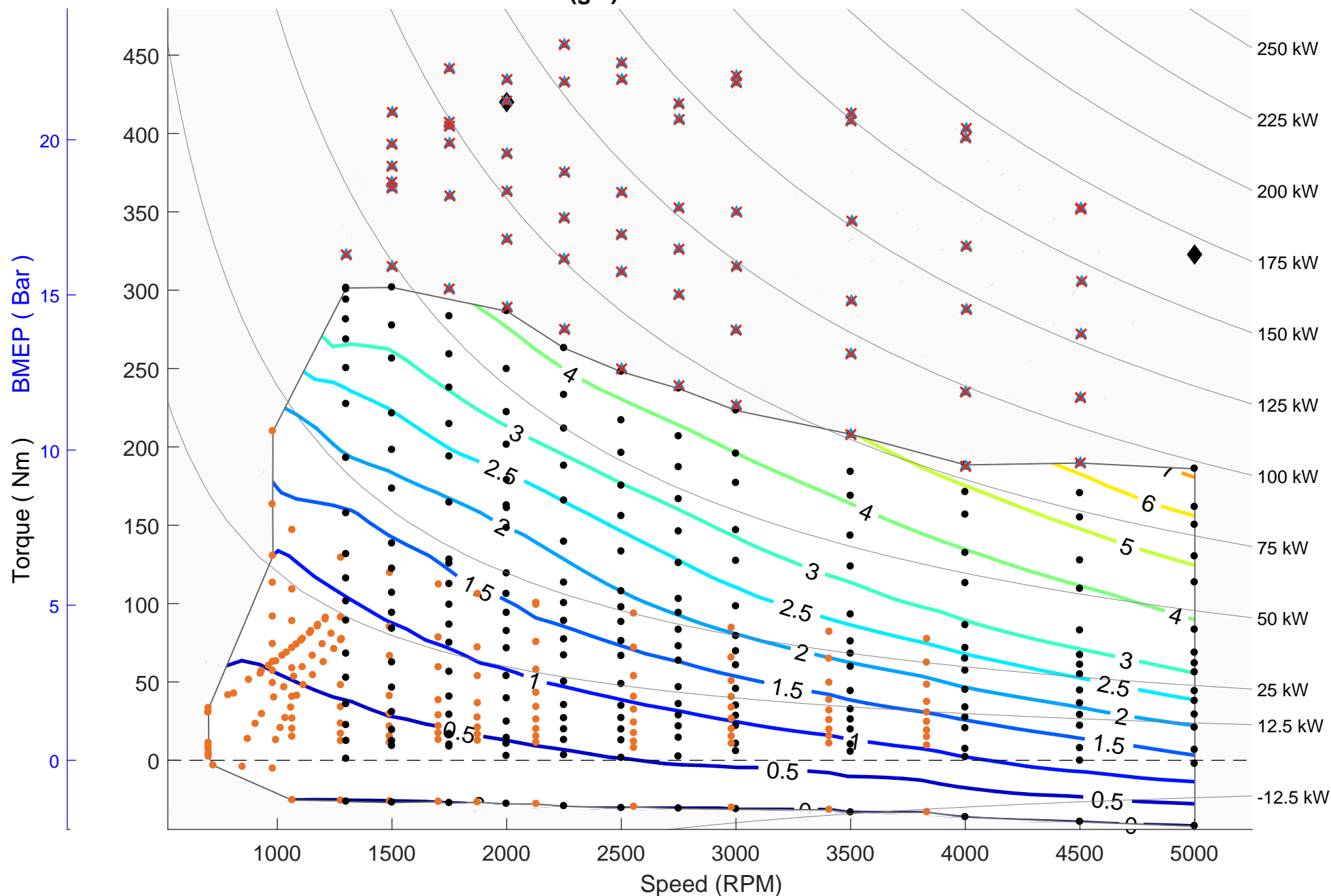


2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Initial
BTE (%) - Brake Thermal Efficiency

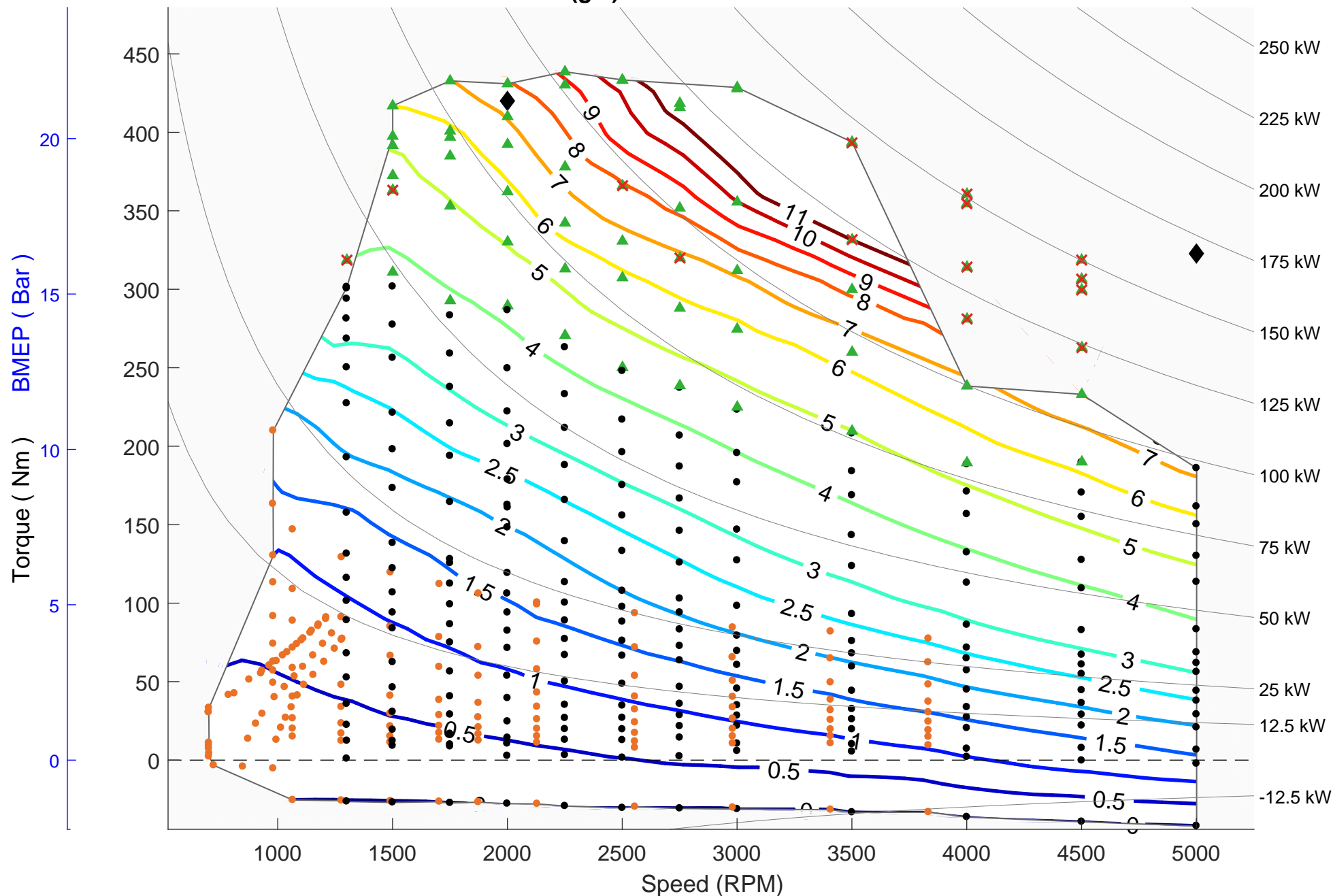


2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Final
BTE (%) - Brake Thermal Efficiency

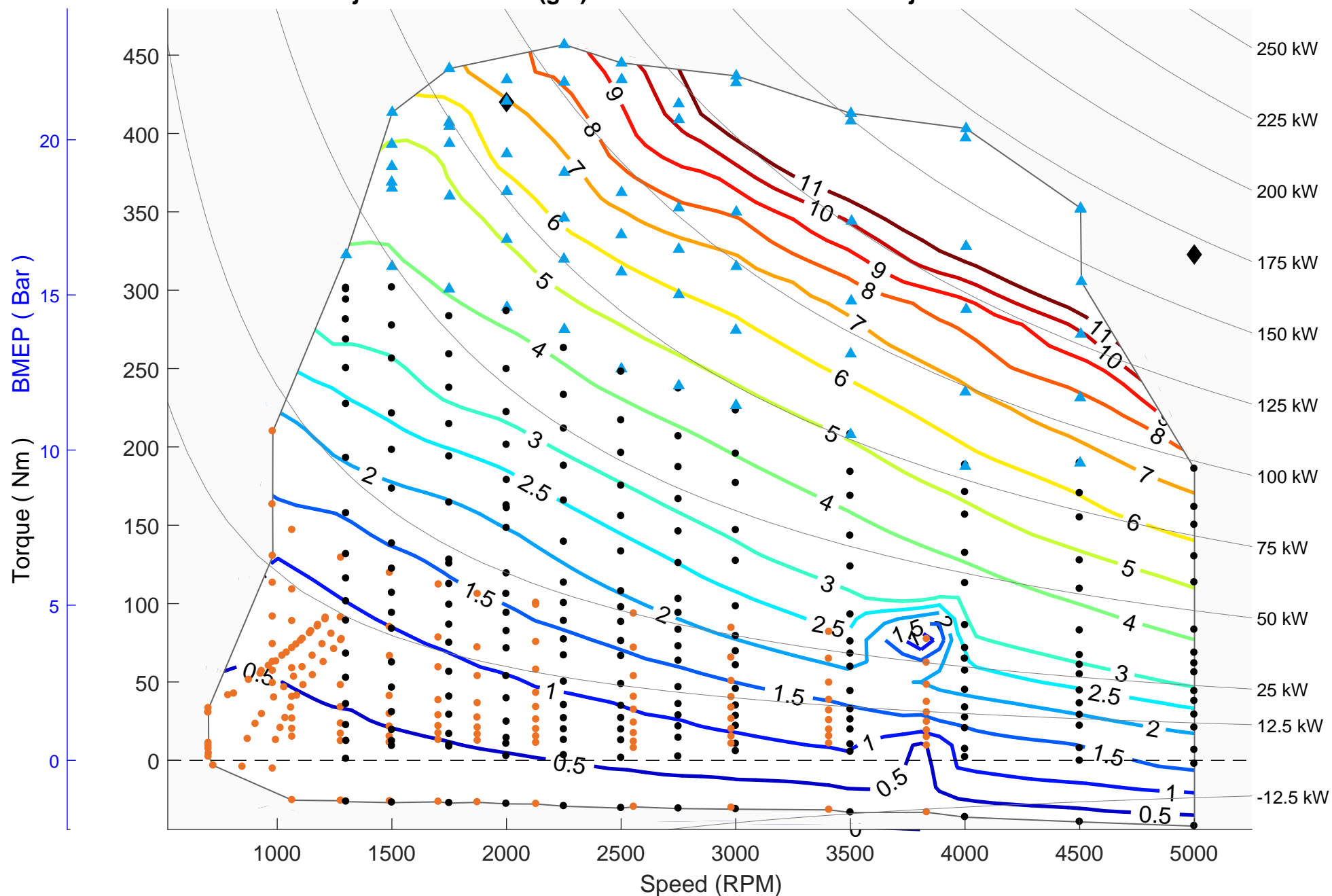




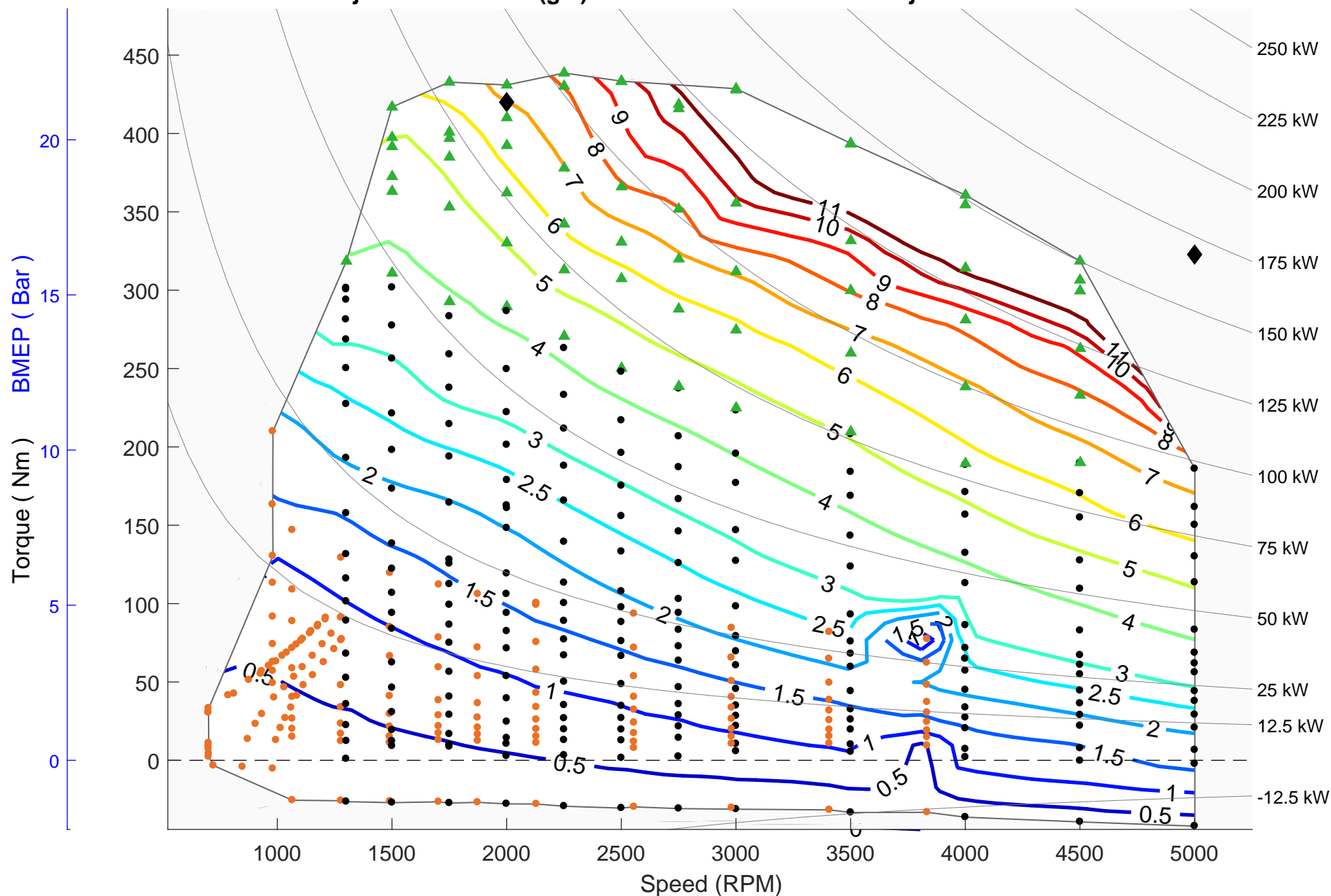
2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Final
Fuel Meter Flow (g/s) - Fuel Flow Measured with Flow Meter



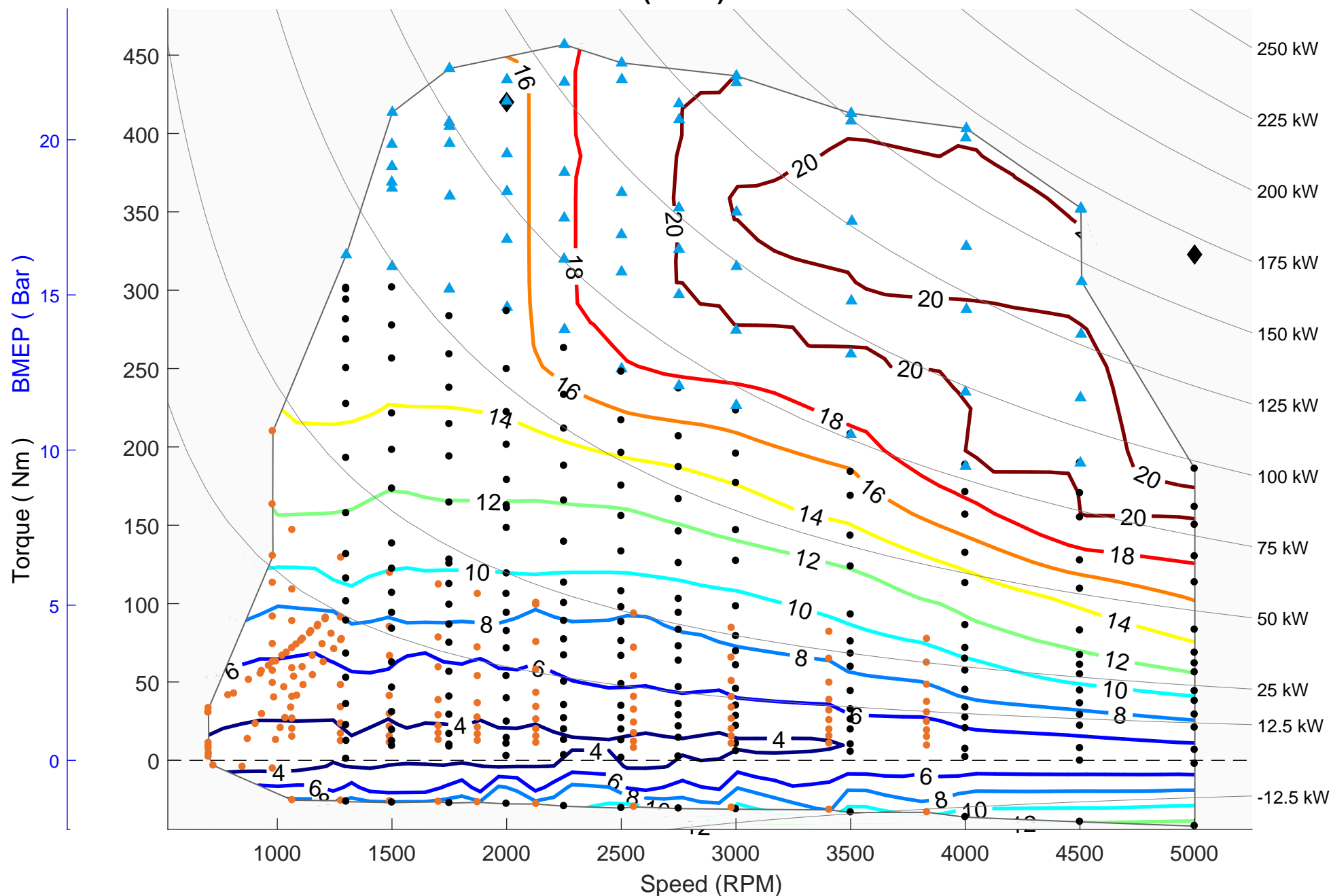
2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Initial
Injector Fuel Flow (g/s) - Fuel Flow Estimate from Injector Calibration



2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Final
Injector Fuel Flow (g/s) - Fuel Flow Estimate from Injector Calibration

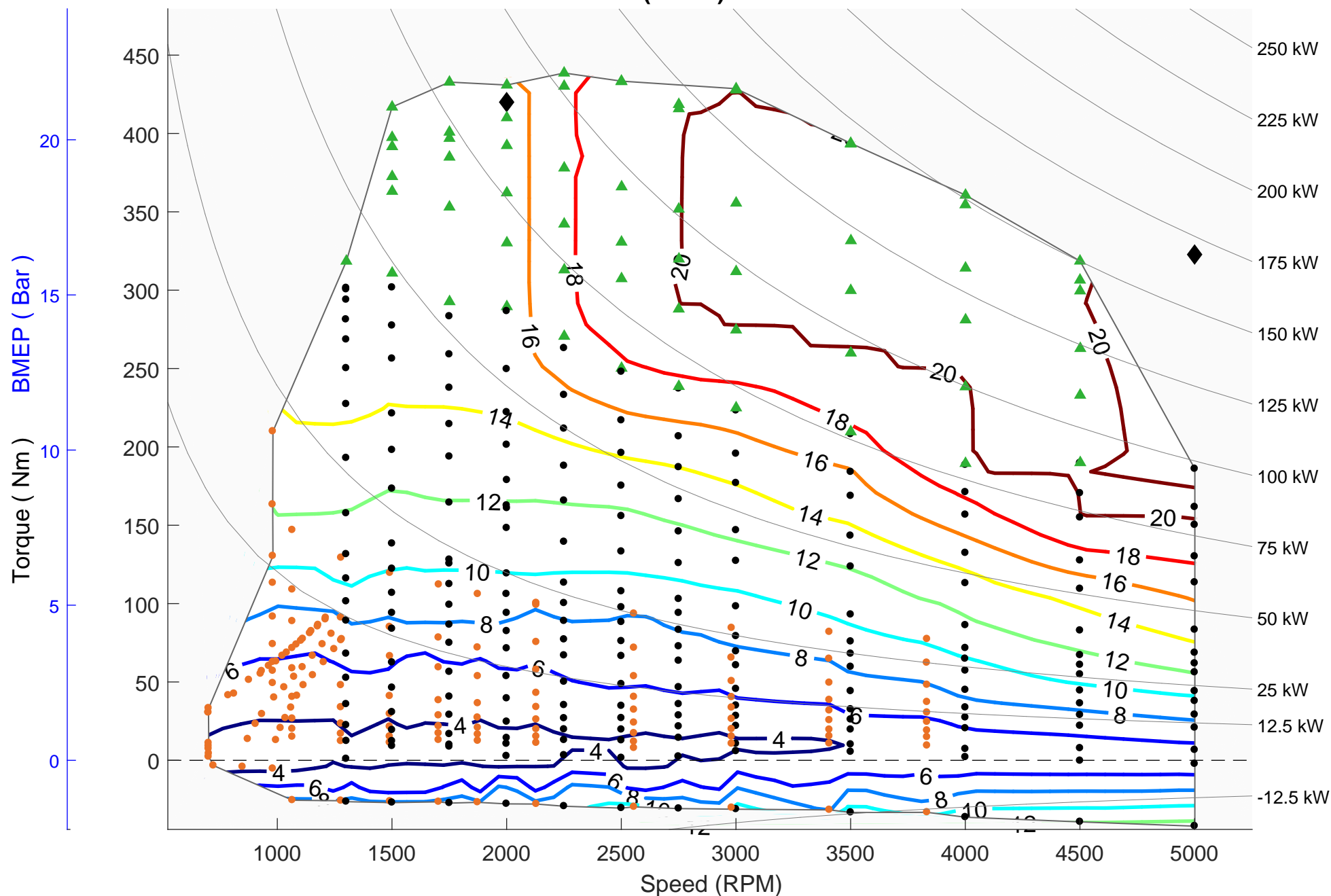


2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Initial
Fuel Rail Press (MPaG) - Fuel Rail Pressure*



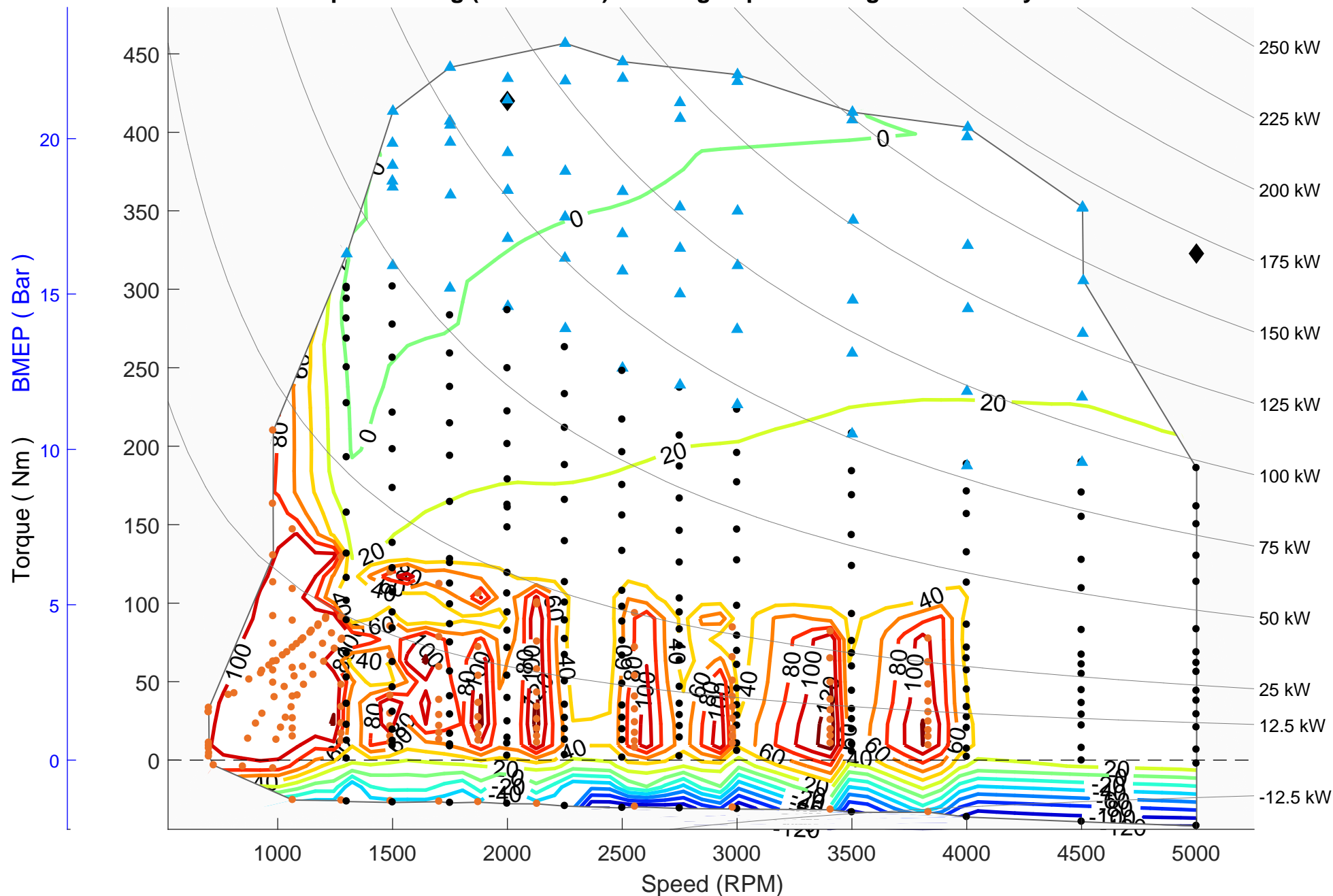
* Reference Only - Voltage Measurement

2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Final
Fuel Rail Press (MPaG) - Fuel Rail Pressure*

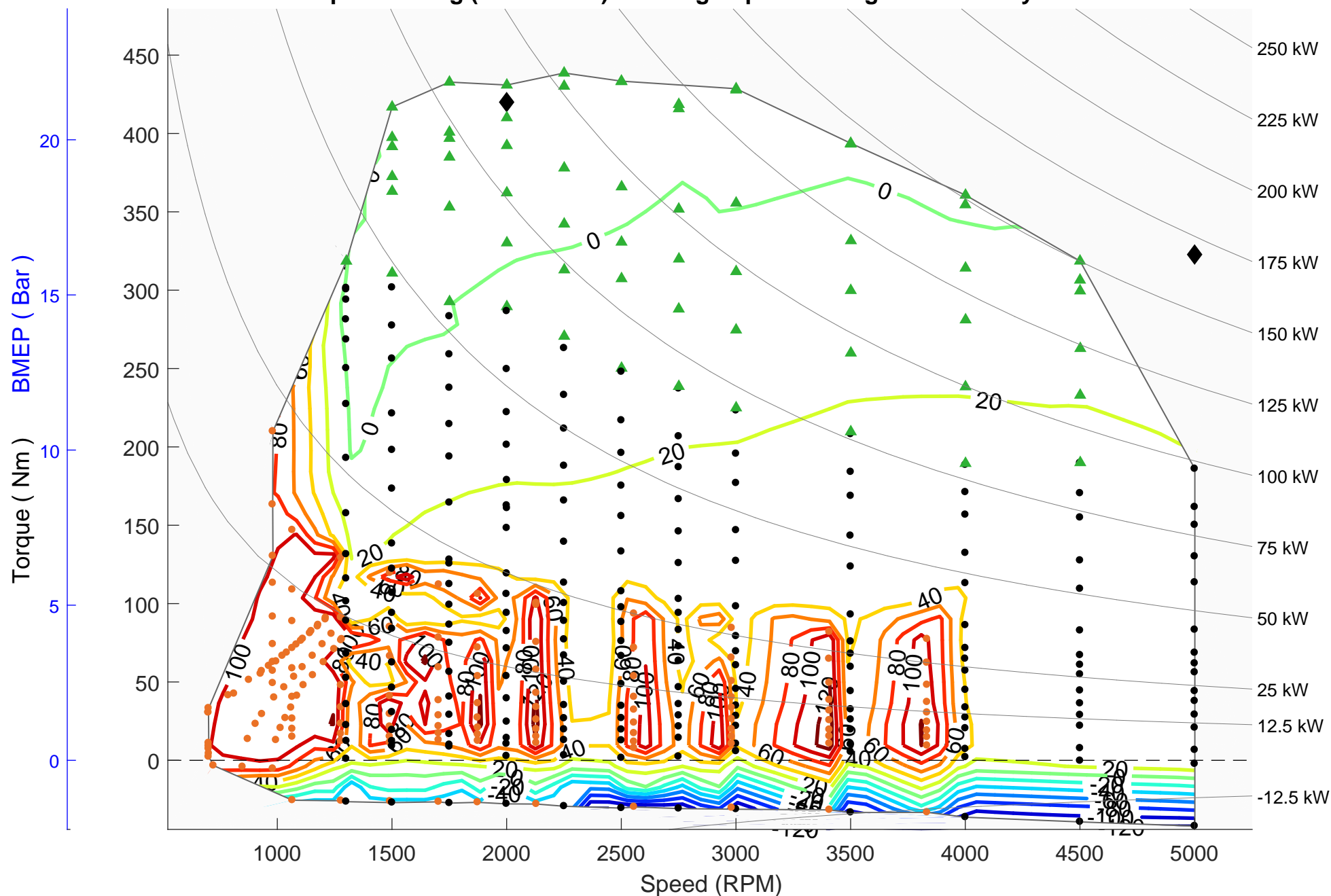


* Reference Only - Voltage Measurement

2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Initial
Spark Timing (CAD BTDC) - Average Spark Timing Across all Cylinders*

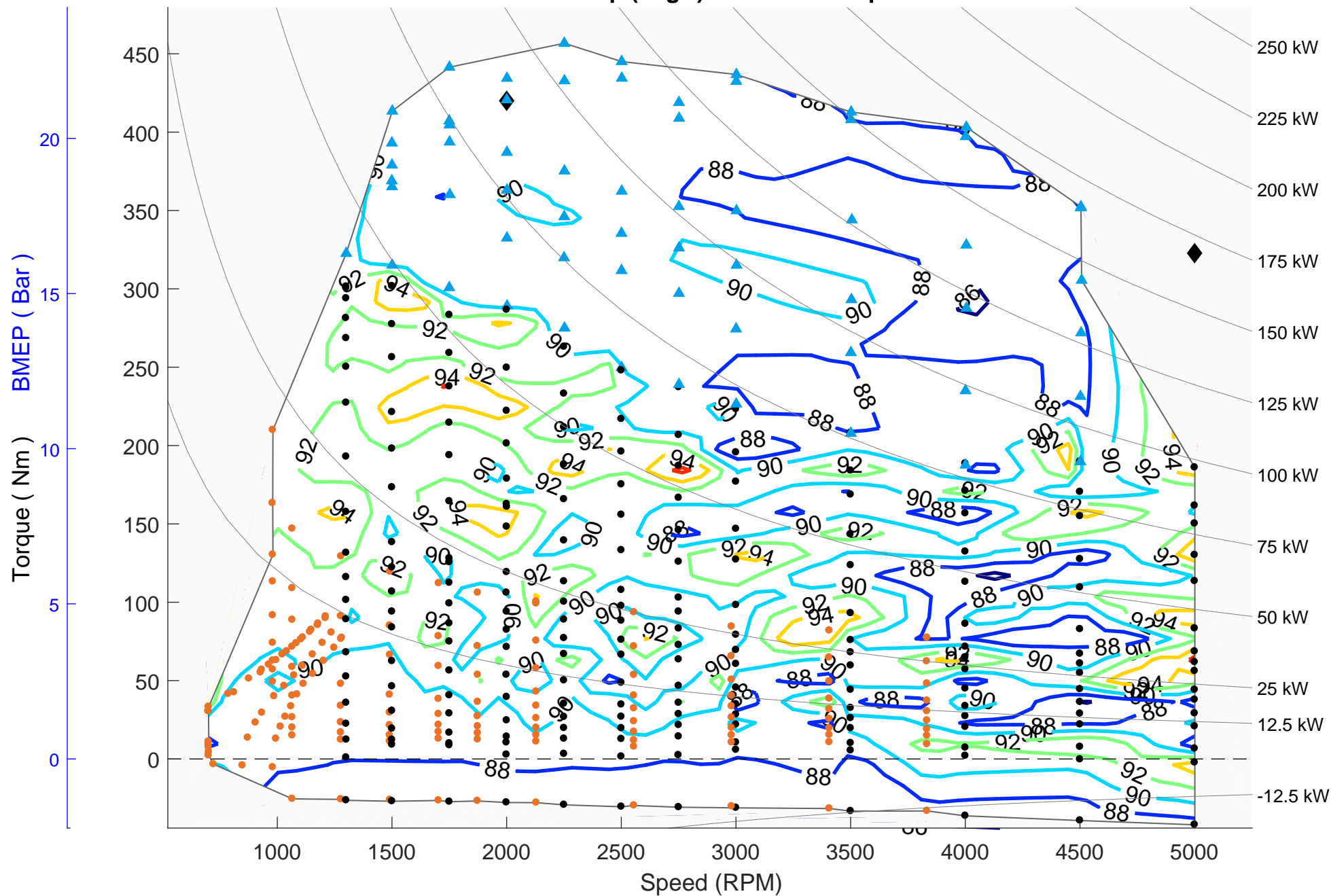


2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Final
Spark Timing (CAD BTDC) - Average Spark Timing Across all Cylinders*

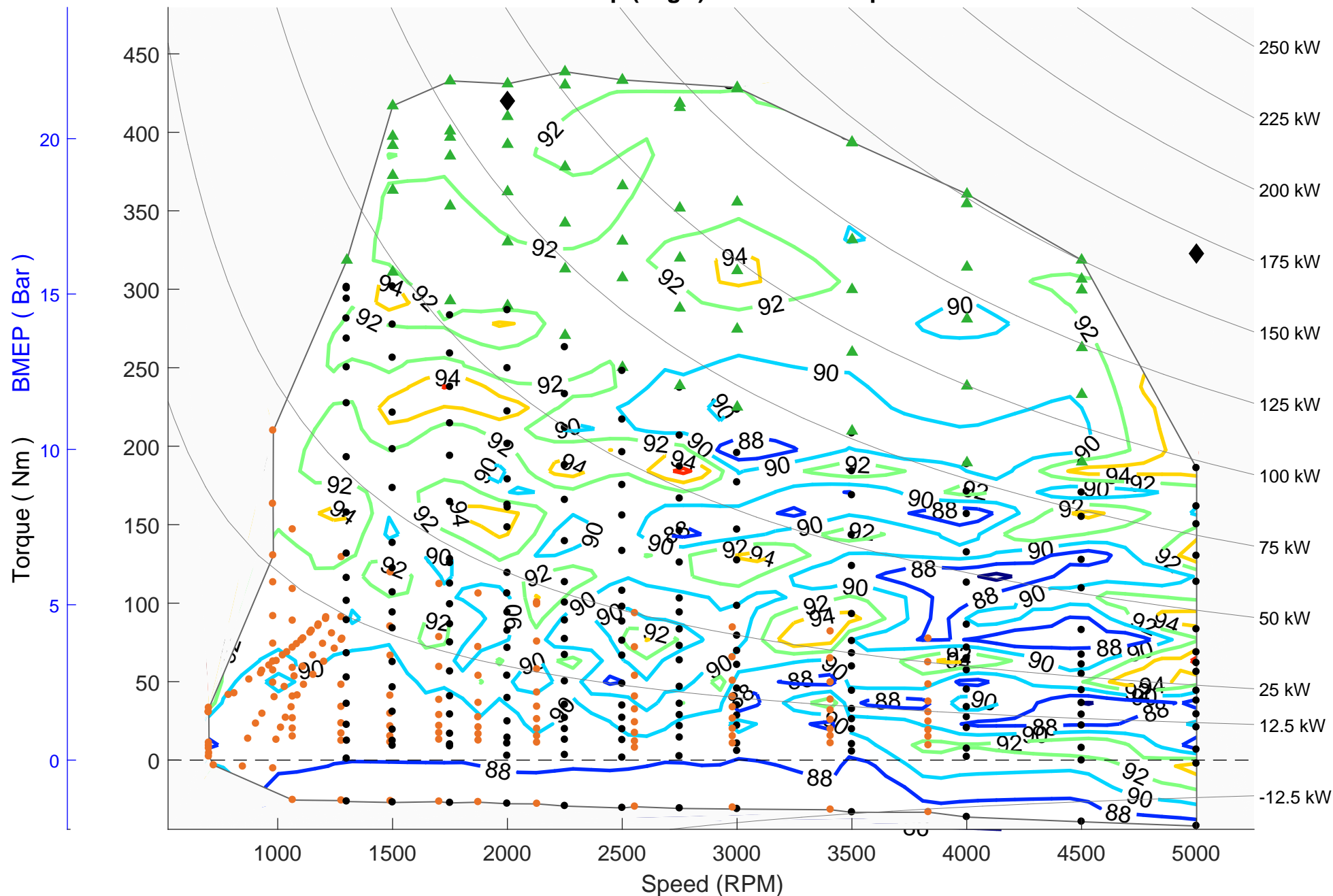


* Reference Only - Digital Measurement

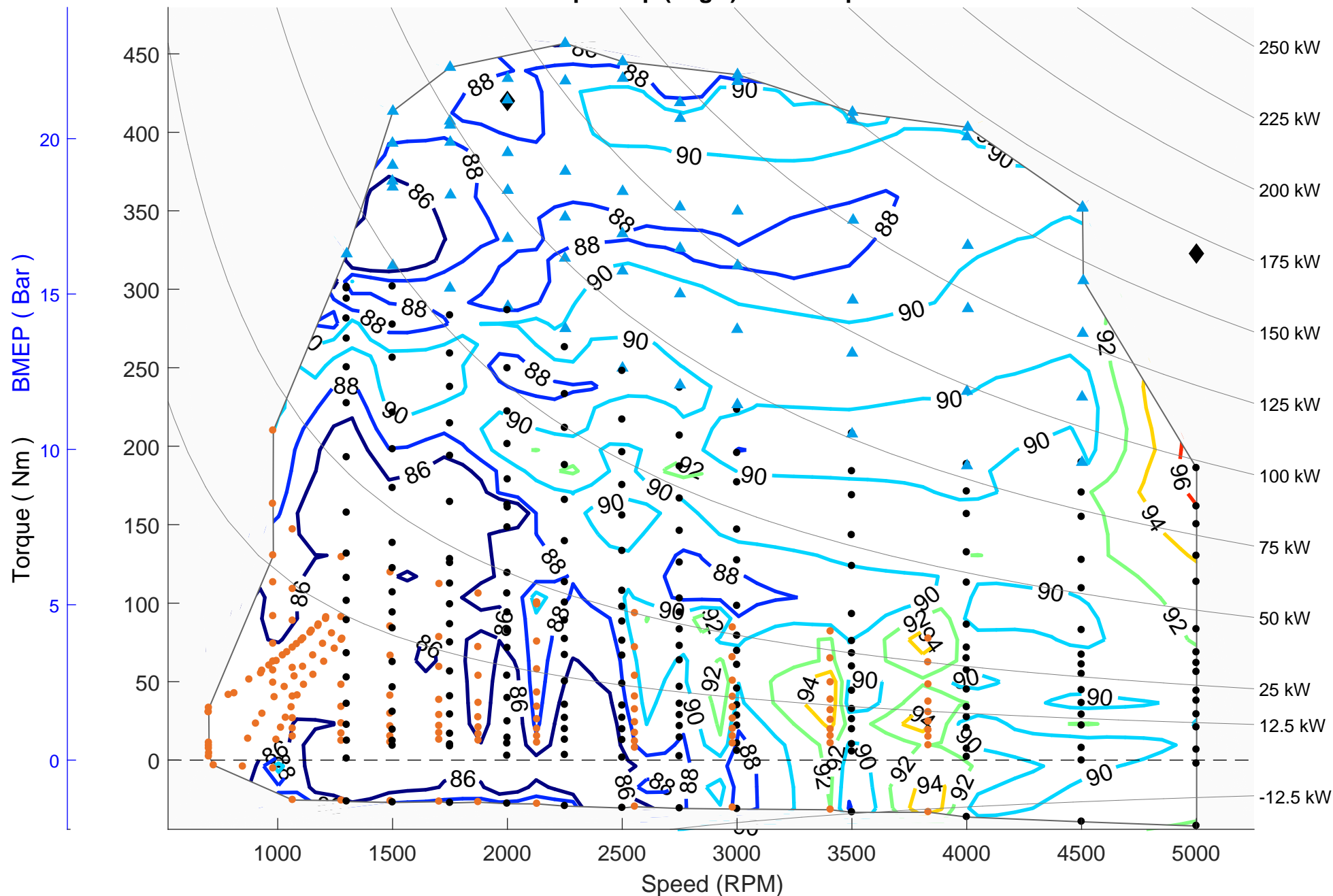
2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Initial
Coolant Temp (degC) - Coolant Temperature



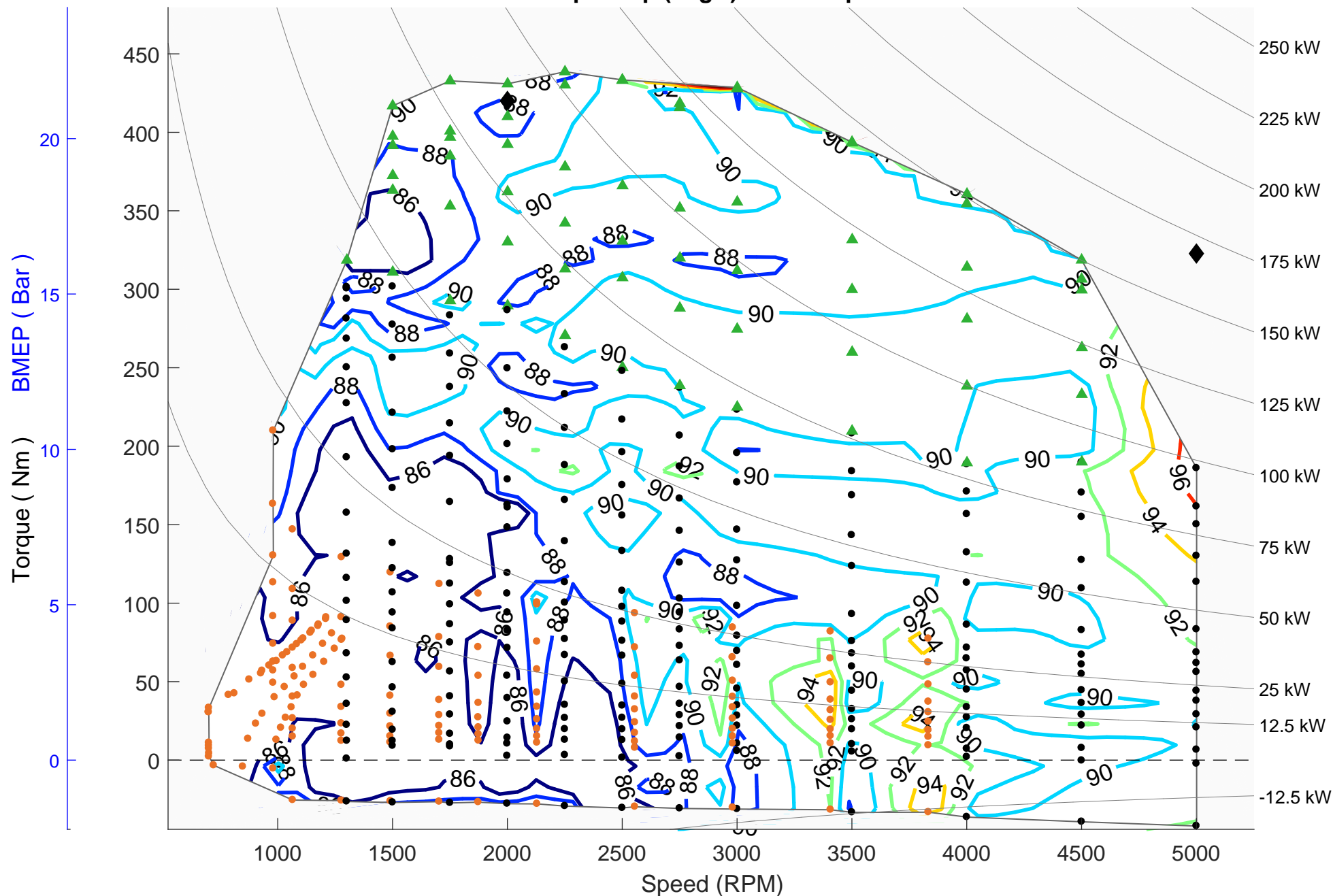
2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Final
Coolant Temp (degC) - Coolant Temperature



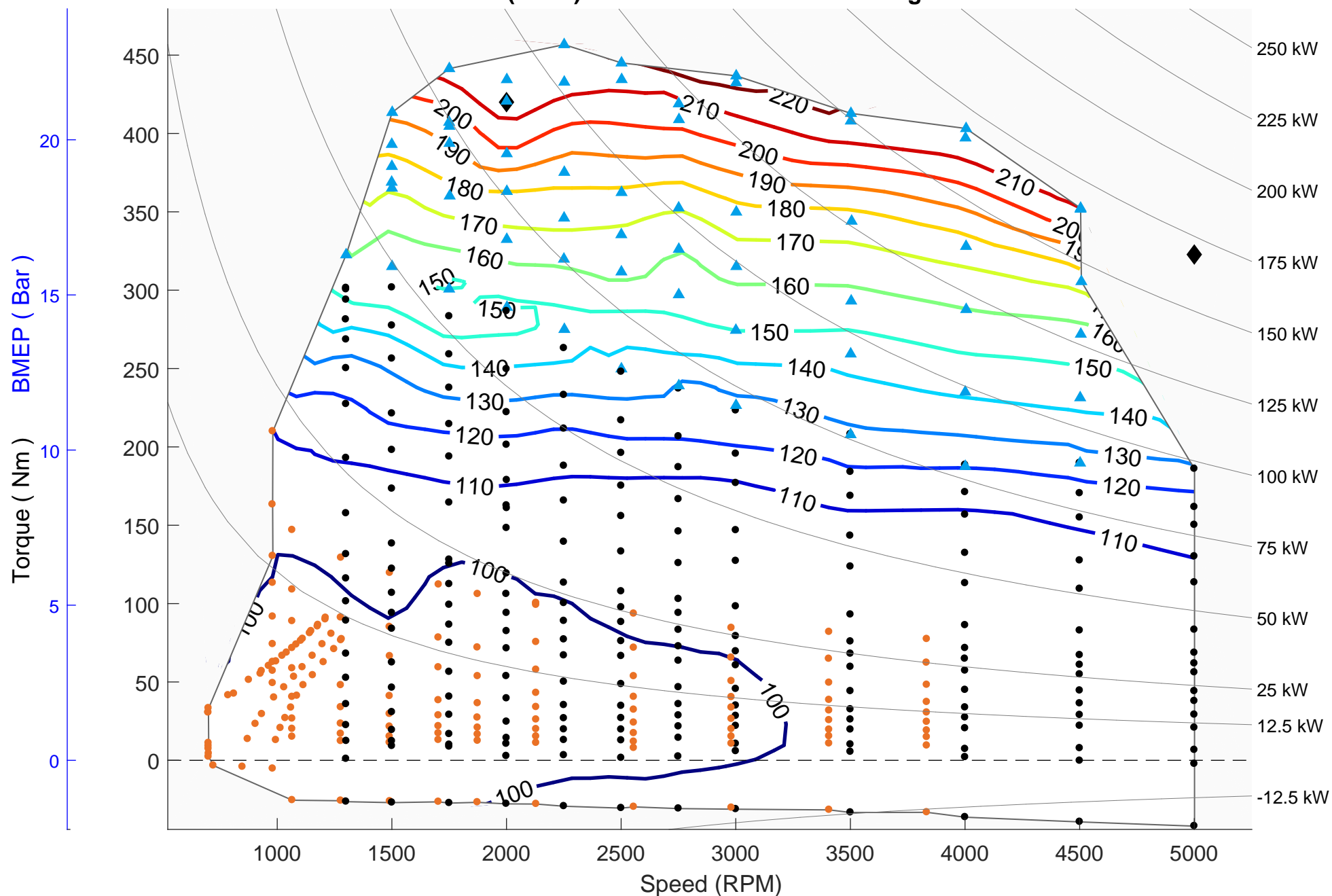
2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Initial
Oil Sump Temp (degC) - Oil Temperature



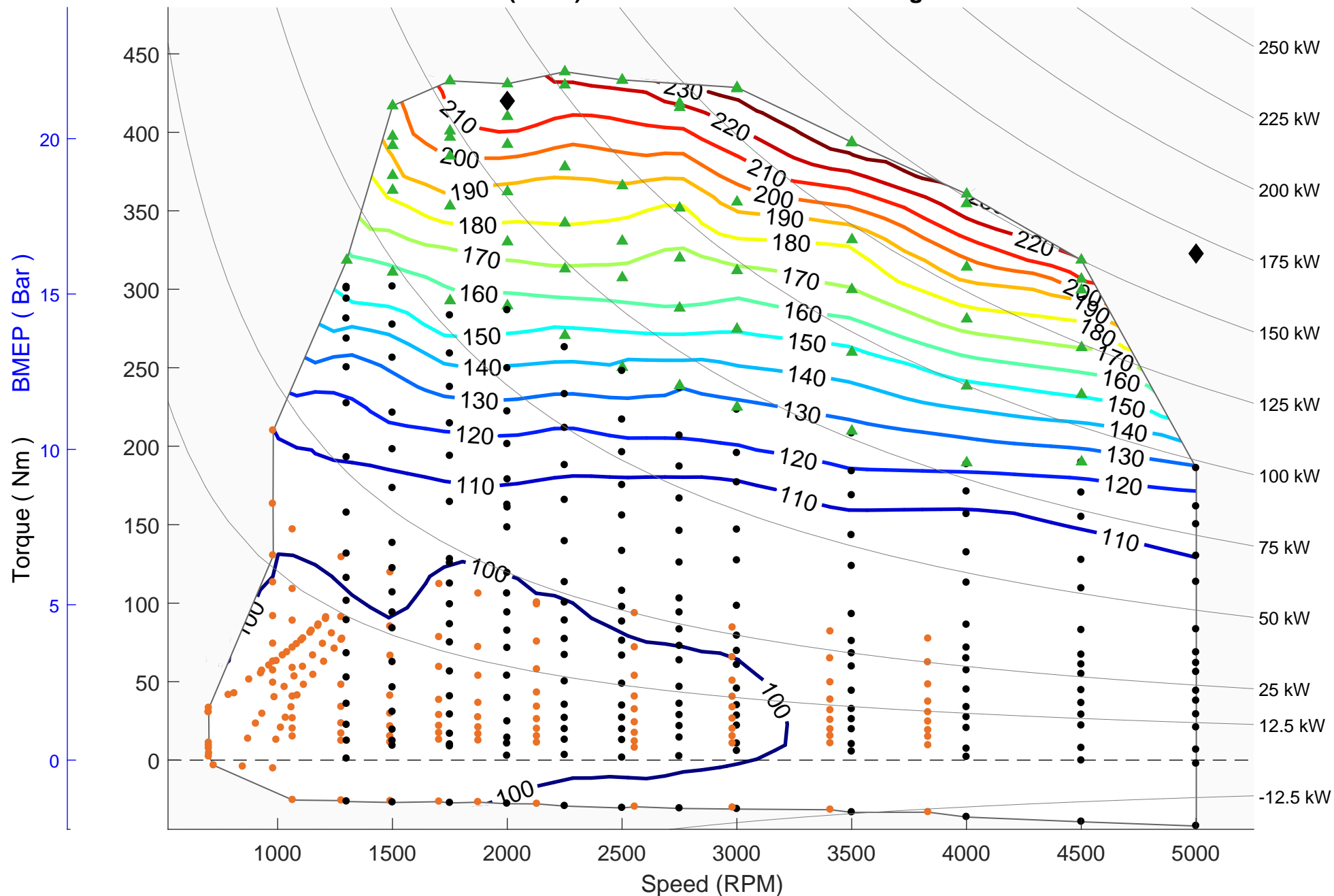
2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Final
Oil Sump Temp (degC) - Oil Temperature



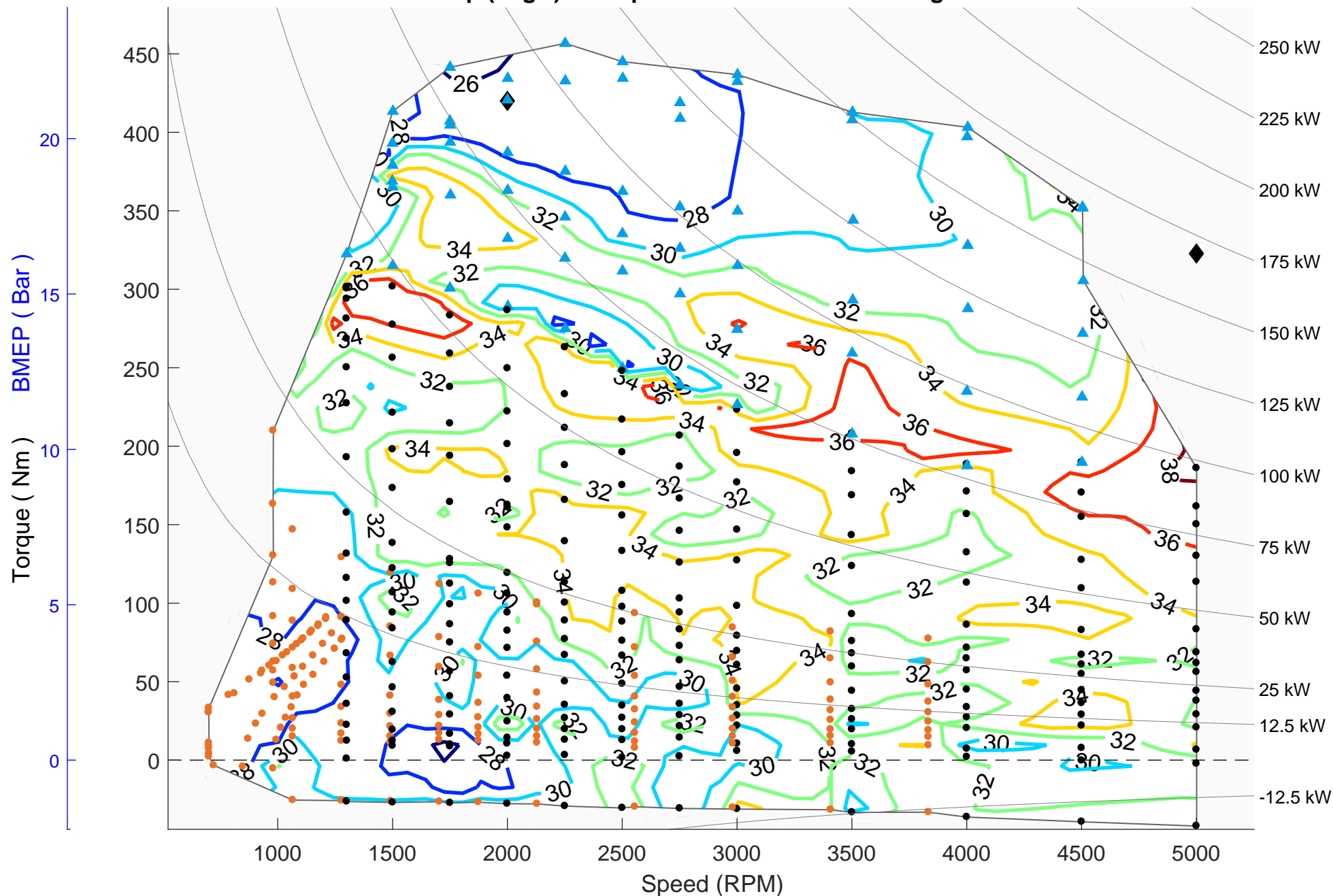
2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Initial
CAC Outlet Press (kPaA) - Pressure Measured at Charge Air Cooler Outlet



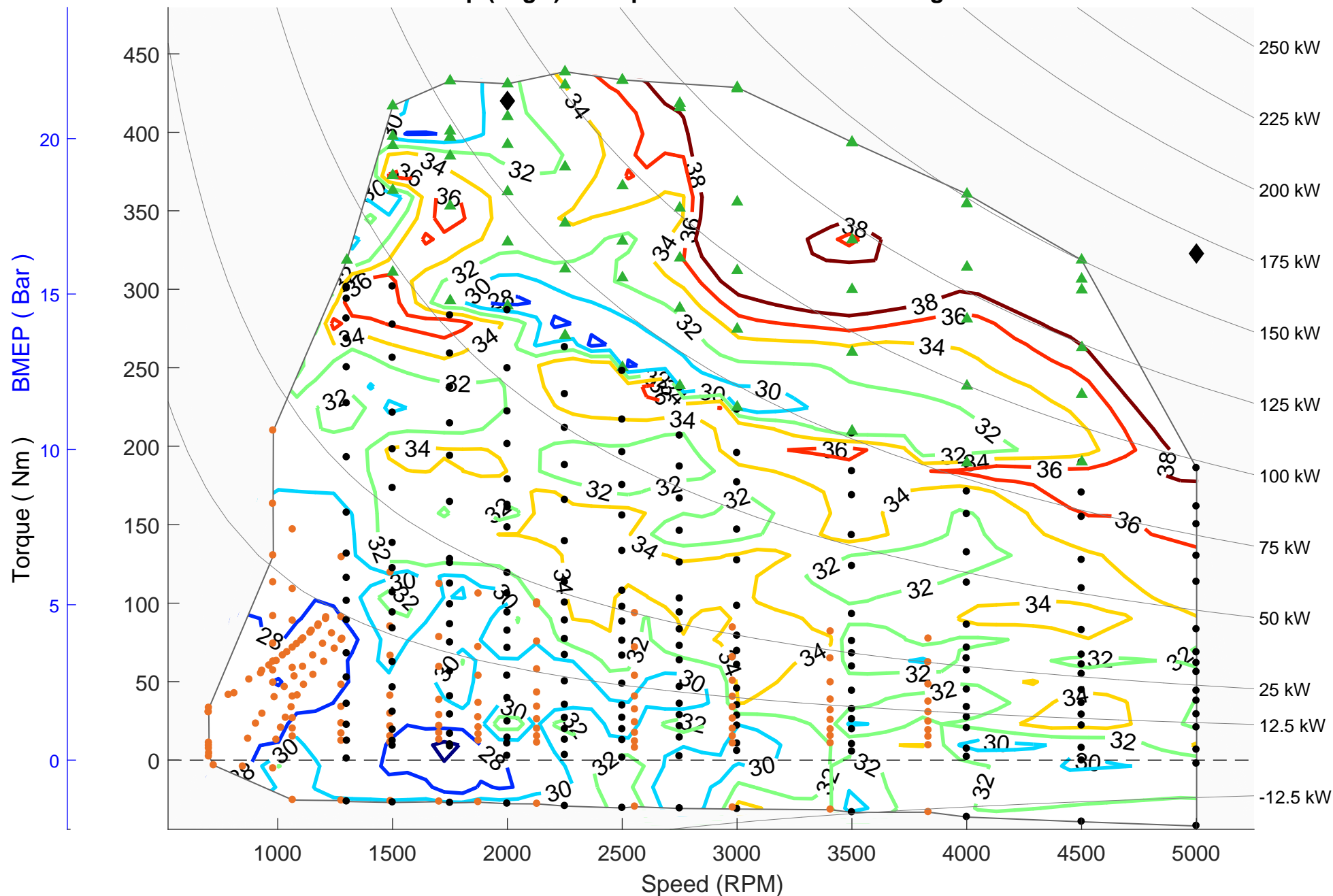
2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Final
CAC Outlet Press (kPaA) - Pressure Measured at Charge Air Cooler Outlet



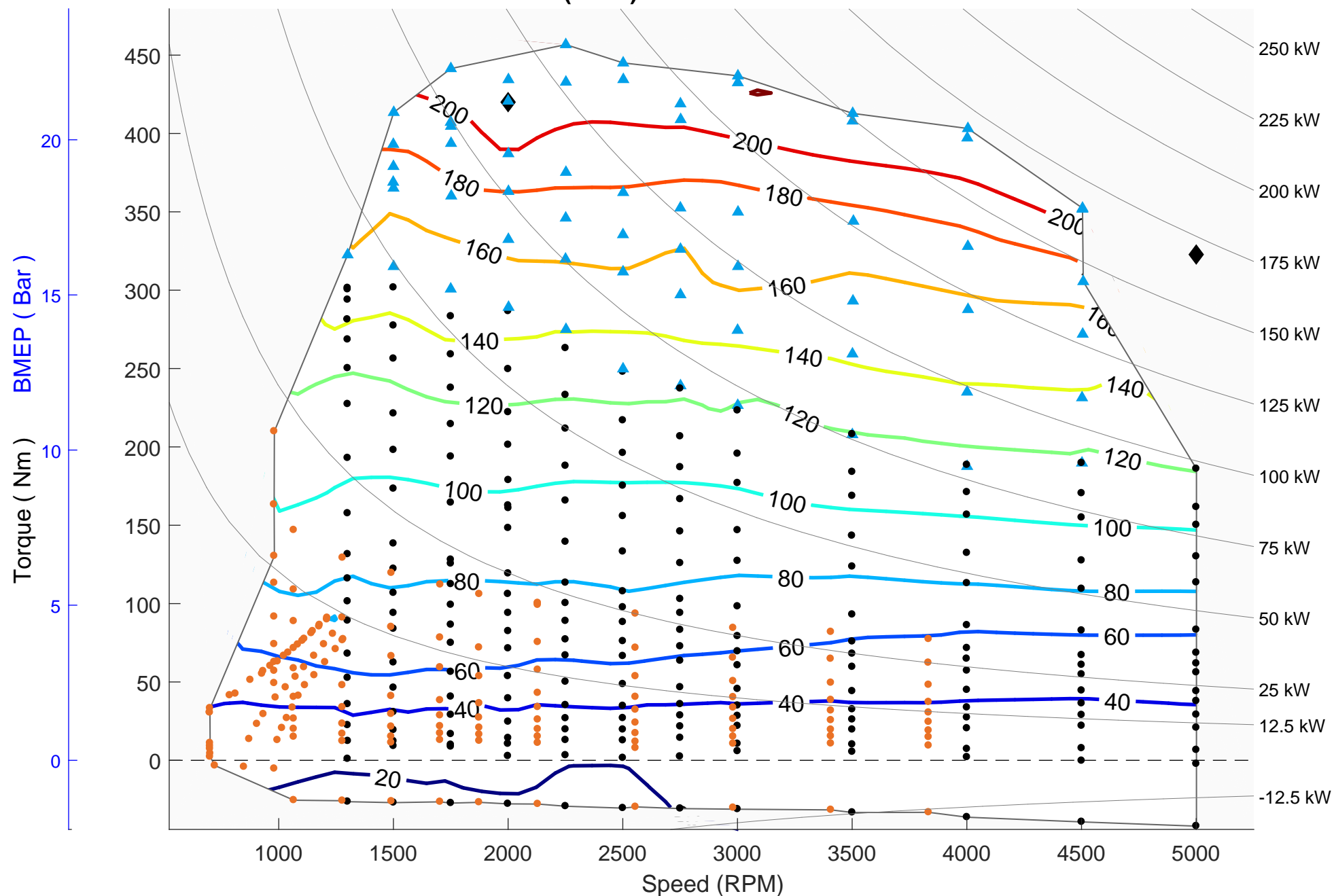
2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Initial
CAC Outlet Temp (degC) - Temperature Measured at Charge Air Cooler Outlet



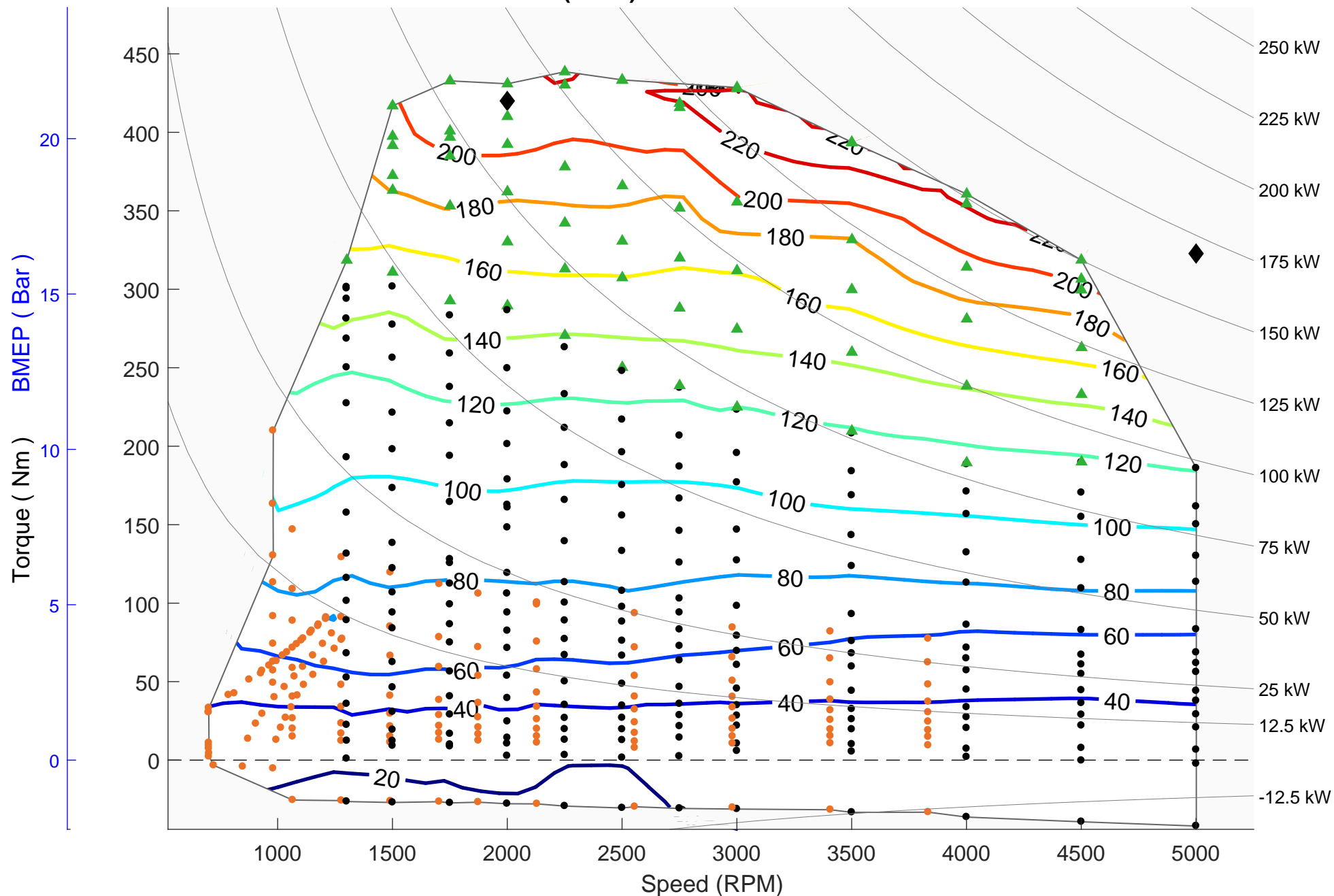
2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Final
CAC Outlet Temp (degC) - Temperature Measured at Charge Air Cooler Outlet



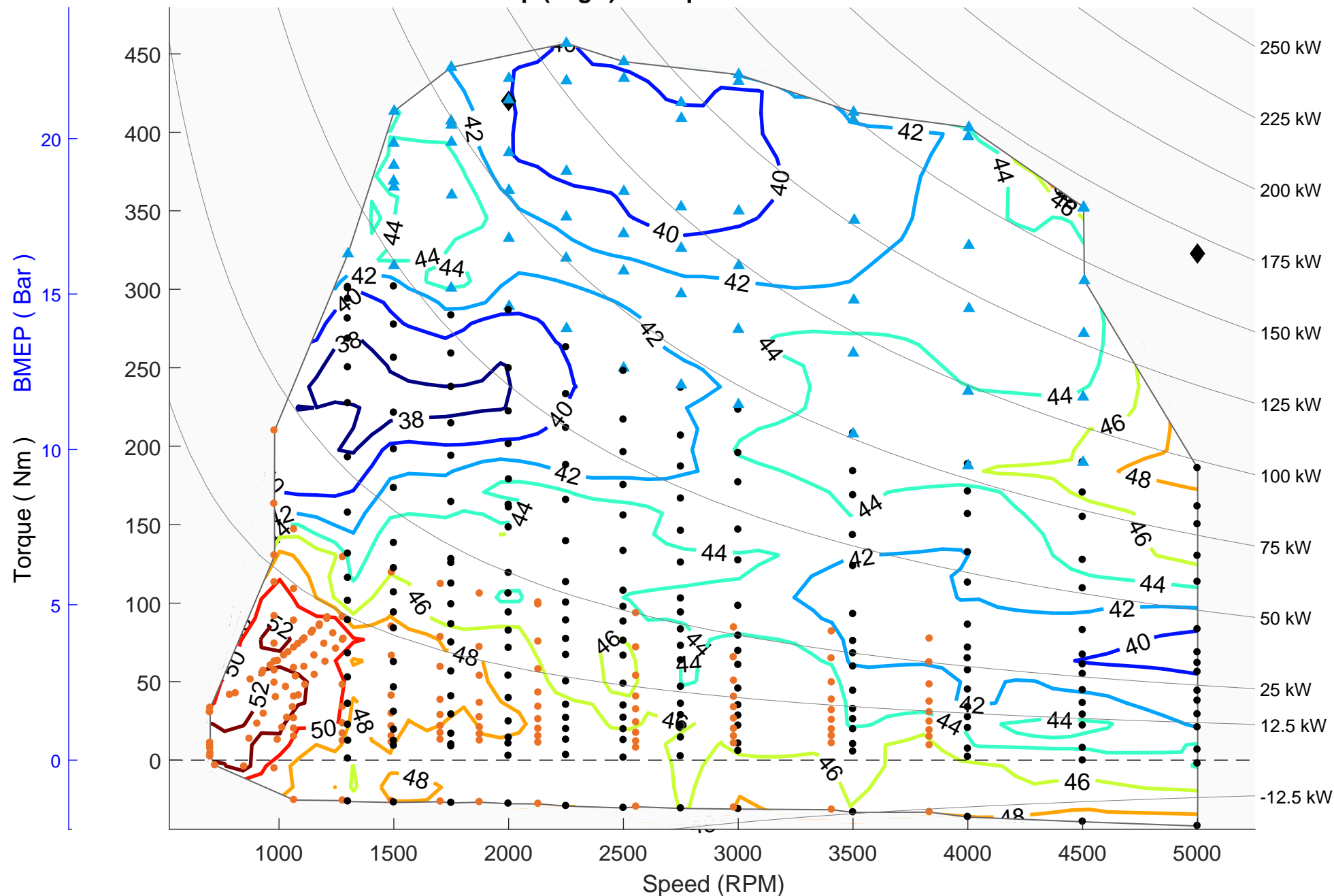
2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Initial
Intake Manifold Press (kPaA) - Pressure Measured in the Intake Manifold



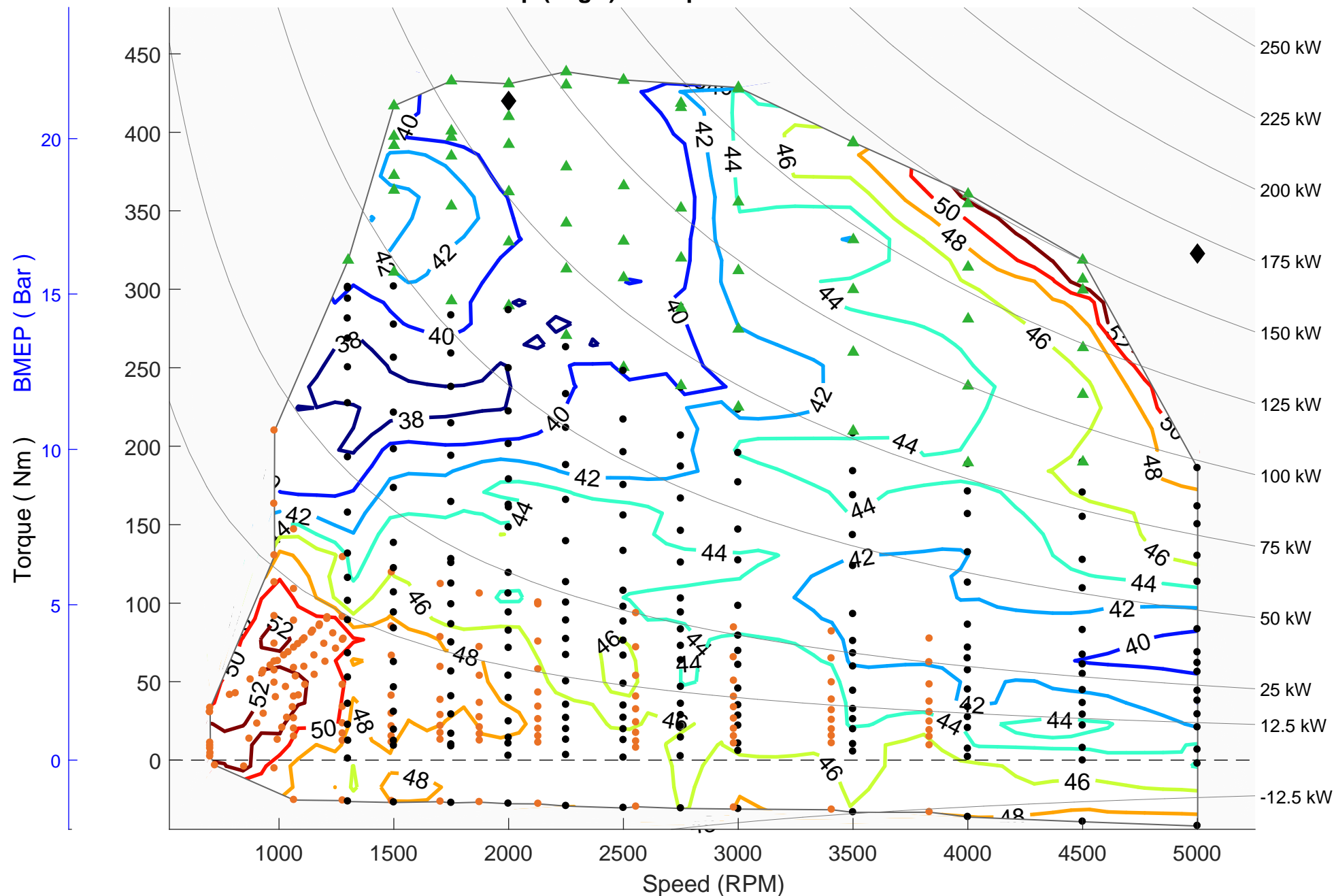
2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Final
Intake Manifold Press (kPaA) - Pressure Measured in the Intake Manifold



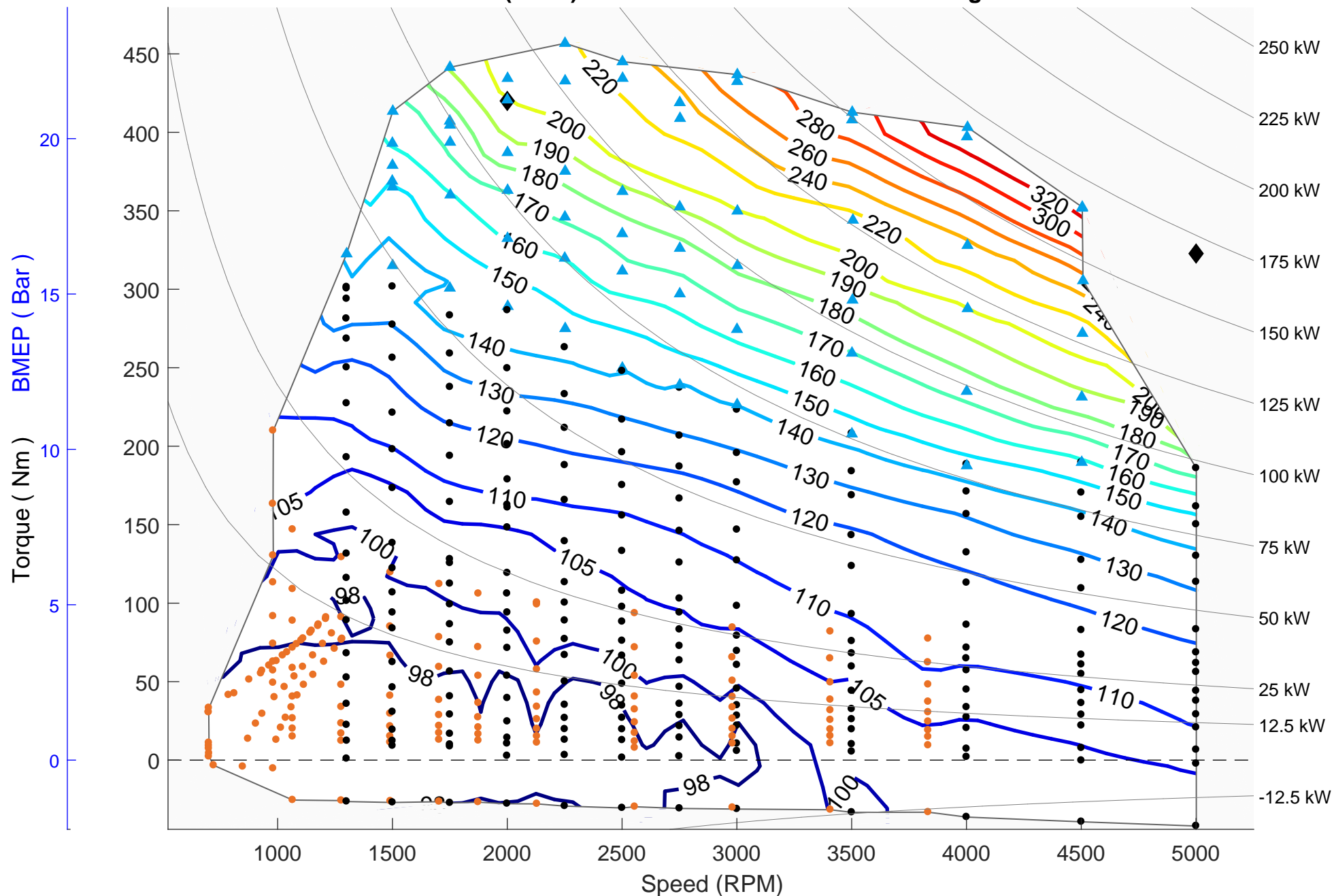
2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Initial
Intake Manifold Temp (degC) - Temperature Measured in the Intake Manifold



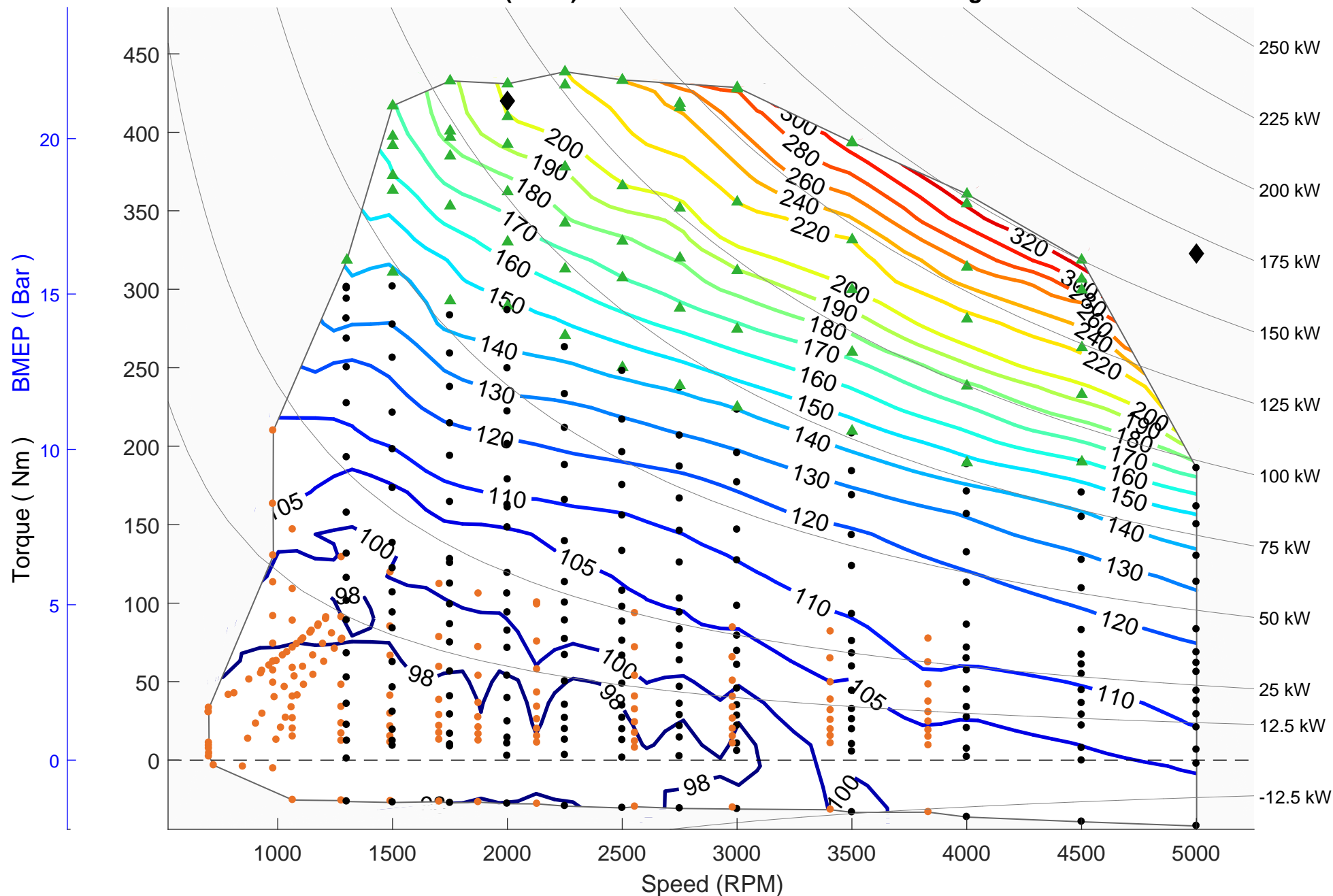
2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Final
Intake Manifold Temp (degC) - Temperature Measured in the Intake Manifold



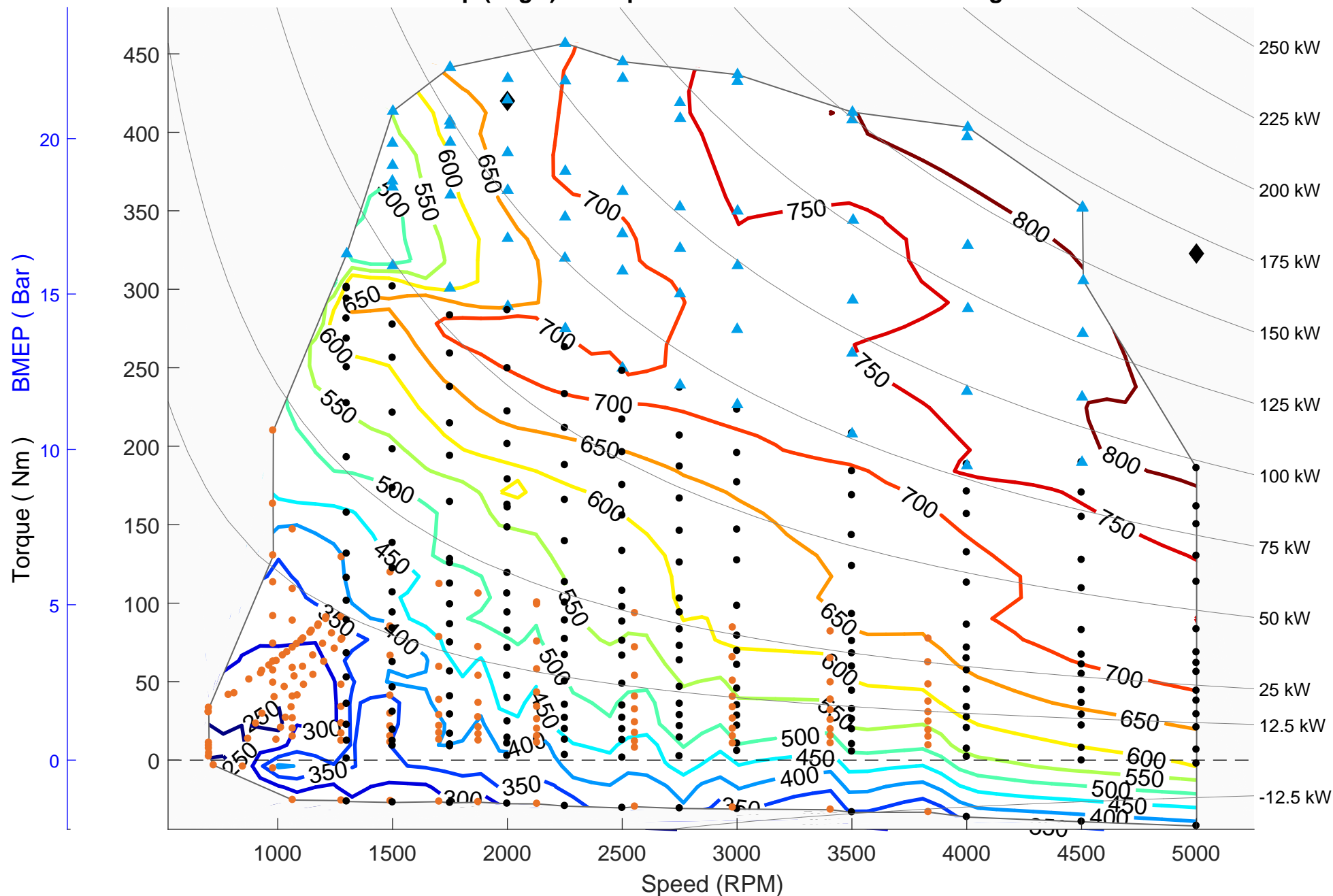
2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Initial
Turbine Inlet Press (kPaA) - Pressure Measured at Turbocharger Turbine Inlet

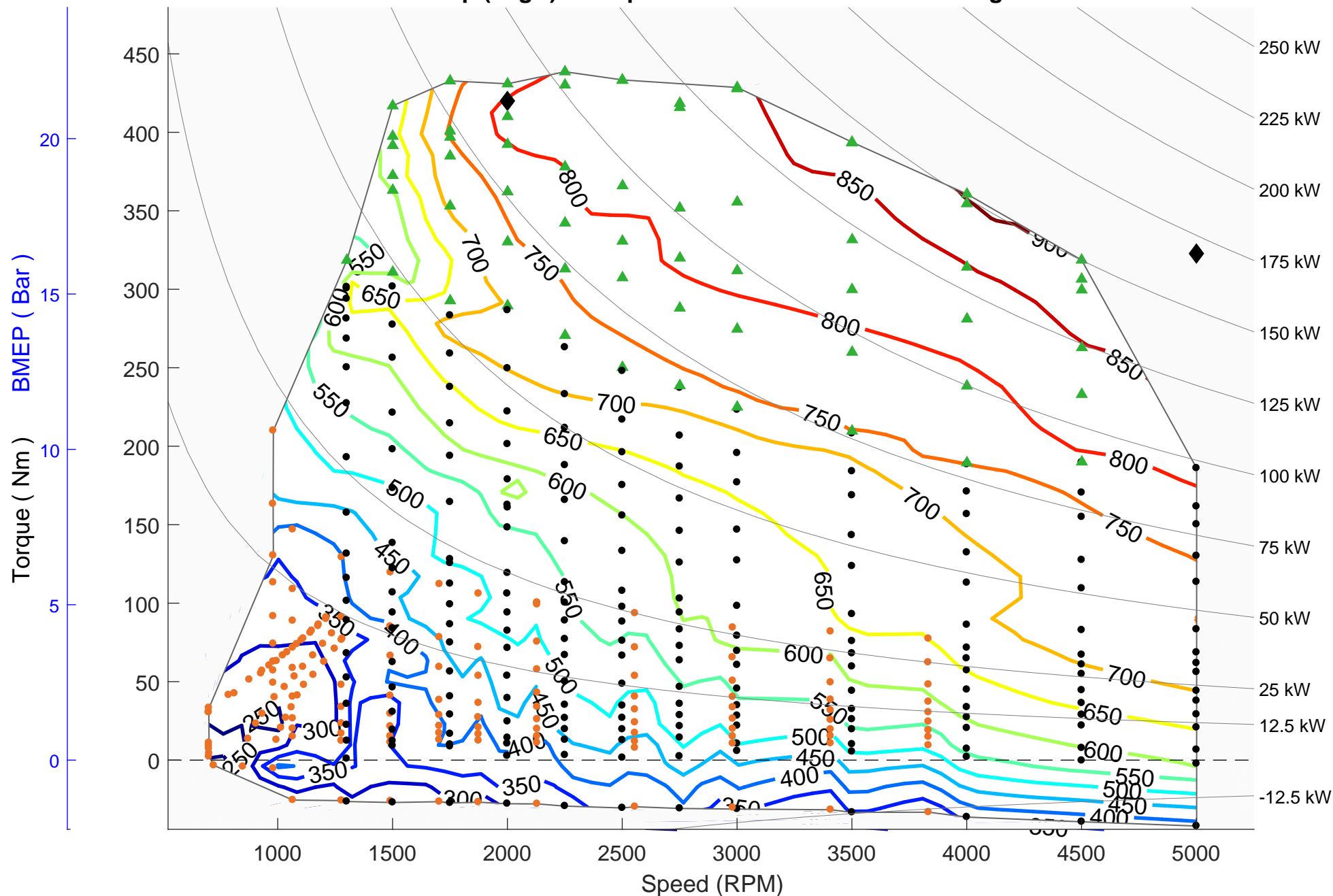


2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Final
Turbine Inlet Press (kPaA) - Pressure Measured at Turbocharger Turbine Inlet

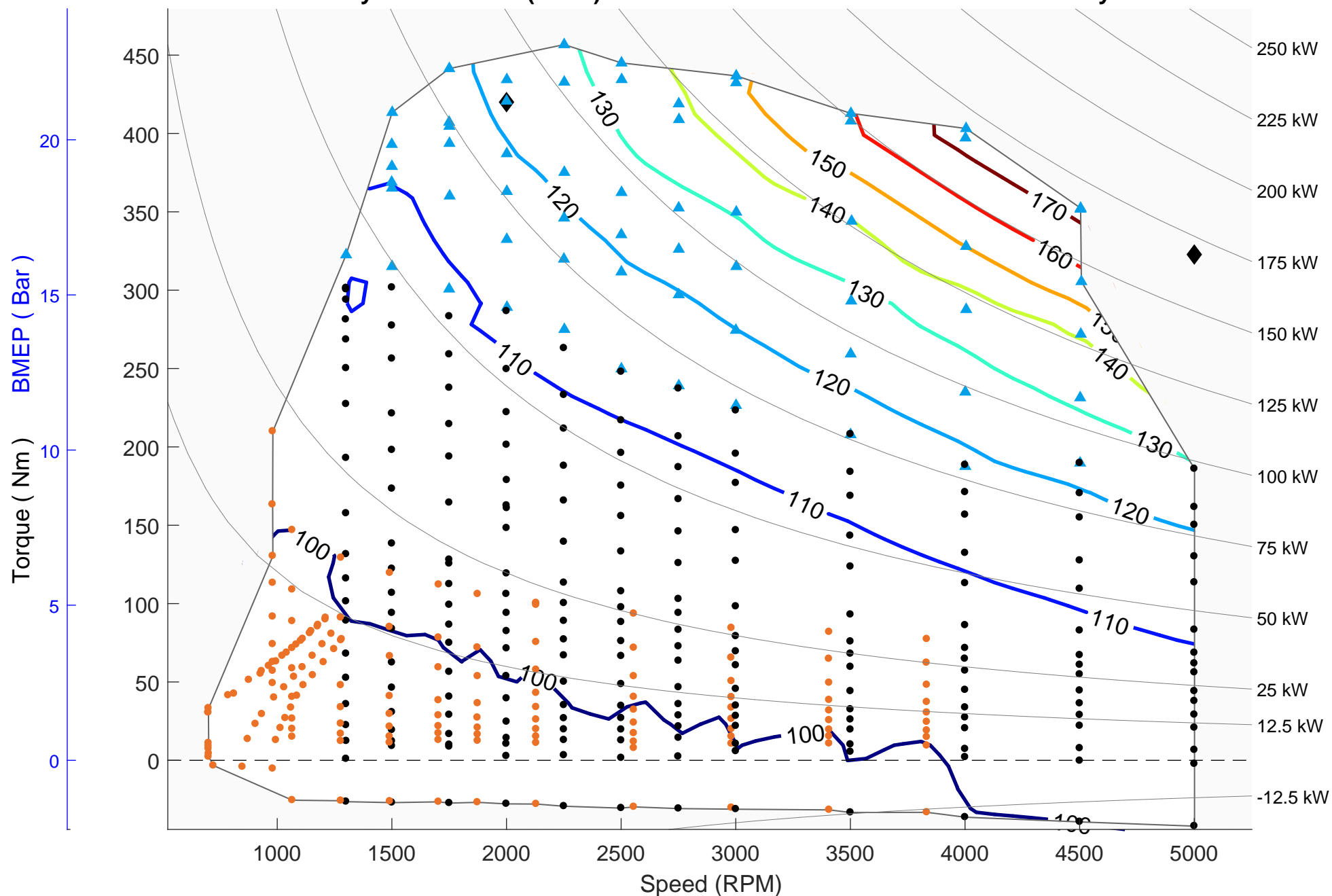


2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Initial
Turbine Inlet Temp (degC) - Temperature Measured at Turbocharger Turbine Inlet

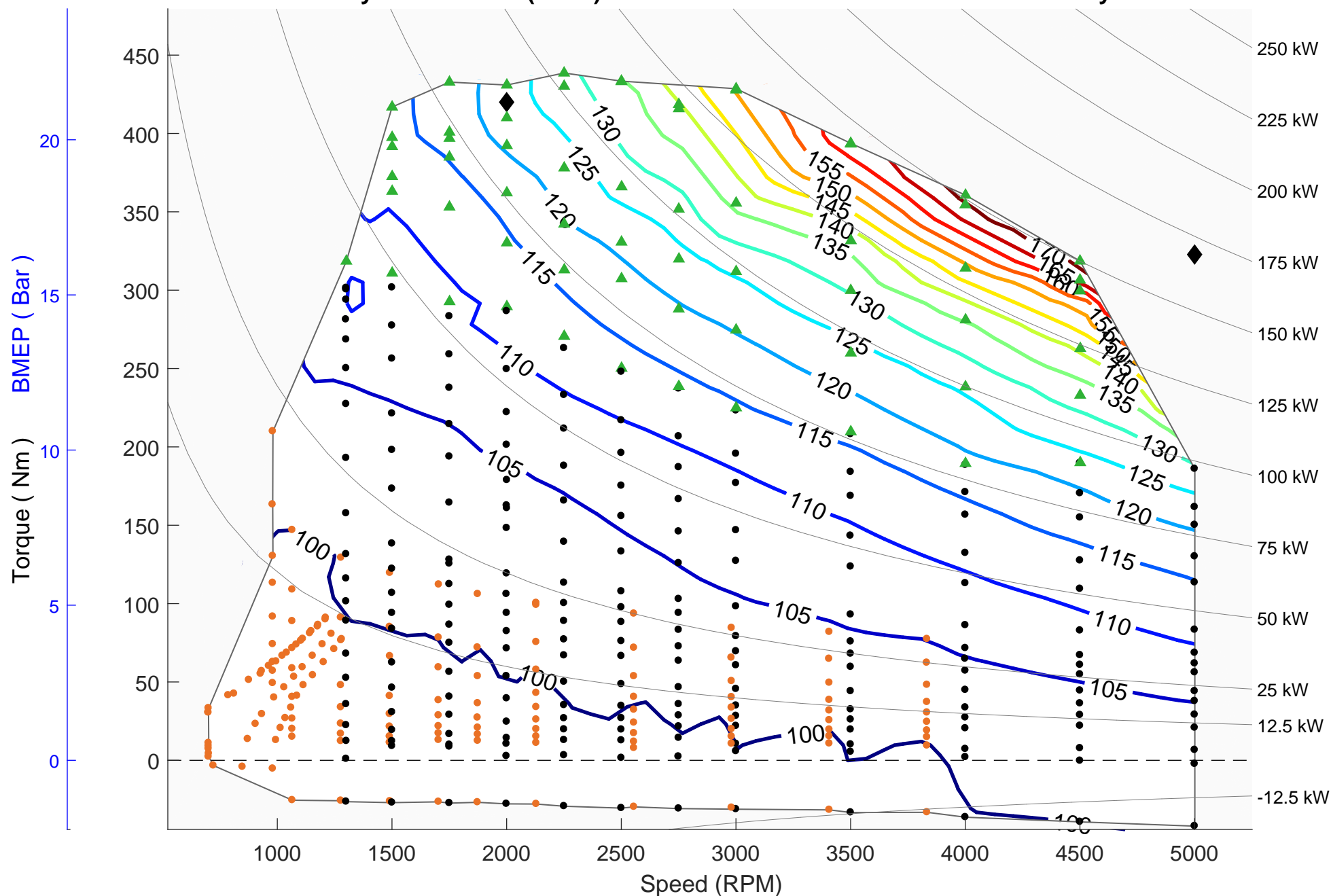




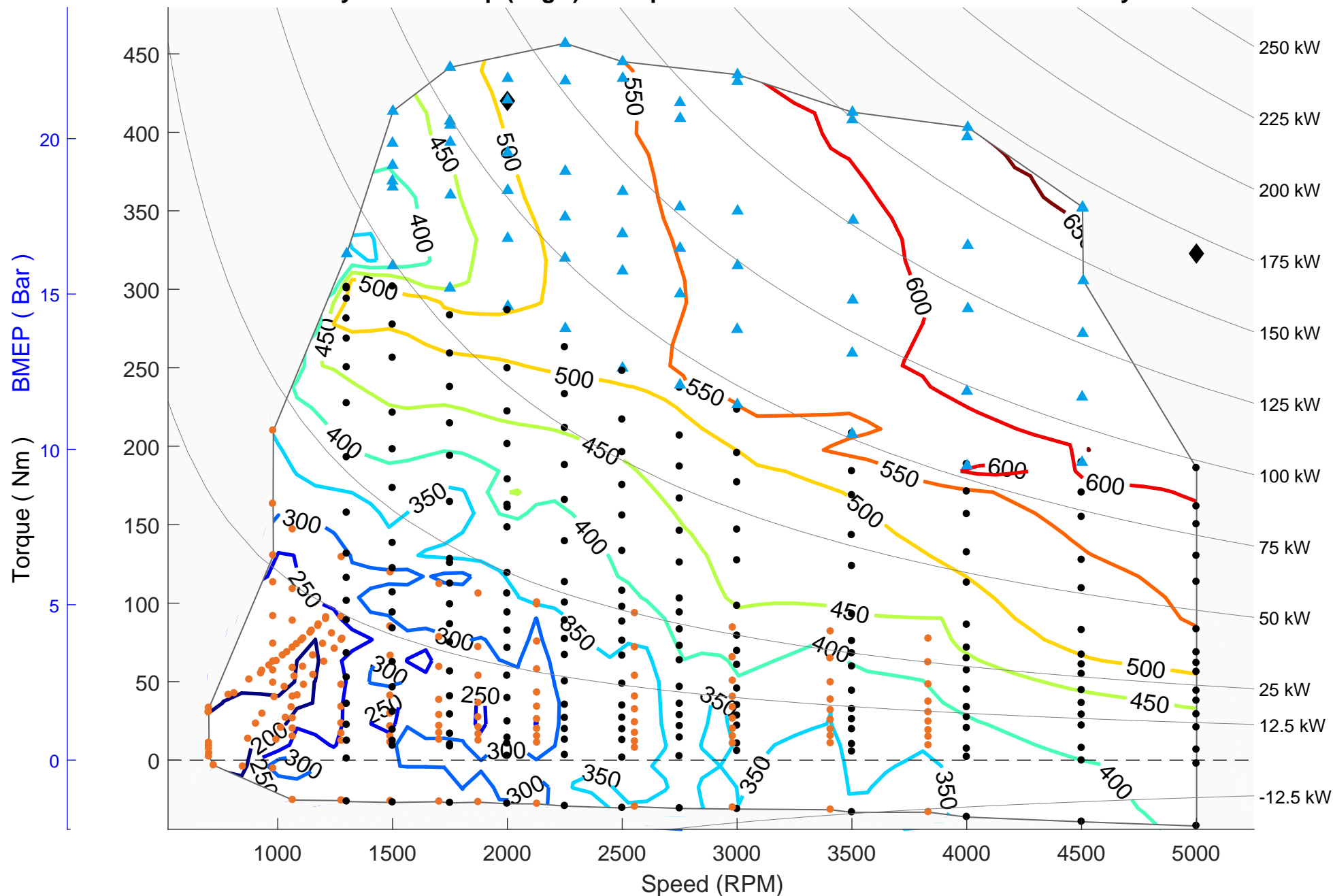
2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Initial
Catalyst Inlet Press (kPaA) - Pressure Measured at the Inlet to the Catalyst

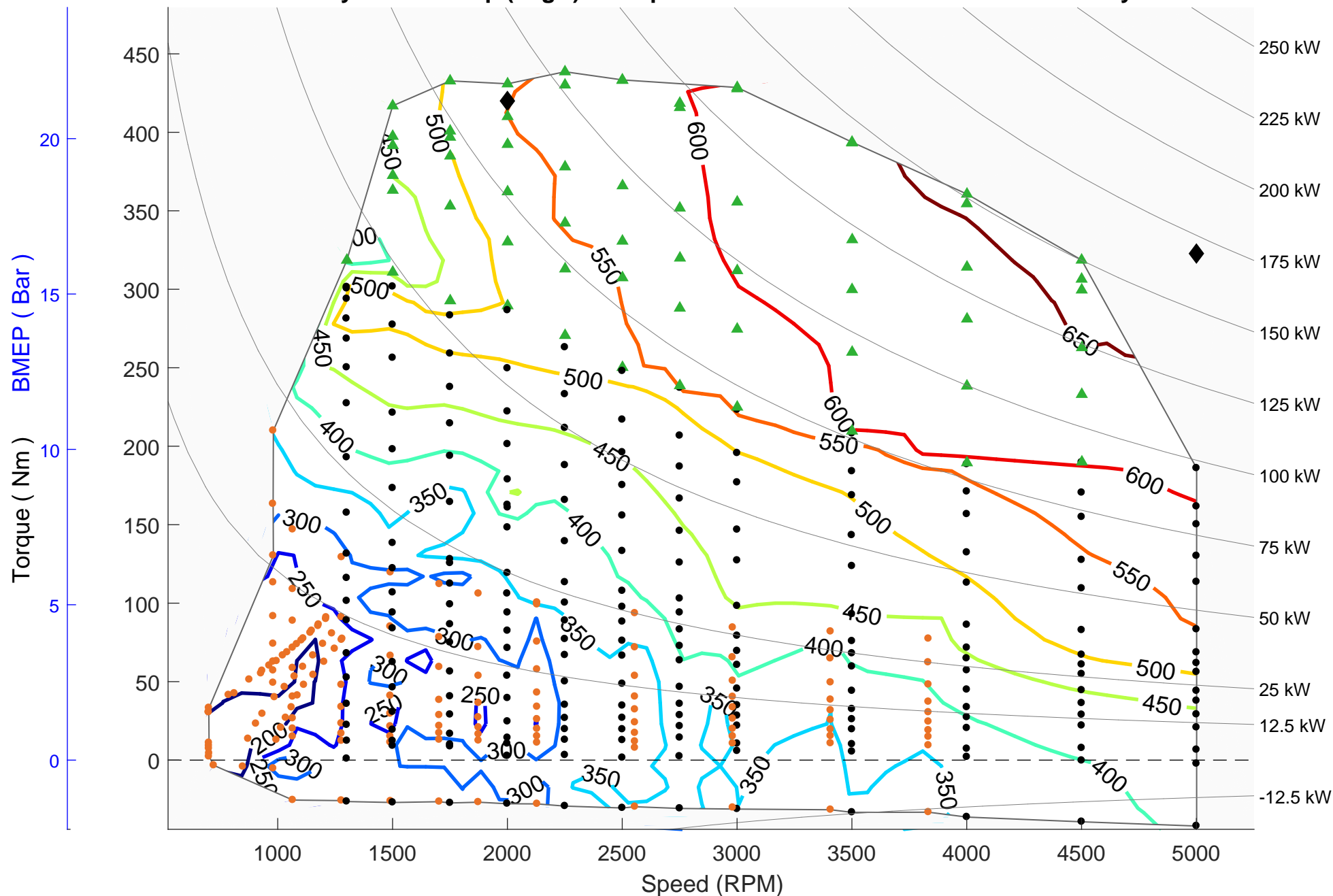


2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Final
Catalyst Inlet Press (kPaA) - Pressure Measured at the Inlet to the Catalyst

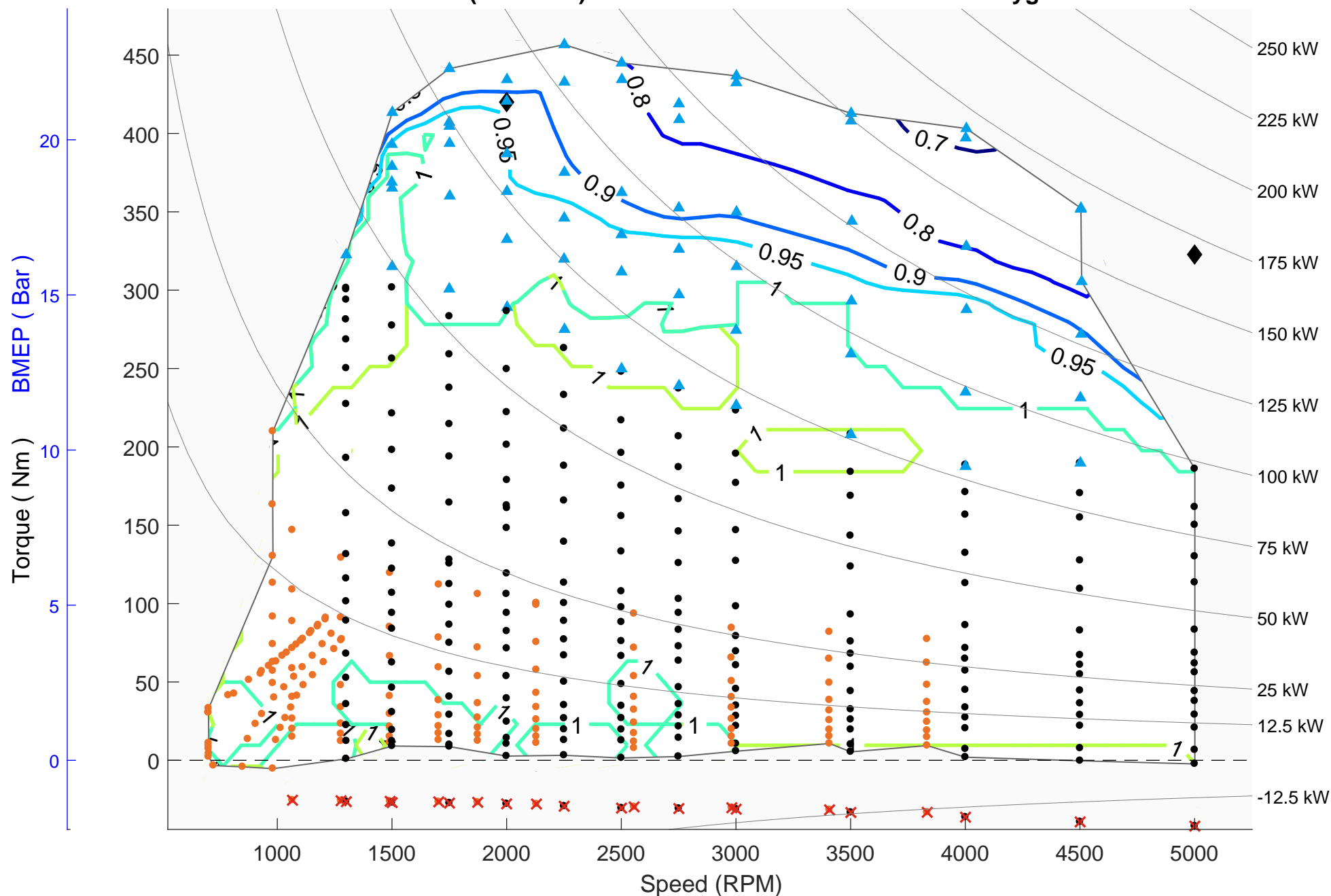


2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Initial
Catalyst Inlet Temp (degC) - Temperature Measured at the Inlet to the Catalyst



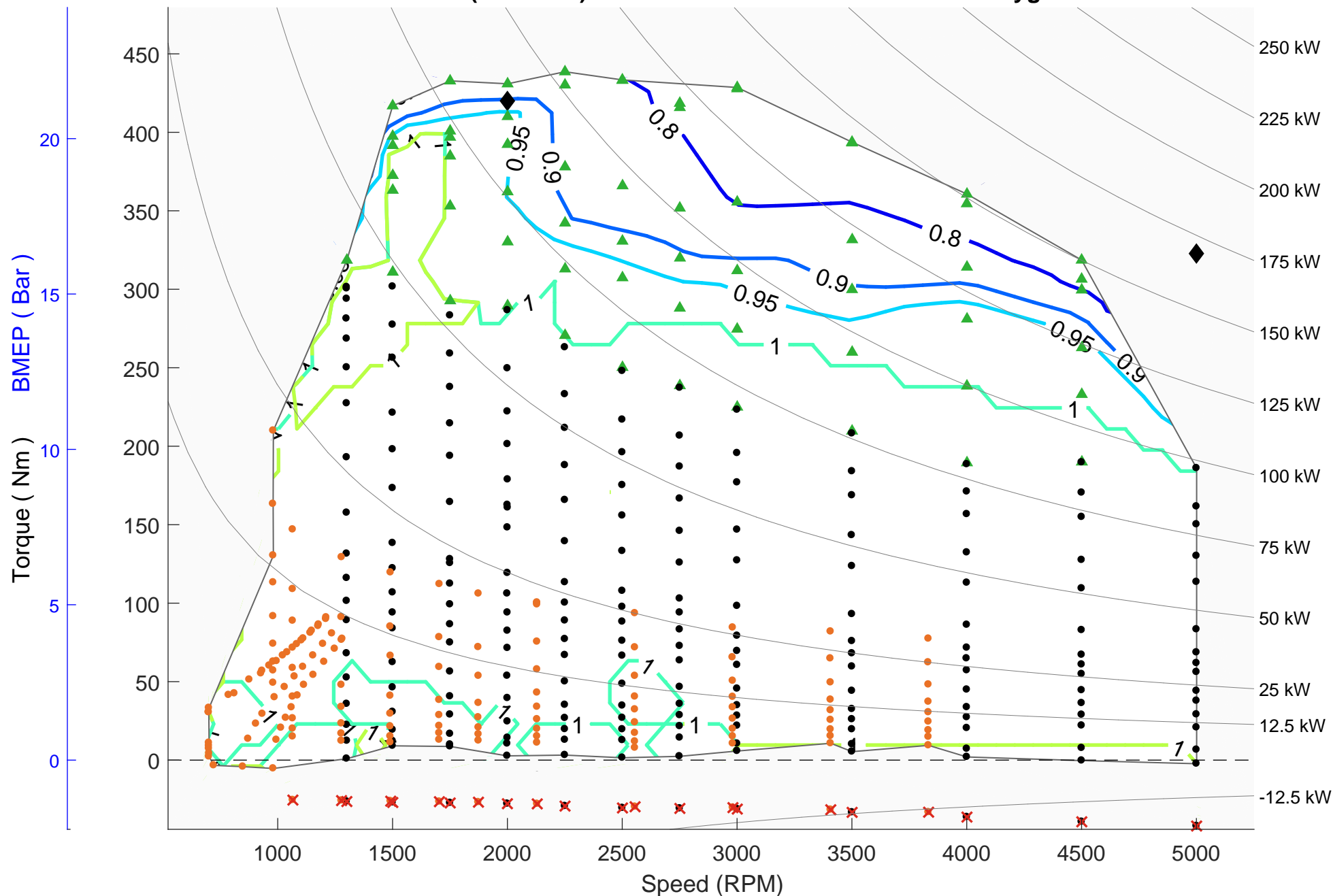


2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Initial
Exhaust Lambda (LAMBDA) - Measured via Wideband Exhaust Oxygen Sensor*

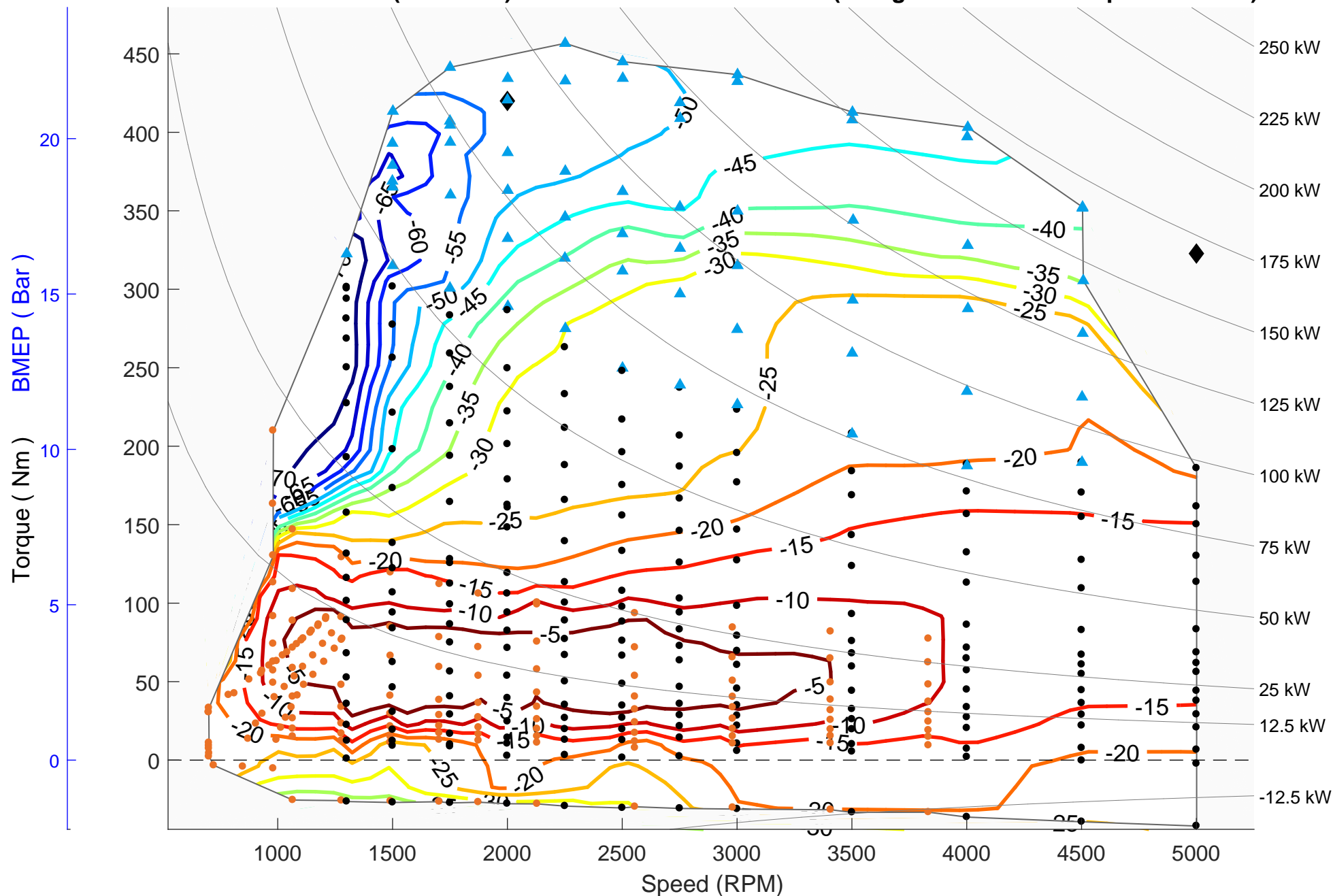


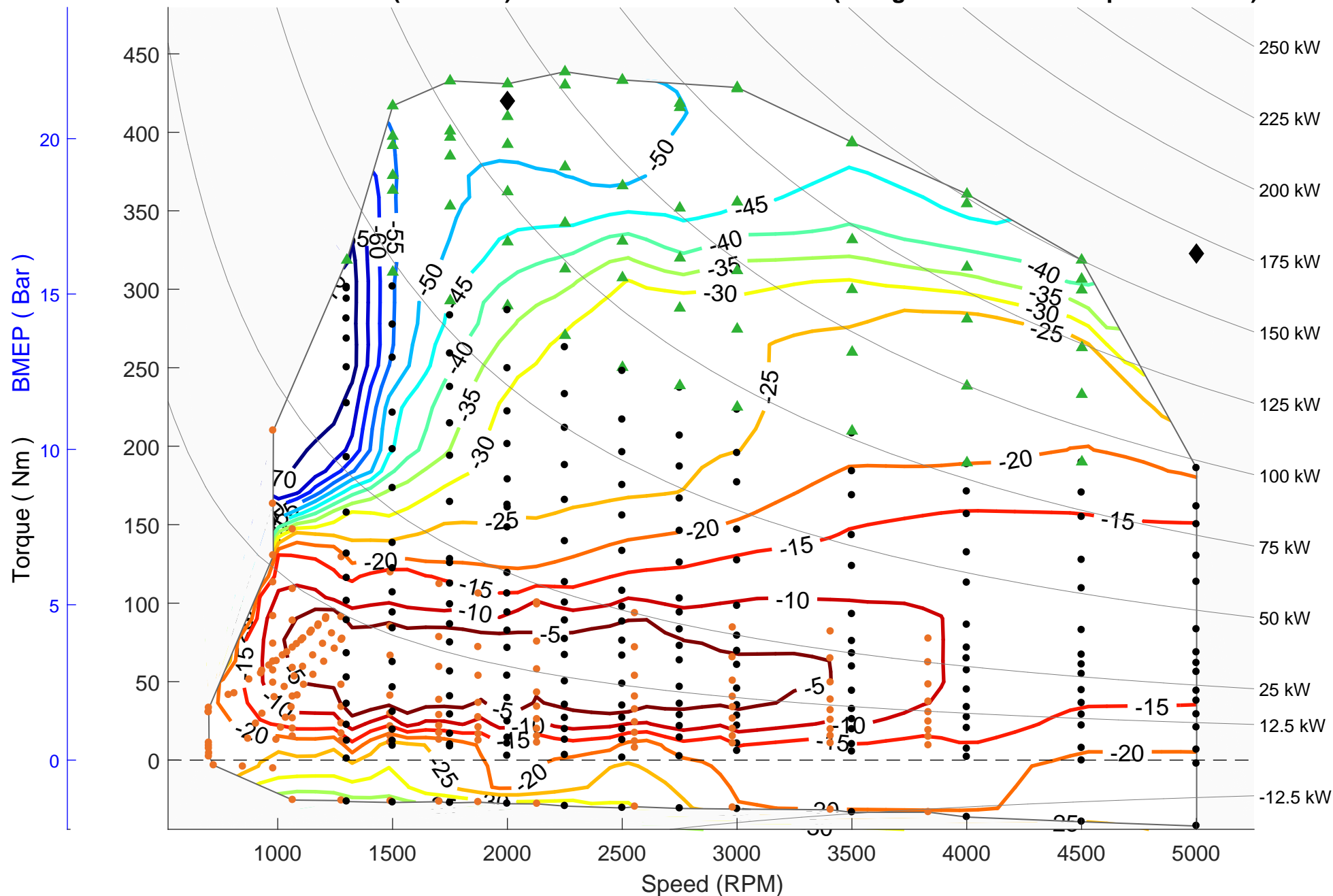
* Reference Only - Uncalibrated Sensor

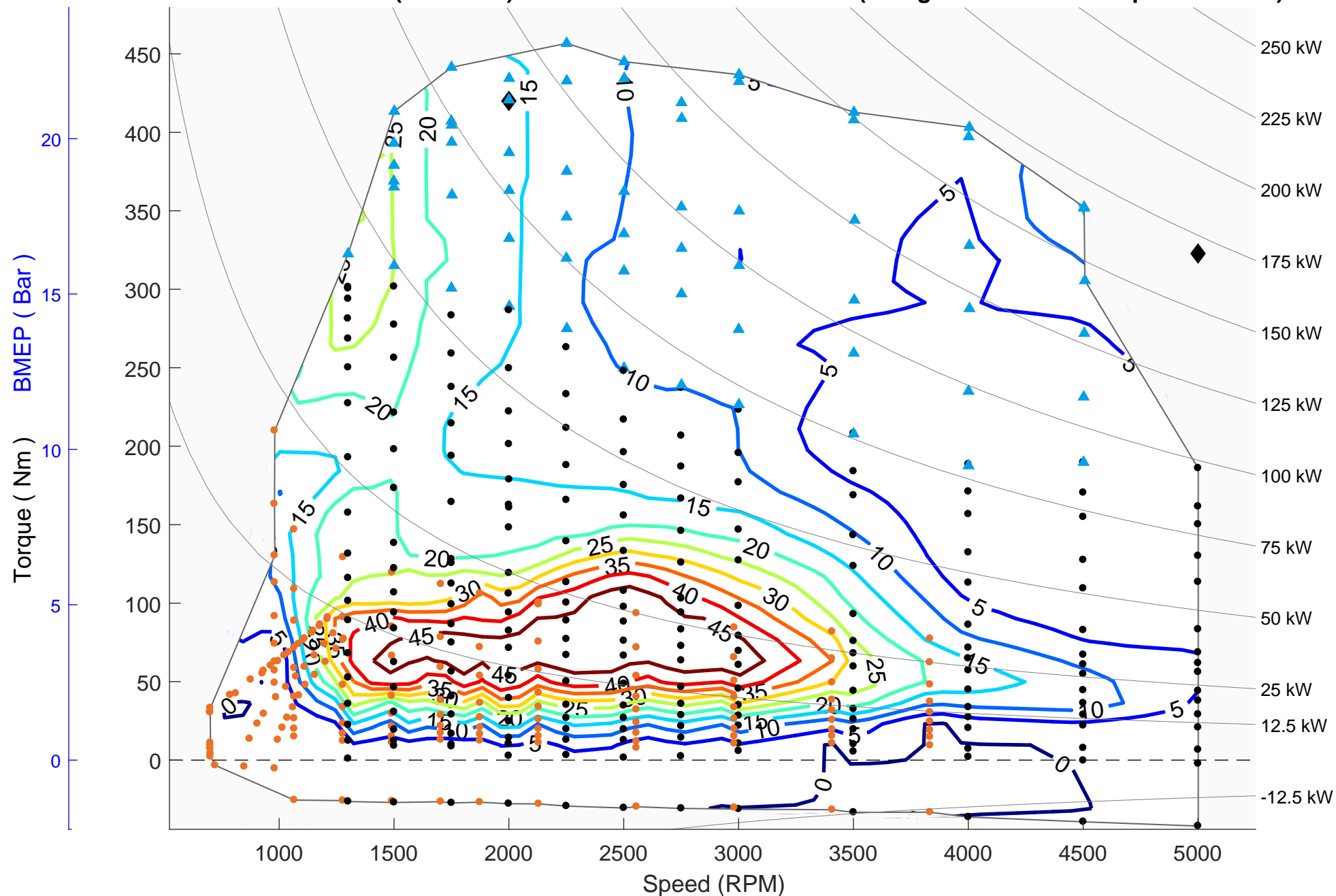
2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Final
Exhaust Lambda (LAMBDA) - Measured via Wideband Exhaust Oxygen Sensor*



* Reference Only - Uncalibrated Sensor

2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots**Steady State and High Load Initial****Intake Cam Phase (CAD RET) - Intake Cam Phaser Retard (Using Service Manual Specifications)**

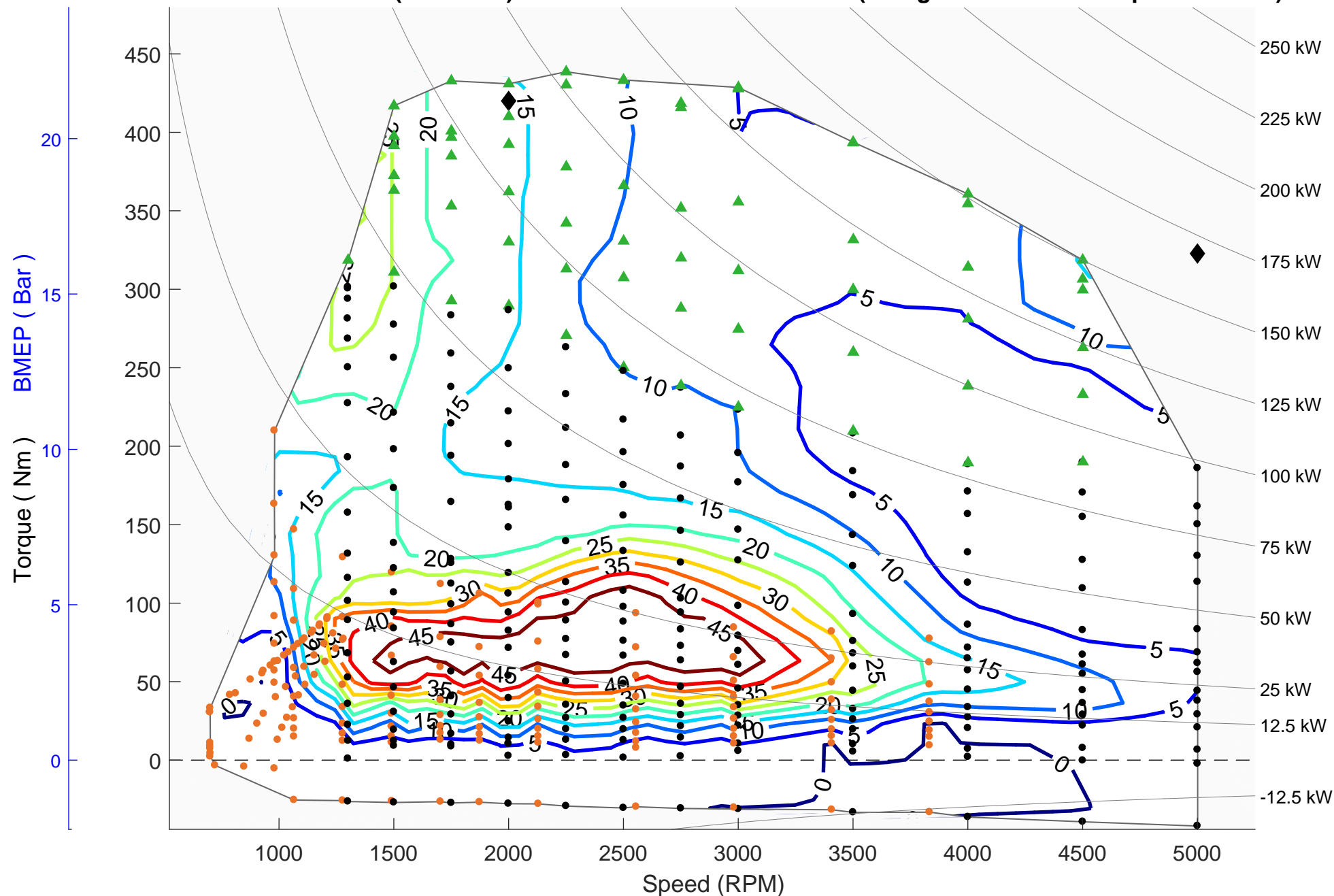
2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots**Steady State and High Load Final****Intake Cam Phase (CAD RET) - Intake Cam Phaser Retard (Using Service Manual Specifications)**

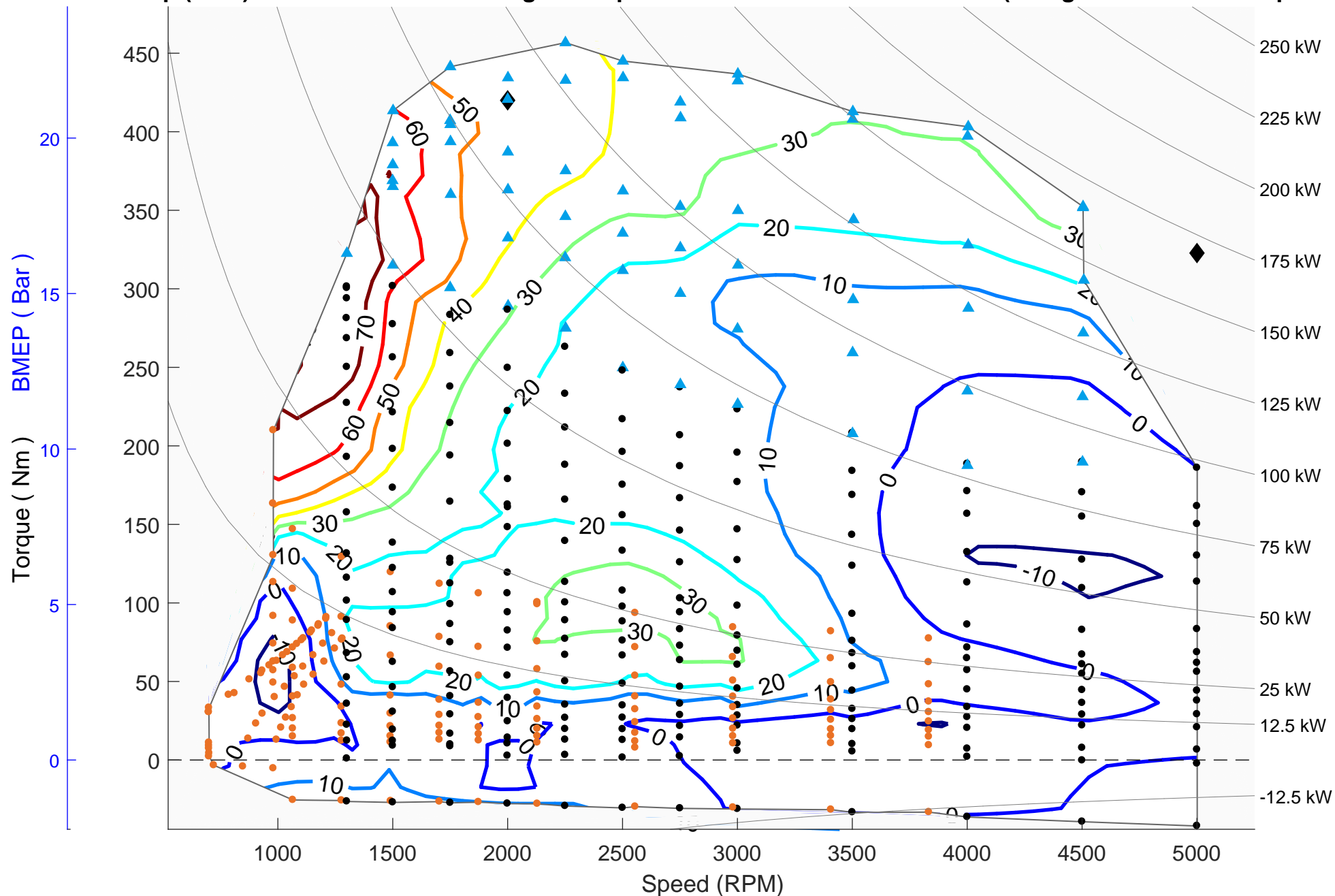
2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots**Steady State and High Load Initial****Exhaust Cam Phase (CAD RET) - Exhaust Cam Phaser Retard (Using Service Manual Specifications)**

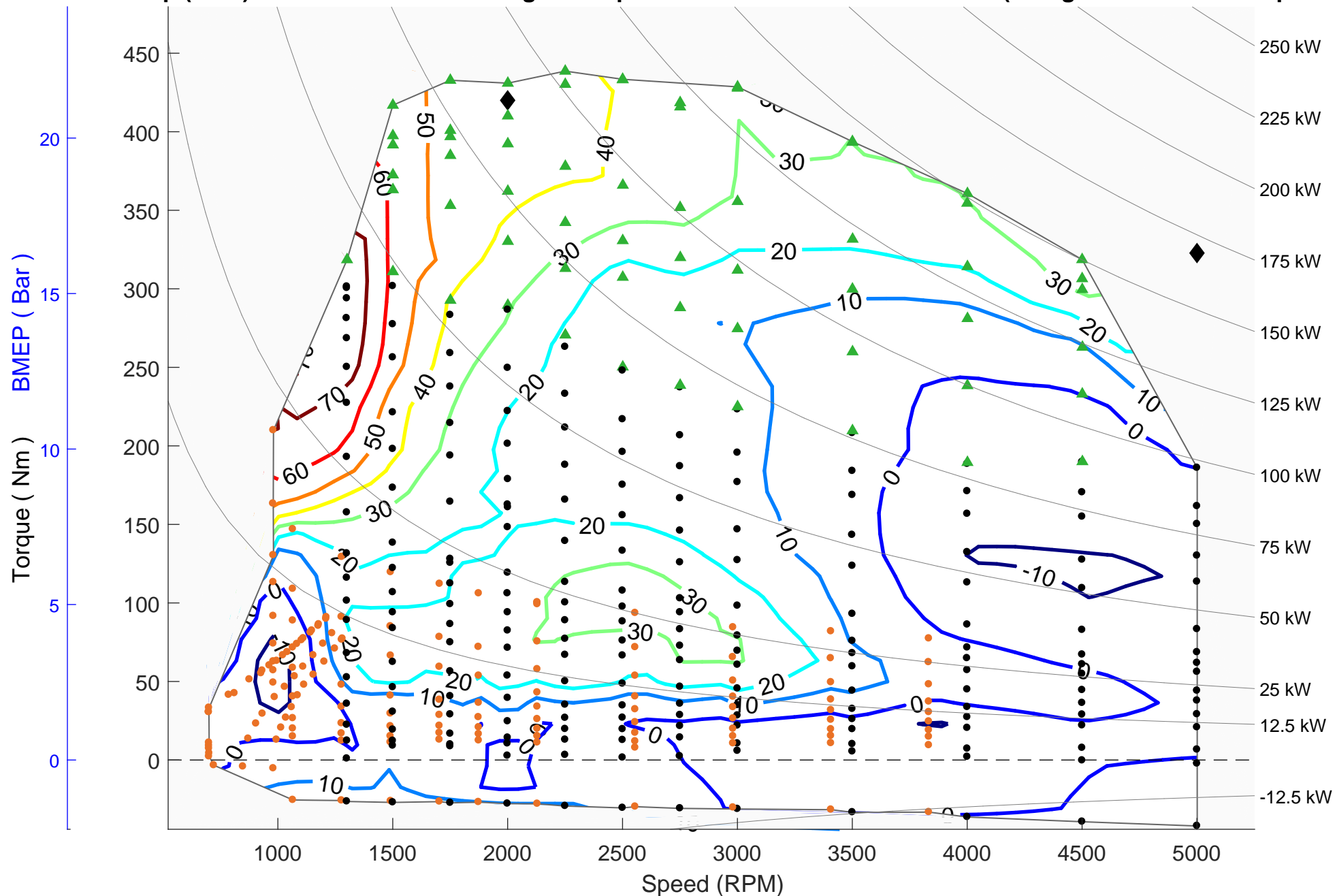
2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots

Steady State and High Load Final

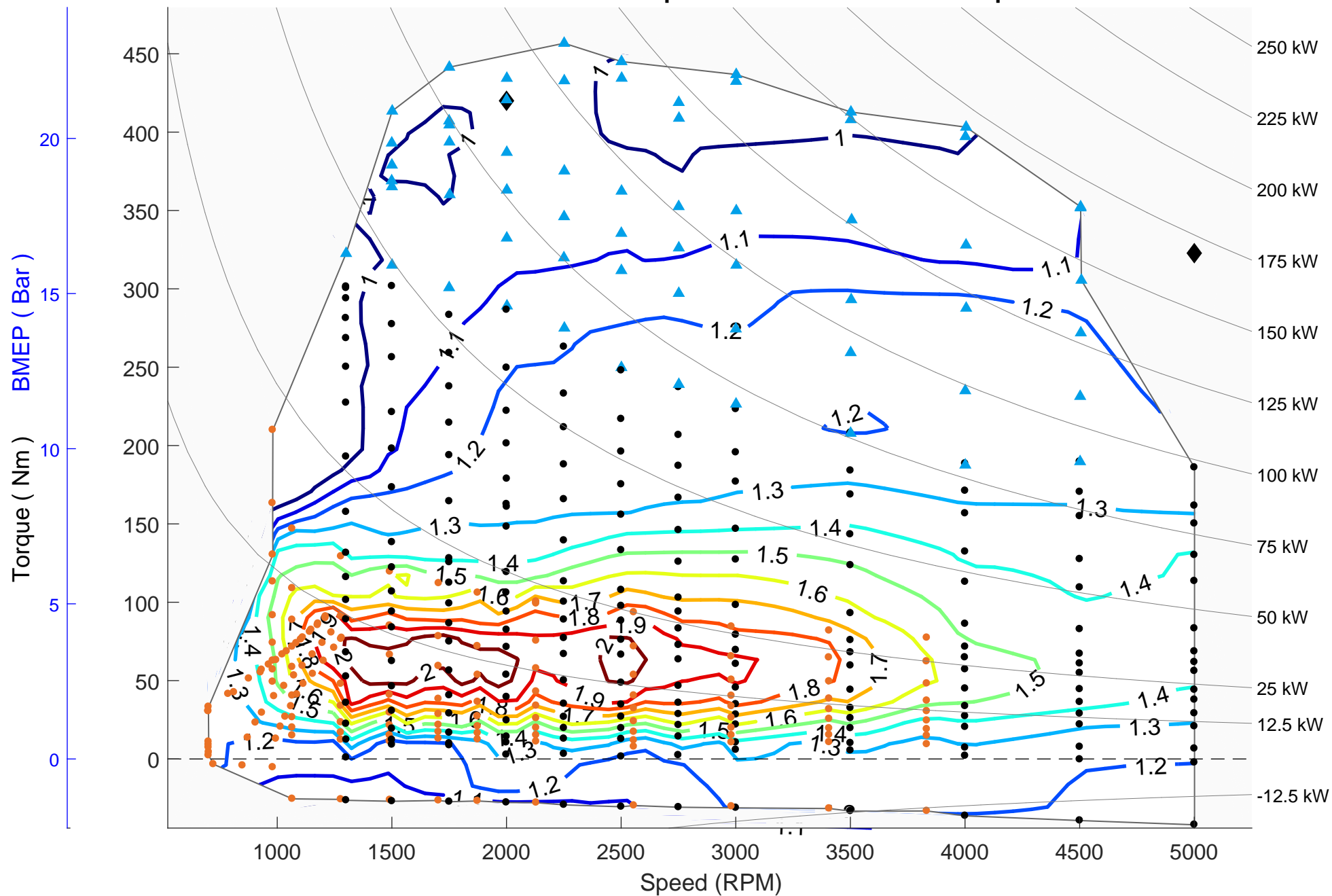
Exhaust Cam Phase (CAD RET) - Exhaust Cam Phaser Retard (Using Service Manual Specifications)



2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots**Steady State and High Load Initial****Valve Overlap (CAD) - Estimated Valve Timing Overlap from Cam Phase Measurements (Using Service Manual Specifications)**

2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots**Steady State and High Load Final****Valve Overlap (CAD) - Estimated Valve Timing Overlap from Cam Phase Measurements (Using Service Manual Specifications)**

2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Initial
EPA Atkinson Ratio - Effective Compression Stroke / Effective Expansion Stroke



2016 Mazda 2.5L Turbo Skyactiv-G Engine Tier 3 Fuel - Test Data Plots
Steady State and High Load Final
EPA Atkinson Ratio - Effective Compression Stroke / Effective Expansion Stroke

