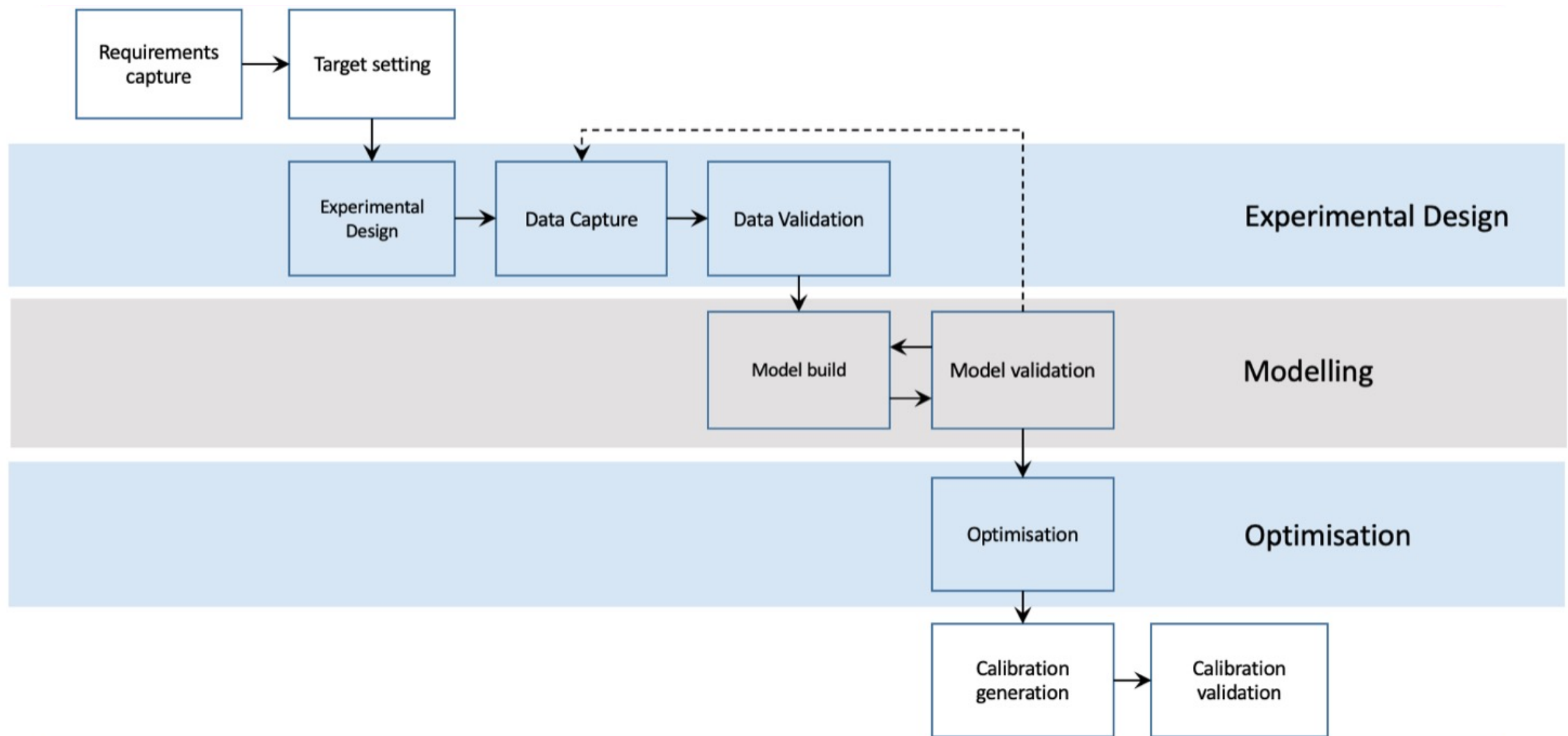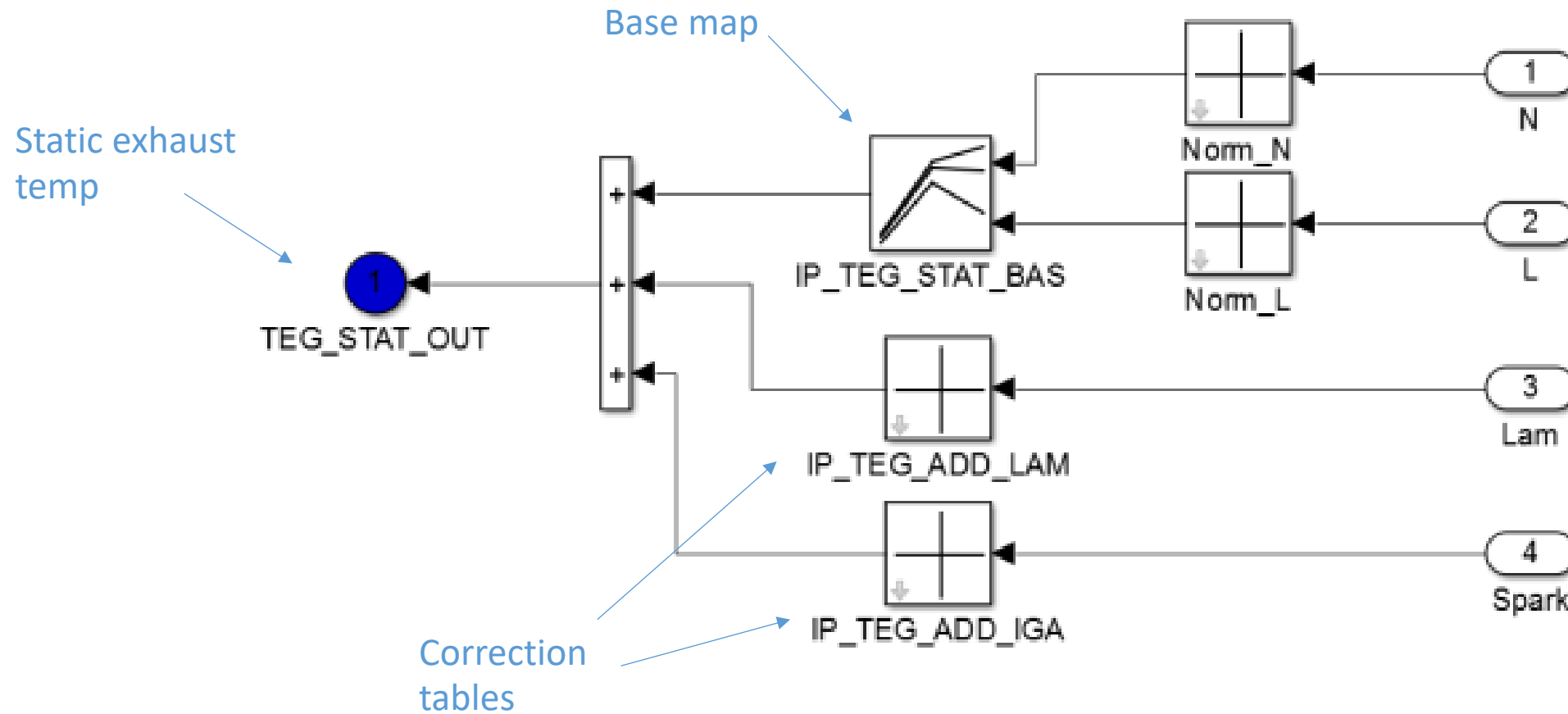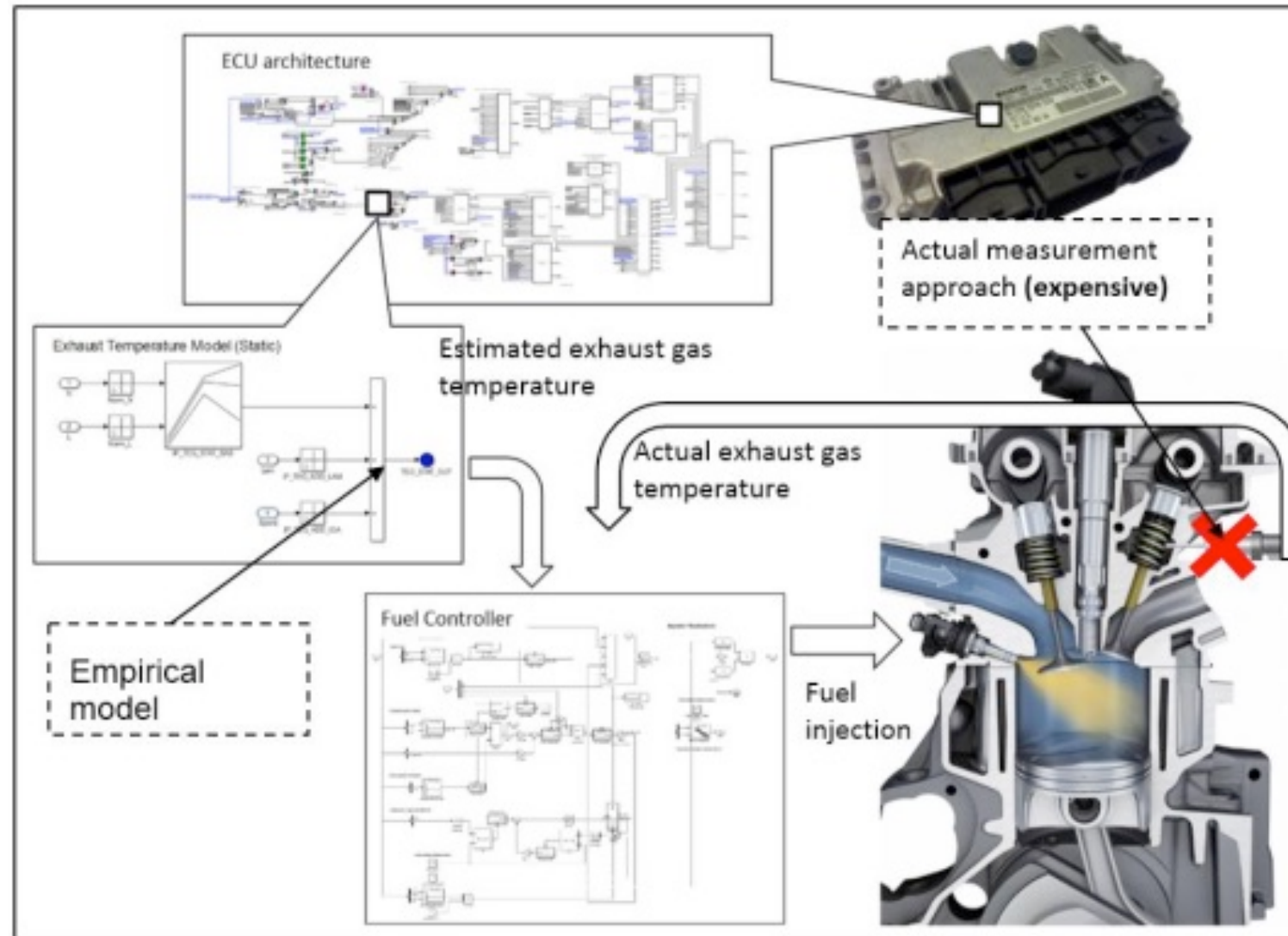# Calibration Exercises

Introduction

Calibration Exercises

☐ Lesson 4 – Engine modelling (v8 Engine Example)

☐ Lesson 5 – Feature Calibration (v8 Engine Example)

- Set up models, features and strategy
- Establish calibration tables
- Calibrate a feature

☐ Lesson 6 – V8 Engine Trade-off Calibration ($BMEP_{mean}$ / $BMEP_{var}$)

☐ Lesson 7 – PI Controller Calibration (optional)

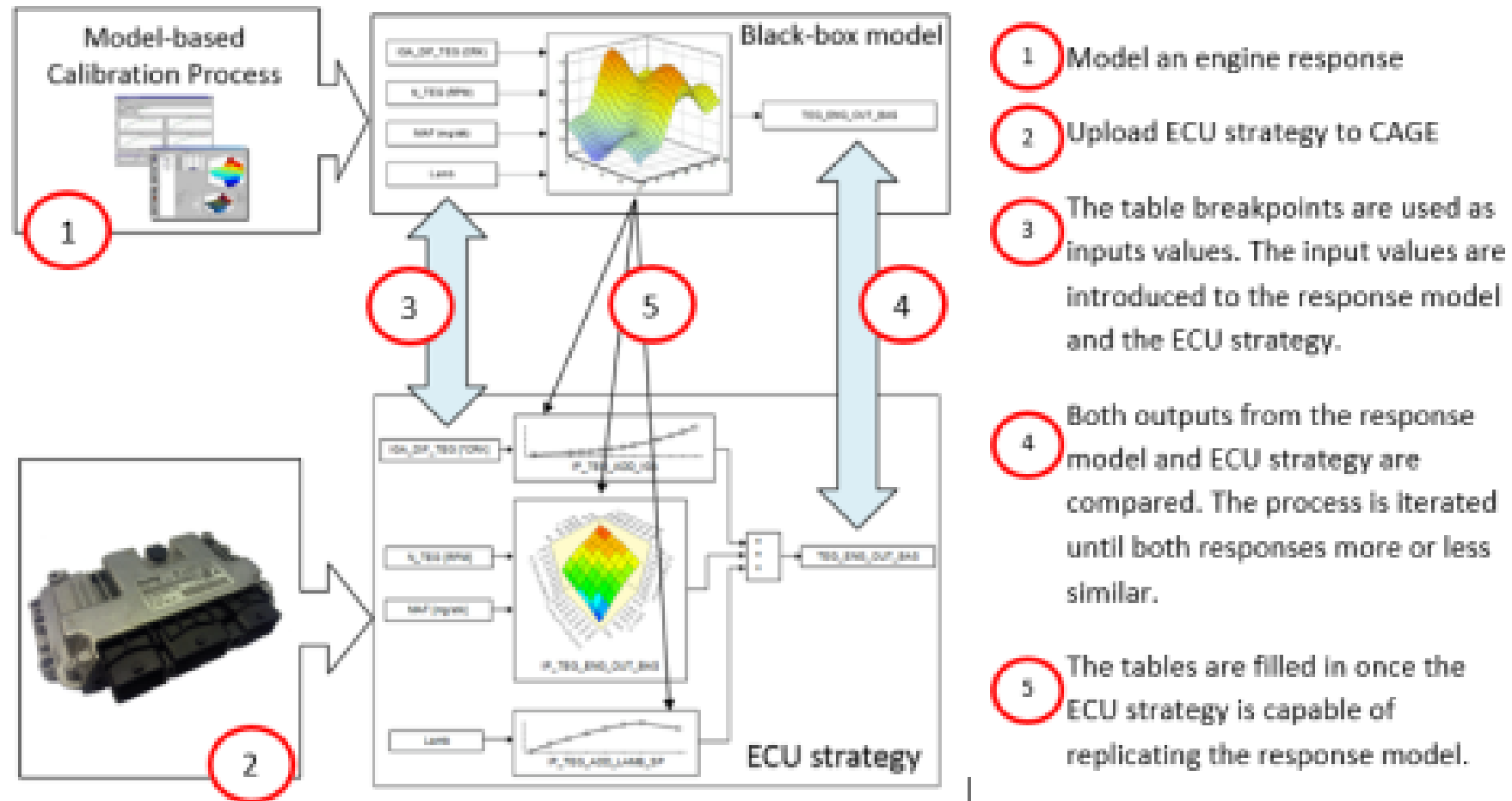# Lesson 5 -Exhaust Temperature Model (simplified)

Base map

Static exhaust temp

Correction tables

TEG_STAT_OUT

IP_TEG_STAT_BAS

Norm_N

Norm_L

IP_TEG_ADD_LAM

IP_TEG_ADD_IGA

1 N

2 L

3 Lam

4 Spark

Powertrain Calibration Optimisation

Powertrain Calibration Optimisation

1. Model an engine response

2. Upload ECU strategy to CAGE

3. The table breakpoints are used as inputs values. The input values are introduced to the response model and the ECU strategy.

4. Both outputs from the response model and ECU strategy are compared. The process is iterated until both responses more or less similar.

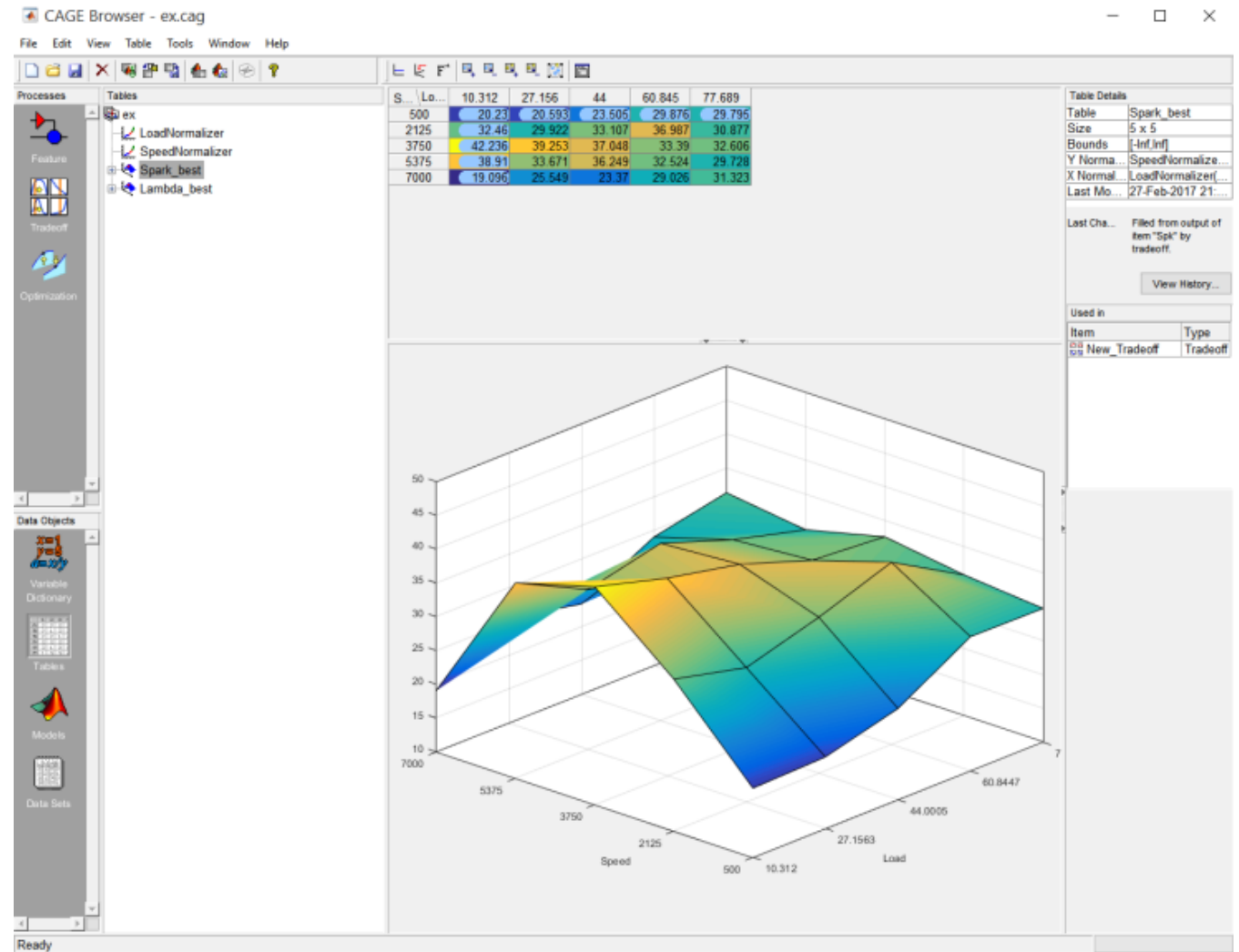5. The tables are filled in once the ECU strategy is capable of replicating the response model.

Lesson 6

- Optimise for $BMEP_{mean}$ whilst minimising $BMEP_{var}$, subject to constraints of $T_{exh} < 800C$.

- Compare a manual and 'automatic' approach

Lesson 7

- PI Controller Calibration
  - Fuel controller