

# TWC O2 Storage Model

**Model Source:** The model is based on the paper “E.P. Brandt, Y. Wang and J.W. Grizzle, Dynamic Modeling of a Three-Way Catalyst for SI Engine Exhaust Emission Control, IEEE T-Control Technology, September 2000, Volume 8, Number 5, pp. 767-776.”

**Restrictions:** Anyone can use this as long as they cite the paper as the source of the model.

**Model Inputs:** feedgas air-fuel ratio in units of lambda (so stoichiometry = 1) and feedgas mass air flow rate in grams per second.

**Model Outputs:** the relative oxygen level of the TWC and the tailpipe air-fuel ratio in units of lambda. As a bonus, you also get some static TWC catalyst efficiency curves from an older catalyst. (Sorry, no further specifications supplied). The efficiency is measured in percent. The model in Brandt et al. estimates the dynamic efficiency of the TWC by passing the tailpipe A/F through the standard static efficiency curves.

**Testing the model:** unzip the file “TWC\_O2\_Storage.zip”, and at the MATLAB command line, change to the directory in which you unzipped the file. Then type  
» test\_twc\_model

Your output should be the plots below.

Enjoy.

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