

Engine RPM

The variation of engine speed in rotations per minute (RPM) is governed by the equation

$$I_{ei}\dot{N}_e = T_e - T_i$$

$$600 \leq N_e \leq 6000$$

$$N_e(0) = 1000$$

where T_e (the engine torque) can be looked up from tabulated data:

$$T_e = f(\text{throttle}, N_e)$$

1. Open the model *EngineRPM.slx* and define the input data. The required variables are loaded automatically upon opening the model.
2. Complete the model *EngineRPM.slx* by constructing the above system. You will need to use a 2-D Lookup Table block to calculate the engine torque(T_e).

Input

Throttle – Throttle input

T_i – Impeller torque ($\text{N} \cdot \text{m}$)

Output

N_e – Engine speed (RPM)

States

N_e – Engine speed (RPM)

Parameters

I_e – Inertia of engine and impeller ($0.022 \text{ kg} \cdot \text{m}^2$)

THROTTLE – Throttle reference for torque tabulated data

ENGINE_SPEED – Speed reference for torque tabulated data

ENGINE_TORQUE – Tabulated data for engine torque