MUSCOD-II: Example 1: Rocket Car

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This is a simple example that should get you started with MUSCOD. It is devoted to the introduction to one-phase optimal control problems. To this end we consider a rocket car, see Figure 1.

- The rocket car should drive for 300m.

- The initial velocity at $t_0 = 0$ is 0m/s.

- The car can accelerate and brake between -2m/s^2 and 1m/s^2.

- The maximum velocity is limited to 30m/s.

- At final time t_f the car should come to a complete stop.

Figure 1: Rocket Car

Tasks

1. Optimization 1: The car should drive for 32s and then come to a complete stop. Minimize energy consumption.

2. Optimization 2: Minimize final time.