

# **Appendix E: Example Output Produced During Controller Validation**

Only the output produced by the controller is included here. Output produced by Gazebo is not included, with the exceptions of the first line showing the version number and the line indicating Gazebo was successfully initialized:

```
Gazebo multi-robot simulator, version 0.10.0
```

```
Loading the controller...
```

```
Load control parameters used by the steering controller...
```

```
useSwaybars: 0
useConstantVelocityMode: 1
useConstantSteeringAngleMode: 1
constantSteeringAngle: -0.376337
useSafeVelocity: 1
velocityOffset: 0 m/s
useTurnRadius: 0
```

```
Load default values for the steering controller...
```

```
defaultTorque: 1000
defaultSteerTorque: 1000
```

```
Load vehicle characteristics used by the steering controller...
```

```
turningCircle: 11.491 m
trackWidth: 1.529 m
wheelBase: 2.619 m
ssf: 1.17
velocityFinal: 27.778 m/s
velocityFinalTime: 5 s
tireRadius: 0.368 m
sectionWidth: 0.235 m
```

```
Loading the joints...
```

```
Loading: left_front_wheel_hinge
```

```
type: full
torque: 10000
steerTorque: 10000
```

```
Loading: right_front_wheel_hinge
```

```
type: full
torque: 10000
steerTorque: 10000
```

```
Loading: left_rear_wheel_hinge
```

```
type: drive
torque: 10000
```

```
Loading: right_rear_wheel_hinge
```

```
type: drive
torque: 10000
```

```
Calculated vehicle characteristics used by the steering controller...
```

```
Radius used to calculate maximum velocity, maximum angular velocity,
and maximum steering angle at vehicle center of gravity: 6.6275 m
Maximum velocity at vehicle center of gravity: 8.72023 m/s
Maximum angular velocity at vehicle center of gravity: 1.31577 rad/s
Maximum steering angle at vehicle center of gravity: 0.376337 rad
Acceleration: 5.5556 m/s^2
```

Gazebo successfully initialized