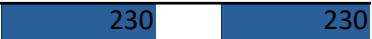









Angle of slope [deg]	Height [cm] Opposite	Length [cm] Adjacent	Drift Dist from start pos after driving 1m. Vehicle dropped by (1m-value)	
			right wheel	left wheel
10	284	1610.6		230
15	422	1574.9		125
20	422	1159.4		200
				115
25	843	1807.8		-100
				105
30	843	1460.1		110
35	843	1203.9		105

No correlation between the angle of slope and drift due to skid steering was found.

The right side tends to drop more, which may be due to the movement pattern:

1. Drive upwards,
2. Turn 90 degrees left,
3. Turn 180 degrees right,
4. Turn 90 degrees left.

Slope Test Tipping

Acceleration [m/s ²]	Angle [deg]	Height [cm]	Length [cm]	Angle [deg]	Height [cm]	Length [cm]
	35	1003	1432.4	40	1003	1195.3
0.02	pass			fail		
0.2	pass					
0.5	pass					
0.75	pass					
0.85	pass					
0.9	pass/fail					
0.95	fail					
1.0	fail					

At 35 degrees inclination the Jackal begins to tip when accelerating with 0.9m/s² and above.

At 40 degrees inclination even the slightest acceleration tips the robot.

Edge Test

Height [cm]	approach angle [deg] from normal	forwards	backwards
3.9	0		pass
4.0	0		pass
4.5	0	pass	pass
	30	pass	pass
	45	pass	fail
	60	fail	fail
5.0	0	pass	pass (barely)
	20	pass	pass
	30	pass	pass
	40	pass	pass
	45	fail	fail
	60	fail	fail
5.5	0	pass	pass x3 fail x1
	20	pass	pass
	45	pass x1 fail x3	fail
	60	fail	fail
6.1	0	pass (barely)	fail
	30	pass (trajectory)	fail
	45	fail	fail
	60	fail	fail
7.1	0	fail	fail
12.1	0	fail	fail

With most failure cases at 0 degrees the front wheels can climb the curb but the hind wheels get stuck. Driving forwards helps as the center of gravity places more weight on the front wheels that climb the curb more easily than the hind wheels.

A slight approach angle can help the hind wheels overcome the edge.

With an angle of 45 degrees and above one hind wheel reaches the slope before the diagonally opposing front wheel does. The front wheel then gets stuck and turns the robot to face parallel to the edge.

Center of Gravity - Angles

Side with ground contact	Height [cm]
Front	36.6
Back	37.5
Right (starboard)	25.8
Left (port)	25.4

Distance between the edges the robot was tipped around:

chassis_width from urdf [m] 0.310

chassis_length from urdf [m] 0.420

Distance of edge to base of height measurement [m] 0.2