

Parameters Table

	Parameter name	Units	Stock	Stock fully loaded	Design 1	Design 1 loaded
<b>Weights and dimensions</b>						
Mass	mass	kg	1412	1712	1412	1712
Front/rear weight distribution	dist	--	0.483	0.44	0.481	0.441
Wheelbase	L	m	2.69			
Front wheel to CG	a	m	1.39	1.50	1.39	1.50
CG to rear wheel	b	m	1.30	1.19	1.30	1.19
CG height	hcg	m	0.52	0.55	0.52	0.5
Height change due to loading (front)	loading_z_f	m	0	0.04	0	0.02
Height change due to loading (rear)	loading_z_r	m	0	0.08	0	0.03
Roll moment arm	h1	m	0.36	0.36	0.457	0.471
Dynamic index	dynamic_index	--	1			
Track (front)	track_f	m	1.430			
Track (rear)	track_r	m	1.423			
Sprung corner mass (front)	Mf	kg	306	344	306	344
Sprung corner mass (rear)	Mr	kg	324	437	324	437
Unsprung corner mass (front)	mf	kg	34			
Unsprung corner mass (rear)	mr	kg	42			
Pitch moment of inertia	I_pitch	kg*m^2	2551	3053	2551	3053
Yaw moment of inertia	I_yaw	kg*m^2	2551	3053	2551	3053
<b>Tire</b>						
Size (virtual)		--	225/50R16			
eta (front)	eta_f	--	0.05			
eta (rear)	eta_r	--	-0.2			
Cornering stiffness (front) at 0.4G	Caf	N/rad	108000	98000	111000	112000
Cornering stiffness (rear) at 0.4G	Car	N/rad	144000	145000	141000	143000
<b>Rates</b>						
True spring rate (front)	kf	N/m	15800	15800	157470	157470
True spring rate (rear)	kr	N/m	35100	35100	85865	85588
Installation ratio (front)	irf	--	0.77	0.77	0.38	0.38
Installation ratio (rear)	irr	--	0.65	0.65	0.62	0.62
Installed Spring (front)	ksf	N/m	9300	9300	22500	22500
Installed Spring (rear)	ksr	N/m	14800	14800	32900	32900
Damping ratio (front)	damping_ratio_f	--	0.30			
Damping ratio (rear)	damping_ratio_r	--	0.30			
Anti-roll bar diameter (front)	dARBf	m	0.026		0.022	
Anti-roll bar diameter (rear)	dARBr	m	0.018		0.027	
Anti-roll bar twist length (front)	sARBf	m	0.97			
Anti-roll bar twist length (rear)	sARBr	m	0.73			
Anti-roll bar arm length (front)	IARBf	m	0.19			
Anti-roll bar arm length (rear)	IARBr	m	0.25			

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Tire stiffness (front)	ktf	N/m		237500		
Tire stiffness (rear)	ktr	N/m		300000		
Roll stiffness (front)	Kphif	Nm/deg	1766	1766	1221	1221
Roll stiffness (rear)	Kphir	Nm/deg	418	418	1389	1389
<b>Suspension Kinematics</b>						
Static Camber (front)	camber_f	deg	-2.0	n/a (strut)		-1.9
Static Camber (rear)	camber_r	deg	-1.6	-7.3	-2.0	-3.1
Roll center (front)	hf	m	0.054	-0.013	0.054	0.025
Roll center (rear)	hr	m	0.270	0.180	0.074	0.033
<b>Steering</b>						
Steering ratio	SteerRatio	--	16.8	16.8	16.8	16.8
Caster		deg		6.5		5.0
Kingpin inclination		deg		17.6		14.2
Mechanical trail		m		0.009		0.027
Scrub radius		cm				1.1
<b>Driver</b>						
Driver position behind front wheel	driver_pos	m	1.60	1.60	1.6	1.6
<b>Steady-state characteristics</b>						
Roll gradient		deg/G	2.4	3.4	2.5	3.2
Initial Understeer gradient		deg/G	0.35	-1.0	0.54	-0.1
Rollover threshold (one wheel lift off)	roll_lat	G	1.06	0.90	1.27	1.30
Which wheel lifts off		--	Front	Front	Rear	Front
Limit characteristic		--	Understeer	Understeer	Understeer	Oversteer
Limit lateral acceleration	limit_lat	G	0.83	0.81	0.86	0.84
<b>Transient Characteristics</b>						
Time to peak yawrate overshoot	YawTimeMax	s	0.47	0.61	0.52	0.45
Steady-state sideslip angle	BssDegrees	degrees	-0.08	-0.12	-0.09	-0.12
TB Value (30m/s)		deg*s	0.04	0.07	0.05	0.05
<b>Ride Quality</b>						
Natural sprung mass frequency (front)	nat_freq_sprung_front	Hz	0.9	0.8	1.3	1.2
Natural sprung mass frequency (rear)	nat_freq_sprung_rear	Hz	1.0	0.9	1.5	1.3
Natural unsprung mass frequency (front)	nat_freq_unsprung_front	Hz	13.7	13.7	14.0	14.0
Natural unsprung mass frequency (rear)	nat_freq_unsprung_rear	Hz	13.7	13.7	14.1	14.1