PODIUM

ADVANCED TECHNOLOGIES

SCG – LMH

Dampers initial build specifications (r02)

<u>Changes</u>:

- **Updated number of sets for each lateral damper type**
- **Added build spec for central dampers**

Information

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- Please find the desired lateral damper characteristics in the following pages
- Where the target curve is outside the baseline damper characteristic provided by Penske, it is acceptable if it is “trimmed” to follow what is achievable (please inform us)
- Above 250mm/s, it is acceptable if the curve slope is reduced
- Desired adjustment ranges have been provided with constant knee speed, if this is not achievable it may be fine anyway, please contact to agree on the solution
- Number of sets to build to each specification is indicated for each “type”

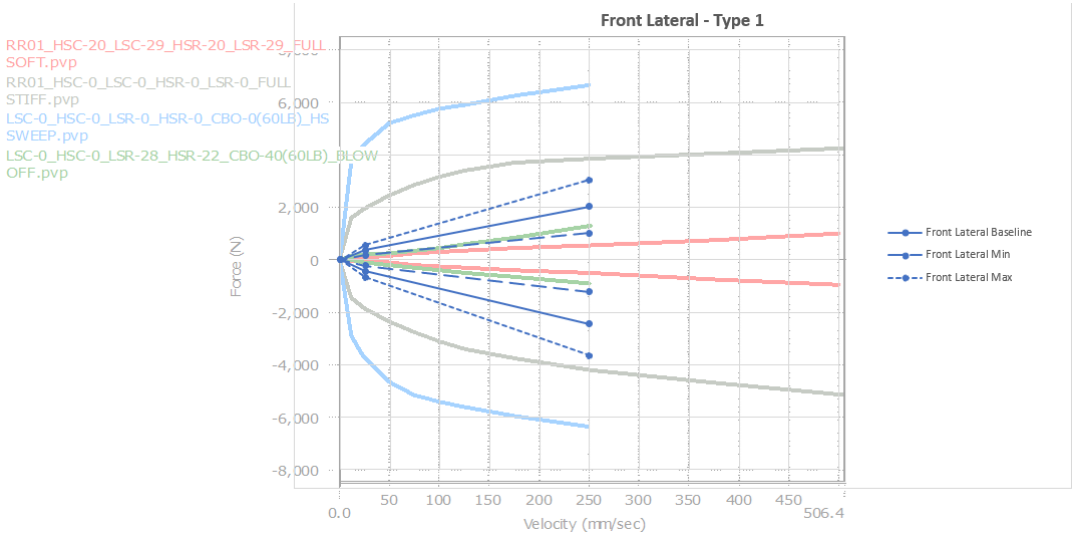
Lateral damper curves – Type 1

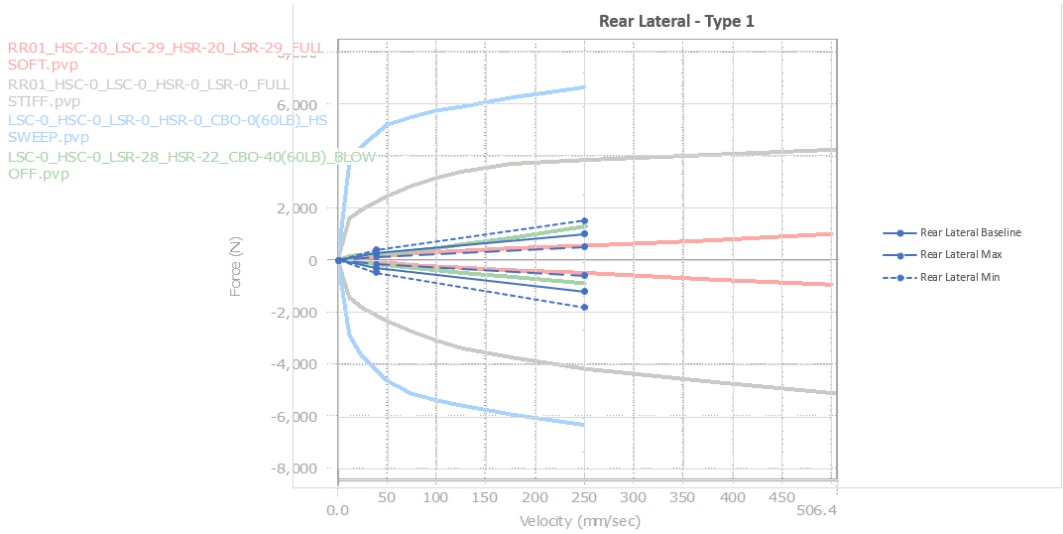
Reference characteristics

Minimum	Damper curves with motion ratio [N] (Velocities in mm/s)			
MR		0.8		0.8
Knee speed		25		38
	Velocity	Front Lateral	Velocity	Rear Lateral
extension	250	-1219	250	-603
	25	-222	38	-159
	0	0	0	0
	25	185	38	133
compression	250	1016	250	503

Baseline	Damper curves with motion ratio [N] (Velocities in mm/s)			
MR		0.8		0.8
Knee speed		25		38
	Velocity	Front Lateral	Velocity	Rear Lateral
extension	250	-2438	250	-1206
	25	-443	38	-318
	0	0	0	0
	25	369	38	265
compression	250	2032	250	1005

Maximum	Damper curves with motion ratio [N] (Velocities in mm/s)			
MR		0.8		0.8
Knee speed		25		38
	Velocity	Front Lateral	Velocity	Rear Lateral
extension	250	-3658	250	-1809
	25	-665	38	-477
	0	0	0	0
	25	554	38	398
compression	250	3048	250	1508





Number of sets to build to this spec: 2

Notes:
Type 1 - "Simulation"
Reference curve is 0.9 roll damping ratio, with 68% front distribution
High speed/low speed = 0.5, rebound/bump = 1.2

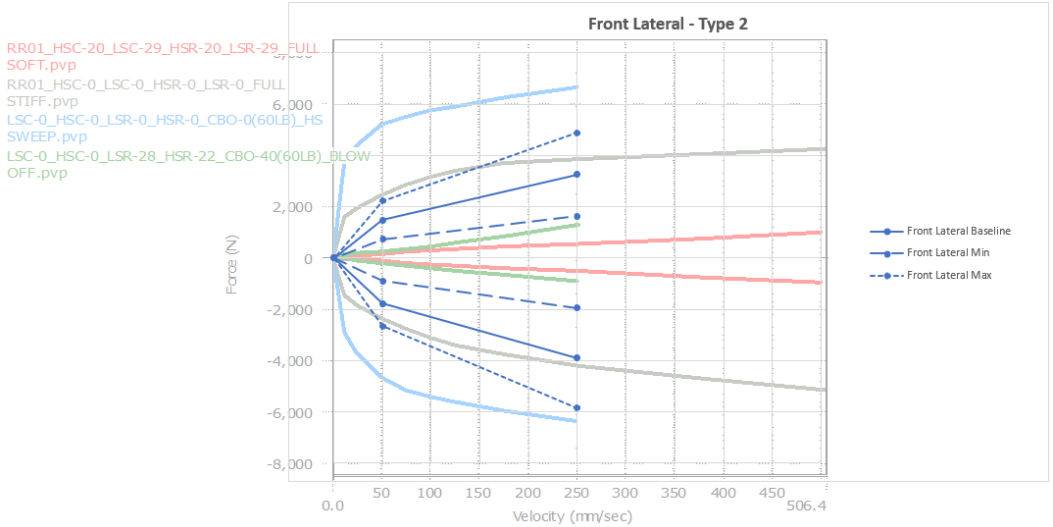
Lateral damper curves – Type 2

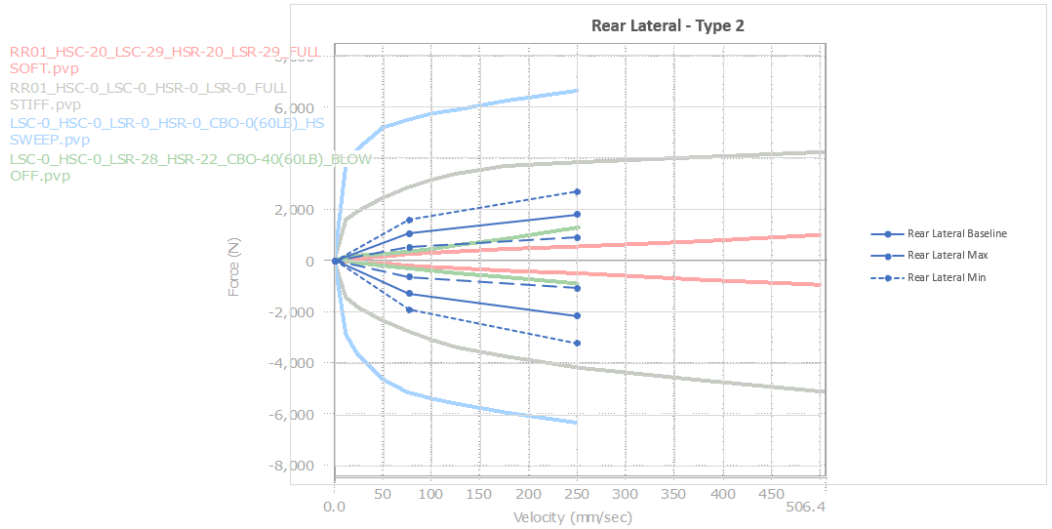
Reference characteristics

Minimum	Damper curves with motion ratio [N] (Velocities in mm/s)			
MR		0.8		0.8
Knee speed		50		76
	Velocity	Front Lateral	Velocity	Rear Lateral
extension	250	-1951	250	-1074
	50	-887	76	-637
	0	0	0	0
	50	739	76	530
compression	250	1626	250	895

Baseline	Damper curves with motion ratio [N] (Velocities in mm/s)			
MR		0.8		0.8
Knee speed		50		76
	Velocity	Front Lateral	Velocity	Rear Lateral
extension	250	-3902	250	-2148
	50	-1773	76	-1273
	0	0	0	0
	50	1478	76	1061
compression	250	3251	250	1790

Maximum	Damper curves with motion ratio [N] (Velocities in mm/s)			
MR		0.8		0.8
Knee speed		50		76
	Velocity	Front Lateral	Velocity	Rear Lateral
extension	250	-5852	250	-3221
	50	-2660	76	-1910
	0	0	0	0
	50	2217	76	1591
compression	250	4877	250	2685





Number of sets to build to this spec: 2

Notes:
Type 2 - "Stronger"
Reference curve is 1.8 roll damping ratio, with 68% front distribution
High speed/low speed = 0.3, rebound/bump = 1.2

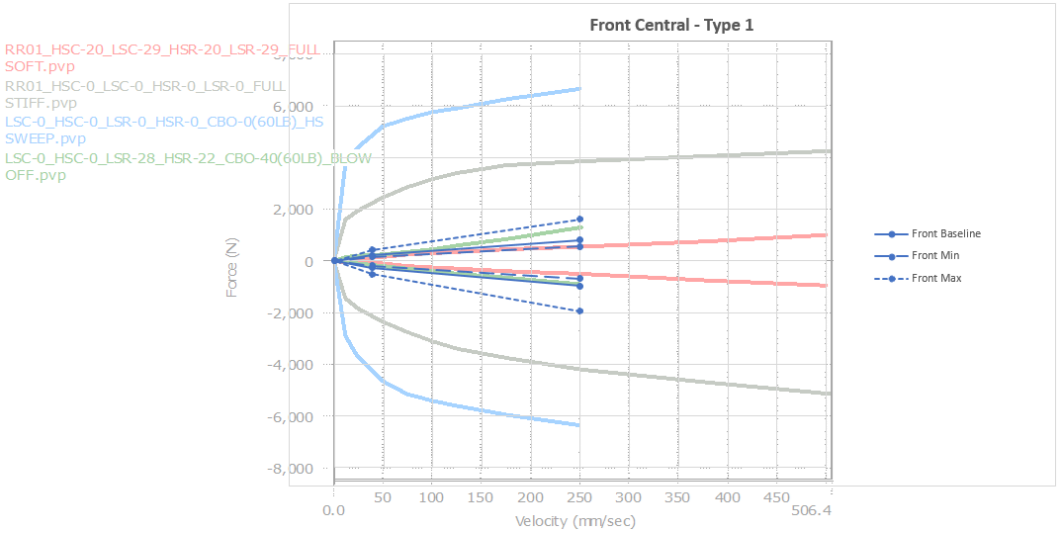
Central damper curves – Type 1

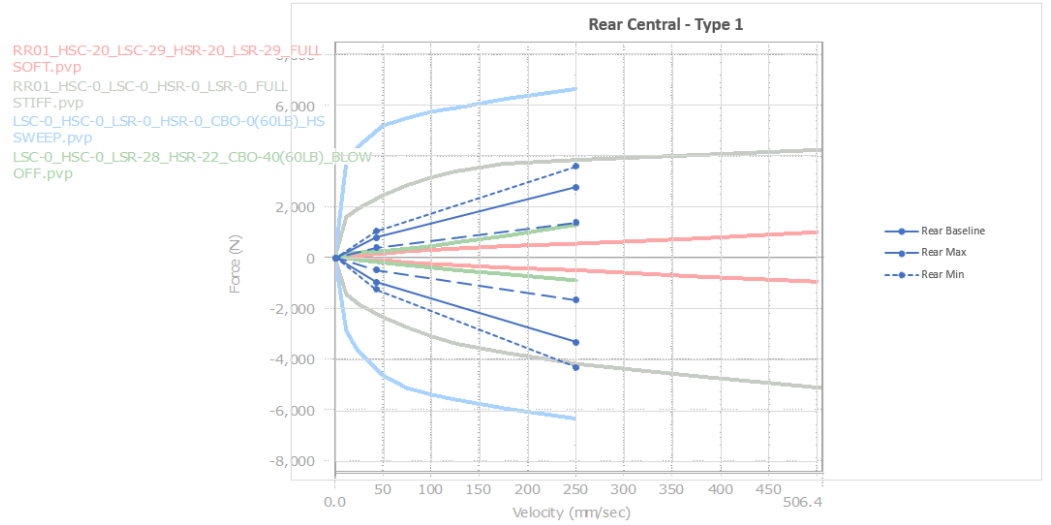
Reference characteristics

Minimum	Damper curves with motion ratio [N] (Velocities in mm/s)			
MR	1.2		0.9	
Knee speed	38		42	
	Velocity	Front Lateral	Velocity	Rear Lateral
extension	250	-681	250	-1656
	38	-180	42	-476
	0	0	0	0
	38	150	42	397
compression	250	568	250	1380

Baseline	Damper curves with motion ratio [N] (Velocities in mm/s)			
MR	1.2		0.9	
Knee speed	38		42	
	Velocity	Front Central	Velocity	Rear Central
extension	250	-973	250	-3311
	38	-257	42	-953
	0	0	0	0
	38	214	42	794
compression	250	811	250	2759

Maximum	Damper curves with motion ratio [N] (Velocities in mm/s)			
MR	1.2		0.9	
Knee speed	38		42	
	Velocity	Front Lateral	Velocity	Rear Lateral
extension	250	-1946	250	-4305
	38	-514	42	-1238
	0	0	0	0
	38	428	42	1032
compression	250	1622	250	3587





Notes:

Type 1 - "Simulation" (C=8920 N/(m/s) front 16840 rear)

Reference curve is 1.40 front heave damping, 1.45 rear heave damping 160kph

High speed/low speed = 0.5, rebound/bump = 1.2

Number of sets to build to this spec: 2

Central damper curves – Type 2

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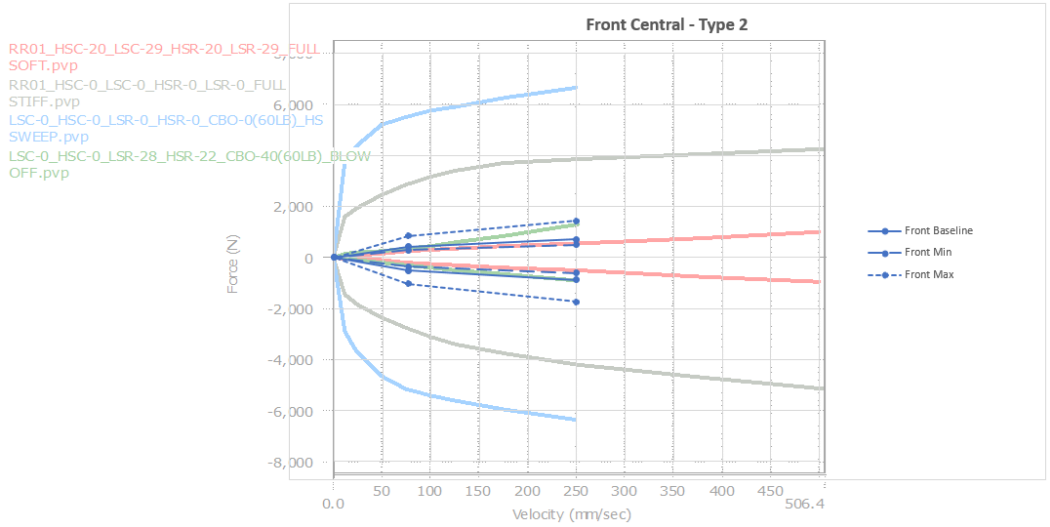
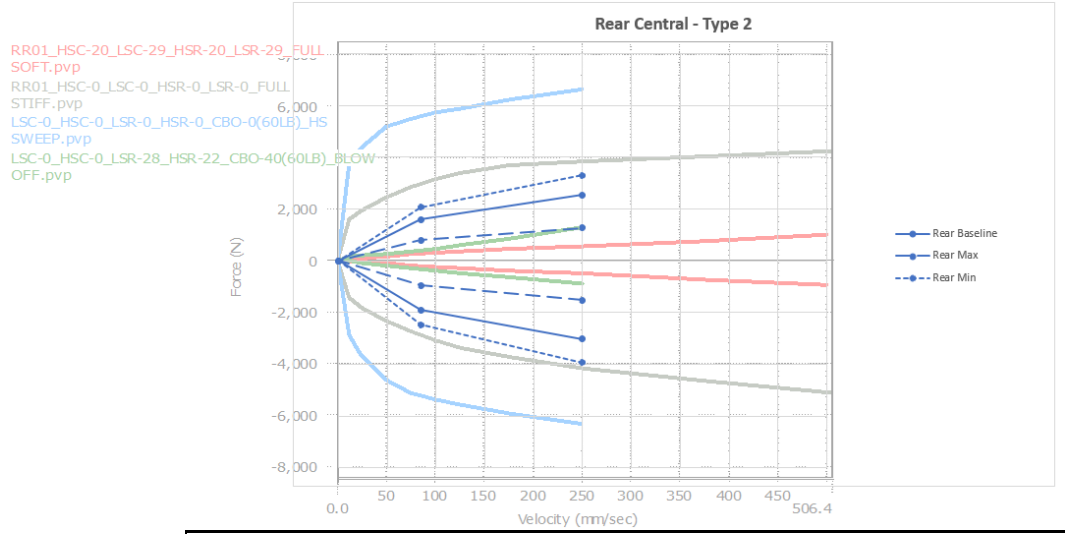
Reference characteristics

Minimum	Damper curves with motion ratio [N] (Velocities in mm/s)			
MR		1.2		0.9
Knee speed		76		84
	Velocity	Front Lateral	Velocity	Rear Lateral
extension	250	-606	250	-1517
	76	-360	84	-953
	0	0	0	0
	76	300	84	794
compression	250	505	250	1264

Baseline	Damper curves with motion ratio [N] (Velocities in mm/s)			
MR		1.2		0.9
Knee speed		76		84
	Velocity	Front Central	Velocity	Rear Central
extension	250	-866	250	-3035
	76	-514	84	-1905
	0	0	0	0
	76	428	84	1588
compression	250	722	250	2529

Maximum	Damper curves with motion ratio [N] (Velocities in mm/s)			
MR		1.2		0.9
Knee speed		76		84
	Velocity	Front Lateral	Velocity	Rear Lateral
extension	250	-1733	250	-3945
	76	-1027	84	-2477
	0	0	0	0
	76	856	84	2064
compression	250	1444	250	3287





Notes:

Type 2 - "Stronger" (C=8920 N/(m/s) front 16840 rear)

Reference curve is 1.40 front heave damping, 1.45 rear heave damping 160kph

High speed/low speed = 0.3, rebound/bump = 1.2

Number of sets to build to this spec: 2

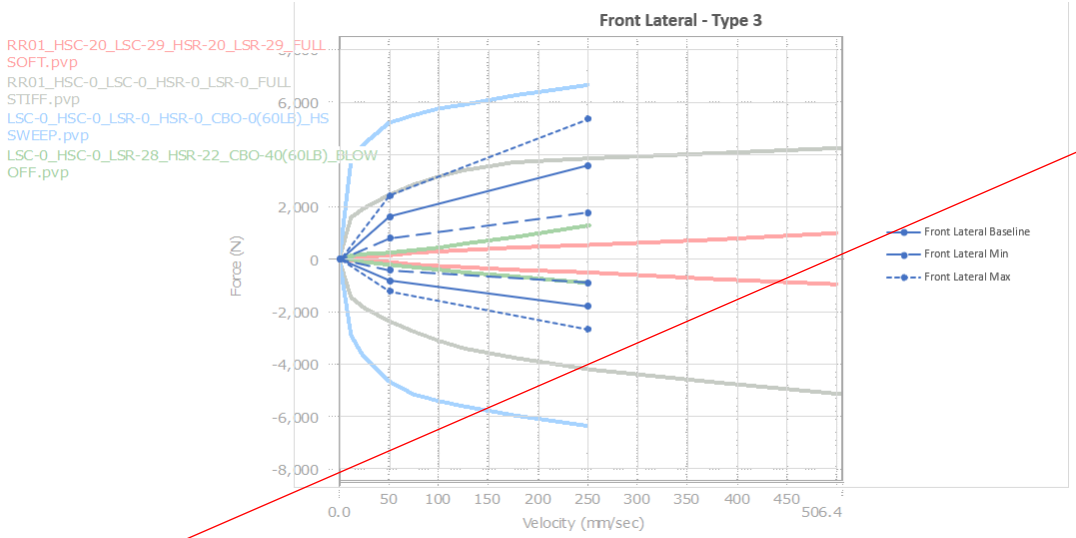
Lateral damper curves – Type 3

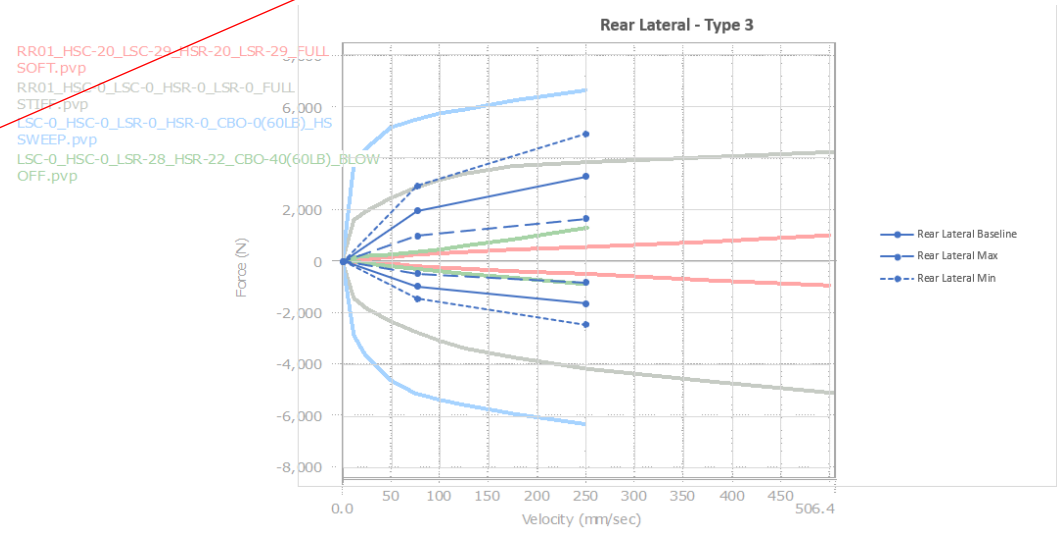
Reference characteristics

Minimum	Damper curves with motion ratio [N] (Velocities in mm/s)			
MR		0.8		0.8
Knee speed		25		38
	Velocity	Front Lateral	Velocity	Rear Lateral
extension	250	-894	250	-820
	50	-406	76	-486
	0	0	0	0
	50	813	76	973
compression	250	1788	250	1641

Baseline	Damper curves with motion ratio [N] (Velocities in mm/s)			
MR		0.8		0.8
Knee speed		25		38
	Velocity	Front Lateral	Velocity	Rear Lateral
extension	250	-1788	250	-1641
	50	-813	76	-973
	0	0	0	0
	50	1626	76	1945
compression	250	3576	250	3281

Maximum	Damper curves with motion ratio [N] (Velocities in mm/s)			
MR		0.8		0.8
Knee speed		25		38
	Velocity	Front Lateral	Velocity	Rear Lateral
extension	250	-2682	250	-2461
	50	-1219	76	-1459
	0	0	0	0
	50	2438	76	2918
compression	250	5365	250	4922





Number of sets to build to this spec: 0

Notes:
Type 3 - "GT3 style"
Reference curve is 1.7 roll damping ratio, with 56% front distribution
High speed/low speed = 0.3, rebound/bump = 0.5

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