

Anlage A6.2

Anlageninformation

Angaben zum Inhalt

Titel	Vergleich der Anhaltwege bei GG-Charakteristik, berechnet mit Modell «BAV_Orig» bzw. mit Referenzmodell RK ₄
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Anhaltewege berechnet mit Referenzmodell RK₄ für GG-Bremssohlen in [m]Berechnungsparameter:

Abbremsung	Bremszylinder-Füllzeit τ	Massenfaktor ξ	Fz-Streueungs r	Δt Berechnung
6,666 N/kg	2,6 s	0,055	0 %	0,01 s

Tabellen-Legende:

Neigung	Bremsverhältnis	Geschwindigkeit
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0 ‰	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
10	22.3	12.8	9.3	7.5	6.4	5.7	5.1	4.7	4.3	4.0	3.8	3.6	3.4	3.3	3.1
20	95.3	52.9	37.5	29.5	24.6	21.3	18.9	17.1	15.6	14.5	13.5	12.7	12.0	11.4	10.8
30	228.1	126.1	88.5	68.9	56.9	48.7	42.9	38.4	34.9	32.1	29.8	27.8	26.2	24.8	23.5
40	421.9	234.2	164.0	127.1	104.5	89.1	78.0	69.6	63.0	57.7	53.3	49.6	46.5	43.8	41.5
50	673.9	377.7	264.7	205.0	168.1	143.0	124.8	111.1	100.3	91.6	84.4	78.4	73.3	69.0	65.1
60	979.7	555.9	390.8	302.8	248.2	210.9	183.9	163.4	147.3	134.3	123.6	114.6	107.0	100.5	94.8
70		767.3	542.0	420.8	345.1	293.2	255.5	226.8	204.3	186.1	171.1	158.5	147.8	138.6	130.6
80			717.1	558.2	458.3	389.6	339.5	301.3	271.3	247.0	226.9	210.1	195.8	183.5	172.8
90			913.7	713.7	587.0	499.5	435.4	386.5	347.9	316.7	290.9	269.3	250.8	234.9	221.1
100				885.4	729.8	621.8	542.5	481.8	433.8	394.9	362.7	335.6	312.6	292.7	275.4
110					885.6	755.8	660.1	586.6	528.3	481.1	441.9	409.0	380.9	356.6	335.4
120						900.5	787.4	700.3	631.1	574.9	528.2	488.9	455.3	426.3	401.0

-40 ‰	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
10			34.0	17.1	11.9	9.4	7.8	6.8	6.1	5.5	5.0	4.7	4.4	4.1	3.9
20			230.5	79.8	50.2	37.3	30.1	25.5	22.2	19.8	18.0	16.5	15.3	14.3	13.4
30				223.8	128.5	91.6	71.9	59.7	51.3	45.2	40.5	36.9	33.9	31.5	29.4
40				487.2	257.6	177.7	136.8	111.9	95.2	83.1	74.0	66.9	61.1	56.4	52.5
50				909.4	446.2	299.7	227.4	184.1	155.3	134.8	119.3	107.3	97.7	89.9	83.3
60					702.5	461.7	346.1	278.0	233.2	201.3	177.6	159.2	144.5	132.5	122.5
70						666.1	494.7	395.0	329.7	283.7	249.4	223.0	201.9	184.7	170.4
80						912.4	673.0	535.0	445.1	381.9	335.0	298.9	270.1	246.7	227.3
90							878.6	696.5	578.2	495.3	433.8	386.5	348.9	318.3	292.9
100								877.5	727.7	622.7	545.0	485.1	437.5	398.9	366.8
110									892.3	763.3	667.8	594.1	535.7	488.1	448.7
120										915.7	801.2	712.8	642.6	585.4	538.0

-80 ‰	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
10					72.3	24.3	15.6	11.8	9.6	8.2	7.2	6.5	5.9	5.4	5.1
20						170.8	74.6	49.8	38.1	31.2	26.6	23.3	20.9	19.0	17.5
30							240.3	135.8	96.8	76.1	63.1	54.3	47.8	42.9	39.0
40							669.4	297.1	197.2	149.4	121.1	102.4	89.0	79.0	71.2
50								572.7	352.0	257.5	204.4	170.3	146.5	128.9	115.4
60									577.2	407.8	317.6	261.2	222.6	194.5	173.1
70									890.0	607.4	464.4	377.6	319.2	277.1	245.3
80										859.0	646.5	520.5	436.9	377.3	332.6
90											861.7	688.4	574.7	494.3	434.3
100												879.3	731.2	627.1	549.7
110													905.1	774.6	678.0
120														935.1	817.7

Anhaltewege berechnet mit Modell BAV_Orig für GG-Bremssohlen in [m]

Berechnungsparameter:

Abbremsung	Äquivalente Füllzeit τ	Massenfaktor ξ	Fz-Streuerungs	Δv Berechnung
6,666 N/kg	0,39 · 2,6 s	0,055	0 %	5 km/h

Tabellen-Legende:

Neigung	Bremsverhältnis	Geschwindigkeit
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0 ‰	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
10	23.9	14.0	10.4	8.6	7.4	6.7	6.1	5.7	5.4	5.2	4.9	4.8	4.6	4.5	4.4
20	100	56.1	40.1	31.8	26.7	23.3	20.8	18.9	17.5	16.3	15.4	14.6	13.9	13.3	12.8
30	236	131	92.7	72.5	60.1	51.8	45.7	41.2	37.6	34.7	32.4	30.4	28.8	27.3	26.1
40	432	242	170	132	109	93.2	81.9	73.3	66.5	61.1	56.7	53.0	49.8	47.1	44.7
50	686	387	272	212	174	148	130	116	105	96.0	88.7	82.6	77.4	73.0	69.1
60	992	567	400	311	256	218	190	169	153	140	129	120	112	105	99.6
70		779	553	430	354	301	263	234	211	192	177	164	154	144	136
80			729	569	468	399	348	309	279	254	234	217	202	190	179
90			926	725	598	510	445	396	357	325	299	277	258	242	228
100				898	742	633	553	492	443	404	372	344	321	301	283
110					898	768	672	598	539	491	452	419	390	366	344
120						913	799	712	642	586	539	499	465	436	411

-40 ‰	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
10			31.5	15.7	11.2	9.0	7.7	6.9	6.3	5.8	5.5	5.2	5.0	4.8	4.7
20			242	78.1	48.9	36.5	29.7	25.3	22.3	20.1	18.4	17.0	15.9	15.0	14.3
30				223	127	90.3	71.1	59.2	51.1	45.2	40.8	37.3	34.5	32.2	30.2
40				488	255	176	135	111	94.7	82.9	74.1	67.2	61.6	57.1	53.3
50				918	444	298	226	183	155	135	119	108	98.3	90.6	84.2
60					701	460	345	277	233	201	178	160	145	133	123
70						663	492	393	329	283	249	223	202	185	171
80						907	670	533	444	381	335	299	271	247	228
90							875	694	577	494	434	387	349	319	294
100								875	726	622	545	485	438	400	368
110									890	762	667	594	536	489	450
120										914	800	713	643	586	539

-80 ‰	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
10					50.9	18.3	12.1	9.5	8.0	7.1	6.4	5.9	5.6	5.3	5.1
20						151	65.4	43.8	33.8	27.9	24.1	21.4	19.4	17.8	16.6
30							222	125	88.9	70.1	58.5	50.6	44.8	40.4	37.0
40							640	279	185	140	114	96.5	84.2	75.1	67.9
50								551	336	245	195	163	140	124	111
60									558	393	306	251	215	188	167
70									865	588	449	365	309	268	238
80										835	628	505	424	367	324
90											842	672	561	483	424
100												861	716	614	539
110													888	760	666
120														920	804

Absolute Anhaltewegdifferenzen Modell BAV_Orig zu Referenzmodell RK4 in [m]

$$\Delta s [m] = s_{BAV_Orig} - s_{Referenzmodell}$$

Die farbliche Intensität der Zelhintergründe mit den Anhaltewegdifferenzen, ist proportional zu der Absolutdifferenz der Anhaltewege.

BAV_Orig zu kurz	Differenz minimal	BAV_Orig zu lang
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0 ‰	λ														
v_0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
10	1.6	1.2	1.1	1.1	1.0	1.0	1.0	1.0	1.1	1.2	1.1	1.2	1.2	1.2	1.3
20	4.7	3.2	2.6	2.3	2.1	2.0	1.9	1.8	1.9	1.8	1.9	1.9	1.9	1.9	2.0
30	7.9	4.9	4.2	3.6	3.2	3.1	2.8	2.8	2.7	2.6	2.6	2.6	2.6	2.5	2.6
40	10.1	7.8	6.0	4.9	4.5	4.1	3.9	3.7	3.5	3.4	3.4	3.4	3.3	3.3	3.2
50	12.1	9.3	7.3	7.0	5.9	5.0	5.2	4.9	4.7	4.4	4.3	4.2	4.1	4.0	4.0
60	12.3	11.1	9.2	8.2	7.8	7.1	6.1	5.6	5.7	5.7	5.4	5.4	5.0	4.5	4.8
70		11.7	11.0	9.2	8.9	7.8	7.5	7.2	6.7	5.9	5.9	5.5	6.2	5.4	5.4
80			11.9	10.8	9.7	9.4	8.5	7.7	7.7	7.0	7.1	6.9	6.2	6.5	6.2
90			12.3	11.3	11.0	10.5	9.6	9.5	9.1	8.3	8.1	7.7	7.2	7.1	6.9
100				12.6	12.2	11.2	10.5	10.2	9.2	9.1	9.3	8.4	8.4	8.3	7.6
110					12.4	12.2	11.9	11.4	10.7	9.9	10.1	10.0	9.1	9.4	8.6
120						12.5	11.6	11.7	10.9	11.1	10.8	10.1	9.7	9.7	10.0

-40 ‰	λ														
v_0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
10			-2.5	-1.4	-0.7	-0.4	-0.1	0.1	0.2	0.3	0.5	0.5	0.6	0.7	0.8
20				-1.7	-1.3	-0.8	-0.4	-0.2	0.1	0.3	0.4	0.5	0.6	0.7	0.9
30				-0.8	-1.5	-1.3	-0.8	-0.5	-0.2	0.0	0.3	0.4	0.6	0.7	0.8
40				0.8	-2.6	-1.7	-1.8	-0.9	-0.5	-0.2	0.1	0.3	0.5	0.7	0.8
50					-2.2	-1.7	-1.4	-1.1	-0.3	0.2	-0.3	0.7	0.6	0.7	0.9
60					-1.5	-1.7	-1.1	-1.0	-0.2	-0.3	0.4	0.8	0.5	0.5	0.5
70						-3.1	-2.7	-2.0	-0.7	-0.7	-0.4	0.0	0.1	0.3	0.6
80						-5.4	-3.0	-2.0	-1.1	-0.9	0.0	0.1	0.9	0.3	0.7
90							-3.6	-2.5	-1.2	-1.3	0.2	0.5	0.1	0.7	1.1
100								-2.5	-1.7	-0.7	0.0	-0.1	0.5	1.1	1.2
110									-2.3	-1.3	-0.8	-0.1	0.3	0.9	1.3
120										-1.7	-1.2	0.2	0.4	0.6	1.0

-80 ‰	λ														
v_0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
10					-21.4	-6.0	-3.5	-2.3	-1.6	-1.1	-0.8	-0.6	-0.3	-0.1	0.0
20						-19.8	-9.2	-6.0	-4.3	-3.3	-2.5	-1.9	-1.5	-1.2	-0.9
30							-18.3	-10.8	-7.9	-6.0	-4.6	-3.7	-3.0	-2.5	-2.0
40							-29.4	-18.1	-12.2	-9.4	-7.1	-5.9	-4.8	-3.9	-3.3
50								-21.7	-16.0	-12.5	-9.4	-7.3	-6.5	-4.9	-4.4
60									-19.2	-14.8	-11.6	-10.2	-7.6	-6.5	-6.1
70									-25.0	-19.4	-15.4	-12.6	-10.2	-9.1	-7.3
80										-24.0	-18.5	-15.5	-12.9	-10.3	-8.6
90											-19.7	-16.4	-13.7	-11.3	-10.3
100												-18.3	-15.2	-13.1	-10.7
110													-17.1	-14.6	-12.0
120														-15.1	-13.7

Relative Anhaltewegdifferenzen Modell BAV_Orig zu Referenzmodell RK4 in [%]

$$\Delta s [\%] = \frac{(s_{BAV_{Orig}} - s_{Referenzmodell})}{s_{Referenzmodell}} \cdot 100\%$$

Die farbliche Intensität der Zelhintergründe mit den Anhaltewegdifferenzen, ist proportional zu der Relativedifferenz der Anhaltewege.

BAV_Orig zu kurz	Differenz minimal	BAV_Orig zu lang
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0 ‰	λ														
v ₀	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
10	7.2	9.4	11.8	14.7	15.6	17.5	19.6	21.3	25.6	30.0	28.9	33.3	35.3	36.4	41.9
20	4.9	6.0	6.9	7.8	8.5	9.4	10.1	10.5	12.2	12.4	14.1	15.0	15.8	16.7	18.5
30	3.5	3.9	4.7	5.2	5.6	6.4	6.5	7.3	7.7	8.1	8.7	9.4	9.9	10.1	11.1
40	2.4	3.3	3.7	3.9	4.3	4.6	5.0	5.3	5.6	5.9	6.4	6.9	7.1	7.5	7.7
50	1.8	2.5	2.8	3.4	3.5	3.5	4.2	4.4	4.7	4.8	5.1	5.4	5.6	5.8	6.1
60	1.3	2.0	2.4	2.7	3.1	3.4	3.3	3.4	3.9	4.2	4.4	4.7	4.7	4.5	5.1
70		1.5	2.0	2.2	2.6	2.7	2.9	3.2	3.3	3.2	3.4	3.5	4.2	3.9	4.1
80			1.7	1.9	2.1	2.4	2.5	2.6	2.8	2.8	3.1	3.3	3.2	3.5	3.6
90			1.3	1.6	1.9	2.1	2.2	2.5	2.6	2.6	2.8	2.9	2.9	3.0	3.1
100				1.4	1.7	1.8	1.9	2.1	2.1	2.3	2.6	2.5	2.7	2.8	2.8
110					1.4	1.6	1.8	1.9	2.0	2.1	2.3	2.4	2.4	2.6	2.6
120						1.4	1.5	1.7	1.7	1.9	2.0	2.1	2.1	2.3	2.5

-35 ‰	λ														
v ₀	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
10			-7.4	-8.2	-5.9	-4.3	-1.3	1.5	3.3	5.5	10.0	10.6	13.6	17.1	20.5
20			0.0	-2.1	-2.6	-2.1	-1.3	-0.8	0.5	1.5	2.2	3.0	3.9	4.9	6.7
30				-0.4	-1.2	-1.4	-1.1	-0.8	-0.4	0.0	0.7	1.1	1.8	2.2	2.7
40				0.2	-1.0	-1.0	-1.3	-0.8	-0.5	-0.2	0.1	0.4	0.8	1.2	1.5
50					-0.5	-0.6	-0.6	-0.6	-0.2	0.1	-0.3	0.7	0.6	0.8	1.1
60					-0.2	-0.4	-0.3	-0.4	-0.1	-0.1	0.2	0.5	0.3	0.4	0.4
70						-0.5	-0.5	-0.5	-0.2	-0.2	-0.2	0.0	0.0	0.2	0.4
80						-0.6	-0.4	-0.4	-0.2	-0.2	0.0	0.0	0.3	0.1	0.3
90							-0.4	-0.4	-0.2	-0.3	0.0	0.1	0.0	0.2	0.4
100								-0.3	-0.2	-0.1	0.0	0.0	0.1	0.3	0.3
110									-0.3	-0.2	-0.1	0.0	0.1	0.2	0.3
120										-0.2	-0.1	0.0	0.1	0.1	0.2

-80 ‰	λ														
v ₀	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
10					-29.6	-24.7	-22.4	-19.5	-16.7	-13.4	-11.1	-9.2	-5.1	-1.9	0.0
20						-11.6	-12.3	-12.0	-11.3	-10.6	-9.4	-8.2	-7.2	-6.3	-5.1
30							-7.6	-8.0	-8.2	-7.9	-7.3	-6.8	-6.3	-5.8	-5.1
40							-4.4	-6.1	-6.2	-6.3	-5.9	-5.8	-5.4	-4.9	-4.6
50								-3.8	-4.5	-4.9	-4.6	-4.3	-4.4	-3.8	-3.8
60									-3.3	-3.6	-3.7	-3.9	-3.4	-3.3	-3.5
70									-2.8	-3.2	-3.3	-3.3	-3.2	-3.3	-3.0
80										-2.8	-2.9	-3.0	-3.0	-2.7	-2.6
90											-2.3	-2.4	-2.4	-2.3	-2.4
100												-2.1	-2.1	-2.1	-1.9
110													-1.9	-1.9	-1.8
120														-1.6	-1.7