

**Mercedes-Benz**

Mercedes-Benz  
Research & Development  
North America, Inc.  
A Daimler Company

December 17, 2015

DEPARTMENT OF MOTOR VEHICLES  
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Mercedes Benz Research & Development North America, Inc. hereby provides the first annual report on disengagements pursuant to California Code of Regulations title 13, article 3.7, section 5227.46 for the period of September 16<sup>th</sup> 2014 to November 30<sup>th</sup> 2015.

Regards,

Heiko Kraft  
Director  
Autonomous Driving



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## Disengagements of Autonomous Vehicle System Report period Sep 16, 2014 - Nov 30, 2015

VEHICLE 1 WDD2221851A001072	miles driven in autonomous mode	total number of disengagements	number of automatic disengagements	average reaction time [s]	number of manual disengagements
September 2014	107.65	44	24	0.68	20
October 2014	227.03	228	103	0.95	125
November 2014	365.30	141	67	1.71	74
December 2014	42.81	36	15	0.76	21
January 2015	29.43	48	18	0.42	30
February 2015	38.90	16	8	0.50	8
March 2015	18.30	39	31	0.89	8
April 2015	47.00	72	51	0.82	21
May 2015	55.10	34	11	0.58	23
June 2015	171.83	127	61	1.02	66
July 2015	118.82	69	30	1.12	39
August 2015	22.17	24	13	1.31	11
September 2015	19.72	50	23	1.14	27
October 2015	29.59	17	5	0.83	12
November 2015	43.50	22	11	0.40	11
total	1336.95	987	471	0.87	496

VEHICLE 2 WDD2221851A000495	miles driven in autonomous mode	total number of disengagements	number of automatic disengagements	average reaction time [s]	number of manual disengagements
October 2014	60.97	16	12	0.72	4
November 2014	341.16	48	19	0.79	29
total	402.13	64	31	0.75	33

VEHICLE 3  
WDDHH8JB7EA926879 only driven on proving ground

VEHICLE 4  
WDF44781313024459 only driven on proving ground

VEHICLE 5  
WDF44781313024388 only driven on proving ground

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September 2014

vehicle: WDD2221851A001072

miles driven in autonomous mode:	107.65
average reaction time:	0.68
total amount of disengagements	44
manual disengagements	20
automatic disengagements	24

location	weather	type of trigger	reaction time	cause for disengagement
urban street	clear	automatic	0.58	technology evaluation management
urban street	clear	automatic	0.66	technology evaluation management
urban street	clear	automatic	1.93	technology evaluation management
urban street	clear	automatic	0.65	technology evaluation management
urban street	clear	automatic	0.64	technology evaluation management
urban street	clear	automatic	0.88	technology evaluation management
urban street	clear	automatic	0.41	technology evaluation management
urban street	clear	automatic	1.45	technology evaluation management
urban street	clear	automatic	0.07	technology evaluation management
urban street	clear	automatic	0.37	technology evaluation management
urban street	clear	automatic	1.55	technology evaluation management
urban street	clear	automatic	0.04	technology evaluation management
urban street	clear	automatic	0.4	technology evaluation management
urban street	clear	automatic	1.86	technology evaluation management
urban street	clear	automatic	0.21	technology evaluation management
urban street	clear	automatic	0.51	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.38	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.22	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	1.38	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.44	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.04	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.29	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	1.35	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.35	technology evaluation management

1

October 2014

vehicle: WDD2221851A001072

miles driven in autonomous mode:	227.03
average reaction time:	0.95
total amount of disengagements	228
manual disengagements	125
automatic disengagements	103

location	weather	type of trigger	reaction time	cause for disengagement
urban street	clear	automatic	1.03	technology evaluation management
urban street	clear	automatic	1.12	technology evaluation management
urban street	clear	automatic	0.42	technology evaluation management
urban street	clear	automatic	0.13	technology evaluation management
urban street	clear	automatic	0.16	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.17	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.21	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	1.05	technology evaluation management
urban street	clear	automatic	0.87	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.57	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.29	technology evaluation management
urban street	clear	automatic	0.56	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.97	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.49	technology evaluation management
urban street	clear	automatic	0.49	technology evaluation management
urban street	clear	automatic	0.29	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.9	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.94	technology evaluation management
urban street	clear	automatic	2.82	technology evaluation management
urban street	clear	automatic	2.68	technology evaluation management
urban street	clear	automatic	0.97	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	2.94	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.74	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.92	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.74	technology evaluation management
urban street	clear	automatic	0.58	technology evaluation management
urban street	clear	automatic	0	technology evaluation management

2

urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.2	technology evaluation management
urban street	clear	automatic	1.29	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	3.31	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	1.21	technology evaluation management
urban street	clear	automatic	0.76	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	1.82	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.87	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.37	technology evaluation management
urban street	clear	automatic	1.33	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	1.65	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	1	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.25	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.95	technology evaluation management
urban street	clear	automatic	0.21	technology evaluation management
urban street	clear	manual		construction zone
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	1.03	technology evaluation management
urban street	clear	automatic	0.22	technology evaluation management
urban street	clear	automatic	0.22	technology evaluation management
urban street	clear	automatic	0.36	technology evaluation management
urban street	clear	automatic	0.35	technology evaluation management
urban street	clear	automatic	0.59	construction zone
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		construction zone
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.35	construction zone
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.23	technology evaluation management
urban street	clear	automatic	1.25	technology evaluation management
urban street	clear	automatic	0.28	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.4	technology evaluation management
urban street	clear	automatic	0.21	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.66	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.21	technology evaluation management

[illegible]

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urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.29	technology evaluation management
urban street	clear	automatic	0.03	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0	technology evaluation management
urban street	clear	automatic	0.01	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.01	technology evaluation management
urban street	clear	automatic	0.42	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.5	technology evaluation management
urban street	clear	automatic	0.62	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.33	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.13	technology evaluation management
urban street	clear	automatic	0.33	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.57	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.34	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.74	technology evaluation management
urban street	clear	automatic	0.52	technology evaluation management
urban street	clear	automatic	0.15	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.72	technology evaluation management
urban street	clear	automatic	0.3	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	1.14	technology evaluation management
urban street	clear	automatic	0.68	technology evaluation management
urban street	clear	automatic	0.06	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable

November 2014

vehicle: WDD2221851A001072

miles driven in autonomous mode:	365.30
average reaction time:	1.71
total amount of disengagements	141
manual disengagements	74
automatic disengagements	67

location	weather	type of trigger	reaction time	cause for disengagement
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.99	technology evaluation management
urban street	clear	automatic	0.43	technology evaluation management
urban street	clear	automatic	0.71	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.3	technology evaluation management
urban street	clear	automatic	0.25	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.35	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	2.47	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	1.13	technology evaluation management
urban street	clear	automatic	0.56	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	1.19	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.56	technology evaluation management
urban street	clear	automatic	0.79	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	2.69	technology evaluation management
urban street	clear	automatic	1.38	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	2.63	technology evaluation management
urban street	clear	automatic	4.84	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.25	technology evaluation management
urban street	clear	automatic	1.76	technology evaluation management
urban street	clear	automatic	0.88	technology evaluation management
urban street	clear	automatic	1.45	technology evaluation management



2

urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.41	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.29	technology evaluation management
urban street	clear	automatic	0.29	technology evaluation management
highway	clear	automatic	1.48	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		twilight
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.34	technology evaluation management
urban street	clear	automatic	3.79	technology evaluation management
urban street	clear	automatic	0.07	sunglare
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.12	technology evaluation management
urban street	clear	automatic	2.6	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.11	technology evaluation management
urban street	clear	automatic	0.22	technology evaluation management
urban street	clear	automatic	0.62	technology evaluation management
urban street	clear	automatic	3.58	technology evaluation management
urban street	clear	manual		construction zone
urban street	clear	manual		construction zone
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.33	technology evaluation management
urban street	clear	automatic	3.08	technology evaluation management
urban street	clear	automatic	0.44	technology evaluation management
urban street	clear	automatic	0.28	technology evaluation management
urban street	clear	automatic	4.05	technology evaluation management
urban street	clear	automatic	1.38	technology evaluation management
urban street	clear	automatic	1.37	technology evaluation management
urban street	clear	automatic	0.34	technology evaluation management
urban street	clear	automatic	0.52	technology evaluation management
urban street	clear	automatic	0.62	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.48	technology evaluation management
urban street	clear	automatic	0.8	technology evaluation management
urban street	clear	automatic	0.27	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.32	technology evaluation management
urban street	clear	manual		driver was uncomfortable
urban street	clear	manual		driver was uncomfortable
urban street	clear	automatic	0.16	technology evaluation management
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	automatic	1.35	technology evaluation management
urban street	cloudy	manual		driver was uncomfortable

3

urban street	cloudy	automatic	0.82	technology evaluation management
urban street	cloudy	automatic	0.78	technology evaluation management
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	automatic	0.68	technology evaluation management
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	automatic	0.63	technology evaluation management
urban street	cloudy	automatic	0.5	technology evaluation management
urban street	cloudy	automatic	0.63	technology evaluation management
urban street	cloudy	automatic	1.06	technology evaluation management
urban street	cloudy	automatic	1.92	technology evaluation management
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	automatic	3.55	technology evaluation management
urban street	cloudy	automatic	0.63	technology evaluation management
urban street	cloudy	automatic	0.72	technology evaluation management
urban street	cloudy	automatic	0.2	technology evaluation management
urban street	cloudy	automatic	0.37	technology evaluation management
urban street	cloudy	manual		driver was uncomfortable
urban street	rainy	manual		rain
urban street	rainy	manual		rain
urban street	rainy	manual		driver was uncomfortable
urban street	cloudy	automatic	1.12	technology evaluation management
urban street	cloudy	automatic	0.5	technology evaluation management
urban street	cloudy	automatic	0.25	technology evaluation management
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	automatic	0.71	technology evaluation management

1

December 2014

vehicle: WDD2221851A001072

miles driven in autonomous mode:	42.81
average reaction time:	0.76
total amount of disengagements	36
manual disengagements	21
automatic disengagements	15

location	weather	type of trigger	reaction time	cause for disengagement
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	automatic	0.33	technology evaluation management
urban street	cloudy	manual		driver was uncomfortable
highway	cloudy	manual		driver was uncomfortable
urban street	cloudy	automatic	1.39	technology evaluation management
urban street	cloudy	manual		driver was uncomfortable
highway	cloudy	manual		driver was uncomfortable
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	automatic	0.23	technology evaluation management
urban street	cloudy	automatic	0.32	technology evaluation management
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	automatic	0.4	technology evaluation management
urban street	cloudy	automatic	0.37	technology evaluation management
urban street	cloudy	automatic	0.67	technology evaluation management
urban street	cloudy	automatic	1.54	technology evaluation management
urban street	cloudy	automatic	0.36	technology evaluation management
urban street	cloudy	automatic	0.56	technology evaluation management
urban street	cloudy	automatic	1.21	technology evaluation management
urban street	cloudy	manual		driver was uncomfortable
urban street	rain	manual		driver was uncomfortable
urban street	rain	automatic	0.45	rain
urban street	rain	manual		driver was uncomfortable
urban street	cloudy	automatic	0.95	technology evaluation management
urban street	cloudy	automatic	1.85	technology evaluation management
urban street	cloudy	automatic	0.43	technology evaluation management
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	manual		driver was uncomfortable

1

January 2015

vehicle: WDD2221851A001072

miles driven in autonomous mode:	29.43
average reaction time:	0.42
total amount of disengagements	48
manual disengagements	30
automatic disengagements	18

location	weather	type of trigger	reaction time	cause for disengagement
highway	cloudy	manual		driver was uncomfortable
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	automatic	0.58	technology evaluation management
urban street	cloudy	automatic	0.18	technology evaluation management
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	automatic	0.17	technology evaluation management
urban street	cloudy	automatic	0.18	technology evaluation management
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	automatic	0.66	technology evaluation management
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	automatic	0.75	technology evaluation management
urban street	cloudy	automatic	0.05	technology evaluation management
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	automatic	0.04	technology evaluation management
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	automatic	0.23	technology evaluation management
urban street	cloudy	automatic	0.23	technology evaluation management
urban street	cloudy	automatic	0.27	technology evaluation management
urban street	cloudy	manual		construction zone
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	automatic	0.53	technology evaluation management
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	automatic	0.37	technology evaluation management
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	automatic	0.01	technology evaluation management
urban street	cloudy	automatic	0.37	technology evaluation management
urban street	cloudy	manual		driver was uncomfortable
urban street	cloudy	automatic	0.02	technology evaluation management