2020 MID-MODEL YEAR CORPORATE AVERAGE FUEL ECONOMY REPORT
LIGHT DUTY TRUCKS
VOLKSWAGEN GROUP OF AMERICA, INC.
July 2020

[redacted] Name
Mgr., Comp.Reporting Title
EEO Department
[redacted] Phone
Fax
E-Mail

July 31, 2020 Date

Administrator
National Highway Traffic Safety Administration
1200 New Jersey Ave. SW
Washington, D.C. 20590

Subject: 2020 Mid-Model Year Corporate Average Fuel Economy Report for Volkswagen Group Light Duty Trucks
[redacted]

Dear Administrator,

Attached is the 2020 Volkswagen Group of America, Inc. (VWGoA) Mid-Model Year Corporate Average Fuel Economy Report for Light-Duty Trucks. This report includes Volkswagen, Audi, Bentley, Lamborghini, Bugatti, and Porsche Brands. This report has been prepared in accordance with the provisions of Title 40 Part 600.510-12 Code of Federal Regulations. A [redacted] request has been submitted to the NHTSA, Office of the Chief Counsel for the projected sales volumes and specific vehicle design information omitted from this submission. Disclosure of information identified as [redacted] from this report would cause substantial competitive harm.

All vehicles classified as light-duty trucks are expected to comply with requirements that are specified in the MY2017-2025 CAFE Final Rule issued on October 15, 2012 (77 FR 62624)

The expected standard for 2020 model year is **33.5 MPG.** The expected performance with inclusion of off-cycle & A/C efficiency credits is **30.7 MPG.**
VWGoA submitted an off-cycle credit application utilizing the alternative methodology pathway for use of high-efficiency alternators in its fleet that covers model years 2016-2019. EPA is currently reviewing this application. It is VWGoA's intent to use the off-cycle credits for CAFE compliance. Pending approval for model years 2017- 2019, VWGoA will submit amended Model Year 2017, 2018, and 2019 reports to reflect these retroactive high-efficiency alternator credits. Please find attached VWGoA's high-efficiency alternator application that is currently under review by EPA. After this application is approved, VWGoA further intends to use these high-efficiency alternator credits for CAFE compliance for model year 2020 and beyond.

Provided in this report are estimates for A/C efficiency credits. Light-duty trucks use the following A/C efficiency technology in accordance with 40 CFR § 86.1868-12:

- Default to Recirculation with feedback sensor
- Default to Recirculation without feedback sensor
- Efficient Blower Motor Controls
- Internal Heat Exchanger
- Oil Separator
- Improved Condenser and/or Evaporator

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Also provided in this submission are estimates for off-cycle menu technologies. Light-duty trucks in this report are equipped with the following technologies in accordance with 40 CFR § 86.1869-12:

- High-efficiency exterior lights
- Active aerodynamic improvements
- Engine idle start-stop
- Active transmission warm-up
- Active engine warm-up
- Active seat ventilation
- Solar Reflective Surface coating
- Thermal glass/glazing

Please contact me at [redacted], if you have any comments or questions related to this report.
Sincerely,

[redacted]

VOLKSWAGEN GROUP

2020 MID-MODEL YEAR CORPORATE AVERAGE FUEL ECONOMY REPORT

LIGHT DUTY TRUCKS

MANUFACTURERS AVERAGE CALCULATION

Calculate fuel economy average of automobiles where:

$$\text{Average MPG} = \frac{1}{\left[\frac{1}{MPG} - CFCIV_{AC} + FCIV_{OC} + FCIV_{PU}\right]}$$

Average MPG = the fleet average fuel economy for a category of vehicles; MPG = the average fuel economy for a category of vehicles

$FCIV_{AC}$ = Air conditioning fuel economy credits for a category of vehicles, in gallons per mile.

$FCIV_{OC}$ = Off-cycle technology fuel economy credits for a category of vehicles, in gallons per mile.

$FCIV_{PU}$ = Pickup truck fuel economy credits for the light truck category, in gallons per mile.

Note: Volkswagen Group of America intends to claim off-cycle credits in the future, impacting the final CAFE calculation.

	MY 2020 LDT
MPG	29.1
$FCIV_{AC}$ (Gal/Mi)	0.0008221
$FCIV_{OC}$ (Gal/Mi)	0.0009435
$FCIV_{PU}$ (Gal/Mi)	0
ACCredit (Mg)	408,853
VLM	225,865
Production	247,779
OCCredit (Mg)	469,244
Average MPG	30.7

Fleet Standard (MPG)	33.5

VWGoA
Engineering and Environmental Office July 2020

Appendix

Pursuant to 49 CFR 537.7, I, [redacted] and Volkswagen Group of America, Inc. do attest to the authenticity and accuracy of the production data in this 2020 Mid-Model Year Report for Volkswagen Group of America, Inc.

This attestation constitutes a representation by Volkswagen Group of America, Inc. that it has established reasonable, prudent procedures to ascertain and provide production data that are accurate and authentic in all material respects and that these procedures have been followed by employees of Volkswagen Group of America, Inc. in the reporting process.

Digitally signed by [redacted] Date: 2020.07.31 18:10:04 -04'00'

[redacted] Date [redacted]

[redacted]

MY20 CAFE Mid-Model Year: Light-Duty Trucks

MTI	Fleet	Brand	Carline Code	Carline	Test Group	Engine (L)	Transm.	IW	ETW	FE CITY	CITY	Formula	FE HWY	HWY	Formula	MT FE COMB	COMB	Confidential Prod	Weighted Prod/MPG	BASE TIRE	TRACK WIDTH (xxx in) - FRONT	TRACK WIDTH (xxx in) - REAR	TRACK WIDTH (xxx in) - AVG	WHEELBASE (xxxx in) - AVG	FOOT PRINT (ft3)	2020 MPG Target	Weighted MPG Target
250	LDT	Audi	351	e-tron Sportback (250 kW)	LVGAT00.0AZE	0 0L EV	E1	6000	6000	249.2000	249 2	3.1822	255.7000	255.7	3.1013	252 0836	252.1	793	3.1456	255/50 R20	64 8	64.6	64.7	115.3	51 8	32.13	24.680984
16	LDT	Audi	62	Q3 quattro	LVGAX02.0A3T	2.0L	S8	4000	4250	23.8000	23 8	1117.1849	39.0000	39.0	681.7692	28.8619	28 9	26,589	920 0346	235/55 R18	61.1	61.2	61 2	102.5	43.6	37.17	715.33495
11	LDT	Audi	330	Q5	LVGAT02 0A7C	2.0L	AMS-7	4500	4500	27.6607	27.7	1216.2094	39.1288	39.1	861.6313	31.8631	31 9	33,689	1056 0815	235/60 R18	63.6	63.3	63.4	111.2	49	33.69	999.97032
400	LDT	Audi	330	Q5 PHEV	LVGAX02 0A3P	2.0L	AMS-7	5000	5000	83.3187	83 3	41.5126	59.6828	59.7	57.9229	70.7163	70.7	3,458	48 9109	235/55 R19	63.6	63.3	63.4	111.2	49	33.69	102.64173
74	LDT	Audi	320	Q7	LVGAT02.0AA7	2.0L	S8	5000	5250	23.9000	23 9	131.2552	34.4000	34.4	91.1919	27.7055	27.7	3,137	113 2491	255/55 R19	65.6	66	65 8	117.9	53 9	31.06	100.99807
47	LDT	Audi	320	Q7	LVGAT03.0N7M	3.0L	S8	5500	5500	21.7828	21 8	358.2569	30.2079	30.2	258.6093	24.9091	24 9	7,810	313.6546	255/55 R19	65.6	66	65 8	117.9	53 9	31.06	251.44881
48	LDT	Audi	380	Q8	LVGAT03.0NAM	3.0L	S8	5500	5500	21.7828	21 8	306.6972	30.2079	30.2	221 3907	24.9091	24 9	6,686	268 5141	275/50R 20	66.1	66.6	66.4	117.9	54.4	30.83	217.00747
71	LDT	Audi	382	RSQ8	LVGAJ04.0NAT	4.0L	S8	6000	6000	17.1000	17.1	15.6725	26.9000	26.9	9.9628	20.4531	20 5	268	13 0732	275/50R 20	66.1	66.6	66.4	117.9	54.4	30.81	8.6984745
33	LDT	Audi	335	SQ5	LVGAJ03 0N7F	3.0L	S8	4500	4750	22.5000	22 5	236.6667	32.0000	32.0	166.4063	25.9693	26 0	5,325	204 8077	255/45 R20	63.6	63.3	63.4	111.2	49	33.69	158.05877
72	LDT	Audi	321	SQ7	LVGAT04.0NAV	4.0L	S8	5500	5500	18.2000	18 2	38.2967	29.7000	29.7	23.4680	22.0404	22 0	697	31.6818	285/40 R21	65.6	66	65 8	117.9	53 9	31.06	22.440438
73	LDT	Audi	381	SQ8	LVGAT04.0NAV	4.0L	S8	5500	5500	18.4000	18.4	49.5109	28.7000	28.7	31.7422	21.9439	21 9	911	41 5982	275/50R 20	66.1	66.6	66.4	117.9	54.4	30.81	29.568322
500	LDT	Bentley	33	Bentayga PHEV	LVGAJ03 0NAP	3.0L	S8	6500	6500	51.4592	51 5	1.8835	41.0242	41.0	2.3659	46.1740	46 2	97	2.0996	285/45 ZR21	66.49	66.65	66.6	117.9	54 5	30.76	3.153446
7	LDT	Bentley	33	Bentayga V8	KVGAT04 0PAA	4.0L	S8	6000	6000	17.6000	17.6	32.1023	28.4000	28.4	19.8944	21.2336	21 2	565	26.6509	285/45 ZR21	66.49	66.65	66.6	117.9	54 5	30.76	18.36801
57	LDT	Bentley	33	Bentayga W12 Speed	LVGAT06 0EAR	6.0L	S8	6000	6000	14.3000	14 3	11.2587	23.4000	23.4	6.8803	17.3333	17 3	161	9.3064	285/45 ZR21	66.49	66.65	66.6	117.9	54 5	30.76	5.2340702
8	LDT	Lamborghini	410	Urus	KVGAT04 0PAA	4.0L	S8	5500	5500	15.0000	15 0	103.7333	22.8000	22.8	68.2456	17.7294	17.7	1,556	87 9096	F 285/45 ZR21 R 315/40 ZR21	66.7	67.3	67	118.2	55	30.52	50.982962
401	LDT	Porsche	401	Cayenne	LPRXT03.0CV6	3	SA-8	5000	5000	23.7000	23.7	415.0633	31.9000	31.9	308 3699	26.8001	26 8	9,837	367 0522	F:255/55R19 R:275/50R19	66.1	65.9	66	114	52 2	31.92	308.17669
403	LDT	Porsche	403	Cayenne Coupé	LPRXT03.0CV6	3	SA-8	5000	5000	23.3000	23 3	52.5322	31.8000	31.8	38.4906	26.4858	26 5	1,224	46.1887	F:275/45 R20 R:305/40 R20	66.1	65.9	66	114	52 2	31.87	38.406024
441	LDT	Porsche	441	Cayenne E-Hybrid	LPRXT03.0CH6	3	SA-8	5500	5500	42.6000	42.6	20.7746	50.9000	50.9	17.3870	45.9439	45 9	885	19 2810	F:275/45R20 R:305/40R20	66.1	65.9	66	114	52 2	31.92	27.725564
442	LDT	Porsche	442	Cayenne E-Hybrid Coupé	LPRXT03.0CH6	3	SA-8	5500	5500	42.6000	42.6	5.5634	50.9000	50.9	4.6562	45.9439	45 9	237	5.1634	F:275/45R20 R:305/40R20	66.1	65.9	66	114	52 2	31.87	7.4364606
411	LDT	Porsche	411	Cayenne S	LPRXT03.0CV6	3	SA-8	5000	5250	22.5000	22 5	78.0889	31.3000	31.3	56.1342	25.7590	25 8	1,757	68.1008	F:255/55R19 R:275/50R19	66.1	65.9	66	114	52 2	31.92	55.04386
413	LDT	Porsche	413	Cayenne S Coupé	LPRXT03.0CV6	3	SA-8	5000	5250	21.9000	21 9	39.8174	29.9000	29.9	29.1639	24.8977	24 9	872	35 0201	F: 285/35 R22 R:315/30 R22	66.1	65.9	66	114	52 2	31.87	27.361155
421	LDT	Porsche	421	Cayenne Turbo	LPRXT04.0CV8	4	SA-8	5500	5500	18.7000	18.7	37.8075	27.6000	27.6	25.6159	21.8741	21 9	707	32 2831	F:285/40R21 R:315/35R21	66.4	66.4	66.4	114	52.6	31.72	22.288777
423	LDT	Porsche	423	Cayenne Turbo Coupé	LPRXT04.0CV8	4	SA-8	5500	5500	18.4000	18.4	34.4565	26.5000	26.5	23.9245	21.3345	21 3	634	29.7653	F:285/40R21 R:315/35R21	66.4	66.4	66.4	114	52.6	31.72	19.98739
451	LDT	Porsche	451	Cayenne Turbo S E-Hybrid	LPRXT04.0CH8	4	SA-8	6000	6000	35.1000	35.1	4.3020	47.0000	47.0	3.2128	39.6129	39.6	151	3.8131	F: 285/40 ZR21 R: 315/35 ZR21	66.4	66.4	66.4	114	52.6	31.87	4.7379981
452	LDT	Porsche	452	Cayenne Turbo S E-Hybrid Coupé	LPRXT04.0CH8	4	SA-8	6000	6000	35.1000	35.1	1.9943	47.0000	47.0	1.4894	39.6129	39.6	70	1.7677	F: 285/40 ZR21 R: 315/35 ZR21	66.4	66.4	66.4	114	52.6	31.87	2.196423
301	LDT	Porsche	301	Macan	LPRXT02 0MR4	2	AMS-7	4500	4500	24.2897	24 3	504.3210	33.7926	33.8	362 5740	27.8088	27 8	12,255	440 8273	F:235/60R18 R:255/55Z18	65 2	65.3	65 2	110.5	50	33.12	370.01812
312	LDT	Porsche	312	Macan GTS	LPRXT03.0CV6	3	AMS-7	4500	4750	21.6834	21.7	63.6866	31.0997	31.1	44.4373	25.1038	25.1	1,382	55 0598	F:265/45R20 R:295/40R20	65 2	65.3	65 3	110.5	50.1	33.06	41.802783
311	LDT	Porsche	311	Macan S	LPRXT03.0CV6	3	AMS-7	4500	4750	22.8432	22 8	313.7719	32.2223	32.2	222.1739	26.2863	26 3	7,154	272 0152	F:235/55R19 R:255/50R19	65 9	65	65 2	110.5	50	33.12	216.00242
321	LDT	Porsche	321	Macan Turbo	LPRXT03.0CV6	3	AMS-7	4500	4750	21.6885	21.7	39.6774	30.5499	30.5	28.2295	24.9445	24 9	861	34 5783	F:265/45R20 R:295/40R20	65 2	65.3	65 2	110.5	50	33.12	25.996377
60	LDT	Volkswagen	180	Atlas	LVGAT03.6VAS	3.6L	S8	4500	4750	21.4000	21.4	43.1776	31.4000	31.4	29.4268	24.9799	25 0	924	36 9600	255/55 R18	67	67.6	67 3	117.3	54 8	30.62	30.176355
29	LDT	Volkswagen	180	Atlas	LVGAT02.0VAA	2.0L	S8	4500	4750	25.7000	25.7	86.2646	34.8000	34.8	63.7069	29.1275	29.1	2,217	76.1856	255/55 R18	67	67.6	67 3	117.3	54 8	30.62	72.403658
58	LDT	Volkswagen	185	Atlas 4Motion	LVGAT03.6VAS	3.6L	S8	5000	5000	20.4157	20.4	150.8824	30.4992	30.5	100 9180	23.9840	24 0	3,078	128 2500	255/55 R18	67	67.6	67 3	117.3	54 8	30.62	100.52253
59	LDT	Volkswagen	195	Atlas Cross Sport 4M	LVGAT03.6VAS	3.6L	S8	4500	4750	20.4157	20.4	762.5490	30.4992	30.5	510 0328	23.9840	24 0	15,556	648.1667	255/55 R18	67	67.6	67 3	117.3	54 9	30.62	508.03396

21	LDT	Volkswagen	195	Atlas Cross Sport 4motion	LVGAT02.0VAA	2.0L	S8	4500	4750	23.1000	23.1	244.1558	33.5000	33.5	168 3582	26.8511	26 9	[	5,640	]	209.6654	255/55 R18	67	67.6	67 3	117.3	54 8	30.62	184.19334
22	LDT	Volkswagen	170	Tiguan	LVGAJ02.0V3A	2.0L	S8	4000	4250	28.5000	28 5	1412.3158	41.4000	41.4	972 2464	33.1479	33.1	[	40,251	]	1216 0423	215/65-17	62.4	62	62 2	109.8	47.4	34.65	1161.645
23	LDT	Volkswagen	175	Tiguan 4Motion	LVGAJ02.0V3A	2.0L	S8	4000	4250	25.9000	25 9	1943.8224	38.2000	38.2	1317 9319	30.2887	30 3	[	50,345	]	1661 5512	215/65-17	62.4	62	62 2	109.8	47.4	34.65	1452.9582
												9918.4476			6833 0420				247,779		8528.4548								7385.6999

AC & OC Adjustment	
MPG	29.1
$FCIV_{AC}$	0.0008221
$FCIV_{OC}$	0.0009435
$FCIV_{PU}$	0
ACCredit	408,853
VLM	225,865
Production	247,779
OCCredit	469,244
Average MP	30.6760

Delta	1.5760

LIGHT TRUCK - CAFE FLEET AVERAGE	
Volkswgen Group Total Units	247,779
Baseline unadj unrounded (MPG)	29.0532
Baseline unadj rounded (MPG)	29.1
Baseline adjusted unrounded (MPG)	0.0000
Baseline adjusted rounded (MPG)	0.0
Volkswagen Group Fleet Average CAFE w/ Average FE Improvement (MPG)	1.6
Volkswagen Group Fleet Average CAFE w/FE Improvement (MPG)	30.676

LIGHT TRUCK- CAFE FLEET STANDARD	
Total Units	247,779
CAFE Fleet Standard	33.5485
Volkswagen Group CAFE Std	33.5

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2020 MID-MODEL YEAR CORPORATE AVERAGE FUEL ECONOMY REPORT
DOMESTIC PASSENGER AUTOMOBILES
VOLKSWAGEN GROUP OF AMERICA, INC.
July 2020

[redacted] Name
Mgr., Comp.Reporting EEO Title
Department
[redacted] Phone
Fax
E-Mail
July 31, 2020 Date

Administrator
National Highway Traffic Safety Administration
1200 New Jersey Ave. NW
Washington, D.C. 20590

Subject: 2020 Mid-Model Year Corporate Average Fuel Economy Report for Volkswagen Group Domestic Passenger Automobiles [redacted]

Dear Administrator,

Attached is the 2020 Volkswagen Group of America, Inc. (VWGoA) Mid-Model Year Corporate Average Fuel Economy Report for Domestic Passenger Cars. This report includes Volkswagen, Audi, Bentley, Lamborghini, Bugatti, and Porsche Brands. This report has been prepared in accordance with the provisions of Title 40 Part 600.510- 12 Code of Federal Regulations. A [redacted] request has been submitted to the NHTSA, Office of Chief Counsel for the projected sales volumes and specific vehicle design information omitted from this submission. Disclosure of information identified as [redacted] from this report would cause substantial competitive harm.

The expected standard for 2020 model year is **41.2 MPG.** The expected performance with inclusion of off-cycle & A/C efficiency credits is **34.2 MPG.**
VWGoA submitted an off-cycle credit application utilizing the alternative methodology pathway for use of high-efficiency alternators in its fleet that covers model years 2016-2019. EPA is currently reviewing this application. It is VWGoA's intent to use the off-cycle credits for CAFE compliance. Pending approval for model years 2017- 2019, VWGoA will submit amended Model Year 2017, 2018, and 2019 reports to reflect these retroactive high-efficiency alternator credits. Please find attached VWGoA's high-efficiency alternator application that is currently under review by EPA. After this application is approved, VWGoA further intends to use these high-efficiency alternator credits for CAFE compliance for model year 2020 and beyond.

Provided in this report are estimates for A/C efficiency credits. Domestic Passenger Automobiles use the following A/C efficiency technology in accordance with 40 CFR § 86.1868-12:

- Default to Recirculation with feedback sensor
- Default to Recirculation without feedback sensor
- Efficient Blower Motor Controls
- Internal Heat Exchanger
- Oil Separator

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- Improved Condenser and/or Evaporator

Also provided in this submission are estimates for off-cycle menu technologies. Domestic Passenger Automobiles in this report are equipped with the following technologies in accordance with 40 CFR § 86.1869-12:

- High-efficiency exterior lights
- Active aerodynamic improvements
- Engine idle start-stop
- Active engine warm-up
- Thermal glass/glazing

Please contact me at [redacted], if you have any comments or questions related to this report.

Sincerely,

[redacted]

Digitally signed by [redacted]
Date: 2020.07.31
18:10:33 -04'00'

[redacted]

[redacted] **GROUP**

2020 MID-MODEL YEAR CORPORATE AVERAGE FUEL ECONOMY REPORT

DOMESTIC PASSENGER AUTOMOBILES MANUFACTURERS AVERAGE CALCULATION

Calculate fuel economy average of domestically produced automobiles where:

Average MPG = the fleet average fuel economy for a category of vehicles; MPG = the average fuel economy for a category of vehicles

$FCIV_{AC}$ = Air conditioning fuel economy credits for a category of vehicles, in gallons per mile.

$FCIV_{OC}$ = Off-cycle technology fuel economy credits for a category of vehicles, in gallons per mile.

$FCIV_{PU}$ = Pickup truck fuel economy credits for the light truck category, in gallons per mile.

Note: Volkswagen Group $_{\text{Average MPG}} = \frac{1}{\left[\frac{1}{MPG} - (FCIV_{AC} + FCIV_{OC} + FCIV_{PU})\right]}$ in the future, impacting the final CAFE calculation.

	MY 2020 Domestic
MPG	33.2
$FCIV_{AC}$ (Gal/Mi)	0.0005267
$FCIV_{OC}$ (Gal/Mi)	0.0003255
$FCIV_{PU}$ (Gal/Mi)	0
ACCredit (Mg)	27,477
VLM	195,264
Production	30,064
OCCredit (Mg)	16,981
Average MPG	34.2

Fleet Standard (MPG)	41.2

VW GoA
Engineering and Environmental Office July 2020

Appendix

Pursuant to 49 CFR 537.7, I, [redacted] and Volkswagen Group of America, Inc. do attest to the authenticity and accuracy of the production data in this 2020 Model Year Report for Volkswagen Group of America, Inc.
This attestation constitutes a representation by Volkswagen Group of America, Inc. that it has established reasonable, prudent procedures to ascertain and provide production data that are accurate and authentic in all material respects and that these procedures have been followed by employees of Volkswagen Group of America, Inc. in the reporting process.

Digitally signed by [redacted]

[redacted]

[redacted]

MTI	Fleet	Brand	Carline Code	Carline	Test Group	Engine (L)	Transm.	IW	ETW	FE CITY	CITY	Formula	FE HWY	HWY	Formula	MT FE COMB	COMB		Confidential Prod		Weighted Prod/MPG	BASE TIRE	TRACK WIDTH (xxx in) - FRONT	TRACK WIDTH (xxx in) - REAR	TRACK WIDTH (xxx in) - AVG	WHEELBASE (xxxx in) - AVG	FOOT PRINT (ft3)	2020 MPG Target	2020 GHG Target	Weighted MPG Target
61	Domestic	Volkswagen	190	Atlas Cross Sport	LVGAT03.6VAS	3.6L	S8	4500	4750	21.4000	21.4	215.4206	31.4000	31.4	146.8153	24 9799	25 0		4,610	]	184.4000	255/55 R19	67	67.6	67.3	117.3	54.8	37.22	221.6	123.8581408
20	Domestic	Volkswagen	190	Atlas Cross Sport	LVGAT02.0VAA	2.0L	S8	4500	4500	26.4000	26.4	112.3864	35.5000	35.5	83 5775	29 8424	29 8		2,967	]	99.5638	255/55 R20	67	67.6	67.3	117.3	54.8	37.22	221.6	79.71520688
46	Domestic	Volkswagen	280	Passat	LVGAJ02.0V3A	2.0L	S6	3500	3750	29.4000	29.4	764.8639	49.7000	49.7	452.4547	36 0207	36 0		22,487	]	624.6389	215/60 R16	61 8	61.3	61.5	110.4	47.2	42.79	191.2	525.5199813
												1092.6709			**682.8475**				**30,064**		**908.6026**									**729.093329**

AC & OC Adjustment	
MPG	33.2
$FCIV_{AC}$	0.0005267
$FCIV_{OC}$	0.0003255
$FCIV_{PU}$	0
ACCredit	27,477
VLM	195,264
Production	30,064
OCCredit	16,981
Average MPG	34.1666

Delta	0.9666

TEST PROCEDURE ADJUSTMENT							
SF 3IWC	0.0000	FE 3IWC (vol)	0	E 3IWC (wtd	0.0000	FE 3IWC	0.0000
SF 4ETW	0.0000	FE 4IWC (vol)	0	E 4IWC (wtd	0.0000	FE 4IWC	0.0000
IW	0.000000						
a factor (Hwy part)	1,092.671	a factor (City part)	682.847	a factor	0.6249	c	0.0014
AFE adj round	33.2262						
AFE adj round	**33.2**						

DOMESTIC PASSENGER CAR - CAFE FLEET AVERAGE	
Volkswgen Group Total Units	**30,064**
Baseline unadj unrounded (MPG)	**33.0882**
Baseline unadj rounded (MPG)	**33.1**
Baseline adjusted unrounded (MPG)	**33.2262**
Baseline adjusted rounded (MPG)	**33.2**
Volkswagen Group Fleet Average CAFE w/ Average FE Improvement (MPG)	**1.0**
Volkswagen Group Fleet Average CAFE w/FE Improvement (MPG)	**34.1666**

DOMESTIC PASSENGER CAR - CAFE FLEET STANDARD	
Total Units	**30,064**
Weighted Target Sum	**729.09333**
CAFE Fleet Standard	**41.2348**
Volkswagen Group CAFE Std	**41.2**

2020 MID-MODEL YEAR CORPORATE AVERAGE FUEL ECONOMY REPORT
IMPORT PASSENGER AUTOMOBILES
VOLKSWAGEN GROUP OF AMERICA, INC.
July 2020

[redacted] Name
Mgr., Comp.Reporting Title
EEO Department
[redacted] Phone
Fax
[redacted] E-Mail
July 31, 2020 Date

Administrator
National Highway Traffic Safety Administration
1200 New Jersey Ave. SW
Washington, D.C. 20590

Subject: 2020 Mid-Model Year Corporate Average Fuel Economy Report for Volkswagen Group Import Passenger Automobiles [redacted])

Dear Administrator,

Attached is the 2020 Volkswagen Group of America, Inc. (VWGoA) Mid-Model Year Corporate Average Fuel Economy Report for Import Passenger Automobiles. This report includes Volkswagen, Audi, Bentley, Lamborghini, Bugatti, and Porsche Brands. This report has been prepared in accordance with the provisions of Title 40 Part 600.510-12 Code of Federal Regulations. A [redacted] request has been submitted to the NHTSA, Office of the Chief Counsel for the projected sales volumes and specific vehicle design information omitted from this submission. Disclosure of information identified as [redacted] from this report would cause substantial competitive harm.

The expected standard for 2020 model year is **44.1 MPG.** The expected performance with inclusion of off-cycle & A/C efficiency credits is **38.9 MPG.**

VWGoA submitted an off-cycle credit application utilizing the alternative methodology pathway for use of high-efficiency alternators in its fleet that covers model years 2016- 2019. EPA is currently reviewing this application. It is VWGoA's intent to use the off- cycle credits for CAFE compliance. Pending approval for model years 2017-2019, VWGoA will submit amended Model Year 2017, 2018, and 2019 reports to reflect these retroactive high-efficiency alternator credits. Please find attached VWGoA's high- efficiency alternator application that is currently under review by EPA. After this application is approved, VWGoA further intends to use these high-efficiency alternator credits for CAFE compliance for model year 2020 and beyond.

Provided in this report are estimates for A/C efficiency credits. Import Passenger Automobiles use the following A/C efficiency technology in accordance with 40 CFR § 86.1868-12:

- Default to Recirculation with feedback sensor
- Default to Recirculation without feedback sensor
- Efficient Blower Motor Controls
- Internal Heat Exchanger
- Oil Separator
- Improved Condenser and/or Evaporator

Also provided in this submission are estimates for off-cycle menu technologies. Import Passenger Automobiles in this report are equipped with the following technologies in accordance with 40 CFR § 86.1869-12:

- High-efficiency exterior lights
- Active aerodynamic improvements
- Engine idle start-stop
- Active transmission warm-up
- Active engine warm-up
- Active seat ventilation
- Solar Reflective Surface coating
- Thermal glass/glazing

Please contact me at [redacted], if you have any comments or questions related to this report.

Sincerely,

[redacted]

VOLKSWAGEN GROUP

2020 MID-MODEL YEAR CORPORATE AVERAGE FUEL ECONOMY REPORT

IMPORT PASSENGER AUTOMOBILES

MANUFACTURERS AVERAGE CALCULATION

Calculate fuel economy average of Imported automobiles where:

$$\text{Average MPG} = \frac{1}{\left[\frac{1}{MPG} - CFCIV_{AC} + FCIV_{OC} + FCIV_{PU}\right]}$$

Average MPG = the fleet average fuel economy for a category of vehicles; MPG = the average fuel economy for a category of vehicles

$FCIV_{AC}$ = Air conditioning fuel economy credits for a category of vehicles, in gallons per mile.

$FCIV_{OC}$ = Off-cycle technology fuel economy credits for a category of vehicles, in gallons per mile.

$FCIV_{PU}$ = Pickup truck fuel economy credits for the light truck category, in gallons per mile.

Note: Volkswagen Group of America intends to claim off-cycle credits in the future, impacting the final CAFE calculation.

	MY 2020 IPC
MPG	37.5
$FCIV_{AC\ (Gal/Mi)}$	0.0005784
$FCIV_{OC\ (Gal/Mi)}$	0.0003815
$FCIV_{PU\ (Gal/Mi)}$	0
ACCredit (Mg)	149,837
VLM	195,264
Production	149,296
OCCredit (Mg)	98,850
Average MPG	38.9

Fleet Standard (MPG)	44.1

VWGoA
Engineering and Environmental Office July 2020

Appendix

Pursuant to 49 CFR 537.7, I, [redacted] and Volkswagen Group of America, Inc. do attest to the authenticity and accuracy of the production data in this 2020 Model Year Report for Volkswagen Group of America, Inc.

This attestation constitutes a representation by Volkswagen Group of America, Inc. that it has established reasonable, prudent procedures to ascertain and provide production data that are accurate and authentic in all material respects and that these procedures have been followed by employees of Volkswagen Group of America, Inc. in the reporting process.

Digitally signed by [redacted]
[redacted]: 2020.07.31 18:11:31
-04'00'

_____ Date_____ [redacted]

[redacted]

MTI	Fleet	Brand	Carline Code	Carline	Test Group	Engine (L)	Transm.	IW	ETW	FE CITY	CITY	Formula	FE HWY	HWY	Formula	MT FE COMB	COMB		Confidential Prod		Weighted Prod/MPG	BASE TIRE	TRACK WIDTH (xxx in) - FRONT	TRACK WIDTH (xxx in) - REAR	TRACK WIDTH (xxx in) - AVG	WHEELBASE (xxxx in) - AVG	FOOT PRINT (ft3)	2020 MPG Target	Weighted MPG Target
27	Import	Audi	67	A3	LVGAV02 0A3A	2.0L	AMS-7	3500	3500	32 9000	32.9	149 2401	50.3000	50 3	97.6143	38.9656	39 0	[	4,910	]	125 8974	225/40 R18	61	59.8	60.4	103.5	43.4	46 25	106.1621622
12	Import	Audi	68	A3 quattro	LVGAJ02.0A3T	2.0L	AMS-7	3500	3750	27 3996	27.4	155 0730	42.5000	42 5	99.9765	32.6142	32.6	[	4,249	]	130 3374	225/40 R18	61	59.8	60.4	103.5	43.4	46 25	91.87027027
32	Import	Audi	10	A4	LVGAV02 0A7B	2.0L	AMS7	3500	3750	35.1000	35.1	106 9516	50.5982	50.6	74.1897	40.7115	40.7	[	3,754	]	92.2359	225/50 R17	61.6	61	61.3	111	47.3	42.71	87.89510653
55	Import	Audi	26	A4 allroad quattro	LVGAJ02.0AAC	2.0L	AMS7	4000	4250	29 8306	29.8	32.8188	43.5590	43.6	22.4312	34.7605	34 8	[	978	]	28.1034	245/45 R18	62.2	61.8	62	111	47.8	42 29	23.12603452
52	Import	Audi	20	A4 quattro	LVGAJ02.0AAC	2.0L	AMS7	4000	4000	29 8557	29.9	224 5485	45.7847	45 8	146 5939	35.3975	35.4	[	6,714	]	189.6610	225/50 R17	61.6	61	61.3	111	47.3	42.71	157.199719
56	Import	Audi	53	A5 Cabrio quattro	LVGAJ02.0AAC	2.0L	AMS7	4000	4250	29 8306	29.8	37.7181	43.5590	43.6	25.7798	34.7605	34 8	[	1,124	]	32.2989	245/40 R18	62.5	61.7	62.1	108.9	47	42 96	26.16387337
53	Import	Audi	40	A5 quattro	LVGAJ02.0AAC	2.0L	AMS7	4000	4000	29 8557	29.9	29.8997	45.7847	45 8	19.5197	35.3975	35.4	[	894	]	25.2542	245/40 R18	62.5	61.7	62.1	108.8	46.9	43 05	20.76655052
54	Import	Audi	41	A5 Sportback quattro	LVGAJ02.0AAC	2.0L	AMS7	4000	4000	29 8557	29.9	140 8361	45.7847	45 8	91.9432	35.3975	35.4	[	4,211	]	118 9548	245/40 R18	62.5	61.7	62.1	111.2	48	42.13	99.95252789
45	Import	Audi	81	A6 Allroad	LVGAV03.0N7N	3.0L	AMS7	4500	4750	26 3000	26.3	29.3916	38.2000	38 2	20.2356	30.5879	30.6	[	773	]	25.2614	245/45 R20	63.9	63.5	62.1	114.6	50.7	40 03	19.31051711
19	Import	Audi	75	A6 quattro	LVGAV02 0A7M	2.0L	AMS7	4500	4500	31 0000	31.0	108.1290	45.7000	45.7	73.3479	36.2466	36 2	[	3,352	]	92.5967	245/45 R19	63.9	63.5	63.7	114.6	50.7	40 03	83.7371971
44	Import	Audi	75	A6 quattro	LVGAV03.0N7N	3.0L	AMS7	4500	4750	28 0651	28.1	72.5267	41.0077	41 0	49.7073	32.7109	32.7	[	2,038	]	62.3242	245/45 R19	63.4	63.1	63.2	114.6	50.3	40 33	50.53310191
43	Import	Audi	70	A7 quattro	LVGAV03.0N7N	3.0L	AMS7	4500	4750	28 0651	28.1	38.7900	41.0077	41 0	26.5854	32.7109	32.7	[	1,090	]	33.3333	255/45 R19	64.6	64.2	64.4	114.7	51.3	39 59	27.5322051
300	Import	Audi	96	A8L PHEV	LVGAJ03.0NAP	3.0L	S8	5500	5500	54.7269	54.7	2.2486	54.0474	54 0	2.2778	54.4190	54.4	[	123	]	2.2610	255/45 R19	64.2	63.8	64	122.9	54.6	37 35	3 293172691
49	Import	Audi	96	A8L	LVGAV03 0N7R	3.0L	S8	5000	5250	23 2000	23.2	15.0862	38.3000	38 3	9.1384	28.2038	28 2	[	350	]	12.4113	255/45 R19	64.2	63.8	64	122.9	54.6	37 35	9.3708166
40	Import	Audi	96	A8L	LVGAV04.0NAT	4.0L	S8	5000	5250	20 0000	20.0	43.6000	31.6000	31.6	27.5949	23.9575	24 0	[	872	]	36.3333	255/45 R19	64.5	64.1	64.3	122.9	54.9	37.16	23.46609257
1	Import	Audi	90	R8	LVGAV05 2NBE	5.2L	S7	4000	4000	15 9230	15.9	12.6415	26.3141	26 3	7.6426	19.3640	19.4	[	201	]	10.3608	F:245/35 R19 R:295/35 R19	64.8	63	63.9	104.3	46.3	43 56	4.614325069
1RC	Import	Audi	90	R8 Coupe V10 plus	LVGAV05 2NBE	5.2L	S7	4000	4000	15 9230	15.9	27.1069	26.3141	26 3	16.3878	19.3640	19.4	[	431	]	22.2165	F:245/30 R20 R:305/30 R20	64.8	63	63.9	104.3	46.3	43 56	9 894398531
6	Import	Audi	92	R8 Spyder	LVGAV05 2NBE	5.2L	S7	4000	4250	15 9230	15.9	6.6038	26.3141	26 3	3.9924	19.3640	19.4	[	105	]	5.4124	F:245/35 R19 R:295/35 R19	64.8	63	63.9	104.3	46.3	43 56	2.41046832
6RC	Import	Audi	92	R8 Spyder V10 plus	LVGAV05 2NBE	5.2L	S7	4000	4250	15 9230	15.9	13.9623	26.3141	26 3	8.4411	19.3640	19.4	[	222	]	11.4433	F:245/30 R20 R:305/30 R20	64.8	63	63.9	104.3	46.3	43 56	5 096418733
50	Import	Audi	15	RS3	LVGAV02.5NAG	2.5L	S8	4000	3875	23 8000	23.8	24.3277	37.9000	37 9	15.2770	28.5856	28.6	[	579	]	20.2448	235/35 R19	60.6	59.6	60.1	103.6	43.2	46.45	12.46501615
17	Import	Audi	64	S3	LVGAV02.0AAB	2.0L	AMS7	4000	3875	27 0000	27.0	46.0370	40.9000	40 9	30.3912	31.8747	31 9	[	1,243	]	38.9655	225/40 R18	60.8	59.8	60.3	103.6	43.4	46 25	26.87567568
34	Import	Audi	30	S4	LVGAJ03.0N7F	3.0L	S8	4000	4250	25 3191	25.3	53.7945	37.6499	37.6	36.1968	29.6957	29.7	[	1,361	]	45.8249	245/40R18	61.5	60.8	61.2	111	47.2	42.79	31.80649685
35	Import	Audi	42	S5	LVGAJ03.0N7F	3.0L	S8	4000	4250	25 3191	25.3	14.7826	37.6499	37.6	9.9468	29.6957	29.7	[	374	]	12.5926	245/40 R18	62.5	61.7	62.1	108.8	46.9	43 05	8.68757259
37	Import	Audi	56	S5 Cabriolet	LVGAJ03.0N7F	3.0L	S8	4500	4500	24.4000	24.4	15.4508	36.6000	36.6	10.3005	28.7059	28.7	[	377	]	13.1359	245/40 R18	62.5	61.7	62.1	108.9	47	42 96	8.775605214
36	Import	Audi	44	S5 Sportback	LVGAJ03.0N7F	3.0L	S8	4000	4250	25 3191	25.3	42.6087	37.6499	37.6	28.6702	29.6957	29.7	[	1,078	]	36.2963	245/40 R18	62.5	61.7	62.1	111.2	48	42.13	25.58746736
39	Import	Audi	76	S6	LVGAV02 9N7S	2.9L	S8	5000	5000	24 0000	24.0	31.8750	37.5000	37 5	20.4000	28.6396	28.6	[	765	]	26.7483	255/40 R20	64.4	64.1	64.2	114.6	51.1	40 33	18.96850979
38	Import	Audi	72	S7	LVGAV02 9N7S	2.9L	S8	5000	5000	24 0000	24.0	32.3750	37.5000	37 5	20.7200	28.6396	28.6	[	777	]	27.1678	255/40 R20	64.4	64.1	64.2	114.7	51.1	39.74	19.55208858
41	Import	Audi	97	S8	LVGAV04.0NAT	4.0L	S8	5500	5500	17 2000	17.2	29.4767	29.9000	29 9	16.9565	21.2644	21 3	[	507	]	23.8028	265/40 R20	64.4	64.1	64.2	117.9	52.6	38.68	13.10754912
14	Import	Audi	37	TT Coupe quattro	LVGAJ02.0A3T	2.0L	AMS-7	3500	3500	27 9868	28.0	6.3929	42.2160	42 2	4.2417	32.9907	33 0	[	179	]	5.4242	245/35 R18	60.7	61	60.8	98.6	41.6	48.1	3.721413721
15	Import	Audi	38	TT Roadster quattro	LVGAJ02.0A3T	2.0L	AMS-7	3500	3750	27 9868	28.0	5.8571	42.2160	42 2	3.8863	32.9907	33 0	[	164	]	4.9697	245/35 R18	60.7	61	60.8	98.6	41.6	48.1	3.40956341
51	Import	Audi	18	TT RS	LVGAV02.5NAG	2.5L	S7	3500	3625	23.7000	23.7	4.7257	38.7000	38.7	2.8941	28.7070	28.7	[	112	]	3.9024	245/35 R19	60.5	60.8	60.6	98.6	41.5	48.2	2 323651452
18	Import	Audi	39	TTS Coupe	LVGAV02.0AAB	2.0L	S7	3500	3625	28 5000	28.5	4.4561	39.8000	39 8	3.1910	32.6746	32.7	[	127	]	3.8838	245/35 R19	60.5	60.8	60.6	98.6	41.5	48.2	2.634854772
9	Import	Bentley	35	Continental GT	LVGAV04.0PAA	4.0L	S8	5000	5250	19 0651	19.1	39.3717	31.5887	31.6	23.7975	23.2050	23 2	[	752	]	32.4138	275/30 ZR20	65.6	65.4	65.5	107.9	49.1	41 25	18.23030303
64	Import	Bentley	35	Continental GT	LVGAV06 0EAR	6.0L	S8	5500	5500	14 9000	14.9	24.6980	26.9000	26 9	13.6803	18.6423	18.6	[	368	]	19.7849	275/30 ZR21	65.6	65.4	65.5	107.9	49.1	41 25	8 921212121
65	Import	Bentley	46	Continental GT Conv	LVGAV06 0EAR	6.0L	S8	6000	6000	15 0000	15.0	28.0000	26.5000	26 5	15.8491	18.6401	18.6	[	420	]	22.5806	275/30 ZR22	65.6	65.4	65.5	107.9	49.1	41 25	10.18181818
10	Import	Bentley	46	Continental GT Convertible	LVGAV04.0PAA	4.0L	S8	5500	5500	19 0651	19.1	54.8691	31.5887	31.6	33.1646	23.2050	23 2	[	1,048	]	45.1724	275/30 ZR23	65.6	65.4	65.5	107.9	49.1	41 25	25.40606061
66	Import	Bentley	40	Flying Spur	LVGAV06 0EAR	6.0L	S8	6000	6000	15 0000	15.0	25.5333	26.5000	26 5	14.4528	18.6401	18.6	[	383	]	20.5914	275/30 ZR24	64.6	64.5	64.6	120.5	54.1	37.67	10.16724184
75	Import	Bentley	15	Mulsanne	LVGAV06 8EDP	6.8L	S8	6500	6500	11 2000	11.2	7.9464	20.8000	20 8	4.2788	14.1359	14.1	[	89	]	6.3121	265/45 ZR20	63.2	65	64.1	128.6	57.2	36.47	2.440361941
28	Import	Bugatti	501	Chiron	LVGAV08.0GLB	8.0L	AMS7	4500	4750	10.4000	10.4	1.1538	18.2000	18 2	0.6593	12.8850	12 9	[	12	]	0.9302	F:285/30R20 R:355/25/R21	68.8	65.4	67.1	106.7	49.7	40.78	0 294261893
76	Import	Bugatti	502	Divo	LVGAV08.0GLB	8.0L	AMS7	5000	4750	10.4000	10.4	1.2500	17.7000	17.7	0.7345	12.7700	12 8	[	13	]	1.0156	F:285/30R20 R:355/25/R21	68.8	65.4	67.1	106.7	49.7	40.78	0 318783718
30	Import	Lamborghini	475	Aventador (S Coupe)	LVGAV06.5LDR	6.5L	AMS7	4500	4500	10.7954	10.8	0.0926	19.7883	19 8	0.0505	13.5707	13.6	[	1	]	0.0735	F 255/30 ZR20 R 355/25 ZR21	67.7	66.1	66.9	106.3	49.4	41 01	0 024384297
30RC	Import	Lamborghini	475	Aventador (SVJ Coupe)	LVGAV06.5LDR	6.5L	AMS7	4000	4250	10.7954	10.8	8.2407	19.7883	19 8	4.4949	13.5707	13.6	[	89	]	6.5441	F 255/30 ZR20 R 355/25 ZR21	67.7	66.1	66.9	106.3	49.4	41 01	2.17020239
31	Import	Lamborghini	476	Aventador Roadster (S)	LVGAV06.5LDR	6.5L	AMS7	4500	4500	10 5988	10.6	0.0943	19.4959	19 5	0.0513	13.3379	13 3	[	1	]	0.0752	F 255/30 ZR20 R 355/25 ZR21	67.7	66.1	66.9	106.3	49.4	41 01	0 024384297
31RC	Import	Lamborghini	476	Aventador Roadster (SVJ)	LVGAV06.5LDR	6.5L	AMS7	4500	4500	10 5988	10.6	16.4151	19.4959	19 5	8.9231	13.3379	13 3	[	174	]	13.0827	F 255/30 ZR20 R 355/25 ZR21	67.7	66.1	66.9	106.3	49.4	41 01	4 242867593
2	Import	Lamborghini	407	Huracan	LVGAV05.2NDE	5.2L	AMS7	4000	3875	16 0000	16.0	23.6875	24.1451	24.1	15.7261	18.8635	18 9	[	379	]	20.0529	F 245/30 ZR20 R 305/30 ZR20	65.7	63.8	64.8	103.1	46.4	43.48	8.716651334
4	Import	Lamborghini	408	Huracan 2WD	LVGAV05.2NDE	5.2L	AMS7	4000	3875	16 0000	16.0	12.7500	24.1465	24.1	8.4647	18.8639	18 9	[	204	]	10.7937	F 245/35 R19 R 305/35 R19	65.7	63.8	64.8	103.1	46.4	43.48	4.691812328
3	Import	Lamborghini	427	Huracan Spyder	LVGAV05.2NDE	5.2L	AMS7	4000	4250	16 0000	16.0	19.5625	24.1451	24.1	12.9876	18.8635	18 9	[	313	]	16.5608	F 245/30 ZR20 R 305/30 ZR20	65.7	63.8	64.8	103.1	46.4	43.48	7.198712052
5	Import	Lamborghini	428	Huracan Spyder 2WD	LVGAV05.2NDE	5.2L	AMS7	4000	4250	16 0000	16.0	11.1250	24.1465	24.1	7.3859	18.8635	18 9	[	178	]	9.4180	F 245/35 R19 R 305/35 R19	65.7	63.8	64.8	103.1	46.4	43.48	4 093836247
0	Import	Lamborghini	475	Sian	LVGAV06.5LDR	6.5L	AMS7	4500	4500	10.7954	10.8	1.1111	19.7883	19 8	0.6061	13.5707	13.6	[	12	]	0.8824	F 255/30 ZR20 R 355/25 ZR21	67.7	66.1	66.9	106.3	49.4	41 01	0 292611558
202	Import	Porsche	860	718 Boxster	LPRXV02.5B82	2	AMS-7	3500	3500	27 2000	27.2	5.4044	38.3000	38 3	3.8381	31.2794	31 3	[	147	]	4.6965	F:235/35ZR20 R:265/35ZR20	59.7	60.3	60	97.4	40.6	48.74	3 016003283
201	Import	Porsche	860	718 Boxster	LPRXV02.5B82	2	M6	3500	3375	25.4000	25.4	1.9291	37.2000	37 2	1.3172	29.6294	29.6	[	49	]	1.6554	F:235/45ZR18 R:265/45ZR18	59.7	60.3	60	97.4	40.6	48.74	1 005334428
222	Import	Porsche	861	718 Boxster S	LPRXV02.5B82	3	AMS-7	3500	3500	24 2000	24.2	4.3802	35.9000	35 9	2.9526	28.3591	28.4	[	106	]	3.7324	F:235/35ZR20 R:265/35ZR20	59.7	60.6	60.2	97.4	40.7	48.74	2.174805088
221	Import	Porsche	861	718 Boxster S	LPRXV02.5B82	3	M6	3500	3500	23.6000	23.6	1.4831	34.3000	34 3	1.0204	27.4540	27 5	[	35	]	1.2727	F:235/40ZR19 R:265/40ZR19	59.7	60.6	60.2	97.4	40.7	48.74	0.71809602
233	Import	Porsche	864	718 Boxster T	LPRXV02.5B82	2	M6	3500	3500	25.4000	25.4	0.3937	37.2000	37 2	0.2688	29.6294	29.6	[	10	]	0.3378	F:235/35 ZR20 R:265/35 ZR20	59.7	60.6	60.2	97.4	40.7	48.74	0 205170291
234	Import	Porsche	864	718 Boxster T	LPRXV02.5B82	2	AMS-7	3500	3500	26.6000	26.6	1.0526	38.2000	38 2	0.7330	30.8102	30 8	[	28	]	0.9091	F:235/35ZR20 R:265/35ZR20	59.7	60.3	60	97.4	40.6	48.74	0 574476816
212	Import	Porsche	870	718 Cayman	LPRXV02.5B82	2	AMS-7	3500	3500	27 2000	27.2	5.0368	38.3000	38 3	3.5770	31.2794	31 3	[	137	]	4.3770	F:235/35ZR20 R:265/35ZR20	59.7	60.3	60	97.4	40.6	48.74	2 810832991
211	Import	Porsche	870	718 Cayman	LPRXV02.5B82	2	M6	3500	3375	25.4000	25.4	1.8504	37.2000	37 2	1.2634	29.6294	29.6	[	47	]	1.5878	F:235/45ZR18 R:265/45ZR18	59.7	60.3	60	97.4	40.6	48.74	0 964300369
235	Import	Porsche	873	718 Cayman GT4	LPRXV04 0S82	4	M6	3500	3625	20 5000	20.5	48.9268	31.5000	31 5	31.8413	24.3220	24 3	[	1,003	]	41.2757	F:245/35 R20 R:295/30 R20	59.7	60.6	60.2	97.4	40.7	48.74	20.57858022
232	Import	Porsche	871	718 Cayman S	LPRXV02.5B82	3	AMS-7	3500	3500	24 2000	24.2	1.0331	35.9000	35 9	0.6964	28.3591	28.4	[	25	]	0.8803	F:235/35ZR20 R:265/35ZR20	59.7	60.6	60.2	97.4	40.7	48.74	0 512925728
231	Import	Porsche	871	718 Cayman S	LPRXV02.5B82	3	M6	3500	3500	23.6000	23.6	0.3814	34.3000	34 3	0.2624	27.4540	27 5	[	9	]	0.3273	F:235/40ZR19 R:265/40ZR19	59.7	60.6	60.2	97.4	40.7	48.74	0.184653262
244	Import	Porsche	874	718 Cayman T	LPRXV02.5B82	2	AMS-7	3500	3500	26.6000	26.6	1.0902	38.2000	38 2	0.7592	30.8102	30 8	[	29	]	0.9416	F:235/35 ZR20 R:265/35 ZR20	59.7	60.6	60.2	97.4	40.7	48.74	0 594993845
243	Import	Porsche	874	718 Cayman T	LPRXV02.5B82	2	M6	3500	3500	25.4000	25.4	0.3937	37.2000	37 2	0.2688	29.6294	29.6	[	10	]	0.3378	F:235/40 ZR19 R:265/40 ZR19	59.7	60.6	60.2	97.4	40.7	48.74	0 205170291
225	Import	Porsche	863	718 Spyder	LPRXV04 0S82	4	M6	3500	3625	20 5000	20.5	30.0488	31.5000	31 5	19.5556	24.3220	24 3	[	616	]	25.3498	F:245/35 R20 R:295/30 R20	59.7	60.6	60.2	97.4	40.7	48.74	12.63848995
102	Import	Porsche	501	911 Carrera	LPRXV03.0C92	3	AMS-7	4000	3875	23.7000	23.7	55.5696	35.0000	35 0	37.6286	27.7286	27.7	[	1,317	]	47.5451	F:245/35ZR20 R:305/30ZR21	60.7	59.8	60.2	96.5	40.3	48.74	27.02092737
110	Import	Porsche	505	911 Carrera 4	LPRXV03.0C92	3	AMS-7	4000	3875	23.7000	23.7	1.9409	35.0000	35 0	1.3143	27.7286	27.7	[	46	]	1.6606	F:245/35ZR20 R:305/30ZR21	60.7	61.3	61	96.5	40.9	48.74	0.94378334
112	Import	Porsche	506	911 Carrera 4 Cabriolet	LPRXV03.0C92	3	AMS-7	4000	4000	23.6000	23.6	1.2712	33.9000	33 9	0.8850	27.3378	27 3	[	30	]	1.0989	F:245/35ZR20 R:305/30ZR21	60.7	61.3	61	96.5	40.9	48.74	0.615510874
114	Import	Porsche	507	911 Carrera 4S	LPRXV03.0C92	3	AMS-7	4000	3875	23.6000	23.6	67.2034	33.7000	33.7	47.0623	27.2790	27 3	[	1,586	]	58.0952	F:245/35ZR20 R:305/30ZR21	60.7	61.3	61	96.5	40.9	48.74	32.54000821
113	Import	Porsche	507	911 Carrera 4S	LPRXV03.0C92	3	M7	4000	3875	22.4000	22.4	4.6875	35.4000	35.4	2.9661	26.8345	26 8	[	105	]	3.9179	F:245/35ZR20 R:305/30ZR21	60.7	61.3	61	96.5	40.9	48.74	2.154288059
116	Import	Porsche	508	911 Carrera 4S Cabriolet	LPRXV03.0C92	3	AMS-7	4000	4000	23.6000	23.6	42.8390	33.4000	33.4	30.2695	27.1901	27 2	[	1,011	]	37.1691	F:245/35ZR20 R:305/30ZR21	60.7	61.3	61	96.5	40.9	48.74	20.74271645
115	Import	Porsche	508	911 Carrera 4S Cabriolet	LPRXV03.0C92	3	M7	4000	4000	22 2000	22.2	3.6937	34.0000	34 0	2.4118	26.3088	26 3	[	82	]	3.1179	F:245/35ZR20 R:305/30ZR21	60.7	61.3	61	96.5	40.9	48.74	1.682396389
104	Import	Porsche	502	911 Carrera Cabriolet	LPRXV03.0C92	3	AMS-7	4000	4000	21 5995	21.6	33.4259	32.8973	32 9	21.9453	25.5477	25 5	[	722	]	28.3137	F:245/35ZR20 R:305/30ZR21	60.7	59.8	60.2	96.5	40.3	48.74	14.81329503
106	Import	Porsche	503	911 Carrera S	LPRXV03.0C92	3	AMS-7	4000	3875	23 3000	23.3	93.7768	34.2000	34 2	63.8889	27.2012	27 2	[	2,185	]	80.3309	F:245/35ZR20 R:305/30ZR21	60.7	59.8	60.2	96.5	40.3	48.74	44.82970866
105	Import	Porsche	503	911 Carrera S	LPRXV03.0C92	3	M7	3500	3750	22.1000	22.1	8.4163	35.7000	35.7	5.2101	26.6724	26.7	[	186	]	6.9663	F:245/35ZR20 R:305/30ZR21	60.7	59.8	60.2	96.5	40.3	48.74	3 816167419
108	Import	Porsche	504	911 Carrera S Cabriolet	LPRXV03.0C92	3	AMS-7	4000	4000	23 2000	23.2	54.4397	33.5000	33 5	37.7015	26.9253	26 9	[	1,263	]	46.9517	F:245/35ZR20 R:305/30ZR21	60.7	59.8	60.2	96.5	40.3	48.74	25.9130078
107	Import	Porsche	504	911 Carrera S Cabriolet	LPRXV03.0C92	3	M7	4000	3875	22 5000	22.5	3.6444	35.7000	35.7	2.2969	26.9909	27 0	[	82	]	3.0370	F:245/35ZR20 R:305/30ZR21	60.7	59.8	60.2	96.5	40.3	48.74	1.682396389
601	Import	Porsche	601	Panamera	LPRXV03.0PV6	3	AMS-8	4500	4500	25 2000	25.2	55.3175	39.7000	39.7	35.1134	30.1564	30 2	[	1,394	]	46.1589	F:275/35ZR21 R:315/30ZR21	65.8	65	65.4	116.1	52.7	38.61	36.1046361
606	Import	Porsche	606	Panamera 4	LPRXV03.0PV6	3	AMS-8	4500	4750	24.7000	24.7	44.0891	38.1000	38.1	28.5827	29.3442	29 3	[	1,089	]	37.1672	F:275/35ZR21 R:315/30ZR21	65.8	65	65.4	116.1	52.7	38.61	28.20512821
641	Import	Porsche	641	Panamera 4 E-Hybrid	LPRXV02.9PH6	3	AMS-8	5500	5500	46 3000	46.3	7.5162	58.2000	58 2	5.9794	51.0117	51 0	[	348	]	6.8235	F:265/45ZR19 R:295/40ZR19	65.8	65	65.4	116.1	52.7	38.61	9 013209013
642	Import	Porsche	642	Panamera 4 E-Hybrid Executi	LPRXV02.9PH6	3	AMS-8	5500	5500	46 3000	46.3	0.3024	58.2000	58 2	0.2405	51.0117	51 0	[	14	]	0.2745	F:265/45ZR19 R:295/40ZR19	65.8	65	65.4	122	55.4	36 84	0 380021716
643	Import	Porsche	643	Panamera 4 E-Hybrid ST	LPRXV02.9PH6	3	AMS-8	5500	5500	46 3000	46.3	0.3240	58.2000	58 2	0.2577	51.0117	51 0	[	15	]	0.2941	F:265/45ZR19 R:295/40ZR19	65.8	65	65.4	116.1	52.7	38.61	0 388500389
607	Import	Porsche	607	Panamera 4 Executive	LPRXV03.0PV6	3	AMS-8	4500	4750	24.7000	24.7	0.9312	38.1000	38.1	0.6037	29.3442	29 3	[	23	]	0.7850	F:275/35ZR21 R:315/30ZR21	65.8	65	65.4	122	55.4	36 84	0.62432139
608	Import	Porsche	608	Panamera 4 ST	LPRXV03.0PV6	3	AMS-8	4500	4750	24 3000	24.3	1.3169	37.2000	37 2	0.8602	28.7931	28 8	[	32	]	1.1111	F:275/35ZR21 R:315/30ZR21	65.8	65	65.4	116.1	52.7	38.61	0 828800829
616	Import	Porsche	616	Panamera 4S	LPRXV03.0PV6	3	AMS-8	4500	4750	23 8000	23.8	25.8824	37.3000	37 3	16.5147	28.4304	28.4	[	616	]	21.6901	F:275/35ZR21 R:315/30ZR21	65.8	65	65.4	116.1	52.7	38.61	15.95441595
617	Import	Porsche	617	Panamera 4S Executive	LPRXV03.0PV6	3	AMS-8	4500	4750	23 8000	23.8	0.7983	37.3000	37 3	0.5094	28.4304	28.4	[	19	]	0.6690	F:275/35ZR21 R:315/30ZR21	65.8	65	65.4	122	55.4	36 84	0 515743757
618	Import	Porsche	618	Panamera 4S ST	LPRXV03.0PV6	3	AMS-8	4500	4750	23 5000	23.5	0.4255	35.4000	35.4	0.2825	27.6885	27.7	[	10	]	0.3610	F:275/35ZR21 R:315/30ZR21	65.8	65	65.4	116.1	52.7	38.61	0 259000259
621	Import	Porsche	621	Panamera GTS	LPRXV04.0PV8	4	AMS-8	5000	5000	20.1000	20.1	37.1144	33.2000	33 2	22.4699	24.4395	24.4	[	746	]	30.5738	F:275/35ZR21 R:315/30ZR21	65.2	64.5	64.8	116.1	52.2	38 95	19.15275995
622	Import	Porsche	622	Panamera GTS ST	LPRXV04.0PV8	4	AMS-8	5000	5000	19.6000	19.6	2.8061	31.2000	31 2	1.7628	23.5381	23 5	[	55	]	2.3404	F:275/35ZR21 R:315/30ZR21	65.2	64.5	64.8	116.1	52.2	38 95	1.412066752
631	Import	Porsche	631	Panamera Turbo	LPRXV04.0PV8	4	AMS-8	5000	5000	23 0000	23.0	3.5217	35.9000	35 9	2.2563	27.4365	27.4	[	81	]	2.9562	F:275/35ZR21 R:315/30ZR21	65.2	64.5	64.8	116.1	52.2	38 95	2 079589217
632	Import	Porsche	632	Panamera Turbo Executive	LPRXV04.0PV8	4	AMS-8	5000	5000	23 0000	23.0	0.6522	35.9000	35 9	0.4178	27.4365	27.4	[	15	]	0.5474	F:275/35ZR21 R:315/30ZR21	65.2	64.5	64.8	122	54.9	37.16	0.403659849
651	Import	Porsche	651	Panamera Turbo S E-Hybrid	LPRXV04.0PH8	4	AMS-8	6000	6000	41 8000	41.8	0.6220	53.1000	53.1	0.4896	46.2436	46 2	[	26	]	0.5628	F:275/35R21 R:315/30ZR21	65.2	64.4	64.8	116.1	52.2	38 95	0.667522465
652	Import	Porsche	652	Panamera Turbo S E-Hybrid E	LPRXV04.0PH8	4	AMS-8	6000	6000	41 8000	41.8	0.0957	53.1000	53.1	0.0753	46.2436	46 2	[	4	]	0.0866	F:275/35R21 R:315/30ZR21	65.2	64.4	64.8	122	54.9	37.16	0.107642626
653	Import	Porsche	653	Panamera Turbo S E-Hybrid S	LPRXV04.0PH8	4	AMS-8	6000	6000	41 8000	41.8	0.1196	53.1000	53.1	0.0942	46.2436	46 2	[	5	]	0.1082	F:275/35R21 R:315/30ZR21	65.2	64.5	64.8	116.1	52.2	38 95	0.128369705
633	Import	Porsche	633	Panamera Turbo ST	LPRXV04.0PV8	4	AMS-8	5000	5000	21 9000	21.9	0.3653	32.5000	32 5	0.2462	25.6671	25.7	[	8	]	0.3113	F:275/35ZR21 R:315/30ZR21	65.2	64.5	64.8	116.1	52.2	38 95	0 205391528
712	Import	Porsche	712	Taycan 4S Perf Batt Plus	LPRXV00.0EVT	0	A-2	5500	5500	235.6000	235.6	8.0900	245.8000	245.8	7.7543	240 0832	240.1	[	1,906	]	7.9384	F:225/55 R19 R:275/45 R19	67.4	66.7	67	114.2	53.1	38.61	49.36544937
721	Import	Porsche	721	Taycan Turbo	LPRXV00.0EVT	0	A-2	5500	5500	235 8000	235.8	6.1366	247.1000	247.1	5.8559	240.7544	240.8	[	1,447	]	6.0091	F:245/45 R20 R:285/40 R20	66.5	65.2	65.8	114.2	52.2	38.61	37.47733748
723	Import	Porsche	723	Taycan Turbo S	LPRXV00.0EVT	0	A-2	5500	5500	232.7000	232.7	4.4736	237.5000	237.5	4.3832	234 8358	234.8	[	1,041	]	4.4336	F:265/35 ZR21 R:305/30 ZR21	66.5	65.2	65.8	114.2	52.2	38.61	26.96192696
62	Import	Volkswagen	300	Arteon	LVGAV02 0VAB	2.0L	S8	4000	4000	28 2996	28.3	25.6184	40.8000	40 8	17.7696	32.8253	32 8	[	725	]	22.1037	245/45 R18	62.5	62.1	62.3	111.8	48.4	41.8	17.34449761
63	Import	Volkswagen	301	Arteon 4Motion	LVGAV02 0VAB	2.0L	S8	4000	4250	25 8000	25.8	48.6822	40.9000	40 9	30.7090	30.9403	30 9	[	1,256	]	40.6472	245/45 R18	62.5	62.1	62.3	111.8	48.4	41.8	30.04784689
69	Import	Volkswagen	201	Golf	LVGAV01.4V3P	1.4L	S8	3000	3250	37 3000	37.3	91.0724	51.2460	51 2	66.3477	42.5053	42 5	[	3,397	]	79.9294	195/65 R15	60.6	59.9	60.2	103.6	43.3	46 35	73.29018339
70	Import	Volkswagen	201	Golf (Manu)	LVGAV01.4V3P	1.4L	M6	3000	3250	35.4000	35.4	14.4915	53.0000	53 0	9.6792	41.6193	41.6	[	513	]	12.3317	195/65 R15	60.6	59.9	60.2	103.6	43.3	46 35	11.06796117
42	Import	Volkswagen	211	GTI	LVGAV02.0V3T	2.0L	AMS7	3500	3500	31 0461	31.0	144 9032	43.6000	43.6	103 0275	35.6675	35.7	[	4,492	]	125 8263	225/40 R18	60.5	59.6	60	103.6	43.2	46.45	96.70613563
24	Import	Volkswagen	211	GTI (Manu)	LVGAV02.0V3T	2.0L	M6	3500	3500	28 8000	28.8	91.8403	44.2000	44 2	59.8416	34.1551	34 2	[	2,645	]	77.3392	225/40 R18	60.5	59.6	60	103.6	43.2	46.45	56.94294941
68	Import	Volkswagen	221	Jetta (Manu)	LVGAV01.4V3P	1.4L	M6	3000	3250	36 2956	36.3	136.1157	57.4000	57.4	86.0801	43.4914	43 5	[	4,941	]	113 5862	205/55-16	60.8	61	60.9	105.5	44.6	45.1	109 556541
067RC	Import	Volkswagen	221	Jetta (SULEV)	LVGAV01.4V3P	1.4L	S8	3500	3375	38 5289	38.5	460 9870	59.5297	59 5	298 2857	45.7996	45 8	[	17,748	]	387 5109	205/55-16	60.8	61	60.9	105.5	44.6	45.1	393.5254989
67	Import	Volkswagen	221	Jetta (ULEV)	LVGAV01.4V7P	1.4L	S8	3500	3375	38 5289	38.5	1053 5325	59.5297	59 5	681.6975	45.7996	45 8	[	40,561	]	885.6114	205/55-16	60.8	61	60.9	105.5	44.6	45.1	899.3569845
26	Import	Volkswagen	221	Jetta GLI	LVGAV02.0V3T	2.0L	AMS7	3500	3625	31 3000	31.3	108 9776	45.9000	45 9	74.3137	36.5286	36 5	[	3,411	]	93.4521	225/40 R18	60.6	60.7	60.6	105.5	44.4	45 29	75.31463899
25	Import	Volkswagen	221	Jetta GLI (Manu)	LVGAV02.0V3T	2.0L	M6	3500	3625	30.1000	30.1	45.7475	45.8000	45 8	30.0655	35.5900	35.6	[	1,377	]	38.6798	225/40 R18	60.6	60.7	60.6	105.5	44.4	45 29	30.40406271
												4732.4153			3106.2799				149,296		4000 0467								3384.45676

AC & OC Adjustment	
MPG	37.5
$FCIV_{AC}$	0.0005784

TEST PROCEDURE ADJUSTMENT							
SF 3IWC	0.0593	FE 3IWC (vol)	8,851	FE 3IWC (wtd)	205.847	FE 3IWC	42.9979
SF 4ETW	0.1091	FE 4IWC (vol)	31,088	FE 4IWC (wtd)	1,034.988	FE 4IWC	30.0371

$FCIV_{OC}$	0.0003815
$FCIV_{PU}$	0
ACCredit	149,837
VLM	195,264
Production	149,296
OCCredit	98,850
Average MPG	38.9003

Delta	1.4003

IW	0.012182						
a factor (Hwy part)	4,732.415	a factor (City part)	3,106.280	a factor	0.6564	c	0.0014
AFE adj Unround	37.4974						
AFE adj Rounded	**37.5**						

IMPORT PASSENGER CAR - CAFE FLEET AVERAGE	
Volkswagen Group Total Units	**149,296**
Baseline unadj unrounded (MPG)	**37.3236**
Baseline unadj rounded (MPG)	**37.3**
Baseline adjusted unrounded (MPG)	**37.4974**
Baseline adjusted rounded (MPG)	**37.5**
Volkswagen Group Fleet Average CAFE w/ Average FE Improvement (MPG)	**1.4**
Volkswagen Group Fleet Average CAFE w/FE Improvement (MPG)	**38.900**

IMPORT PASSENGER CAR - CAFE FLEET STANDARD	
Total Units	**149,296**
Weighted Target Sum	**3,384**
CAFE Fleet Standard	**44.1122**
Volkswagen Group CAFE Std	**44.1**

MY20 CAFE Mid-Model Year Performance Estimates

Fleet (EEO)	Fleet Units	Unrounded Average	Rounded Average	FE Improvement	Fleet Average w/ Improvement	Fleet Standard	Δ [MPG]	Credits / Debits
Domestic PC	30,064	33.2262	33 2	1 0	**34.2**	**41.2**	-7.0	-2,104,480
LDT	247,779	29.0532	29.1	1.6	**30.7**	**33.5**	-2.8	-6,937,812
Import PC	149,296	37.4974	37 5	1.4	**38.9**	**44.1**	-5.2	-7,763,392
	427,139							**-16,805,684**

Appendix: VWGoA Alternative Methodology Off-Cycle Credit Application Approval Request for High- Efficiency Alternators for MYs 2016-2019

Mr. Linc Wehrly Compliance
Office of Transportation an
U.S. Environmental Protecti
Ann Arbor, Michigan 48105

VOLKSWAGEN
GROUP OF AMERICA

[redacted] Name
Comp.Reporting Mgr. Title
EEO Department
[redacted] Phone
[redacted] Fax
[redacted] E-Mail

April 30, 2020 Date

Subject: Alternative Method Off-Cycle Credit Application Approval Request by VWGoA for High-Efficiency Alternators for MYs 2016-2019

Volkswagen Group of America (VWGoA) requests approval of off-cycle greenhouse gas ("GHG") credits for high-efficiency alternator technology in accordance with the provisions of 40 CFR 86.1869-12(d). VWGoA requests approval to use a scalable GHG credit value of 0.16 gram/mile CO2 per 1% efficiency improvement above a baseline efficiency level of 67% VDA[1].

VWGoA's requested credit value and table of efficiency-specific credits per model type are listed in Attachment 1. Volkswagen's proposed baseline and scalable credits are also consistent with analyses in EPA's rulemaking documents, the EU Technical Guidelines for Eco-Innovations, and the basis described in Volkswagen's attached application. This request and credit value are also consistent with previous approvals issued by the Environmental Protection Agency to other manufacturers[2].

This credit value would be applied to all vehicle categories that use high-efficiency alternator technology for 2016, 2017, 2018 and 2019 model years.

To reduce the burden and to streamline the review process, VWGoA has patterned this application on modeling, engineering methods, analytical methods, and credit determinations that the Agency has already approved for similar high-efficiency alternator technology used by other manufacturers. VWGoA agrees with assessment of other Manufacturers that this "template" approach can encourage accelerated adoption of high-efficiency alternator technology by reducing the resources and time required for redundant data collection and analysis.

The Agency has supported this approach in a memo from August of 2018[3] that states the following in support of this technology -

- GHG improvements for the high efficiency alternators in applications approved by EPA (including EPA ALPHA modeling results) are relatively consistent across manufacturers and could serve as the basis for a menu credit for high efficiency alternators
- Multiple manufacturers employed similar methodologies to document the GHG benefits of using the high efficiency alternator technology methodologies
- These methodologies were designed to cover a variety of operating conditions (e.g., seasons, driving speeds, distances) and different vehicle types (cars and trucks) with different electrical loads and alternator controls
- Results are aligned with results from EPA's ALPHA model, which also predicted a similar impact of a high efficiency alternator on vehicle GHG emission

This application meets the requirements of 40 CFR 86.1869-12 in that neither the 2-cycle test procedure (used to determine manufacturer compliance with fleet-average GHG standards) nor the 5-cycle test procedure outlined in 40 CFR 86.1869- 12(c) adequately measure the real-world emission reduction attributable to the use of high-efficiency alternator technology.

VWGoA requests that the Agency accept its previous recognition of an equivalent alternative demonstration program for high-efficiency alternator used by other manufacturers - satisfies the pre-approval requirement in 40 CFR 86.1869-12(d)(1).

The high-efficiency alternator technology is not subject to the credit exclusion provisions of 40 CFR 86.1869-12(a) because it does not relate to safety-critical systems, crash avoidance systems or safety standard compliance.

VWGoA appreciates the Agency's consideration of this application. Should you have further questions please contact [redacted] of VWGoA's EEO Office at (248)754-4848 or e-mail: Sashi.Velnati@vw.com.

Sincerely yours,

Volkswagen Group of America, Inc.

[redacted]

[redacted] Digitally si

1. Verband der Automobilindustrie efficiency the internationally accepted industry standard for measuring alternator efficiency. EPA-OTAQ memorandum to docket EPA-HQ-OAR-2018-0283 entitled Potential Off-Cycle Credit Levels for High Efficiency Alternators and Advanced Air Conditioning Compressors dated Aug. 1 2018.
2. See EPA Decision Document: Off-Cycle Credits for General Motors and Toyota Motor Corporation EPA-420-R-18-014 June 2018 EPA Decision Document: Off-Cycle Credits for Fiat Chrysler Automobiles and Toyota Motor Corporation EPA-420-R-18-015 June 2018 EPA
3. EPA-OTAQ memorandum to docket EPA-HQ-OAR-2018-0283 entitled Potential Off-Cycle Credit Levels for High Efficiency Alternators dated August 1 2018

Introduction

To provide electrical energy for the vehicle's batteries and electrical systems, alternators are used to convert mechanical energy from the internal combustion engine to electrical energy. The additional mechanical load from the alternator results [1] in the increased consumption of fuel and subsequent CO_2 emissions The energy conversion process involves a variety of mechanical and electrical losses, therefore high efficiency alternators can reduce these losses thereby reducing the alternator load on the engine and offering better fuel economy and lower CO_2 emissions

The alternator efficiency is the ratio of the alternator output power to the power supplied to the alternator. EPA used a baseline alternator efficiency of 65% in its Joint TSD for the 2017-2025 GHG regulation, based on a 2008 Delco-Remy Alternator. The EU approved methodology for calculating eco-innovation credit uses a baseline efficiency of 67% defined from the "Verband der Automobilindustrie" (VDA). Furthermore, the VDA defined an accepted industry standard for measuring alternator efficiency.

In the Federal Register Final Rule for 2017-2025 EPA already indicated that 68% VDA would be an appropriate threshold to begin awarding high efficiency alternator off-cycle credits: "The 68% VDA number stated by the Alliance of Automobile Manufacturers seems to be appropriate starting point given current technology ..."

Based on EPA's comments and in harmonization with the European Commission's decision VWGoA recommends that 67% VDA baseline efficiency is used for the high efficiency alternator off-cycle credit calculation. VWGoA's request substantiates EPA's technical assessment that "GHG emissions benefits for high efficiency alternators were fairly consistent across manufcturers, conditions and vehicle types." The Agency concluded that the scalable GHG credit value that was already reviewed and approved for other manufacturers "could serve as the basis for a [generalized] menu credit for high efficiency alternators." This credit request adopts EPA's table of credit values contained in EPA's technical assessment and is applicable to all vehicle categories.

Approach to Quantifying Off-Cycle GHG Benefit

Increased electrical loads on the vehicle in on road conditions allow high efficiency alternators to generate a higher greenhouse gas benefit outside the conditions of the Federal Test Procedure and the Highway Fuel Economy Test. Therefore, VWGoA proposes the use of a single scalable credit value that accounts for all vehicle categories.

Rationale for Using the Alternative EPA-approval Methodology

The High efficiency alternator technology is currently not part of the pre-approved technology menu. VWGoA considered both the 5-cycle and alternative methodologies for requesting the credit. Although the 5- cycle methodology tends to captures a broader range of driving parameters, the potential for greenhouse gas benefits from high efficiency alternators can be fully realized when customers experience high accessory loads on a regular basis, loads which are not fully captured in the 5-cycle methodology. Vehicle systems are continuing to become increasingly complex with increasing accessory loads

1. 77 FR 62731
2. EPA Decision Document: Off-Cycle Credits for Fiat Chrysler Automobiles and Toyota Motor Corporation EPA-420-R-18-015 June 2018 EPA EPA Decision Document: Off-Cycle Credits for BMW Group Ford Motor Company and Hyundai Motor Company EPA-420-R-17-010

why VWGoA is pursuing off-cycle credits under the alternative demonstration methodology pursuant to 40 CFR § 86.1869- 12(d).

EPA/NHTSA Final Rule 2021-2026 GHG and Fuel Economy Standards (SAFE Part-2)

This application is requesting off-cycle credits for retroactive model years prior to MY21 and thus does not reflect the changes in the proposed rule for MYs 2021-2026. On March 31st, 2020 EPA and NHTSA released the new MY2021-2026 GHG and Fuel Economy (CAFE) Rule with revised standards for those model years, otherwise referred to as SAFE Rule Part-2. The rule proposes to include high-efficiency alternators to the pre-defined off-cycle menu. The credit values basis is proposed to be 0.16 g/mi CO2 per percent improvement in alternator efficiency above 67% VDA efficiency, rounded to the nearest 0.1 g/mi.

Electrical load during 2-cycle and on-road driving conditions

In granting off-cycle credits for high-efficiency alternators, EPA has accepted a large body of electrical load data for LDV and LDT models operated under on-road driving conditions and 2-cycle test pattern driving conditions. Ford's data demonstrated a credit basis of 297 Watts for 2-cycle test electrical load and 588 Watts for on-road driving conditions. That data was used to determine electrical saving values resulting from the use of high efficiency alternator. Toyota conducted 2-cycle electrical load testing of additional models. That testing showed electrical load under 2-cycle test conditions that is similar to Ford's 2-cycle test data. If 2-cycle electrical loads are similar, on-road electrical loads can be considered similar. On the basis of the Agency approved submissions and other information, the Agency concluded in a memo filed in 2018 that "GHG emissions benefits for high efficiency alternators were fairly consistent across manufacturers, conditions and vehicle types," and "could serve as the basis for a [generalized] menu credit for high efficiency alternators"[3].

The following table summarizes the available data from previous applications along with power consumption values from VWGoA's 2-cycle testing.

3. EPA-OTAQ memorandum to docket EPA-HQ-OAR-2018-0283 entitled Potential Off-Cycle Credit Levels for High Efficiency Alternators dated August 1 2018

Table 1

		2-cycle testing	
Manufacturer	**Model**	**Electrical load [Watt]**	**Ave. [Watt]**
VW Group	Q5	342	**307**
	Jetta	272	
FCA	14 vehicles which represent a cross section FCA's portfolio	additional 262.85 [W] in real world compared to 2-cycle testing	
Toyota	RAV4 with engine-stop function	252	**308**
	RAV4 without engine-stop function	364	
Ford	Fusion	275	**297**
	F-150	318	
GM	Impala	233	**276**
	Sierra	319	
Hyundai	Sorento	236	**224**
	Tuscon	212	
Nissan	Rogue	309	**295**
	Altima	281	

Durability

High-efficiency alternators installed within VWGoA vehicles are subject to the same durability requirements as other full useful-life components installed on VW products. VWGoA requires that alternators must meet all the durability requirements of 40 CFR §86.1869- 12(d) and are not subject to any deterioration factors that would reduce the benefits of the high efficiency alternator.

Credit Calculation Approach

Pursuant to the basis to use the scalable credit values utilized by various manufacturers whose applications for credits were approved, VWGoA is requesting off-cycle greenhouse gas credit values of 0.16 gram/mile CO2 per 1% efficiency improvement over a baseline efficiency level of 67% VDA. The credit is calculated as follows

Off-cycle Credit = (eta-0.67)*0.16 (eta: is the efficiency value of the alternator)

Corresponding scalable credit values is provided in the table below.

Table 2

% VDA	Credit (g/mi)
67	0.0
68	0.2
69	0.3
70	0.5
71	0.6
72	0.8
73	1.0
74	1.1
75	1.3
76	1.4
77	1.6
78	1.8
79	1.9
80	2.1
81	2.x (TBD)

Consistent with the credit equation and table shown above, VWGoA calculated the model-specific and fleet-wide credit values in accordance with 40 CFR 600.510-12(c) considering vehicle lifetime miles for the applicable category of vehicles and total production volume.

Scope of Credit Calculation

Utilizing the credit calculation approach outlined above and the scalable credit (Table 2), VWGoA calculated the model-specific and fleet-wide credit values in accordance with 40 CFR 600.510-12(c) considering vehicle lifetime miles for the applicable category of vehicles and total production volume. Attachment 2 of this application lists the applicable 2016 through 2019 models, their related sales, applicable VDA values, and model-specific and fleet-wide GHG credit calculations.

Summary

VWGoA requests EPA's approval of off-cycle greenhouse gas credit value of 0.16 gram/mile CO2 per 1% efficiency improvement over a baseline efficiency level of 67% VDA for all VWGoA's 2016-2019 MY vehicles from with high-efficiency alternator technology

Additional High Efficiency Alternator EPA Decision Document References

- EPA Decision Document: Off-Cycle Credits for Fiat Chrysler Automobiles and Toyota Motor Corporation (EPA- 420-R-18-015, June 2018
- EPA Decision Document: Off-Cycle Credits for American Honda Motor Company, Ford Motor Company, and Nissan North America, Inc. (April 2020, EPA-420-R-20-007)
- EPA Decision Document: Off-Cycle Credits for BMW Group, Ford Motor Company, and Hyundai Motor Company (December 2017, EPA-420-R-17-010, About PDF)
- EPA Decision Document: Off-Cycle Credits for General Motors and Toyota Motor Corporation (EPA-420-R-18- 014, June 2018)

Attachment 2

Model-specific details, Model Type identifier, Alternator efficiency, Alternator efficiency measurement method, Alternator part identifier, Manufacturer of the part and Calculation of fleet-wide off-cycle greenhouse gas credit values

[redacted] BUSINESS INFORMATION

Appendix: VWGoA Alternative Methodology Application for High-Efficiency Alternators

2016 MY

MODEL YEAR 2016 Credit Summary

MY 2016 VWGoA HEA technology Credits	VWGoA High Efficiency Alternator Credits	MY16	
		50 State Volume	Off-Cycle Credit [Mg]
	PV	53,190	21,460
	LT	-	-
	Total	**53,190**	**21,460**

MODEL YEAR 2016 Model Specific Credit Calculation

Factory Model Code	MT INDEX	Brand	FullCarline	famKPB	EngDesc	TransCode	GHGClass	PR_GEN	PR_GEN_TEXT	Generator efficiency (Worst Case Eff.)	Measurement Method	Part Name	Manufacturer	Credit [g/mi]	Prod50S	Off-Cycle Credit [Mg]
4GC52A	MT2016_002	Audi	A6 quattro	AU571/0EU_K (4G0)	V6 3,0l 245kW(333PS) 440Nm 4V TFSI h	AL551-8Q	PV	9G4	Drehstromgenerator 140-180 A	80.0%	ISO 8854	EG18S	Valeo	2.08	12647	5,137
4GC58A	MT2016_015	Audi	A6 quattro	AU571/0EU_K (4G0)	R4 2,0l 185kW(252PS) 370Nm 4V TFSI	AL551-8Q	PV	9G4	Drehstromgenerator 140-180 A	80.0%	ISO 8854	EG18S	Valeo	2.08	11264	4,575
4GC58G	MT2016_016	Audi	A6	AU571/0EU_K (4G0)	R4 2,0l 185kW(252PS) 370Nm 4V TFSI	DL382-7F	PV	9G4	Drehstromgenerator 140-180 A	80.0%	ISO 8854	EG18S	Valeo	2.08	3214	1,305
4GF52A	MT2016_001	Audi	A7 quattro	AU573/0EU_K (4G8)	V6 3,0l 245kW(333PS) 440Nm 4V TFSI h	AL551-8Q	PV	9G4	Drehstromgenerator 140-180 A	80.0%	ISO 8854	EG18S	Valeo	2.08	8079	3,281
8K2S2A	MT2016_033	Audi	A4 quattro	AU491/0EU_K (8W0)	R4 2,0l 162kW(220PS) 350Nm 4V TFSI h E85	DQ250-6A	PV	9G3	Drehstromgenerator 120-180 A	80.0%	ISO 8854	EG18S	Valeo	2.08	11502	4,672
8K2S49	MT2016_045	Audi	S4 manual	AU491/0EU_KS (8W0)	V6 3,0l 245kW(333PS) 440Nm 4V TFSI E25	ML4S1-6Q	PV	9G3	Drehstromgenerator 120-180 A	80.2%	ISO 8854	180eSC4	Denso	2.08	455	185
8K2S4Y	MT2016_042	Audi	S4	AU491/0EU_KS (8W0)	V6 3,0l 245kW(333PS) 440Nm 4V TFSI E25	AL552-8Q	PV	9G3	Drehstromgenerator 120-180 A	80.2%	ISO 8854	180eSC4	Denso	2.08	1462	594
8K2SG9	MT2016_049	Audi	A4 quattro manual	AU491/0EU_K (8W0)	R4 2,0l 162kW(220PS) 350Nm 4V TFSI h	ML402-6A	PV	9G2	Drehstromgenerator 100-150 A	79.5%	ISO 8854	150eSC2	Denso	1.92	641	240
8K2SGH	MT2016_051	Audi	A4	AU491/0EU_K (8W0)	R4 2,0l 162kW(220PS) 350Nm 4V TFSI h	DL382-7F	PV	9G2	Drehstromgenerator 100-150 A	79.5%	ISO 8854	150eSC2	Denso	1.92	3926	1,472

TOTAL VWGoA	**PV**	**53190**	**21,460**
	LT	**0**	**0**
	total	**53190**	**21,460**

AUDI	**PV**	**53190**	**21,460**
	LT	**0**	**0**
	total	**53190**	**21,460**

VOLKSWAGEN
GROUP OF AMERICA

2017 MY

MODEL YEAR 2017 Credit Summary

MY 2017 VWGoA HEA technology Credits	VWGoA High Efficiency Alternator Credits	MY17	
		50 State Volume	Off-Cycle Credit [Mg]
	PV	308,593	103,765
	LT	78,766	28,991
	Total	**387,359**	**132,756**

MODEL YEAR 2017 Model Specific Credit Calculation

Factory Model Code	MT INDEX	Brand	FullCarline	famKPB	EngDesc	TransCode	GHGClass	PR_GEN	PR_GEN_TEXT	Generator efficiency (Worst Case Eff.)	Measurement Method	Part Name	Manufacturer	Credit [g/mi]	Prod50S	Off-Cycle Credit [Mg]
4GC52A	VGA012	Audi	A6 quattro	AU571/0EU_K (4G0)	V6 3.0 4V TFSI	AL551-8Q	PV	9G4	Drehstromgenerator 140-180 A	80.0%	ISO 8854	EG18S	Valeo	2.08	4978	2,022
4GC53A	VGA012	Audi	A6 Competition quattro	AU571/0EU_K (4G0)	V6 3.0 4V TFSI	AL551-8Q	PV	9G4	Drehstromgenerator 140-180 A	80.0%	ISO 8854	EG18S	Valeo	2.08	610	248
4GF52A	VGA013	Audi	A7 quattro	AU573/0EU_K (4G8)	V6 3.0 4V TFSI	AL551-8Q	PV	9G4	Drehstromgenerator 140-180 A	80.0%	ISO 8854	EG18S	Valeo	2.08	3636	1,477
4GF53A	VGA013	Audi	A7 Competition quattro	AU573/0EU_K (4G8)	V6 3.0 4V TFSI	AL551-8Q	PV	9G4	Drehstromgenerator 140-180 A	80.0%	ISO 8854	EG18S	Valeo	2.08	562	228
4MB5A1	VGA001	Audi	Q7	AU536/0EU_K (4M0)	V6 3.0 4V TFSI	AL552-8Q	LT	9G3	Drehstromgenerator 120-180 A	80.2%	ISO 8854	180eSC4	Denso	2.08	44214	20,772
4MB5H1	VGA006	Audi	Q7	AU536/0EU_K (4M0)	R4 2.0 4V TFSI	AL552-8Q	LT	9G3	Drehstromgenerator 120-180 A	80.0%	ISO 8854	EG18S	Valeo	2.08	6836	3,212
8UG5CL	VGA058	Audi	Q3 quattro	AU316/0EU_K1 (8U0)	R4 2.0 4V TFSI	AQ450-6A	PV	8GU	Drehstromgenerator 140 A	70.0%	VDA	TG14C	VALEO	0.48	9733	912
8UG5CX	VGA057	Audi	Q3	AU316/0EU_K1 (8U0)	R4 2.0 4V TFSI	AQ450-6F	PV	8GU	Drehstromgenerator 140 A	70.0%	VDA	TG14C	VALEO	0.48	4794	449
8VEB8L	VGA074	Audi	A3 Cabriolet quattro	AU375/0EU_K1 (8VC)	R4 2.0 4V TFSI	DQ250-6A	PV	9G2	Drehstromgenerator 100-150 A	78.5%	VDA	EL7150S	SEG (BOSCH)	1.76	898	309
8VEBUG	VGA084	Audi	A3 Cabriolet	AU375/0EU_K1 (8VC)	R4 2.0 4V TFSI BZ	DQ381-7F	PV	9G2	Drehstromgenerator 100-150 A	78.5%	VDA	EL7150S	SEG (BOSCH)	1.76	447	154
8VMB8L	VGA060	Audi	A3 quattro	AU371/0EU_K1 (8V0)	R4 2.0 4V TFSI	DQ250-6A	PV	9G2	Drehstromgenerator 100-150 A	78.5%	VDA	EL7150S	SEG (BOSCH)	1.76	8694	2,988
8VMBUG	VGA083	Audi	A3	AU371/0EU_K1 (8V0)	R4 2.0 4V TFSI BZ	DQ381-7F	PV	9G2	Drehstromgenerator 100-150 A	78.5%	VDA	EL7150S	SEG (BOSCH)	1.76	6362	2,186
8VMS1L	VGA059	Audi	S3	AU371/0EU_KS1 (8V0)	R4 2.0 4V TFSI	DQ250-6A	PV	9G2	Drehstromgenerator 100-150 A	78.5%	VDA	EL7150S	SEG (BOSCH)	1.76	2640	907
8W2SMG	VGA014	Audi	A4 Ultra	AU491/0EU_K (8W0)	R4 2.0 4V TFSI BZ	DL382-7F	PV	9G2	Drehstromgenerator 100-150 A	79.5%	ISO 8854	150eSC2	Denso	1.92	6517	2,443
8W2SN9	VGA090	Audi	A4 quattro manual	AU491/0EU_K (8W0)	R4 2.0 4V TFSI	ML402-6A	PV	9G2	Drehstromgenerator 100-150 A	79.5%	ISO 8854	150eSC2	Denso	1.92	884	331
8W2SNG	VGA005	Audi	A4	AU491/0EU_K (8W0)	R4 2.0 4V TFSI	DL382-7F	PV	9G2	Drehstromgenerator 100-150 A	79.5%	ISO 8854	150eSC2	Denso	1.92	7726	2,897
8W2SNY	VGA002	Audi	A4 quattro	AU491/0EU_K (8W0)	R4 2.0 4V TFSI	DL382-7Q	PV	9G2	Drehstromgenerator 100-150 A	79.5%	ISO 8854	150eSC2	Denso	1.92	35218	13,203
8WH5NY	VGA011	Audi	A4 allroad quattro	AU492/0EU_KA (8WA)	R4 2.0 4V TFSI	DL382-7A	PV	9G2	Drehstromgenerator 100-150 A	79.5%	ISO 8854	150eSC2	Denso	1.92	2854	1,070
1639N2	VGA030	VW	JETTA GP	VW361/0ME_K1	R4 2,0l 155kW(211PS) 280Nm 4V TFSI	MQ350-6F	PV	8GU	Drehstromgenerator 140 A	72.0%	VDA	EL6140	SEG/Bosch	0.80	3595	562
1639N6	VGA029	VW	JETTA GP	VW361/0ME_K1	R4 2,0l 155kW(211PS) 280Nm 4V TFSI	DQ250-6F	PV	8GU	Drehstromgenerator 140 A	72.0%	VDA	EL6140	SEG/Bosch	0.80	6761	1,056
163WR6	VGA031	VW	JETTA GP	VW361/0ME_K1	R4 1,8l 125kW(170PS) 250Nm 4V TFSI	AQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	VALEO	1.92	2795	1,048
163XR6	VGA031	VW	JETTA GP	VW361/0ME_K1	R4 1,8l 125kW(170PS) 250Nm 4V TFSI	AQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	VALEO	1.92	10978	4,116
5C22R6	VGA035	VW	BEETLE GP	VW324/1ME_K1	R4 1,8l 125kW(170PS) 250Nm 4V TFSI	AQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	VALEO	1.92	6125	2,296
5C23R6	VGA035	VW	BEETLE GP	VW324/1ME_K1	R4 1,8l 125kW(170PS) 250Nm 4V TFSI	AQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	VALEO	1.92	2672	1,002
5C24N6	VGA024	VW	BEETLE GP	VW324/1ME_K1	R4 2,0l 155kW(211PS) 280Nm 4V TFSI	DQ250-6F	PV	8GU	Drehstromgenerator 140 A	72.0%	VDA	EL6140	SEG/Bosch	0.80	61	10
5C2CR6	VGA037	VW	BEETLE GP	VW324/1ME_K1	R4 1,8l 125kW(170PS) 250Nm 4V TFSI	AQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	VALEO	1.92	776	291
5C83R6	VGA036	VW	BEETLE CONVERTIBLE GP	VW325/1ME_K1	R4 1,8l 125kW(170PS) 250Nm 4V TFSI	AQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	VALEO	1.92	6612	2,479
5C8CR6	VGA038	VW	BEETLE CONVERTIBLE GP	VW325/1ME_K1	R4 1,8l 125kW(170PS) 250Nm 4V TFSI	AQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	VALEO	1.92	871	327
5G1RS6	VGA023	VW	Golf R	VW370/0EU_KR	R4 2,0l 215kW(292PS) 380Nm 4V TFSI	MQ350-6A	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	SEG/BOSCH	1.92	1774	665
5G1RS7	VGA022	VW	Golf R	VW370/0EU_KR	R4 2,0l 215kW(292PS) 380Nm 4V TFSI	DQ250-6A	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	SEG/BOSCH	1.92	2521	945
5N21V1	VGA021	VW	TIGUAN	VW316/0EU_K1	R4 2,0l 147kW(200PS) 280Nm 4V TFSI h	AQ450-6F	PV	8GU	Drehstromgenerator 140 A	72.0%	VDA	M8E140	BOSCH/SEG	0.80	23192	3,623
5N21V3	VGA020	VW	TIGUAN	VW316/0EU_K1	R4 2,0l 147kW(200PS) 280Nm 4V TFSI h	AQ450-6A	LT	8GU	Drehstromgenerator 140 A	72.0%	VDA	M8E140	BOSCH/SEG	0.80	27716	5,008
A332R6	VGA047	VW	PASSAT GP	VW411/1NA_K1	R4 1,8l 125kW(170PS) 250Nm 4V TFSI	AQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	VALEO	1.92	39242	14,712
A333R6	VGA047	VW	PASSAT GP	VW411/1NA_K1	R4 1,8l 125kW(170PS) 250Nm 4V TFSI	AQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	VALEO	1.92	30015	11,253
A333T6	VGA015	VW	PASSAT GP	VW411/1NA_K1	VR6 3,6l 206kW(280PS) 350Nm 4V FSI	DQ250-6F	PV	8GU	Drehstromgenerator 140 A	72.0%	VDA	M8E140	BOSCH/SEG	0.80	166	26
A334R6	VGA047	VW	PASSAT GP	VW411/1NA_K1	R4 1,8l 125kW(170PS) 250Nm 4V TFSI	AQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	VALEO	1.92	6302	2,363
A334T6	VGA015	VW	PASSAT GP	VW411/1NA_K1	VR6 3,6l 206kW(280PS) 350Nm 4V FSI	DQ250-6F	PV	8GU	Drehstromgenerator 140 A	72.0%	VDA	M8E140	BOSCH/SEG	0.80	772	121
AU19S2	VGA028	VW	GTI (A7)	VW370/0EU_KS	R4 2,0l 155kW(211PS) 350Nm 4V TFSI	MQ350-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	SEG/BOSCH	1.92	4873	1,827
AU19S3	VGA027	VW	GTI (A7)	VW370/0EU_KS	R4 2,0l 155kW(211PS) 350Nm 4V TFSI	DQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	SEG/BOSCH	1.92	7639	2,864
AU19X2	VGA028	VW	GTI (A7)	VW370/0EU_KS	R4 2,0l 162kW(220PS) 350Nm 4V TFSI	MQ350-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	SEG/BOSCH	1.92	8243	3,090
AU19X3	VGA027	VW	GTI (A7)	VW370/0EU_KS	R4 2,0l 162kW(220PS) 350Nm 4V TFSI	DQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	SEG/BOSCH	1.92	11732	4,398
BXS2N1	VGA042	VW	Golf Sportwagen	VW372/0ME_K	R4 1,8l 125kW(170PS) 250Nm 4V TFSI	MQ250-5F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	SEG/BOSCH	1.92	593	222
BXS2N3	VGA041	VW	Golf Sportwagen	VW372/0ME_K	R4 1,8l 125kW(170PS) 270Nm 4V TFSI	AQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	SEG/BOSCH	1.92	5604	2,101
BXS2N6	VGA092	VW	Golf Sportwagen	VW372/0ME_K	R4 1,8l 125kW(170PS) 270Nm 4V TFSI	MQ350-6A	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	SEG/BOSCH	1.92	619	232
BXS2N7	VGA026	VW	Golf Sportwagen	VW372/0ME_K	R4 1,8l 125kW(170PS) 270Nm 4V TFSI	DQ250-6A	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	SEG/BOSCH	1.92	3241	1,215
BXSCN6	VGA091	VW	Golf Sportwagen	VW372/0ME_K	R4 1,8l 125kW(170PS) 270Nm 4V TFSI	MQ350-6A	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	SEG/BOSCH	1.92	2060	772
BXSCN7	VGA025	VW	Golf Sportwagen	VW372/0ME_K	R4 1,8l 125kW(170PS) 270Nm 4V TFSI	DQ250-6A	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	SEG/BOSCH	1.92	22206	8,325

TOTAL VWGoA	**PV**	**308593**	**103,765**
	LT	**78766**	**28,991**
	total	**387359**	**132,756**

AUDI	**PV**	**96553**	**31,825**

	LT	51050	23,983
	total	147603	55,808

VW	PV	212040	71,940
	LT	27716	5,008
	total	239756	76,948

VOLKSWAGEN
GROUP OF AMERICA

2018 MY

MODEL YEAR 2018 Credit Summary

MY 2018 VWGoA HEA technology Credits	VWGoA High Efficiency Alternator Credits	MY18	
		50 State Volume	Off-Cycle Credit [Mg]
	PV	273,840	85,772
	LT	353,326	152,744
	Total	**627,166**	**238,515**

MODEL YEAR 2018 Model Specific Credit Calculation

Factory Model Code	MT INDEX	Brand	FullCarline	famKPB	EngDesc	TransCode	GHGClass	PR_GEN	PR_GEN_TEXT	Generator efficiency (Worst Case Eff.)	Measurement Method	Part Name	Manufacturer	Credit [g/mi]	Prod50S	Off-Cycle Credit [Mg]
8VEB8L	VGA049	Audi	A3 CB-37P	AU375 A3 Cabrio PA	R4 2,0I 162kW(220PS) 350Nm 4V TFSI	DQ250-6A	PV	9G2	Drehstromgenerator 100-150 A	78.5%	VDA	EL7150S	SEG (BOSCH)	1.76	1158	398
8VEBUG	VGA084	Audi	A3 CB-37P	AU375 A3 Cabrio PA	R4 2,0I 137kW(186PS) 300Nm 4V TFSI BZ	DQ381-7F	PV	9G2	Drehstromgenerator 100-150 A	78.5%	VDA	EL7150S	SEG (BOSCH)	1.76	846	291
8VMB8L	VGA048	Audi	A3 SE-37P	AU371 A3 Limousine PA	R4 2,0I 162kW(220PS) 350Nm 4V TFSI	DQ250-6A	PV	9G2	Drehstromgenerator 100-150 A	78.5%	VDA	EL7150S	SEG (BOSCH)	1.76	7150	2,457
8VMBUG	VGA083	Audi	A3 SE-37P	AU371 A3 Limousine PA	R4 2,0I 137kW(186PS) 300Nm 4V TFSI BZ	DQ381-7F	PV	9G2	Drehstromgenerator 100-150 A	78.5%	VDA	EL7150S	SEG (BOSCH)	1.76	7740	2,660
8VMS1Y	VGA059	Audi	A3 SE-37P	AU371 A3 Limousine PA	R4 2,0I 215kW(292PS) 380Nm 4V TFSI	DQ381-7A	PV	9G2	Drehstromgenerator 100-150 A	78.5%	VDA	EL7150S	SEG (BOSCH)	1.76	2095	720
8VMRWY	VGA025	Audi	A3RSE-37P	AU371/0EU RS3 Limousine PA1	R5 2,5I 294kW(400PS) 480Nm 4V TFSI E25	DQ500-7A	PV	8GV	Drehstromgenerator 180 A	73.0%	VDA	FG18TB	VALEO	0 96	1842	345
8WH5NY	VGA027	Audi	A4 AR-49	AU492/4 A4 Allroad	R4 2,0I 185kW(252PS) 370Nm 4V TFSI	DL382-7A	PV	9G2	Drehstromgenerator 100-150 A	79.5%	ISO 8854	150eSC2	Denso	1 92	3805	1,427
8W2S4A	VGA007	Audi	A4 SE-49	AU491 A4 Limousine	V6 3,0I 260kW(355PS) 500Nm 4V TFSI	AL552-8Q	PV	9G2	Drehstromgenerator 100-150 A	78.5%	ISO 8854	EG15T	Valeo	1.76	5977	2,054
8W2SMG	VGA055	Audi	A4 SE-49	AU491 A4 Limousine	R4 2,0I 140kW(190PS) 320Nm 4V TFSI BZ	DL382-7F	PV	9G2	Drehstromgenerator 100-150 A	79.5%	ISO 8854	150eSC2	Denso	1 92	12225	4,583
8W2SN9	VGA015	Audi	A4 SE-49	AU491 A4 Limousine	R4 2,0I 185kW(252PS) 370Nm 4V TFSI	ML402-6A	PV	9G2	Drehstromgenerator 100-150 A	79.5%	ISO 8854	150eSC2	Denso	1 92	1236	463
8W2SNY	VGA006	Audi	A4 SE-49	AU491 A4 Limousine	R4 2,0I 185kW(252PS) 370Nm 4V TFSI	DL382-7Q	PV	9G2	Drehstromgenerator 100-150 A	79.5%	ISO 8854	150eSC2	Denso	1 92	24399	9,147
F5754A	VGA010	Audi	A5 CB-49	AU495 A5 Cabrio	V6 3,0I 260kW(355PS) 500Nm 4V TFSI	AL552-8Q	PV	9G2	Drehstromgenerator 100-150 A	78.5%	ISO 8854	EG15T	Valeo	1.76	2774	953
F575NY	VGA003	Audi	A5 CB-49	AU495 A5 Cabrio	R4 2,0I 185kW(252PS) 370Nm 4V TFSI	DL382-7Q	PV	9G2	Drehstromgenerator 100-150 A	79.5%	ISO 8854	150eSC2	Denso	1 92	7466	2,799
F5354A	VGA008	Audi	A5 CP-49	AU494 A5 Coupe	V6 3,0I 260kW(355PS) 500Nm 4V TFSI	AL552-8Q	PV	9G2	Drehstromgenerator 100-150 A	78.5%	ISO 8854	EG15T	Valeo	1.76	3019	1,038
F535N9	VGA016	Audi	A5 CP-49	AU494 A5 Coupe	R4 2,0I 185kW(252PS) 370Nm 4V TFSI	ML402-6A	PV	9G2	Drehstromgenerator 100-150 A	79.5%	ISO 8854	150eSC2	Denso	1 92	552	207
F535NY	VGA005	Audi	A5 CP-49	AU494 A5 Coupe	R4 2,0I 185kW(252PS) 370Nm 4V TFSI	DL382-7Q	PV	9G2	Drehstromgenerator 100-150 A	79.5%	ISO 8854	150eSC2	Denso	1 92	6673	2,502
F5A54A	VGA009	Audi	A5 SB-49	AU493 A5 Sportback	V6 3,0I 260kW(355PS) 500Nm 4V TFSI	AL552-8Q	PV	9G2	Drehstromgenerator 100-150 A	78.5%	ISO 8854	EG15T	Valeo	1.76	7915	2,720
F5A5NY	VGA004	Audi	A5 SB-49	AU493 A5 Sportback	R4 2,0I 185kW(252PS) 370Nm 4V TFSI	DL382-7Q	PV	9G2	Drehstromgenerator 100-150 A	79.5%	ISO 8854	150eSC2	Denso	1 92	16308	6,114
F53RXA	VGA073	Audi	A5RCP-49	AU494/0EU RS5 Coupe	V6 2,9I 331kW(450PS) 600Nm 4V FSI BiT	AL552-8Q	PV	9G2	Drehstromgenerator 100-150 A	78.5%	ISO 8854	EG15T	Valeo	1.76	1260	433
4GC53A	VGA034	Audi	A6 SE-57P	AU571 A6 Limousine GP	V6 3,0I 250kW(340PS) 440Nm 4V TFSI	AL551-8Q	PV	9G4	Drehstromgenerator 140-180 A	80.0%	ISO	EG18S	Valeo	2.08	5383	2,186
4GF53A	VGA035	Audi	A7 SB-57P	AU573 A7 Sportback GP	V6 3,0I 250kW(340PS) 440Nm 4V TFSI	AL551-8Q	PV	9G4	Drehstromgenerator 140-180 A	80.0%	ISO	EG18S	Valeo	2.08	3208	1,303
8UG5CL	VGA021	Audi	Q3 SU-31P	AU316 Q3 GP	R4 2,0I 147kW(200PS) 280Nm 4V TFSI h	AQ450-6A	PV	8GU	Drehstromgenerator 140 A	70.0%	VDA	TG14C	VALEO	0.48	18365	1,721
8UG5CX	VGA022	Audi	Q3 SU-31P	AU316 Q3 GP	R4 2,0I 147kW(200PS) 280Nm 4V TFSI h	AQ450-6F	PV	8GU	Drehstromgenerator 140 A	70.0%	VDA	TG14C	VALEO	0.48	11034	1,034
FYB54A	VGA014	Audi	Q5 SU-42	AU426 Q5	V6 3,0I 260kW(355PS) 500Nm 4V TFSI	AL552-8Q	LT	9G2	Drehstromgenerator 100-150 A	78.5%	ISO 8854	EG15T	Valeo	1.76	14645	5,822
FYB5NY	VGA017	Audi	Q5 SU-42	AU426 Q5	R4 2,0I 185kW(252PS) 370Nm 4V TFSI	DL382-7A	LT	9G2	Drehstromgenerator 100-150 A	78.5%	ISO 8854	EG15T	Valeo	1.76	99166	39,421
4MB5A1	VGA037	Audi	Q7 SU-73	AU736 Q7	V6 3,0I 245kW(333PS) 440Nm 4V TFSI h	AL552-8Q	LT	9G3	Drehstromgenerator 120-180 A	80.2%	ISO 8854	180eSC4	Denso	2.08	36168	16,992
4MB5H1	VGA019	Audi	Q7 SU-73	AU736 Q7	R4 2,0I 185kW(252PS) 370Nm 4V TFSI	AL552-8Q	LT	9G3	Drehstromgenerator 120-180 A	80.0%	ISO	EG18S	Valeo	2.08	11220	5,271
1639N6	VGA053	VW	JETTA GP	VW361/0ME_K1	R4 2,0I 155kW(211PS) 280Nm 4V TFSI	DQ250-6F	PV	8GU	Drehstromgenerator 140 A	72.0%	VDA	M8E140	BOSCH/SEG	0 80	1236	193
163VF1	VGA051	VW	JETTA GP	VW361/0ME_K1	R4 1,4I 110kW(150PS) 250Nm 4V TSI	MQ250-5F	PV	8GU	Drehstromgenerator 140 A	72.0%	VDA	EL6140	BOSCH/SEG	0 80	919	144
163VF6	VGA050	VW	JETTA GP	VW361/0ME_K1	R4 1,4I 110kW(150PS) 250Nm 4V TSI	AQ250-6F	PV	8GU	Drehstromgenerator 140 A	72.0%	VDA	EL6140	BOSCH/SEG	0 80	12679	1,981
163WF1	VGA051	VW	JETTA GP	VW361/0ME_K1	R4 1,4I 110kW(150PS) 250Nm 4V TSI	MQ250-5F	PV	8GU	Drehstromgenerator 140 A	72.0%	VDA	EL6140	BOSCH/SEG	0 80	1134	177
163WF6	VGA050	VW	JETTA GP	VW361/0ME_K1	R4 1,4I 110kW(150PS) 250Nm 4V TSI	AQ250-6F	PV	8GU	Drehstromgenerator 140 A	72.0%	VDA	EL6140	BOSCH/SEG	0 80	11006	1,719
163WR6	VGA052	VW	JETTA GP	VW361/0ME_K1	R4 1,8I 125kW(170PS) 250Nm 4V TFSI	AQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	VALEO	1 92	3924	1,471
163XR6	VGA052	VW	JETTA GP	VW361/0ME_K1	R4 1,8I 125kW(170PS) 250Nm 4V TFSI	AQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	VALEO	1 92	675	253
5C22P6	VGA042	VW	BEETLE GP	VW324/1ME_K1	R4 2,0I 130kW(177PS) 250Nm 4V TFSI BZ **	AQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	VALEO	1 92	5750	2,156
5C23P6	VGA042	VW	BEETLE GP	VW324/1ME_K1	R4 2,0I 130kW(177PS) 250Nm 4V TFSI BZ **	AQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	VALEO	1 92	2033	762
5C2CP6	VGA040	VW	BEETLE GP	VW324/1ME_K1	R4 2,0I 130kW(177PS) 250Nm 4V TFSI BZ **	AQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	VALEO	1 92	572	214
5C83P6	VGA043	VW	BEETLE CONVERTIBLE GP	VW325/1ME_K1	R4 2,0I 130kW(177PS) 250Nm 4V TFSI BZ **	AQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	VALEO	1 92	5442	2,040
5C8CP6	VGA041	VW	BEETLE CONVERTIBLE GP	VW325/1ME_K1	R4 2,0I 130kW(177PS) 250Nm 4V TFSI BZ **	AQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	VALEO	1 92	121	45
5N21V1	VGA081	VW	TIGUAN	VW316/0EU_K1	R4 2,0I 147kW(200PS) 280Nm 4V TFSI h	AQ450-6F	PV	8GU	Drehstromgenerator 140 A	72.0%	VDA	M8E140	BOSCH/SEG	0 80	2604	407
5N21V3	VGA080	VW	TIGUAN	VW316/0EU_K1	R4 2,0I 147kW(200PS) 280Nm 4V TFSI h	AQ450-6A	LT	8GU	Drehstromgenerator 140 A	72.0%	VDA	M8E140	BOSCH/SEG	0 80	3516	635
A332P6	VGA039	VW	PASSAT GP	VW411/1NA_K1	R4 2,0I 130kW(177PS) 250Nm 4V TFSI BZ **	AQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	VALEO	1 92	18174	6,814
A333P6	VGA039	VW	PASSAT GP	VW411/1NA_K1	R4 2,0I 130kW(177PS) 250Nm 4V TFSI BZ **	AQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	VALEO	1 92	17777	6,665
A333T6	VGA054	VW	PASSAT GP	VW411/1NA_K1	VR6 3,6I 206kW(280PS) 350Nm 4V FSI	DQ250-6F	PV	8GU	Drehstromgenerator 140 A	72.0%	VDA	M8E140	BOSCH/SEG	0 80	3568	557
A334P6	VGA039	VW	PASSAT GP	VW411/1NA_K1	R4 2,0I 130kW(177PS) 250Nm 4V TFSI BZ **	AQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	VALEO	1 92	2020	757
A334T6	VGA054	VW	PASSAT GP	VW411/1NA_K1	VR6 3,6I 206kW(280PS) 350Nm 4V FSI	DQ250-6F	PV	8GU	Drehstromgenerator 140 A	72.0%	VDA	M8E140	BOSCH/SEG	0 80	242	38
AU23N1	VGA089	VW	GOLF GP	VW370/0ME_K1	R4 1,8I 125kW(170PS) 250Nm 4V TFSI	MQ250-5F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	BOSCH/SEG	1 92	1005	377
AU23N3	VGA082	VW	GOLF GP	VW370/0ME_K1	R4 1,8I 125kW(170PS) 270Nm 4V TFSI	AQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	BOSCH/SEG	1 92	5171	1,939
AU24N3	VGA082	VW	GOLF GP	VW370/0ME_K1	R4 1,8I 125kW(170PS) 270Nm 4V TFSI	AQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	BOSCH/SEG	1 92	3	1
AU29X2	VGA078	VW	GTI GP	VW370/0ME_KS1	R4 2,0I 162kW(220PS) 350Nm 4V TFSI	MQ350-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	BOSCH/SEG	1 92	6506	2,439
AU29XY	VGA079	VW	GTI GP	VW370/0ME_KS1	R4 2,0I 162kW(220PS) 350Nm 4V TFSI	DQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	BOSCH/SEG	1 92	8355	3,132
BW22VJ	VGA028	VW	TIGUAN LWB	VW326/0ME_KL	R4 2,0I 137kW(186PS) 300Nm 4V TFSI BZ	AQ450-8A	LT	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	BOSCH/SEG	1 92	9968	4,323
BW22VS	VGA029	VW	TIGUAN LWB	VW326/0ME_KL	R4 2,0I 137kW(186PS) 300Nm 4V TFSI BZ	AQ450-8F	LT	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	BOSCH/SEG	1 92	11733	5,088
BW23VJ	VGA028	VW	TIGUAN LWB	VW326/0ME_KL	R4 2,0I 137kW(186PS) 300Nm 4V TFSI BZ	AQ450-8A	LT	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	BOSCH/SEG	1 92	42124	18,268
BW23VS	VGA029	VW	TIGUAN LWB	VW326/0ME_KL	R4 2,0I 137kW(186PS) 300Nm 4V TFSI BZ	AQ450-8F	LT	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	BOSCH/SEG	1 92	32633	14,152
BW24VJ	VGA028	VW	TIGUAN LWB	VW326/0ME_KL	R4 2,0I 137kW(186PS) 300Nm 4V TFSI BZ	AQ450-8A	LT	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	BOSCH/SEG	1 92	4969	2,155
BW24VS	VGA029	VW	TIGUAN LWB	VW326/0ME_KL	R4 2,0I 137kW(186PS) 300Nm 4V TFSI BZ	AQ450-8F	LT	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	BOSCH/SEG	1 92	3359	1,457
BX63N1	VGA090	VW	GOLF SPORTWAGEN GP	VW372/0ME_K1	R4 1,8I 125kW(170PS) 250Nm 4V TFSI	MQ250-5F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	BOSCH/SEG	1 92	411	154
BX63N3	VGA085	VW	GOLF SPORTWAGEN GP	VW372/0ME_K1	R4 1,8I 125kW(170PS) 270Nm 4V TFSI	AQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	BOSCH/SEG	1 92	2608	978
BX63N6	VGA088	VW	GOLF SPORTWAGEN GP	VW372/0ME_K1	R4 1,8I 125kW(170PS) 270Nm 4V TFSI	MQ350-6A	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	BOSCH/SEG	1 92	490	184
BX63N7	VGA091	VW	GOLF SPORTWAGEN GP	VW372/0ME_K1	R4 1,8I 125kW(170PS) 270Nm 4V TFSI	DQ250-6A	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	BOSCH/SEG	1 92	1136	426
BX64N3	VGA085	VW	GOLF SPORTWAGEN GP	VW372/0ME_K1	R4 1,8I 125kW(170PS) 270Nm 4V TFSI	AQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	BOSCH/SEG	1 92	608	228
BX6CN6	VGA087	VW	GOLF SPORTWAGEN GP	VW372/0ME_K1	R4 1,8I 125kW(170PS) 270Nm 4V TFSI	MQ350-6A	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	BOSCH/SEG	1 92	1349	506
BX6CN7	VGA074	VW	GOLF SPORTWAGEN GP	VW372/0ME_K1	R4 1,8I 125kW(170PS) 270Nm 4V TFSI	DQ250-6A	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	BOSCH/SEG	1 92	3892	1,459
CA12NZ	VGA056	VW	ATLAS	VW416/0NA_K	R4 2,0I 175kW(238PS) 350Nm 4V TFSI	AQ450-8F	LT	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	BOSCH/SEG	1 92	3101	1,345
CA12UR	VGA012	VW	ATLAS	VW416/0NA_K	VR6 3,6I 206kW(280PS) 360Nm 4V FSI	AQ450-8A	LT	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	BOSCH/SEG	1 92	3752	1,627
CA12UR	VGA012	VW	ATLAS	VW416/0NA_K	VR6 3,6I 206kW(280PS) 360Nm 4V FSI	AQ450-8A	LT	9G3	Drehstromgenerator 120-180 A	81.0%	VDA	EG18S	BOSCH/SEG	2 24	1	1
CA12UZ	VGA011	VW	ATLAS	VW416/0NA_K	VR6 3,6I 206kW(280PS) 360Nm 4V FSI	AQ450-8F	LT	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	BOSCH/SEG	1 92	2912	1,263
CA13NZ	VGA056	VW	ATLAS	VW416/0NA_K	R4 2,0I 175kW(238PS) 350Nm 4V TFSI	AQ450-8F	LT	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	BOSCH/SEG	1 92	4100	1,778
CA13UR	VGA012	VW	ATLAS	VW416/0NA_K	VR6 3,6I 206kW(280PS) 360Nm 4V FSI	AQ450-8A	LT	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	BOSCH/SEG	1 92	16743	7,261
CA13UR	VGA012	VW	ATLAS	VW416/0NA_K	VR6 3,6I 206kW(280PS) 360Nm 4V FSI	AQ450-8A	LT	9G3	Drehstromgenerator 120-180 A	81.0%	VDA	EG18S	BOSCH/SEG	2 24	7174	3,630
CA13UZ	VGA011	VW	ATLAS	VW416/0NA_K	VR6 3,6I 206kW(280PS) 360Nm 4V FSI	AQ450-8F	LT	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	BOSCH/SEG	1 92	13811	5,989
CA13UZ	VGA011	VW	ATLAS	VW416/0NA_K	VR6 3,6I 206kW(280PS) 360Nm 4V FSI	AQ450-8F	LT	9G3	Drehstromgenerator 120-180 A	81.0%	VDA	EG18S	BOSCH/SEG	2 24	2375	1,202
CA14NZ	VGA056	VW	ATLAS	VW416/0NA_K	R4 2,0I 175kW(238PS) 350Nm 4V TFSI	AQ450-8F	LT	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	BOSCH/SEG	1 92	528	229
CA14UR	VGA012	VW	ATLAS	VW416/0NA_K	VR6 3,6I 206kW(280PS) 360Nm 4V FSI	AQ450-8A	LT	9G3	Drehstromgenerator 120-180 A	81.0%	VDA	EG18S	BOSCH/SEG	2 24	12376	6,261
CA14UZ	VGA011	VW	ATLAS	VW416/0NA_K	VR6 3,6I 206kW(280PS) 360Nm 4V FSI	AQ450-8F	LT	9G3	Drehstromgenerator 120-180 A	81.0%	VDA	EG18S	BOSCH/SEG	2 24	5405	2,735
CA15UR	VGA012	VW	ATLAS	VW416/0NA_K	VR6 3,6I 206kW(280PS) 360Nm 4V FSI	AQ450-8A	LT	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	BOSCH/SEG	1 92	1	0
CA15UR	VGA012	VW	ATLAS	VW416/0NA_K	VR6 3,6I 206kW(280PS) 360Nm 4V FSI	AQ450-8A	LT	9G3	Drehstromgenerator 120-180 A	81.0%	VDA	EG18S	BOSCH/SEG	2 24	11546	5,842

	PV LT	273,840	85,772	

AUDI	**PV**	**153,666**	**47,749**
	LT	**161,199**	**67,505**
	total	**314,865**	**115,254**

VW	**PV**	**120,174**	**38,023**
	LT	**192,127**	**85,238**
	total	**312,301**	**123,261**

TOTAL VWGoA	**total**	**353,326**	**152,744**
		627,166	**238,515**

VOLKSWAGEN
GROUP OF AMERICA

2019 MY

MODEL YEAR 2019 Credit Summary

MY 2019 VWGoA HEA technology Credits	**VWGoA High Efficiency Alternator Credits**	**MY19**	
		50 State Volume	**Off-Cycle Credit [Mg]**
	PV	332,268	122,651
	LT	295,081	132,496
	Total	**627,349**	**255,147**

MODEL YEAR 2019 Model Specific Credit Calculation

Factory Model Code	MT INDEX	Brand	FullCarline	famKPB	EngDesc	TransCode	GHGClass	PR_GEN	PR_GEN_TEXT	Generator efficiency (Worst Case Eff.)	Measurement Method	Part Name	Manufacturer	Credit [g/mi]	ProdS0S	Off-Cycle Credit [Mg]
8VMBUG	19VGA053	Audi	A3	AU371/0EU K1	R4 2.0l 4V TFSI BZ	DQ381-7F	PV	9G2	Drehstromgenerator 100-150 A	78.5%	VDA	EL7150S	SEG (BOSCH)	1.76	4315	1,483
8VEBUG	19VGA054	Audi	A3 Cabriolet	AU375/0EU K1	R4 2.0l 4V TFSI BZ	DQ381-7F	PV	9G2	Drehstromgenerator 100-150 A	78.5%	VDA	EL7150S	SEG (BOSCH)	1.76	378	130
8VEBEY	19VGA056	Audi	A3 Cabriolet quattro	AU375/0EU_K1	R4 2.0l 4V TFSI	DQ381-7A	PV	9G2	Drehstromgenerator 100-150 A	78.5%	VDA	EL7150S	SEG (BOSCH)	1.76	540	186
8VMBEY	19VGA055	Audi	A3 quattro	AU371/0EU_K1	R4 2.0l 4V TFSI	DQ381-7A	PV	9G2	Drehstromgenerator 100-150 A	78.5%	VDA	EL7150S	SEG (BOSCH)	1.76	3191	1,097
8W25MG	19VGA052	Audi	A4	AU491/0EU_K	R4 2.0l 4V TFSI BZ	DL382-7F	PV	9G2	Drehstromgenerator 100-150 A	79.5%	ISO 8854	150eSC2	Denso	1.92	9193	3,447
8WH5NY	19VGA069	Audi	A4 allroad quattro	AU492/0EU_KA	R4 2.0l 4V TFSI	DL382-7A	PV	9G2	Drehstromgenerator 100-150 A	79.5%	ISO 8854	150eSC2	Denso	1.92	1465	549
8W25NY	19VGA020	Audi	A4 quattro	AU491/0EU_K	R4 2.0l 4V TFSI	DL382-7Q	PV	9G2	Drehstromgenerator 100-150 A	79.5%	ISO 8854	150eSC2	Denso	1.92	16751	6,280
F575NY	19VGA023	Audi	A5 Cabriolet quattro	AU495/0EU_K	R4 2.0l 4V TFSI	DL382-7Q	PV	9G2	Drehstromgenerator 100-150 A	79.5%	ISO 8854	150eSC2	Denso	1.92	3428	1,285
F535NY	19VGA021	Audi	A5 quattro	AU494/0EU_K	R4 2.0l 4V TFSI	DL382-7Q	PV	9G2	Drehstromgenerator 100-150 A	79.5%	ISO 8854	150eSC2	Denso	1.92	2508	940
F5A5NY	19VGA022	Audi	A5 Sportback quattro	AU493/0EU_K	R4 2.0l 4V TFSI	DL382-7Q	PV	9G2	Drehstromgenerator 100-150 A	79.5%	ISO 8854	150eSC2	Denso	1.92	12545	4,703
F3BBEA	19VGA068	Audi	Q3 quattro	AU326/0EU_K	R4 2.0l 4V TFSI	AQ450-8A	LT	9G2	Drehstromgenerator 100-150 A	78.5%	VDA	EL7150S	SEG (BOSCH)	1.76	1675	666
F38CEA	19VGA068	Audi	Q3 quattro	AU326/0EU K	R4 2.0l 4V TFSI	AQ450-8A	LT	9G2	Drehstromgenerator 100-150 A	78.5%	VDA	EL7150S	SEG (BOSCH)	1.76	1280	509
FYB5NY	19VGA049	Audi	Q5	AU426/0ME_K	R4 2.0l 4V TFSI	DL382-7A	LT	9G2	Drehstromgenerator 100-150 A	78.5%	ISO 8854	EG15T	Valeo	1.76	50642	20,131
4MB5A1	19VGA009	Audi	Q7	AU536/0EU_K	V6 3.0l 4V TFSI	AL552-8Q	LT	9G3	Drehstromgenerator 120-180 A	80.2%	ISO8854	180eSC4	Denso	2.08	14651	6,883
4MB5H1	19VGA010	Audi	Q7	AU536/0EU_K	R4 2.0l 4V TFSI	AL552-8Q	LT	9G3	Drehstromgenerator 120-180 A	80.0%	ISO	EG18S	Valeo	2.08	8289	3,894
8VMRWY	19VGA064	Audi	RS 3	AU371/0EU_KR1	RS 2.5l 4V TFSI	DQ500-7A	PV	8GV	Drehstromgenerator 180 A	73.0%	VDA	FG18TB	VALEO	0.96	1426	267
F53RXA	19VGA042	Audi	RS 5	AU494/0EU_KR	V6 2.9l 4V FSI BiT	AL552-8Q	PV	9G2	Drehstromgenerator 100-150 A	78.5%	ISO 8854	EG15T	Valeo	1.76	1093	376
F5ARXA	19VGA043	Audi	RS 5 Sportback	AU493/0EU_KR	V6 2.9l 4V FSI BiT	AL552-8Q	PV	9G2	Drehstromgenerator 100-150 A	78.5%	ISO 8854	EG15T	Valeo	1.76	3181	1,093
8VMS1Y	19VGA044	Audi	S3	AU371/0EU_KS1	R4 2.0l 4V TFSI	DQ381-7A	PV	9G2	Drehstromgenerator 100-150 A	78.5%	VDA	EL7150S	SEG (BOSCH)	1.76	806	277
8W254A	19VGA031	Audi	S4	AU491/0EU_KS	V6 2.9l 4V FSI BiT	AL552-8Q	PV	9G2	Drehstromgenerator 100-150 A	78.5%	ISO 8854	EG15T	Valeo	1.76	3485	1,198
F5354A	19VGA032	Audi	S5	AU494/0EU_KS	V6 2.9l 4V FSI BiT	AL552-8Q	PV	9G2	Drehstromgenerator 100-150 A	78.5%	ISO 8854	EG15T	Valeo	1.76	1112	382
F5754A	19VGA034	Audi	S5 Cabriolet	AU495/0EU KS	V6 2.9l 4V FSI BiT	AL552-8Q	PV	9G2	Drehstromgenerator 100-150 A	78.5%	ISO 8854	EG15T	Valeo	1.76	1104	379
F5A54A	19VGA033	Audi	S5 Sportback	AU493/0EU_KS	V6 2.9l 4V FSI BiT	AL552-8Q	PV	9G2	Drehstromgenerator 100-150 A	78.5%	ISO 8854	EG15T	Valeo	1.76	5291	1,818
FYB54A	19VGA035	Audi	SQ5	AU426/0ME_KS	V6 2.9l 4V FSI BiT	AL552-8Q	LT	9G2	Drehstromgenerator 100-150 A	78.5%	ISO 8854	EG15T	Valeo	1.76	7710	3,065
FVP5EY	19VGA050	Audi	TT Coupe quattro	AU434/1EU_K1	R4 2.0l 4V TFSI	DQ381-7A	PV	9G2	Drehstromgenerator 100-150 A	78.5%	ISO 8854	EG15T	VALEO	1.76	342	118
FVR5EY	19VGA051	Audi	TT Roadster quattro	AU435/1EU_KR1	R4 2.0l 4V TFSI	DQ381-7A	PV	9G2	Drehstromgenerator 100-150 A	78.5%	ISO 8854	EG15T	VALEO	1.76	292	100
FVPRSY	19VGA065	Audi	TT RS	AU434/1EU_KR1	RS 2.5l 4V TFSI	DQ500-7A	PV	8GV	Drehstromgenerator 180 A	73.0%	VDA	FG18TB	VALEO	0.96	491	92
FVP51Y	19VGA057	Audi	TTS Coupe	AU434/1EU_KS1	R4 2.0l 4V TFSI	DQ381-7A	PV	9G2	Drehstromgenerator 100-150 A	78.5%	ISO 8854	EG15T	VALEO	1.76	310	107
3H72Q8	19VGA067	VW	ARTEON	VW483/0EU_K	R4 2,0l 200kW(272PS) 350Nm 4V TFSI	AQ450-8A	PV	8GV	Drehstromgenerator 180 A	73.0%	VDA	FG18T	Valeo	0.96	2700	506
3H72QA	19VGA066	VW	ARTEON	VW483/0EU_K	R4 2,0l 200kW(272PS) 350Nm 4V TFSI	AQ450-8F	PV	8GV	Drehstromgenerator 180 A	73.0%	VDA	FG18T	Valeo	0.96	1380	259
5C22P6	19VGA007	VW	BEETLE GP	VW324/1ME_K1	R4 2,0l 130kW(177PS) 250Nm 4V TFSI BZ	AQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	Valeo	1.92	5612	2,104
5C23P6	19VGA007	VW	BEETLE GP	VW324/1ME_K1	R4 2,0l 130kW(177PS) 250Nm 4V TFSI BZ	AQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	Valeo	1.92	3376	1,266
5C83P6	19VGA008	VW	BEETLE CONVERTIBLE GP	VW325/1ME K1	R4 2,0l 130kW(177PS) 250Nm 4V TFSI BZ	AQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	Valeo	1.92	11019	4,131
A332P6	19VGA006	VW	PASSAT GP	VW411/1NA K1	R4 2,0l 130kW(177PS) 250Nm 4V TFSI BZ	AQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	Valeo	1.92	11958	4,483
A333P6	19VGA006	VW	PASSAT GP	VW411/1NA_K1	R4 2,0l 130kW(177PS) 250Nm 4V TFSI BZ	AQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	Valeo	1.92	2060	772
AU23M2	19VGA028	VW	GOLF GP	VW370/0ME_K1	R4 1,4l 110kW(150PS) 250Nm 4V TSI	AQ300-8F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	Valeo	1.92	1018	382
AU23MS	19VGA026	VW	GOLF GP	VW370/0ME_K1	R4 1,4l 110kW(150PS) 250Nm 4V TSI	AQ300-8F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	Valeo	1.92	4898	1,836
AU29V2	19VGA045	VW	GTI GP	VW370/0ME_KS1	R4 2,0l 170kW(231PS) 350Nm 4V TFSI	MQ350-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	SEG	1.92	6578	2,466
AU29VZ	19VGA046	VW	GTI GP	VW370/0ME_KS1	R4 2,0l 170kW(231PS) 350Nm 4V TFSI	DQ381-7F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	SEG	1.92	7635	2,862
BQ1R56	19VGA047	VW	GOLF R GP	VW370/0EU_KR1	R4 2,0l 215kW(292PS) 380Nm 4V TFSI	MQ350-6A	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	SEG	1.92	2171	814
BQ1RST	19VGA048	VW	GOLF R GP	VW370/0EU_KR1	R4 2,0l 215kW(292PS) 380Nm 4V TFSI	DQ381-7A	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	SEG	1.92	3166	1,187
BU32M2	19VGA002	VW	JETTA NF	VW371/0ME_K	R4 1,4l 110kW(150PS) 250Nm 4V TSI	MQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	Valeo	1.92	10935	4,100
BU32MS	19VGA001	VW	JETTA NF	VW371/0ME_K	R4 1,4l 110kW(150PS) 250Nm 4V TSI	AQ300-8F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	Valeo	1.92	131432	49,275
BU33MS	19VGA001	VW	JETTA NF	VW371/0ME K	R4 1,4l 110kW(150PS) 250Nm 4V TSI	AQ300-8F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	Valeo	1.92	19606	7,350
BU34MS	19VGA001	VW	JETTA NF	VW371/0ME_K	R4 1,4l 110kW(150PS) 250Nm 4V TSI	AQ300-8F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	Valeo	1.92	6618	2,481
BU39V2	19VGA062	VW	JETTA NF	VW371/0ME_K	R4 2,0l 170kW(231PS) 350Nm 4V TFSI	MQ350-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	SEG	1.92	4498	1,686
BU39VZ	19VGA063	VW	JETTA NF	VW371/0ME_K	R4 2,0l 170kW(231PS) 350Nm 4V TFSI	DQ381-7F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	SEG	1.92	6387	2,395
BW22VJ	19VGA018	VW	TIGUAN LWB	VW326/0ME_KL	R4 2,0l 137kW(186PS) 300Nm 4V TFSI BZ	AQ450-8A	LT	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	SEG	1.92	8184	3,549
BW22VS	19VGA017	VW	TIGUAN LWB	VW326/0ME_KL	R4 2,0l 137kW(186PS) 300Nm 4V TFSI BZ	AQ450-8F	LT	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	SEG	1.92	11621	5,040
BW23VJ	19VGA018	VW	TIGUAN LWB	VW326/0ME_KL	R4 2,0l 137kW(186PS) 300Nm 4V TFSI BZ	AQ450-8A	LT	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	SEG	1.92	52395	22,722
BW23VS	19VGA017	VW	TIGUAN LWB	VW326/0ME_KL	R4 2,0l 137kW(186PS) 300Nm 4V TFSI BZ	AQ450-8F	LT	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	SEG	1.92	28887	12,527
BW24VJ	19VGA018	VW	TIGUAN LWB	VW326/0ME_KL	R4 2,0l 137kW(186PS) 300Nm 4V TFSI BZ	AQ450-8A	LT	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	SEG	1.92	8785	3,810
BX63M2	19VGA029	VW	GOLF SPORTWAGEN GP	VW372/0ME_K1	R4 1,4l 110kW(150PS) 250Nm 4V TSI	MQ250-6F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	Valeo	1.92	309	116
BX63MS	19VGA027	VW	GOLF SPORTWAGEN GP	VW372/0ME_K1	R4 1,4l 110kW(150PS) 250Nm 4V TSI	AQ300-8F	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EG15T	Valeo	1.92	2432	912
BX63N6	19VGA060	VW	GOLF SPORTWAGEN GP	VW372/0ME K1	R4 1,8l 125kW(170PS) 270Nm 4V TFSI	MQ350-6A	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	SEG	1.92	616	231
BX63N7	19VGA058	VW	GOLF SPORTWAGEN GP	VW372/0ME_K1	R4 1,8l 125kW(170PS) 270Nm 4V TFSI	DQ250-6A	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	SEG	1.92	1130	424
BX6CN6	19VGA059	VW	GOLF SPORTWAGEN GP	VW372/0ME_K1	R4 1,8l 125kW(170PS) 270Nm 4V TFSI	MQ350-6A	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	SEG	1.92	4639	1,739
BX6CN7	19VGA061	VW	GOLF SPORTWAGEN GP	VW372/0ME_K1	R4 1,8l 125kW(170PS) 270Nm 4V TFSI	DQ250-6A	PV	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	SEG	1.92	6848	2,567
CA12NZ	19VGA019	VW	ATLAS	VW416/0NA_K	R4 2,0l 175kW(238PS) 350Nm 4V TFSI	AQ450-8F	LT	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	SEG	1.92	2541	1,102
CA12UR	19VGA015	VW	ATLAS	VW416/0NA_K	VR6 3,6l 206kW(280PS) 360Nm 4V FSI	AQ450-8A	LT	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	SEG	1.92	545	236
CA12UR	19VGA015	VW	ATLAS	VW416/0NA_K	VR6 3,6l 206kW(280PS) 360Nm 4V FSI	AQ450-8A	LT	9G3	Drehstromgenerator 120-180 A	81.0%	VDA	EG18S	Valeo	2.24	2031	1,028
CA13NZ	19VGA019	VW	ATLAS	VW416/0NA_K	R4 2,0l 175kW(238PS) 350Nm 4V TFSI	AQ450-8F	LT	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	SEG	1.92	3904	1,693
CA13UR	19VGA015	VW	ATLAS	VW416/0NA_K	VR6 3,6l 206kW(280PS) 360Nm 4V FSI	AQ450-8A	LT	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	SEG	1.92	7040	3,053
CA13UR	19VGA015	VW	ATLAS	VW416/0NA_K	VR6 3,6l 206kW(280PS) 360Nm 4V FSI	AQ450-8A	LT	9G3	Drehstromgenerator 120-180 A	81.0%	VDA	EG18S	Valeo	2.24	27399	13,862
CA13UZ	19VGA016	VW	ATLAS	VW416/0NA K	VR6 3,6l 206kW(280PS) 360Nm 4V FSI	AQ450-8F	LT	9G2	Drehstromgenerator 100-150 A	79.0%	VDA	EL7150S	SEG	1.92	5059	2,194
CA13UZ	19VGA016	VW	ATLAS	VW416/0NA K	VR6 3,6l 206kW(280PS) 360Nm 4V FSI	AQ450-8F	LT	9G3	Drehstromgenerator 120-180 A	81.0%	VDA	EG18S	Valeo	2.24	16953	8,577
CA14UR	19VGA015	VW	ATLAS	VW416/0NA_K	VR6 3,6l 206kW(280PS) 360Nm 4V FSI	AQ450-8A	LT	9G3	Drehstromgenerator 120-180 A	81.0%	VDA	EG18S	Valeo	2.24	16710	8,454
CA14UZ	19VGA016	VW	ATLAS	VW416/0NA_K	VR6 3,6l 206kW(280PS) 360Nm 4V FSI	AQ450-8F	LT	9G3	Drehstromgenerator 120-180 A	81.0%	VDA	EG18S	Valeo	2.24	6138	3,105
CA15UR	19VGA015	VW	ATLAS	VW416/0NA_K	VR6 3,6l 206kW(280PS) 360Nm 4V FSI	AQ450-8A	LT	9G3	Drehstromgenerator 120-180 A	81.0%	VDA	EG18S	Valeo	2.24	12642	6,396

TOTAL VWGoA	**PV LT total**	**332,268**	**122,651**
		295,081	**132,496**
		627,349	**255,147**

AUDI	**PV LT total**	**73,247**	**26,307**
		84,247	**35,148**
		157,494	**61,455**

VW	**PV**	**259,021**	**96,344**
	LT	**210,834**	**97,348**
	total	**469,855**	**193,692**

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2016 MY through 2019 MY (CREDITS GRAND TOTAL)

TOTAL MY 2016 - MY 2019 VWGoA HEA technology Credits	**VWGoA High Efficiency Alternator Credits**	**Summary (2016 MY Through 2019 MY)**	
		50 State Volume	Off-Cycle Credit [Mg]
	PV	967,891	333,647
	LT	727,173	314,231
	Total	**1,695,064**	**647,878**