

# In-Service Conformity (ISC)

**ISC testing according to EU Regulation 2017/1151 as amended by EU  
Regulation 2018/1832**

## **Final Report - ISC testing for 2021**

Table 1. Revision management

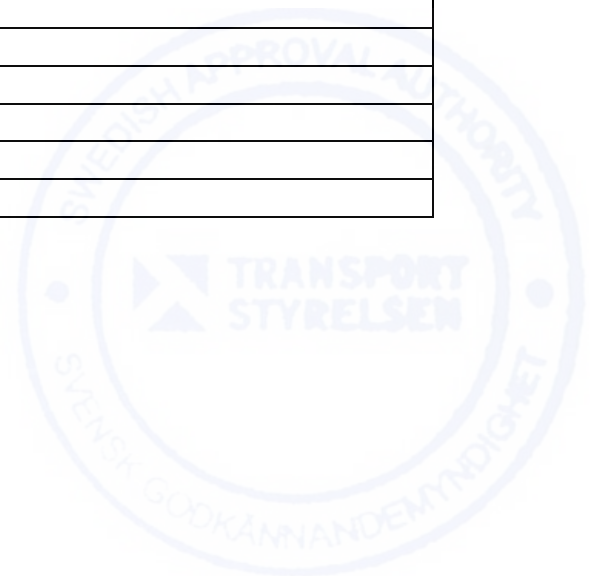
Rev.	Date	Comments
00	2022-03-31	Interim report
01	2023-02-10	Final report, updated and results added
02	2023-03-10	Final report, results added and correction of typing errors



## Glossary

Table 2. Glossary of terms

Term	Description
ISC	In-Service Conformity
GTAA	Granting Type Approval Authority
STA	Swedish Transport Agency
RDE	Real Driving Emission
PEMS	Portable Emission Measurement System
VIN	Vehicle Identification Number
UND	Undecided
NTE	Not to exceed
COC	Certificate of Conformity
ECG	Emissions Characteristics Group
MRO	Mass In Running Order
ICE	Internal Combustion Engine
WLTP	Worldwide Harmonised Light Vehicles Test Procedure
CO	Carbon Monoxide
HC	Hydro Carbons
NMHC	Non-Methane Hydro Carbons
THC	Total Hydro Carbons
NOx	Nitrogen Oxides
PM	Particle Mass
PN	Particle Number



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## A. Quick overview and main conclusions

As of 01 January 2020, Granting Type Approval Authorities (GTAA) are required to perform ISC testing. These new requirements are contained within Annex II, Part B, of Regulation (EU) 2017/1151, as amended by 2018/1832. The regulation also opens up the possibility for accredited laboratories and technical services to conduct ISC testing, in the following referred to as third party testing. This Final report summaries the testing for ISC-2021 conducted by manufacturers, third parties and the Swedish Transport Agency (STA). STA is the GTAA in Sweden.

STA has issued emission type approvals (e5\*715/2007\*2018/1832\*....) for seven manufacturers qualified for the ISC testing programme, sales per ISC-Family in EU>5000 vehicles for previous year.

- Ford-Werke GmbH
- Hyundai Assan Otomotiv Sanayi Ve Ticaret A.S.
- Hyundai Motor Manufacturing Czech s.r.o.
- Kia Motors Corporation Seoul Korea
- Kia Motors Slovakia s.r.o
- Volvo Cars Corporation
- Ford Motor Company of Australia Ltd

Two manufacturers, BMW AG and Jaguar Land Rover Limited, does not fulfil the sales of 5000 vehicles in EU for the previous year. These two manufacturers are still chosen for testing in ISC-2021 according to Article 9 in the above mentioned legislation.

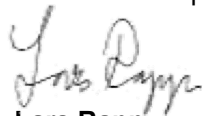
Table 3 describes the final status for ISC-2021. Due to the four failed vehicles, in different ISC families in the GTAA test programme, the sample size increased with one extra vehicle per family. One manufacturer performed a detailed investigation followed by a retest on the investigated vehicle and another manufacturer remained untested for ISC-2021, two ISC-families, due to that no vehicles were available for testing. An overview of the results is presented in section B2, C3 and D6 in the report. A more detailed presentation of the results per manufacturer is presented in annexes I – X.

Table 3. Summary of planned and performed tests and outcome from STA and third party testing.

ISC-2021	Planned vehicles	Tested vehicles	PASS	FAILED	Retest after investigation
STA	54	53	49	4	1
3 <sup>rd</sup> Parties	14	14	12	2	-



**Olof Lindell**  
Type Approval Compliance Officer  
Swedish Transport Agency



**Lars Rapp**  
Type Approval Compliance Officer  
Swedish Transport Agency



**Anna-Karin Bergström**  
Section Manager Type Approval  
Swedish Transport Agency



**Per Johansson**  
Type Approval Compliance Officer  
Swedish Transport Agency

## B. ISC activities performed by the manufacturer in the previous year:

### 1. Information gathering by manufacturer

This section is an overview of the testing performed per manufacturer. If sales numbers pass the mark of 5000 in EU for the previous year, a statistical folder is opened for the ISC family.

As long as the sales pass the mark of 5000 in EU the time period between commencing two in-service conformity checks by the manufacturer for a given ISC-family shall not exceed 24 month.

The requirements for ISC checks are applicable until 5 years after the last COC or individual approval certificate is issued for vehicles of that ISC family.

Manufacturer results reported to GTAA are presented in tables 5 to 23. A summary of the manufacturers ISC testing is presented in table 4.

### 2. ISC testing by manufacturers

Table 4. Summary of ISC-families qualified for manufacturer testing and statistical folders status for period 2020 / 2021.

Section	Manufacturer	ISC-families Qualified for ISC testing		Report period 2020 / 2021		
		2020	2021	PASS	FAILED	UND Backlog, test period expired 2021-12-31
2.1	Ford-Werke GmbH	10	13	12	0	0
2.2	Hyundai Assan Otomotiv San ve Tic. A.Ş.	4	5	4	0	0
2.3	Hyundai Motor Manufacturing Czech s.r.o.	8	3	8	0	0
2.4	Jaguar Land Rover Limited	1	0	1	0	0
2.5	Kia Motor Corporation	2	5	2	0	0
2.6	Kia Motors Slovakia s.r.o	4	4	3	0	1
2.7	Volvo Cars Corporation	2	8	5	0	0
2.8	Ford Motor Company of Australia Pty Ltd	0	2	0	0	0

## 2.1 Ford-Werke GmbH

Table 5. Number of ISC-families for manufacturer testing and status from Ford-Werke GmbH.

ISC-families Qualified for ISC		Report period 2020 / 2021, statistical folder summary		
2020	2021	PASS	FAILED	UND Backlog, test period expired 2021-12-31
10	13	12	0	0

Table 6. ISC-families to test (Type 1) and status by Ford-Werke GmbH.

Qualified for ISC test Sales for previous year>5000 vehicles		ISC-Family	Status	
2020	2021		2020	2021
x	x	11-WF0-D10	PASS	UND
x	x	5-WF0-D25* 11-WF0-D6*	PASS	
x	x	5-WF0-P28* 11-WF0-P9*	PASS	UND
-	x	11-WF0-P16	-	PASS
x	x	11-WF0-D8	PASS	UND
x	x	5-WF0-D13	PASS	
x	x	5-WF0-D14	PASS	
-	x	5-WF0-P27	-	PASS
x	-	11-WF0-P7	PASS	
x	-	11-WF0-P8	PASS	UND
x	-	11-WF0-P20* 11-WF0-P22*	PASS	UND
x	-	11-WF0-D16	PASS	
-	x	5-WF0-P34	-	UND
-	x	5-WF0-D41	-	UND
-	x	5-WF0-D42	-	UND
-	x	5-WF0-D40	-	UND
-	x	5-WF0-D36	-	UND

\*Request from Ford to merge ISC-families with identical specifications, agreed with STA.

## 2.2 Hyundai Assan Otomotiv San ve Tic A.S

Table 7. Number of ISC-families and status for manufacturer testing from Hyundai Assan Otomotiv Sanayi Ve Ticaret A.S.

ISC-families Qualified for ISC		Report period 2020 / 2021, statistical folder summary		
2020	2021	PASS	FAILED	UND Backlog, test period expired 2021-12-31
4	5	4	0	0

Table 8. ISC-families to test (Type 1) and status by Hyundai Assan Otomotiv Sanayi Ve Ticaret A.S.

Qualified for ISC test Sales for previous year>5000 vehicles		ISC-Family	Status	
2020	2021		2020	2021
x	x	11-HAO-1	PASS	
x	-	11-HAO-2	PASS	
x	x	11-HAO-3	PASS	
x	x	11-HAO-4	PASS	
-	x	11-HAO-17	-	UND
-	x	11-HAO-18	-	UND

Table 9. Additional RDE-test by Hyundai Assan Otomotiv Sanayi Ve Ticaret A.S.

Test	ISC-Family	Tested vehicles	Cold Start	Hot Start	Status
1	11-HAO-1	1	x	x	Approved
2	11-HAO-2	1	x	x	Approved
3	11-HAO-3	1	x	x	Approved
4	11-HAO-4	1	x	x	Approved



## 2.3 Hyundai Motor Manufacturing Czech s.r.o

Table 10. Number of ISC-families and status for manufacturer testing from Hyundai Motor Manufacturing Czech s.r.o.

ISC-families Qualified for ISC		Report period 2020 / 2021, statistical folder summary		
2020	2021	PASS	FAILED	UND Backlog, test period expired 2021-12-31
8	3	8	0	0

Table 11. ISC-families to test (Type 1) and status by Hyundai Motor Manufacturing Czech s.r.o.

Qualified for ISC test Sales for previous year>5000 vehicles		ISC-Family	Status	
2020	2021		2020	2021
x	x	11-HMM-5	PASS	
x	-	11-HMM-6	PASS	
x	x	11-HMM-8	PASS	
x	-	11-HMM-10	PASS	
x	-	11-HMM-11	PASS	
x	-	11-HMM-12	PASS	
x	-	11-HMM-14	PASS	
x	x	11-HMM-15	PASS	

Table 12. Additional RDE-test by Hyundai Motor Manufacturing Czech s.r.o.

Test	ISC-Family	Tested vehicles	Cold Start	Hot start	Result
1	11-HMM-5	1	x		Approved
2	11-HMM-6	1	x	x	Approved
3	11-HMM-8	1	x	x	Approved



## 2.4 Jaguar Land Rover Limited

Table 13. Number of ISC-families and status for manufacturer testing from Jaguar Land Rover Limited.

ISC-families Qualified for ISC		Report period 2020 / 2021, statistical folder summary		
2020	2021	<b>PASS</b>	<b>FAILED</b>	UND Backlog, test period expired 2021-12-31
1	0	1	0	0

Table 14. ISC-families to test (Type I) and status by Jaguar Land Rover Limited.

Qualified for ISC test Sales for previous year>5000 vehicles		ISC-Family	Status	
2020	2021		2020	2021
x	-	11-SAJ-001	<b>PASS</b>	UND

## 2.5 Kia Motor Corporation

Table 15. Number of ISC-families and status for manufacturer testing from Kia Motor Corporation.

ISC-families Qualified for ISC		Report period 2020 / 2021, statistical folder summary		
2020	2021	<b>PASS</b>	<b>FAILED</b>	UND Backlog, test period expired 2021-12-31
2	5	2	0	0

Table 16. ISC-families to test (Type I) and status by Kia Motor Corporation.

Qualified for ISC test Sales for previous year>5000 vehicles		ISC-Family	Status	
2020	2021		2020	2021
-	x	11-KMC-4	-	UND
-	x	11-KMC-5	-	UND
x	x	11-KMC-7	UND	<b>PASS</b>
x	x	11-KMC-8	UND	<b>PASS</b>
-	x	5-KMC-14	-	UND

## 2.6 Kia Motors Slovakia s.r.o

Table 17. Number of ISC-families and status for manufacturer testing from Kia Motors Slovakia s.r.o.

ISC-families Qualified for ISC		Report period 2020 / 2021, statistical folder summary		
2020	2021	PASS	FAILED	UND Backlog, test period expired 2021-12-31
4	4	3	0	1

Table 18. ISC-families to test (Type 1) and status by Kia Motors Slovakia s.r.o.

Qualified for ISC test Sales for previous year>5000 vehicles		ISC-Family	Status	
2020	2021		2020	2021
x	x	11-HMM-5	UND	PASS
x	x	11-HMM-6	UND	PASS
x	x	11-HMM-8	UND	PASS
x	x	11-HMM-15	UND	UND

Table 19. Additional RDE-test by Kia Motors Slovakia s.r.o.

Test	ISC-Family	Tested vehicles	Status
1	11-HMM-5	1	Approved
2	11-HMM-6	1	Approved
3	11-HMM-8	1	Approved

## 2.7 Volvo Cars Corporation

Table 20. Number Of ISC-families and status for manufacturer testing from Volvo Cars Corporation.

ISC-families Qualified for ISC		Report period 2020 / 2021, statistical folder summary		
2020	2021	PASS	FAILED	UND Backlog, test period expired 2021-12-31
2	8	5	0	0

Table 21. ISC-families to test (Type I) and status by Volvo Cars Corporation.

Qualified for ISC test Sales for previous year>5000 vehicles		ISC-Family	Status	
2020	2021		2020	2021
x	x	5-YV1-012	PASS	UND
x	x	5-YV1-016	PASS	UND
-	x	5-YV1-020	-	UND
-	x	5-YV1-021	-	PASS
-	x	5-YV1-022	-	UND
-	x	5-YV1-023	-	PASS
-	x	5-YV1-026	-	UND
-	x	5-YV1-027	-	PASS

## 2.8 Ford Motor Company of Australia Pty Ltd

Table 22. Number of ISC-families and status for manufacturer testing from Ford Motor Company of Australia Pty Ltd.

ISC-families Qualified for ISC		Report period 2020 / 2021, statistical folder summary		
2020	2021	PASS	FAILED	UND Backlog, test period expired 2021-12-31
0	2	0	0	0

Table 23. ISC-families to test (Type 1) and status by Ford Motor Company of Australia Pty Ltd.

Qualified for ISC test Sales for previous year>5000 vehicles		ISC-Family	Status	
2020	2021		2020	2021
-	x	5-6FP-D32	-	UND
-	x	5-6FP-D33	-	UND

## C. ISC activities performed by accredited laboratories or technical services in the previous year:

### 2 Information gathering an risk assessment

No data available

### 3 ISC testing from accredited laboratories or technical services

Table 24. Third party ISC testing performed during 2021.

Test	STA-Ref	Manufacturer	ISC-Family	Technical service	Test type	Status
1	2021-3005	Kia Motors Slovakia	11-HMM-15	Emisia	RDE	FAILED
2	2021-3007	Kia Motors Slovakia	11-HMM-6	JRC	RDE / WLTP	PASS
3	2021-3868	Hyundai Motor Manufacturing Czech	11-HMM-16	DTI	RDE	PASS
4	2021-4386	Ford-Werke GmbH	5-WF0-P34	TNO	RDE	PASS
5	2021-4387	Kia Motor Corporation	11-KMC-8	Emisia	RDE	PASS
6	2021-4452	Volvo Cars Corporation	5-YV1-023	DTI	RDE	PASS
7	2021-4606	Hyundai Assan Otomotiv	11-HAO-1	Emisia	RDE	PASS
8	2021-7042	Kia Motors Slovakia	11-HMM-6	Emisia	RDE	PASS
9	2021-7791	Ford-Werke GmbH	11-WF0-P8	DTI	RDE	PASS
10	2021-8243	Ford-Werke GmbH	5-WF0-D14	VVT	RDE	PASS
11	2021-8517	Ford-Werke GmbH	5-WF0-D13	DTI	RDE	PASS
12	2021-9829	Hyundai Motor Manufacturing Czech	5-HMM-2	Emisia	RDE	PASS
13	2021-9836	Hyundai Motor Manufacturing Czech	11-HMM-4	Emisia	RDE	FAILED
14	2021-9839	Hyundai Motor Manufacturing Czech	5-HMM-18	Emisia	RDE	PASS

Please refer to Annex X – 3<sup>rd</sup> party testing, for results.

## D. ISC activities performed by the granting type approval authority in the previous year:

### 5. Information gathering and risk assessment

A common risk assessment methodology was applied for all manufacturers applicable for ISC testing by the GTAA. Only Type 1 and RDE tests were conducted for this ISC programme.

As a first step, all e5\*715/2007\*2018/1832\* emissions approvals that were applicable to GTAA ISC testing were identified for the manufacturer. Each approval was accompanied by the associated IP and ISC (PEMS) families, 2020 sales volumes, warranty claims and other administrative information to assist in the information gathering process (such as test reports and basic vehicle specification).

The risk assessment methodology was split into two parts:

#### Risk Rating 1 – Quantifying the emissions performance of ‘similar’ vehicles

In-market emissions test data for Euro 6d\* vehicles, available from a variety of independent sources, were collated into a database. Each tested vehicle was assigned an ‘Emissions Characteristics Group’ (ECG) identifier, which is a concatenated string of the vehicles’:

- *Mass class* (‘Light’: MIRO < 1500 kg; ‘Medium’: 1500 ≤ MIRO < 2250 kg; ‘Heavy’: MIRO ≥ 2250 kg)
- *Powertrain architecture* (‘ICE / Mild NOVC-HEV’; ‘Full NOVC-HEV’; ‘OVC-HEV’)
- *Fuel* (‘Petrol’; ‘Diesel’)
- *Aspiration* (‘Naturally aspirated’; ‘Turbocharged (single)’; ‘Turbocharged (multiple)’; ‘Turbocharged and Supercharged’; ‘Supercharged’)
- *Fuelling method* (‘Direct Injection’; ‘Indirect Injection’)
- *Engine volume* (< 1500 cm<sup>3</sup>; ≥ 1500 cm<sup>3</sup>)

For example: “*Medium\_ICE / Mild NOVC-HEV\_Diesel\_Turbocharged (single) Direct Injection\_Greater than or equal to 1500*”

This allowed the grouping of ‘similar’ vehicles (those which had the same ECG identifier), and the emissions performance of each ECG could be expressed as a risk rating (in terms of the probability that a similar vehicle would exceed pollutant limits) as follows:

$$\text{Risk Rating 1} = \frac{\text{Number of exceedances within ECG}}{\text{Number of tests performed within ECG}} \times 100\%$$

where: ‘exceedances’ in this case actually refers to any exhaust pollutant being at least 70% of the applicable type-approval limit in a Type 1 or RDE test. It was decided to define exceedances in this way, with a low exceedance threshold of 70% (i.e. not 100%), due to rates of vehicle compliance actually being very high on the 194 Euro-6d\* in-market tests collected. It was found that if an exceedance was defined as exceeding the type-approval limit, this method would almost allocate no risk to any ECGs. Lowering the exceedance threshold still allows the ‘riskiest’ vehicles to be identified, even if those vehicles are still found to comply. ECGs identifiers were then assigned to each ISC family for the manufacturer, with the corresponding Risk Rating 1 for that ECG.

#### Risk Rating 2 – Based on manufacturer/vehicle-specific data

This part of the risk rating draws upon the information available from the manufacturer during the initial information gathering step, as well as type-approval test data each ISC family. The rating is built of six parameters, which can each effectively be treated as a form of probability marker, a component of risk for each ISC family:

1. *Rate of emissions-related warranty claims or repairs (%)*  
The number of warranty claims or repairs divided by the number of sales in 2020.
2. *Sales compared to average ISC family registrations in EU (%)*  
This is analogous to the exposure of the ISC family to the market; high sales is a greater risk if emissions-related issue is present on affected vehicles. This was calculated by taking the 2020 sales volume of an ISC family, and dividing it by the 'expected' number of registrations for the ISC family.
3. *In-market test history failure rate (%)*  
Of the vehicle tests that were gathered for the purpose of generating Risk Rating 1, the failure rate of any vehicles that coincidentally happened to be from one of the ISC families was factored in (i.e. number of exceedances divided by the number of tests). In most cases, a vehicle from a particular ISC family had not been tested and where that was the case, this parameter was excluded from the Risk Rating 2 calculation.
4. *Type-approval Type 1 performance (%)*  
For each ISC family, the type-approval Type 1 test results for all IP families contained within it were collected. Any final pollutant result that was at least 70% of the limit (for VH, VL or VM) was deemed an 'exceedance' (see Risk Rating 1 for explanation). The total number of exceedances within an ISC family were counted and then divided by the number of IP families in the ISC family.
5. *Relative type-approval RDE performance (%)*  
For each ISC family, the ratio of the final pollutant result / NTE limit for all RDE tests performed at type-approval were collected and averaged across each pollutant (CO, NOx and PN). To quantify the relative RDE performance of an ISC family, the results were normalised to reveal families that were closer to exceeding the NTE limits. This method was used as vehicles generally were found to be well below the NTE limits at type-approval, and understanding families' *relative* performance gave more insight as to the families who were more likely to emit higher levels of pollutants.
6. *ISC family complexity (%)*  
Calculated by taking the number of IP families in an ISC family and dividing by the total number of IP families across all ISC families. This metric is thought to provide an indication of ISC family complexity, since a greater number of IP families generally corresponds to a greater number of vehicle configurations being available. More configurations arguably adds complexity for a manufacturer in terms of ensuring robust powertrain design and calibration to support compliant emissions performance across a broad range of configurations, where characteristics such as rated engine power, vehicle mass, exhaust system layouts (and more) could differ considerably within the definition of an ISC (PEMS) family.

These six parameters were then averaged for each ISC family to generate Risk Rating 2 value (%).

#### Combined Risk Rating

A Combined Risk Rating is then calculated for each ISC family, by summing Risk Rating 1 and Risk Rating 2.

The two ISC families with the highest Combined Risk Rating were then selected to be tested for ISC (Type 1 and RDE). A check was performed to ensure that two ISC families were sufficient to meet the annual minimum test frequency requirements (to test a minimum of 5% or at least two ISC families per year), which showed that two families were sufficient for this manufacturer.

## **6. ISC testing (including selection of ISC families and final results)**



Table 25. GTAA ISC-2021 testing programme, for detailed test result, see section and annex for each manufacturer.

Sec.	Manufacturer <i>Test Comment</i>	ISC-Family	Planned Vehicles	Tested Vehicles	Result
6.1	Ford-Werke GmbH	11-WF0-D10	3	3	PASS
		5-WF0-D25	3	3	PASS
6.2	Hyundai Assan Otomotiv San ve Tic A.S <i>5-HAO-17, Vehicle 1 low mileage 13426km</i>	5-HAO-17	3	3	PASS
		11-HAO-3	3	3	PASS
6.3	Hyundai Motor Manufacturing Czech s.r.o <i>11-HMM-5, Vehicle 1 low mileage 14019km 11-HMM-8, Vehicle 4 low mileage 14620km</i>	11-HMM-5	3	4	PASS
		11-HMM-8	3	4	PASS
6.4	Jaguar Land Rover Limited**	11-SAJ-001	3	4	PASS
		11-SAL-005	3	4	PASS
6.5	Kia Motor Corporation	11-KMC-4	3	3	PASS
		11-KMC-8	3	3	PASS
6.6	Kia Motors Slovakia s.r.o.*	11-HMM-5	3	0	UND
		11-HMM-15	3	0	UND
6.7	Volvo Cars Corporation	5-YV1-012	3	3	PASS
		5-YV1-023	3	3	PASS
6.8	Ford Motor Company of Australia Pty Ltd <i>5-6FP-D32, Vehicle 3 low mileage 11266km</i>	5-6FP-D32	3	3	PASS
		5-6FP-D33	3	3	PASS
6.9	BMW AG**	5-WBA-O21	3	3	PASS
		5-WBA-O35	3	3	PASS

\*No vehicles within the specified ISC families found for testing.

\*\*Jaguar Land Rover and BMW AG are not qualified to ISC testing because sales for the previous year is less than 5000 vehicles. Nevertheless, STA has chosen to test them according to Article 9 of Regulation (EU) 2017/1151, as amended by 2018/1832.



## 6.1 Ford-Werke GmbH

Table 26. Ford-Werke GmbH ISC-families from risk assessment and IP families on tested vehicles.

		ISC family 1 (11-WF0-D10)				ISC family 2 (5-WF0-D25)			
No. of vehicles tested (Type 1 and RDE)		3				3			
IP families tested	Vehicle 1	IP-11-WF0-2018-0014	Type 1: 2021-11-05	IP-C519_2019_00018-WF0-1	Type 1: 2022-02-16				
			RDE: 2021-11-04		RDE: 2022-02-24				
	Vehicle 2	IP-11-WF0-2018-0014	Type 1: 2021-10-30	IP-C519_2019_00018-WF0-1	Type 1: 2022-02-16				
			RDE: 2021-11-02		RDE: 2022-02-18				
	Vehicle 3	IP-11-WF0-2018-0014	Type 1: 2022-01-12	IP-C519_2019_00018-WF0-1	Type 1: 2022-02-17				
			RDE: 2022-01-13		RDE: 2022-02-21				

Table 27. Statistical Folder Status and Test Results ISC family 1 (11-WF0-D10)

		ISC family 1 (11-WF0-D10), Diesel, Direct Injection												SAMPLE DECISION
		Vehicle 1				Vehicle 2				Vehicle 3				
		p	f	i.o.	e.o.	p	f	i.o.	e.o.	p	f	i.o.	e.o.	
Type 1	CO	x				x				x				PASS
	THC													
	NMHC													
	NOX	x				x				x				PASS
	THC+NOX	x				x				x				PASS
	PM	x				x				x				PASS
	PN	x				x				x				PASS
RDE	NOX	x				x				x				PASS
	PN	x				x				x				PASS

p=pass; f=fail; i.o.=intermediate outlier; e.o.=extreme outlier

Table 28. Statistical Folder Status and Test Results ISC family 2 (5-WF0-D25)

		ISC family 2 (5-WF0-D25), Diesel, Direct Injection												SAMPLE DECISION
		Vehicle 1				Vehicle 2				Vehicle 3				
		p	f	i.o.	e.o.	p	f	i.o.	e.o.	p	f	i.o.	e.o.	
Type 1	CO	x				x				x				PASS
	THC													
	NMHC													
	NOX	x				x				x				PASS
	THC+NOX	x				x				x				PASS
	PM	x				x				x				PASS
	PN	x				x				x				PASS
RDE	NOX	x				x				x				PASS
	PN	x				x				x				PASS

p=pass; f=fail; i.o.=intermediate outlier; e.o.=extreme outlier

Please refer to Annex I – Ford-Werke GmbH for detailed results.

## 6.2 Hyundai Assan Otomotiv San ve Tic A.S

Table 29. Hyundai Assan Otomotiv San ve Tic A.S ISC-families from risk assessment and IP families on tested vehicles.

		ISC family 1 (5-HAO-17)				ISC family 2 (11-HAO-3)			
No. of vehicles tested (Type 1 and RDE)		3				3			
IP families tested	Vehicle 1	IP-050534-NLH-1	Type 1: 2021-10-20		IP-11-NLH-2018-0022	Type 1: 2022-01-14			
			RDE: 2021-10-25			RDE: 2022-01-18			
	Vehicle 2	IP-050531-NLH-1	Type 1: 2022-03-24		IP-11-NLH-2018-0022	Type 1: 2022-01-13			
			RDE: 2022-03-31			RDE: 2022-01-24			
	Vehicle 3	IP-050531-NLH-1	Type 1: 2022-04-07		IP-11-NLH-2018-0016	Type 1: 2022-04-11			
			RDE: 2022-04-11			RDE: 2022-04-13			

Table 30. Statistical Folder Status and Test Results ISC family 1 (5-HAO-17).

		ISC family 1 (5-HAO-17), Petrol, Indirect Injection												SAMPLE DECISION
		Vehicle 1				Vehicle 2				Vehicle 3				
		p	f	i.o.	e.o.	p	f	i.o.	e.o.	p	f	i.o.	e.o.	
Type 1	CO	x				x				x				PASS
	THC	x				x				x				PASS
	NMHC	x				x				x				PASS
	NOX	x				x				x				PASS
	THC+NOX													
	PM													
	PN													
RDE	NOX	x				x				x				PASS
	PN													

p=pass; f=fail; i.o.=intermediate outlier; e.o.=extreme outlier

Table 31. Statistical Folder Status and Test Results ISC family 2 (11-HAO-3)

		ISC family 2 (11-HAO-3), Petrol, Direct Injection												SAMPLE DECISION
		Vehicle 1				Vehicle 2				Vehicle 3				
		p	f	i.o.	e.o.	p	f	i.o.	e.o.	p	f	i.o.	e.o.	
Type 1	CO	x				x				x				PASS
	THC	x				x				x				PASS
	NMHC	x				x				x				PASS
	NOX	x				x				x				PASS
	THC+NOX													
	PM	x				x				x				PASS
	PN	x				x				x				PASS
RDE	NOX	x				x				x				PASS
	PN	x				x				x				PASS

p=pass; f=fail; i.o.=intermediate outlier; e.o.=extreme outlier

Please refer to Annex II – Hyundai Assan Otomotiv San ve Tic A.S for detailed results.

### 6.3 Hyundai Motor Manufacturing Czech s.r.o

For information regarding vehicle 3 in ISC family 1 (11-HMM-5) see chapter 7 detailed investigation.

Tabell 32. Hyundai Motor Manufacturing Czech s.r.o ISC-families from risk assessment and IP families on tested vehicles.

		ISC family 1 (11-HMM-5)				ISC family 2 (11-HMM-8)			
No. of vehicles tested (Type 1 and RDE)		4				4			
IP families tested	Vehicle 1	IP-110001-TMA-1 (IP-11-TMA-2018-0001)		Type 1: 2021-10-15 RDE: 2021-10-20	IP-110009-TMA-1 (IP-11-TMA-2018-0009)		Type 1: 2022-03-18 RDE: 2022-03-24		
	Vehicle 2	IP-110001-TMA-1 (IP-11-TMA-2018-0001)		Type 1: 2021-10-19 RDE: 2021-10-13	IP-110011-TMA-1 (IP-11-TMA-2018-0011)		Type 1: 2022-03-17 RDE: 2022-03-21		
	Vehicle 3	IP-110001-TMA-1 (IP-11-TMA-2018-0001)		Type 1: 2022-02-25 RDE: 2022-03-03	IP-110008-TMA-1 (IP-11-TMA-2018-0008)		Type 1: 2022-04-01 RDE: 2022-04-04		
	Vehicle 4	IP-110001-TMA-1 (IP-11-TMA-2018-0001)		Type 1: 2022-06-10 RDE: 2022-06-16	IP-110011-TMA-1 (IP-11-TMA-2018-0011)		Type 1: 2022-05-04 RDE: 2022-05-05		

Table 33. Statistical Folder Status and Test Results ISC family 1 (11-HMM-5).

		ISC family 1 (11-HMM-5), Petrol, Direct Injection																SAMPLE DECISION
		Vehicle 1				Vehicle 2				Vehicle 3				Vehicle 4				
		p	f	i.o.	e.o.	p	f	i.o.	e.o.	p	f	i.o.	e.o.	p	f	i.o.	e.o.	
Type 1	CO	x				x				x				x				PASS
	THC	x				x				x				x				PASS
	NMHC	x				x				x				x				PASS
	NOX	x				x							x	x				PASS
	THC+NOX																	
	PM	x				x				x				x				PASS
	PN	x				x				x				x				PASS
RDE	NOX	x				x							x	x				PASS
	PN	x				x				x				x				PASS

p=pass; f=fail; i.o.=intermediate outlier; e.o.=extreme outlier

Table 34. Statistical Folder Status and Test Results ISC family 2 (11-HMM-8)

		ISC family 2 (11-HMM-8), Diesel, Direct Injection																SAMPLE DECISION
		Vehicle 1				Vehicle 2				Vehicle 3				Vehicle 4				
		p	f	i.o.	e.o.	p	f	i.o.	e.o.	p	f	i.o.	e.o.	p	f	i.o.	e.o.	
Type 1	CO	x				x				x				x				PASS
	THC																	
	NMHC																	
	NOX	x				x				x				x				PASS
	THC+NOX	x				x				x				x				PASS
	PM	x				x				x				x				PASS
	PN	x				x				x				x				PASS
RDE	NOX		x			x				x				x				PASS
	PN	x				x				x				x				PASS

p=pass; f=fail; i.o.=intermediate outlier; e.o.=extreme outlier

Please refer to Annex III – Hyundai Motor Manufacturing Czech s.r.o for detailed results.

## 6.4 Jaguar Land Rover Limited

Table 35. Jaguar Land Rover Limited ISC-families from risk assessment and IP families on tested vehicles.

		ISC family 1 (11-SAJ-001)				ISC family 2 (11-SAL-005)					
No. of vehicles tested (Type 1 and RDE)		4				4					
IP families tested	Vehicle 1	IP-20a20d132TAR_01-SAD-1				Type 1: 2022-03-31 RDE: 2022-04-01	IP-20u20d177TAA_01-SAL-1				Type 1: 2022-03-08 RDE: 2022-03-10
	Vehicle 2	IP-11-SAD-2018-0009				Type 1: 2022-04-12 RDE: 2022-04-12	IP-20u20d177TAA_01-SAL-1				Type 1: 2022-03-09 RDE: 2022-03-11
	Vehicle 3	IP-11-SAD-2018-0009				Type 1: 2022-04-14 RDE: 2022-04-22	IP-20u20d177TAA_01-SAL-1				Type 1: 2022-03-24 RDE: 2022-03-25
	Vehicle 4	IP-11-SAD-2018-0009				Type 1: 2022-06-16 RDE: 2022-06-17	IP-20u20d177TAA_01-SAL-1				Type 1: 2022-04-05 RDE: 2022-04-07

Table 36. Statistical Folder Status and Test Results ISC family 1 (11-SAJ-001)

		ISC family 1 (11-SAJ-001), Diesel, Direct Injection																SAMPLE DECISION
		Vehicle 1				Vehicle 2				Vehicle 3				Vehicle 4				
		p	f	i.o.	e.o.	p	f	i.o.	e.o.	p	f	i.o.	e.o.	p	f	i.o.	e.o.	
Type 1	CO	x				x				x				x				PASS
	THC																	
	NMHC																	
	NOX	x				x				x				x				PASS
	THC+NOX	x				x				x				x				PASS
	PM	x				x				x				x				PASS
	PN	x				x				x				x				PASS
RDE	NOX	x				x				x				x				PASS
	PN	x				x					x			x				PASS

p=pass; f=fail; i.o.=intermediate outlier; e.o.=extreme outlier

Table 37. Statistical Folder Status and Test Results ISC family 2 (11-SAL-005)

		ISC family 2 (11-SAL-005), Diesel, Direct Injection																SAMPLE DECISION
		Vehicle 1				Vehicle 2				Vehicle 3				Vehicle 4				
		p	f	i.o.	e.o.	p	f	i.o.	e.o.	p	f	i.o.	e.o.	p	f	i.o.	e.o.	
Type 1	CO	x				x				x				x				PASS
	THC																	
	NMHC																	
	NOX		x			x				x				x				PASS
	THC+NOX	x				x				x				x				PASS
	PM	x				x				x				x				PASS
	PN	x				x				x				x				PASS
RDE	NOX	x				x				x				x				PASS
	PN	x				x				x				x				PASS

p=pass; f=fail; i.o.=intermediate outlier; e.o.=extreme outlier

Please refer to Annex IV – Jaguar Land Rover Limited for detailed results.

## 6.5 Kia Motor Corporation

Table 38. Kia Motor Corporation ISC-families from risk assessment and IP families on tested vehicles.

		ISC family 1 (11-KMC-4)				ISC family 2 (11-KMC-8)			
No. of vehicles tested (Type 1 and RDE)		3				3			
IP families tested	Vehicle 1	IP-11-KNA-2018-0001		Type 1: 2021-11-12 RDE: 2021-11-16	IP-11-KNA-2018-0017		Type 1: 2021-11-11 RDE: 2021-11-15		
	Vehicle 2	IP-11-KNA-2018-0003		Type 1: 2021-11-18 RDE: 2021-11-24	IP-11-KNA-2018-0017		Type 1: 2021-11-17 RDE: 2021-11-19		
	Vehicle 3	IP-11-KNA-2018-0003		Type 1: 2021-11-18 RDE: 2021-11-23	IP-11-KNA-2018-0017		Type 1: 2022-02-24 RDE: 2022-03-01		

Table 39. Statistical Folder Status and Test Results ISC family 1 (11-KMC-4)

		ISC family 1 (11-KMC-4), Petrol, Indirect Injection												SAMPLE DECISION
		Vehicle 1				Vehicle 2				Vehicle 3				
		p	f	i.o.	e.o.	p	f	i.o.	e.o.	p	f	i.o.	e.o.	
Type 1	CO	x				x				x				PASS
	THC	x				x				x				PASS
	NMHC	x				x				x				PASS
	NOX	x				x				x				PASS
	THC+NOX													
	PM													
	PN													
RDE	NOX	x				x				x				PASS
	PN													

p=pass; f=fail; i.o.=intermediate outlier; e.o.=extreme outlier

Table 40. Statistical Folder Status and Test Results ISC family 2 (11-KMC-8)

		ISC family 2 (11-KMC-8), Petrol, Indirect Injection												SAMPLE DECISION
		Vehicle 1				Vehicle 2				Vehicle 3				
		p	f	i.o.	e.o.	p	f	i.o.	e.o.	p	f	i.o.	e.o.	
Type 1	CO	x				x				x				PASS
	THC	x				x				x				PASS
	NMHC	x				x				x				PASS
	NOX	x				x				x				PASS
	THC+NOX													
	PM													
	PN													
RDE	NOX	x				x				x				PASS
	PN													

p=pass; f=fail; i.o.=intermediate outlier; e.o.=extreme outlier

Please refer to Annex V – Kia Motor Corporation for detailed results.

## 6.6 Kia Motors Slovakia s.r.o

Table 41. Kia Motors Slovakia s.r.o. ISC-families from risk assessment and IP families on tested vehicles.

		ISC family 1 (11-HMM-5)		ISC family 2 (11-HMM-15)	
No. of vehicles tested (Type 1 and RDE)		0		0	
IP families tested	Vehicle 1	No test object identified	Type 1:	No test object identified	Type 1:
			RDE:		RDE:
	Vehicle 2	No test object identified	Type 1:	No test object identified	Type 1:
			RDE:		RDE:
	Vehicle 3	No test object identified	Type 1:	No test object identified	Type 1:
			RDE:		RDE:

Table 42. Statistical Folder Status and Test Results ISC family 1 (11-HMM-5)

		ISC family 1 (11-HMM-5), Petrol, Direct Injection												SAMPLE DECISION	
		Vehicle 1				Vehicle 2				Vehicle 3					
		p	f	i.o.	e.o.	p	f	i.o.	e.o.	p	f	i.o.	e.o.		
Type 1	CO														UND
	THC														UND
	NMHC														UND
	NOX														UND
	THC+NOX														
	PM														UND
	PN														UND
RDE	NOX														UND
	PN														UND

p=pass; f=fail; i.o.=intermediate outlier; e.o.=extreme outlier

Table 43. Statistical Folder Status and Test Results ISC family 2 (11-HMM-15)

		ISC family 2 (11-HMM-15), Diesel, Direct Injection												SAMPLE DECISION	
		Vehicle 1				Vehicle 2				Vehicle 3					
		p	f	i.o.	e.o.	p	f	i.o.	e.o.	p	f	i.o.	e.o.		
Type 1	CO														UND
	THC														
	NMHC														
	NOX														UND
	THC+NOX														UND
	PM														UND
	PN														UND
RDE	NOX														UND
	PN														UND

p=pass; f=fail; i.o.=intermediate outlier; e.o.=extreme outlier

Please refer to Annex VI – Kia Motors Slovakia s.r.o for detailed results.

## 6.7 Volvo Cars Corporation

Table 44. Volvo Cars Corporation ISC-families from risk assessment and IP families on tested vehicles.

		ISC family 1 5-YV1-012				ISC family 2 5-YV1-023			
No. of vehicles tested (Type 1 and RDE)		3				3			
IP families tested	Vehicle 1	IP-05-YV1-2018-0016		Type 1: 2021-12-28 RDE: 2021-12-29	IP-2020_225K6D-YV1-1		Type 1: 2022-02-09 RDE: 2022-02-10		
	Vehicle 2	IP-2019_225AKD-YV1-1		Type 1: 2022-01-06 RDE: 2022-05-20	IP-2020_536K9D-YV1-1		Type 1: 2022-03-23 RDE: 2022-04-06		
	Vehicle 3	IP-05-YV1-2018-0001		Type 1: 2022-04-27 RDE: 2022-04-22	IP-2020_225K9D-YV1-1		Type 1: 2022-04-29 RDE: 2022-05-02		

Table 45. Statistical Folder Status and Test Results ISC family 1 (5-YV1-012)

		ISC family 1 (5-YV1-012), Petrol, Direct Injection												SAMPLE DECISION
		Vehicle 1				Vehicle 2				Vehicle 3				
		p	f	i.o.	e.o.	p	f	i.o.	e.o.	p	f	i.o.	e.o.	
Type 1	CO	x				x				x				PASS
	THC	x				x				x				PASS
	NMHC	x				x				x				PASS
	NOX	x				x				x				PASS
	THC+NOX													
	PM	x				x				x				PASS
	PN	x				x				x				PASS
RDE	NOX	x				x				x				PASS
	PN	x				x				x				PASS

p=pass; f=fail; i.o.=intermediate outlier; e.o.=extreme outlier

Table 46. Statistical Folder Status and Test Results ISC family 2 (5-YV1-023)

		ISC family 2 (5-YV1-023), Petrol, Direct Injection												SAMPLE DECISION
		Vehicle 1				Vehicle 2				Vehicle 3				
		p	f	i.o.	e.o.	p	f	i.o.	e.o.	p	f	i.o.	e.o.	
Type 1	CO	x				x				x				PASS
	THC	x				x				x				PASS
	NMHC	x				x				x				PASS
	NOX	x				x				x				PASS
	THC+NOX													
	PM	x				x				x				PASS
	PN	x				x				x				PASS
RDE	NOX	x				x				x				PASS
	PN	x				x				x				PASS

p=pass; f=fail; i.o.=intermediate outlier; e.o.=extreme outlier

Please refer to Annex VII – Volvo Cars Corporation for detailed results.



## 6.8 Ford Motor Company of Australia Pty Ltd

Table 47. Ford Motor Company of Australia Pty Ltd ISC-families from risk assessment and IP families on tested vehicles.

		ISC family 1 5-6FP-D32			ISC family 2 5-6FP-D33		
No. of vehicles tested (Type 1 and RDE)		3			3		
IP families tested	Vehicle 1	IP-P375_2019_00005-6FP-1		Type 1: 2022-01-20 RDE: 2022-01-25	IP-P375_2019_00007-6FP-1		Type 1: 2021-11-04 RDE: 2021-11-09
	Vehicle 2	IP-P375_2019_00003-6FP-1		Type 1: 2022-03-03 RDE: 2022-03-07	IP-P375_2019_00007-6FP-1		Type 1: 2021-11-16 RDE: 2021-11-11
	Vehicle 3	IP-P375_2019_00005-6FP-1		Type 1: 2022-06-10 RDE: 2022-06-09	IP-P375_2019_00008-6FP-1		Type 1: 2022-03-04 RDE: 2022-03-10

Table 48. Statistical Folder Status and Test Results ISC family 1 (5-6FP-D32)

		ISC family 1 (5-6FP-D32), Diesel, Direct Injection												SAMPLE DECISION	
		Vehicle 1				Vehicle 2				Vehicle 3					
		p	f	i.o.	e.o.	p	f	i.o.	e.o.	p	f	i.o.	e.o.		
Type 1	CO	x				x				x				PASS	
	THC														
	NMHC														
	NOX	x				x				x					PASS
	THC+NOX	x				x				x					PASS
	PM	x				x				x					PASS
	PN	x				x				x					PASS
RDE	NOX	x				x				x				PASS	
	PN	x				x				x				PASS	

p=pass; f=fail; i.o.=intermediate outlier; e.o.=extreme outlier

Table 49. Statistical Folder Status and Test Results ISC family 2 (5-6FP-D33)

		ISC family 2 (5-6FP-D33), Diesel, Direct Injection												SAMPLE DECISION	
		Vehicle 1				Vehicle 2				Vehicle 3					
		p	f	i.o.	e.o.	p	f	i.o.	e.o.	p	f	i.o.	e.o.		
Type 1	CO	x				x				x				PASS	
	THC														
	NMHC														
	NOX	x				x				x					PASS
	THC+NOX	x				x				x					PASS
	PM	x				x				x					PASS
	PN	x				x				x					PASS
RDE	NOX	x				x				x				PASS	
	PN	x				x				x				PASS	

p=pass; f=fail; i.o.=intermediate outlier; e.o.=extreme outlier

Please refer to Annex VIII – Ford Motor Company of Australia Pty Ltd for detailed results.

## 6.9 BMW AG

Table 50. BMW AG ISC-families from risk assessment and IP families on tested vehicles.

		ISC family 1 5-WBA-O21				ISC family 2 5-WBA-O35			
No. of vehicles tested (Type 1 and RDE)		3				3			
IP families tested	Vehicle 1	IP-0000609-WBA-1		Type 1: 2021-10-20 RDE: 2021-10-22	IP-0000619-WBA-1		Type 1: 2021-12-01 RDE: 2021-12-02		
	Vehicle 2	IP-0000580-WBA-1		Type 1: 2022-01-20 RDE: 2022-01-19	IP-0000619-WBA-1		Type 1: 2021-12-02 RDE: 2021-12-03		
	Vehicle 3	IP-0000580-WBA-1		Type 1: 2022-02-23 RDE: 2022-02-24	IP-0000619-WBA-1		Type 1: 2022-02-08 RDE: 2022-02-09		

Table 51. Statistical Folder Status and Test Results ISC family 1 (5-WBA-O21)

		ISC family 1 (5-WBA-O21), Petrol, Direct Injection													
		Vehicle 1				Vehicle 2				Vehicle 3				SAMPLE DECISION	
		p	f	i.o.	e.o.	p	f	i.o.	e.o.	p	f	i.o.	e.o.		
Type 1	CO	x				x				x				PASS	
	THC	x				x				x				PASS	
	NMHC	x				x				x				PASS	
	NOX	x				x				x				PASS	
	THC+NOX														
	PM	x				x				x				PASS	
	PN	x				x				x				PASS	
RDE	NOX	x				x				x				PASS	
	PN	x				x				x				PASS	

p=pass; f=fail; i.o.=intermediate outlier; e.o.=extreme outlier

Table 52. Statistical Folder Status and Test Results ISC family 2 (5-WBA-O35)

		ISC family 2 (5-WBA-O35), Petrol, Direct Injection													
		Vehicle 1				Vehicle 2				Vehicle 3				SAMPLE DECISION	
		p	f	i.o.	e.o.	p	f	i.o.	e.o.	p	f	i.o.	e.o.		
Type 1	CO	x				x				x				PASS	
	THC	x				x				x				PASS	
	NMHC	x				x				x				PASS	
	NOX	x				x				x				PASS	
	THC+NOX														
	PM	x				x				x				PASS	
	PN	x				x				x				PASS	
RDE	NOX	x				x				x				PASS	
	PN	x				x				x				PASS	

p=pass; f=fail; i.o.=intermediate outlier; e.o.=extreme outlier

Please refer to Annex IX – BMW AG for results.

## 7. Detailed investigations

### 7.1 Hyundai Motor Manufacturing Czech s.r.o. – ISC-family 11-HMM-5

Vehicle 3 in the sample showed an elevated NO<sub>x</sub> level in both Type 1 and Type 1A tests. After an investigation, it was identified that the vehicle was not qualified for ISC testing and a fourth vehicle was tested in 11-HMM-5. STA opened an investigation to understand why the OBD system did not detect the problem with vehicle 3 in table 32.

## 8. Remedial measures

Not applicable.

## E. Assessment of the yearly expected emissions decrease due to any ISC remedial measures

Not applicable.

## F. Lessons Learned (including for performance of instruments used)

From the ISC activities performed by accredited laboratories or technical services, STA have noticed that there are different driving patterns during the cold start phase. In the graph below one of the tests has a varying vehicle speed between 18 – 23 km/h during the entire cold start phase compared to a “normal” cold start phase. Both tests are according to the regulation, approved ISC tests. However, according to section 5.5.5 in Annex IIIA 2017/1151 *“The test vehicles shall not be driven with the intention to generate a passed or failed test due to extreme driving patterns that do not represent normal condition of use”*.

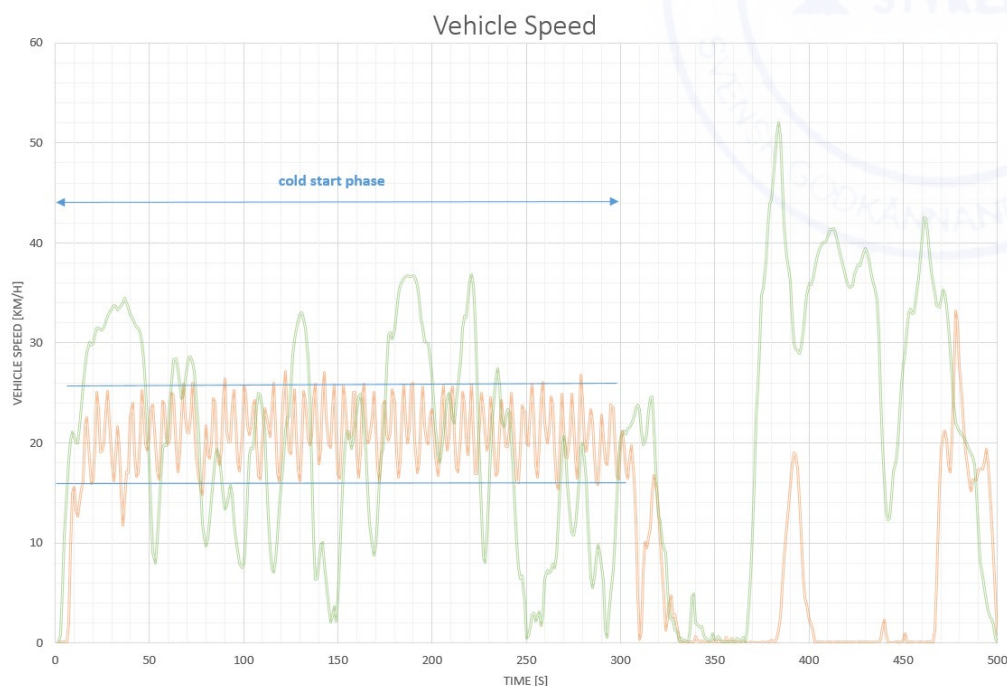


Figure 1.

## G. Report of other invalid tests

Nothing to report.

### ANNEXES:

**Annex I:** Ford-Werke GmbH, Final\_rev02 Report ISC-2021

**Annex II:** Hyundai Assan Otomotiv San ve Tic A.S, Final\_rev02 Report ISC-2021

**Annex III:** Hyundai Motor Manufacturing Czech s.r.o, Final\_rev02 Report ISC-2021

**Annex IV:** Jaguar Land Rover Limited, Final\_rev02 Report ISC-2021

**Annex V:** Kia Motor Corporation, Final\_rev02 Report ISC-2021

**Annex VI:** Kia Motors Slovakia s.r.o, Final\_rev02 Report ISC-2021

**Annex VII:** Volvo Cars Corporation, Final\_rev02 Report ISC-2021

**Annex VIII:** Ford Motor Company of Australia Pty, Ltd Final\_rev02 Report ISC-2021

**Annex IX:** BMW AG, Final\_rev02 Report ISC-2021

**Annex X:** 3rd party ISC testing, Final\_rev02 Report ISC-2021



**Annex I – Ford Werke GmbH, Final\_rev02 Report ISC-2021**

ISC year: 2021  
Manufacturer: Ford Werke GmbH  
Report status: Final\_rev02  
Report number: ISC-2021-01  
Issue date: 2023-03-10



## Annex I – Ford Werke GmbH, Final\_rev02 Report ISC-2021

### Test overview for Ford Werke GmbH

ISC Family	Manufacturer (Section B) 2020 / 2021	STA (Section D) ISC-2021	3 <sup>rd</sup> parties (Section C) 2021
5-WF0-D13	<ul style="list-style-type: none"> <li>• Qualified for ISC-2020/2021</li> <li>• High sale →2 sample lots</li> <li>• Testing completed 2021</li> <li>• Statistical folder <b>PASS</b></li> </ul>		<ul style="list-style-type: none"> <li>• 1 vehicle tested, Type 1A</li> <li>• Tested by Technological Institute in Denmark</li> <li>• Meets applicable regulations</li> <li>• STA ref: TSV 2021-8517</li> </ul>
11-WF0-P7	<ul style="list-style-type: none"> <li>• Qualified for ISC-2020</li> <li>• Testing completed 2021</li> <li>• Statistical folder <b>PASS</b></li> </ul>		
5-WF0-D25 11-WF0-D6	<ul style="list-style-type: none"> <li>• Qualified for ISC-2020/2021</li> <li>• 1 vehicle failed</li> <li>• Extra vehicle tested</li> <li>• Testing completed 2021</li> <li>• Statistical folder <b>PASS</b></li> </ul>	<ul style="list-style-type: none"> <li>• 3 vehicle tested, Type 1+1A</li> <li>• Tested by AVL in Sweden</li> <li>• Statistical Folder <b>PASS</b></li> </ul>	
11-WF0-D10	<ul style="list-style-type: none"> <li>• Qualified for ISC-2020/2021</li> <li>• Testing completed 2020</li> <li>• Statistical folder <b>PASS</b></li> </ul>	<ul style="list-style-type: none"> <li>• 3 vehicle tested, Type 1+1A</li> <li>• Tested by AVL in Sweden</li> <li>• Statistical Folder <b>PASS</b></li> </ul>	
5-WF0-P28 11-WF0-P9	<ul style="list-style-type: none"> <li>• Qualified for ISC-2020/2021</li> <li>• Testing completed 2020</li> <li>• Statistical folder <b>PASS</b></li> </ul>		
11-WF0-P16	<ul style="list-style-type: none"> <li>• Qualified for ISC-2021</li> <li>• Testing completed 2021</li> <li>• Statistical folder <b>PASS</b></li> </ul>		
11-WF0-D8	<ul style="list-style-type: none"> <li>• Qualified for ISC-2020/2021</li> <li>• Testing completed 2020</li> <li>• Statistical folder <b>PASS</b></li> </ul>		
5-WF0-D14	<ul style="list-style-type: none"> <li>• Qualified for ISC-2020/2021</li> <li>• Testing completed 2021</li> <li>• Statistical folder <b>PASS</b></li> </ul>		<ul style="list-style-type: none"> <li>• 1 vehicle tested, Type 1A</li> <li>• Tested by Technical Research Centre of Finland Ltd</li> <li>• Meets applicable regulations</li> <li>• STA ref: TSV 2021-8243</li> </ul>

## Annex I – Ford Werke GmbH, Final\_rev02 Report ISC-2021

11-WF0-P8	<ul style="list-style-type: none"> <li>• Qualified for ISC-2020</li> <li>• Testing completed 2020</li> <li>• Statistical folder <b>PASS</b></li> </ul>		<ul style="list-style-type: none"> <li>• 1 vehicle tested, Type 1A</li> <li>• Tested by Technological Institute in Denmark</li> <li>• Meets applicable regulations</li> <li>• STA ref: TSV 2021-7791</li> </ul>
11-WF0-P20 11-WF0-P22	<ul style="list-style-type: none"> <li>• Qualified for ISC-2020</li> <li>• Testing completed 2020</li> <li>• Statistical folder <b>PASS</b></li> </ul>		
11-WF0-D16	<ul style="list-style-type: none"> <li>• Qualified for ISC-2020</li> <li>• 1 vehicle failed</li> <li>• Extra vehicle tested</li> <li>• Testing completed 2021</li> <li>• Statistical folder <b>PASS</b></li> </ul>		
5-WF0-P27	<ul style="list-style-type: none"> <li>• Qualified for ISC-2021</li> <li>• Testing completed 2021</li> <li>• Statistical folder <b>PASS</b></li> </ul>		
5-WF0-P34	<ul style="list-style-type: none"> <li>• Qualified for ISC-2021</li> <li>• Completed before end of 2022</li> <li>• Statistical folder UND</li> </ul>		<ul style="list-style-type: none"> <li>• 1 vehicle tested, Type 1A</li> <li>• Tested by TNO</li> <li>• Meets applicable regulations</li> <li>• STA ref: TSV 2021-4386</li> </ul>
5-WF0-D41	<ul style="list-style-type: none"> <li>• Qualified for ISC-2021</li> <li>• Completed before end of 2022</li> <li>• Statistical folder UND</li> </ul>		
5-WF0-D42	<ul style="list-style-type: none"> <li>• Qualified for ISC-2021</li> <li>• Completed before end of 2022</li> <li>• Statistical folder UND</li> </ul>		
5-WF0-D40	<ul style="list-style-type: none"> <li>• Qualified for ISC-2021</li> <li>• Completed before end of 2022</li> <li>• Statistical folder UND</li> </ul>		
5-WF0-D36	<ul style="list-style-type: none"> <li>• Qualified for ISC-2021</li> <li>• Completed before end of 2022</li> <li>• Statistical folder UND</li> </ul>		

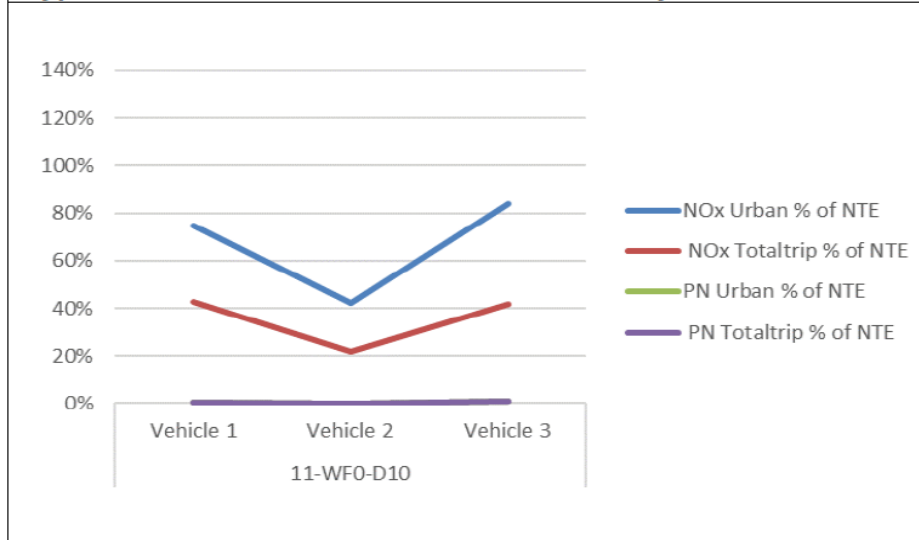


# Annex I – Ford Werke GmbH, Final\_rev02 Report ISC-2021

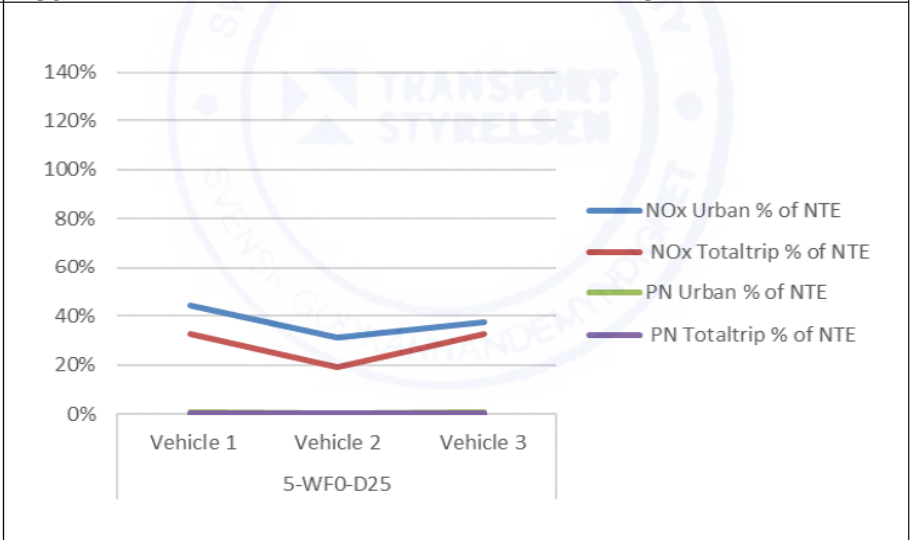
## Detailed Type 1A (RDE) data from STA test (D), Ki included

ISC-Family	STA ref	EmissionTypeApproval	Limit CO NTE (mg/km)	Limit NOx NTE (mg/km)	Limit PN NTE (#/km)	CO Totaltrip (mg/km)	NOx Totaltrip (mg/km)	NOx Totaltrip % of NTE	PN Totaltrip (#/km)	PN Totaltrip % of NTE	CO Urban (mg/km)	NOx Urban (mg/km)	NOx Urban % of NTE	PN Urban (#/km)	PN Urban % of NTE
11-WF0-D10-2	Vehicle 1	e5*715/2007*2018/1832DG*1069*02	N/A	168,0	9,0E+11	30,7	71,3	42%	3,9E+09	0%	76,4	125,8	75%	5,4E+09	1%
11-WF0-D10-2	Vehicle 2	e5*715/2007*2018/1832DG*1069*02	N/A	168,0	9,0E+11	45,7	36,6	22%	8,6E+08	0%	85,7	71,0	42%	1,3E+09	0%
11-WF0-D10-2	Vehicle 3	e5*715/2007*2018/1832DG*1069*02	N/A	168,0	9,0E+11	35,8	70,2	42%	6,9E+09	1%	46,9	141,0	84%	1,1E+10	1%
5-WF0-D25-0	Vehicle 1	e5*715/2007*2018/1832DG*0558*01	N/A	168,0	9,0E+11	18,4	54,6	32%	3,5E+09	0%	32,5	73,9	44%	7,9E+09	1%
5-WF0-D25-0	Vehicle 2	e5*715/2007*2018/1832DG*0558*01	N/A	168,0	9,0E+11	27,3	32,4	19%	1,3E+09	0%	27,0	52,1	31%	1,9E+09	0%
5-WF0-D25-0	Vehicle 3	e5*715/2007*2018/1832DG*0558*01	N/A	168,0	9,0E+11	57,8	54,7	33%	3,5E+09	0%	64,6	62,7	37%	6,7E+09	1%

Type 1A results 11-WF0-D10, Diesel, Direct Injection



Type 1A results 5-WF0-D25, Diesel, Direct Injection

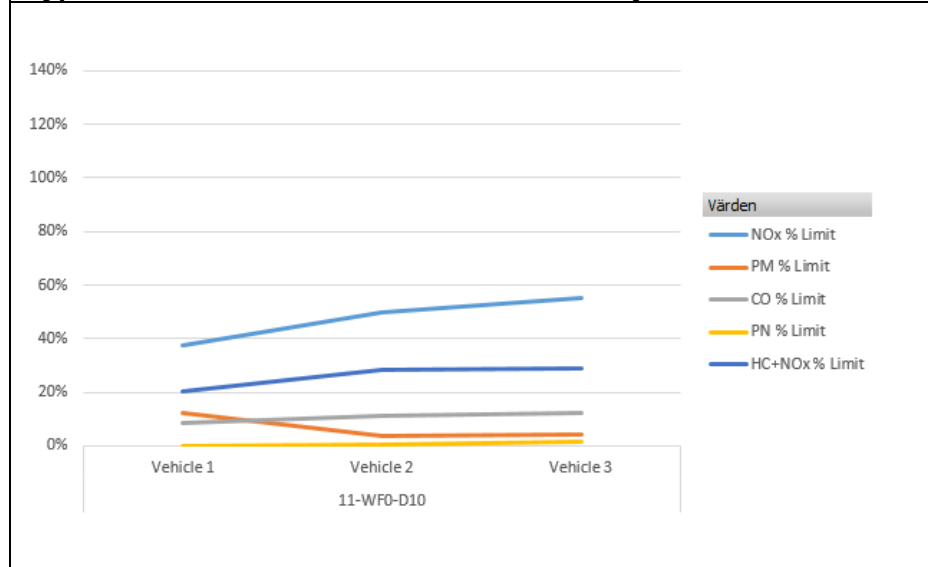


# Annex I – Ford Werke GmbH, Final\_rev02 Report ISC-2021

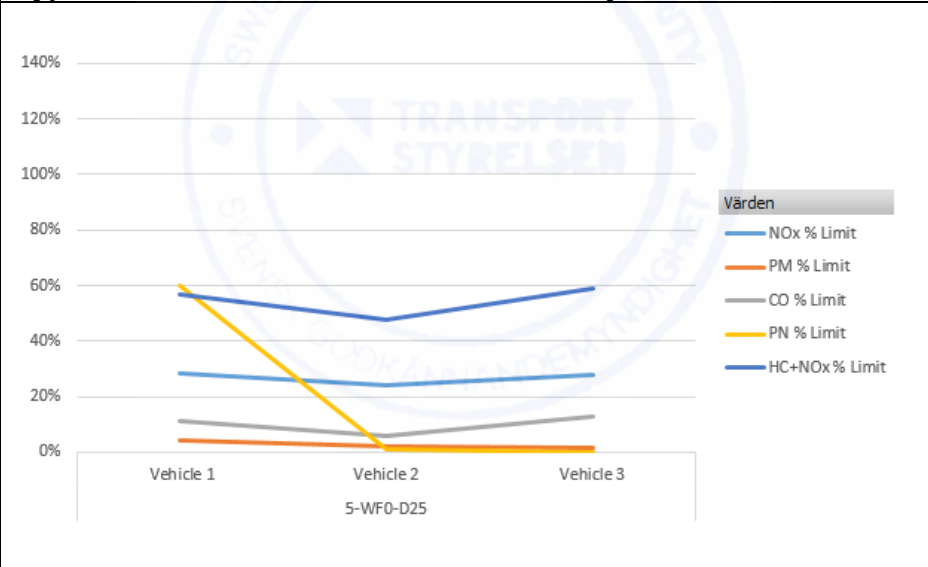
## Detailed Type 1 (WLTP) data from STA test (D) Ki included

ISC-family	STA ref	Emission Type Approval	CO (mg/km)	Limit CO (mg/km)	CO % of Limit	NOx (mg/km)	Limit NOx (mg/km)	NOx % of Limit	THC+NOx (mg/km)	Limit THC+NOx (mg/km)	THC+NOx % of Limit	PM (mg/km)	Limit PM (mg/km)	PM % of Limit	PN (#/km)	Limit PN (#/km)	PN % of Limit
11-WF0-D10-2	Vehicle 1	e5*715/2007*2018/1832DG*1069*02	55,7	500	11%	35,1	80	44%	40,0	170	24%	0,60	4,5	13%	5,0E+08	6E+11	0%
11-WF0-D10-2	Vehicle 2	e5*715/2007*2018/1832DG*1069*02	70,5	500	14%	44,9	80	56%	53,5	170	31%	0,21	4,5	5%	3,4E+09	6E+11	1%
11-WF0-D10-2	Vehicle 3	e5*715/2007*2018/1832DG*1069*02	74,0	500	15%	49,2	80	61%	55,1	170	32%	0,23	4,5	5%	9,0E+09	6E+11	1%
5-WF0-D25-0	Vehicle 1	e5*715/2007*2018/1832DG*0558*01	71,5	500	14%	37,6	80	47%	111,4	170	66%	0,24	4,5	5%	3,6E+11	6E+11	60%
5-WF0-D25-0	Vehicle 2	e5*715/2007*2018/1832DG*0558*01	44,4	500	9%	33,8	80	42%	95,8	170	56%	0,14	4,5	3%	5,6E+09	6E+11	1%
5-WF0-D25-0	Vehicle 3	e5*715/2007*2018/1832DG*0558*01	81,7	500	16%	37,0	80	46%	115,2	170	68%	0,12	4,5	3%	2,3E+08	6E+11	0%

Type 1 results 11-WF0-D10, Diesel, Direct Injection



Type 1 results 5-WF0-D25, Diesel, Direct Injection



**Annex I – Ford Werke GmbH, Final\_rev02 Report ISC-2021**

**Additive Ki**

ISC-family	CO (mg/km)	THC (mg/km)	NMHC (mg/km)	NOx (mg/km)	THC+NOx (mg/km)	PM (mg/km)	PN (mg/km)
11-WF0-D10-2	13,2882	0,4561		5,0511	5,5073	0,0482	
5-WF0-D25-0	16,3733	0,7532		14,6978	14,9685	0,0384	



**Annex II – Hyundai Assan Otomotiv San ve Tic. A.Ş, Final\_rev02 Report ISC-2021**

ISC year: 2021  
Manufacturer: Hyundai Assan Otomotiv San ve Tic. A.Ş.  
Report status: Final\_rev02  
Report number: ISC-2021-02  
Issue date: 2023-03-10



## Annex II – Hyundai Assan Otomotiv San ve Tic. A.Ş, Final\_rev02 Report ISC-2021

### Test overview for Hyundai Assan Otomotiv San ve Tic. A.Ş.

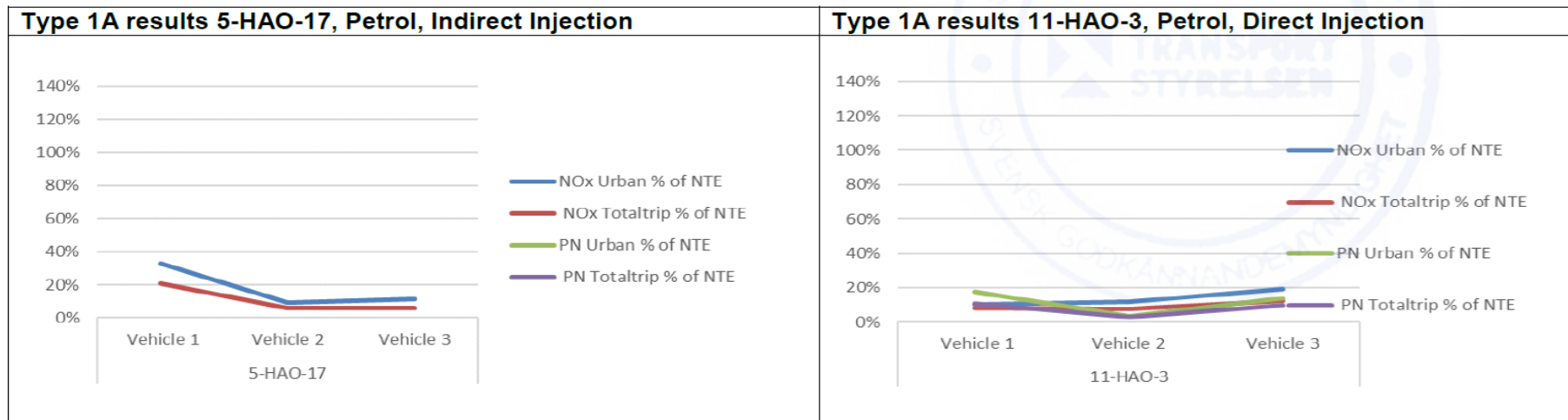
ISC Family	Manufacturer (Section B) 2020 / 2021	STA (Section D) ISC-2021	3 <sup>rd</sup> parties (Section C) 2021
11-HAO-1	<ul style="list-style-type: none"> <li>Qualified for ISC-2020/2021</li> <li>Testing completed 2021</li> <li>Statistical Folder: <b>PASS</b></li> <li>RDE test on a vehicle with approved results</li> </ul>		<ul style="list-style-type: none"> <li>1 vehicle tested, Type 1A</li> <li>Emisia in Greece</li> <li>Meets applicable regulations</li> <li>TSV 2021-4606</li> </ul>
11-HAO-2	<ul style="list-style-type: none"> <li>Qualified for ISC-2020</li> <li>Testing completed 2021</li> <li>Statistical Folder: <b>PASS</b></li> <li>RDE test on a vehicle with approved results</li> </ul>		
11-HAO-3	<ul style="list-style-type: none"> <li>Qualified for ISC-2020/2021</li> <li>Testing completed 2021</li> <li>Statistical Folder: <b>PASS</b></li> <li>RDE test on a vehicle with approved results</li> </ul>	<ul style="list-style-type: none"> <li>3 vehicles tested, Type 1+1A</li> <li>Tested at AVL in Sweden</li> <li>Meets the applicable regulation</li> <li>Statistical Folder <b>PASS</b></li> </ul>	
11-HAO-4	<ul style="list-style-type: none"> <li>Qualified for ISC-2020/2021</li> <li>Testing completed 2021</li> <li>Statistical Folder: <b>PASS</b></li> <li>RDE test on a vehicles with approved results</li> </ul>		
5-HAO-17	<ul style="list-style-type: none"> <li>Qualified for ISC-2021</li> <li>Completed before end of 2022</li> <li>Statistical Folder UND</li> </ul>	<ul style="list-style-type: none"> <li>3 vehicles tested, Type 1+1A</li> <li>Tested at AVL in Sweden</li> <li>Meets the applicable regulation</li> <li>Statistical Folder <b>PASS</b></li> </ul>	
5-HAO-18	<ul style="list-style-type: none"> <li>Qualified for ISC-2021</li> <li>Completed before end of 2022</li> <li>Statistical Folder UND</li> </ul>		

## Annex II – Hyundai Assan Otomotiv San ve Tic. A.Ş, Final\_rev02 Report ISC-2021

### Detailed Type 1A (RDE) data from STA test (D)

ISC-Family	STA ref	EmissionTypeApproval	Limit CO NTE (mg/km)	Limit NOx NTE (mg/km)	Limit PN NTE (#/km)	CO Totaltrip (mg/km)	NOx Totaltrip (mg/km)	NOx Totaltrip % of NTE	PN Totaltrip (#/km)	PN Totaltrip % of NTE	CO Urban (mg/km)	NOx Urban (mg/km)	NOx Urban % of NTE	PN Urban (#/km)	PN Urban % of NTE
5-HAO-17	Vehicle 1	e5*715/2007*2018/1832AP*0534*02	N/A	85,8	N/A	337,9	18,0	21%			653,0	28,3	33%		
5-HAO-17	Vehicle 2	e5*715/2007*2018/1832AP*0531*02	N/A	85,8	N/A	224,5	5,3	6%			112,7	8,0	9%		
5-HAO-17	Vehicle 3	e5*715/2007*2018/1832AP*0531*02	N/A	85,8	N/A	139,3	5,0	6%			301,8	9,9	11%		
11-HAO-3	Vehicle 1	e5*715/2007*2018/1832DG*1345*00	N/A	126,0	9,0E+11	54,8	10,3	8%	1,0E+11	11%	79,1	13,2	10%	1,6E+11	17%
11-HAO-3	Vehicle 2	e5*715/2007*2018/1832DG*1345*00	N/A	126,0	9,0E+11	98,3	9,4	7%	2,7E+10	3%	98,1	14,9	12%	3,3E+10	4%
11-HAO-3	Vehicle 3	e5*715/2007*2018/1832DG*1338*00	N/A	126,0	9,0E+11	1,3	15,5	12%	8,6E+10	10%	0,0	24,1	19%	1,2E+11	14%

For approvals with emission character AP in 5-HAO-17, Maximum Declared RDE values in COC (48.2) = Legislation limit

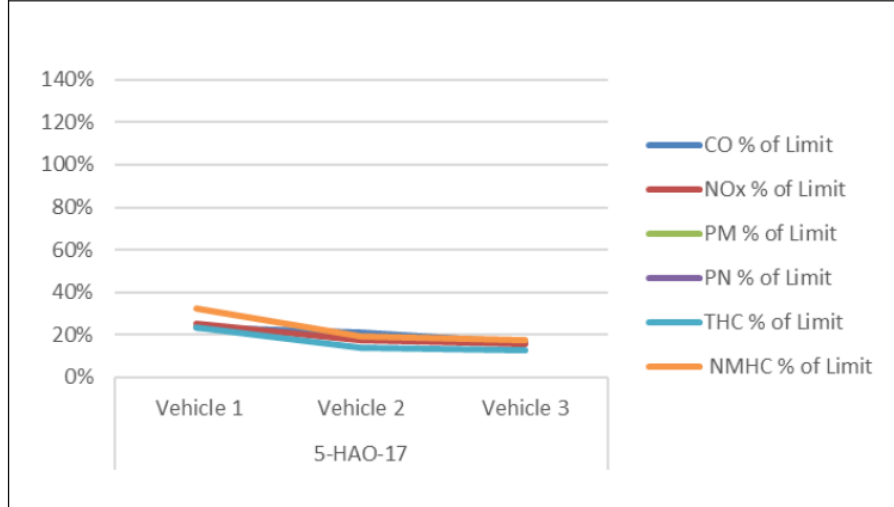


## Annex II – Hyundai Assan Otomotiv San ve Tic. A.Ş, Final\_rev02 Report ISC-2021

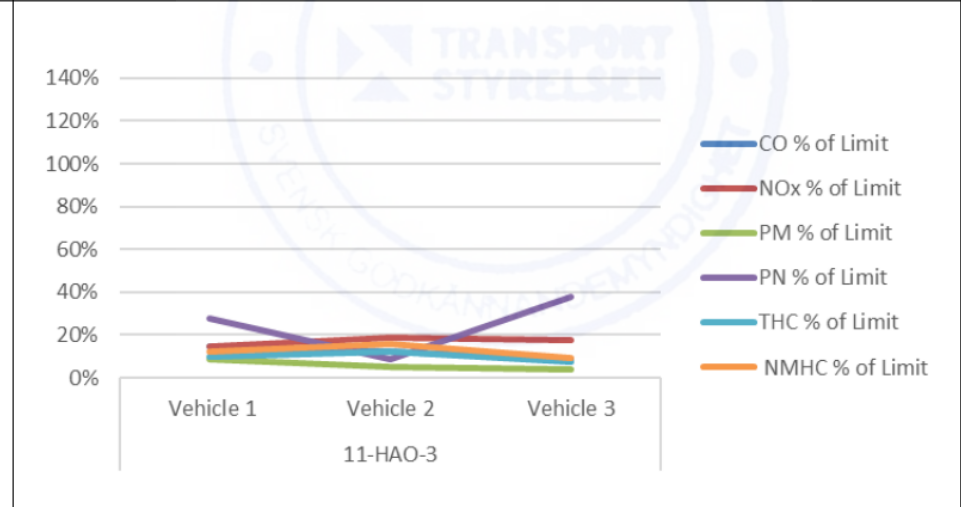
### Detailed Type 1 (WLTP) data from STA test (D)

ISC-family	STA ref	Emission Type Approval	CO (mg/km)	Limit CO (mg/km)	CO % of Limit	NOx (mg/km)	Limit NOx (mg/km)	NOx % of Limit	PM (mg/km)	Limit PM (mg/km)	PM % of Limit	PN (#/km)	Limit PN (#/km)	PN % of Limit
5-HAO-17	Vehicle 1	e5*715/2007*2018/1832AP*0534*02	232,4	1000	23%	15,1	60	25%		N/A			N/A	
5-HAO-17	Vehicle 2	e5*715/2007*2018/1832AP*0531*02	208,8	1000	21%	10,5	60	17%		N/A			N/A	
5-HAO-17	Vehicle 3	e5*715/2007*2018/1832AP*0531*02	165,2	1000	17%	9,3	60	16%		N/A			N/A	
11-HAO-3	Vehicle 1	e5*715/2007*2018/1832DG*1345*00	144,7	1000	14%	8,7	60	15%	0,38	4,5	8%	1,7E+11	6E+11	28%
11-HAO-3	Vehicle 2	e5*715/2007*2018/1832DG*1345*00	119,6	1000	12%	11,3	60	19%	0,22	4,5	5%	5,2E+10	6E+11	9%
11-HAO-3	Vehicle 3	e5*715/2007*2018/1832DG*1338*00	87,1	1000	9%	10,5	60	18%	0,17	4,5	4%	2,3E+11	6E+11	38%

Type 1 results 5-HAO-17, Petrol, Indirect Injection



Type 1 results 11-HAO-3, Petrol, Direct Injection





**Annex III – Hyundai Motor Manufacturing Czech s.r.o, Final\_rev02 Report ISC-2021**

ISC year: 2021  
Manufacturer: Hyundai Motor Manufacturing Czech s.r.o  
Report status: Final\_rev02  
Report number: ISC-2021-03  
Issue date: 2023-03-10



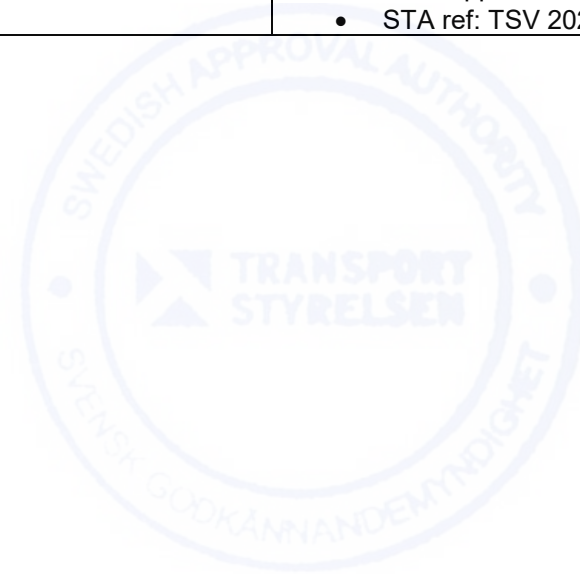
## Annex III – Hyundai Motor Manufacturing Czech s.r.o, Final\_rev02 Report ISC-2021

### Test overview on Hyundai Motor Manufacturing

ISC Family	Manufacturer (Section B) 2020 / 2021	STA (Section D) ISC-2021	3 <sup>rd</sup> parties (Section C) 2021
11-HMM-4	<ul style="list-style-type: none"> <li>Not qualified for ISC 2020/2021</li> </ul>		<ul style="list-style-type: none"> <li>1 vehicle tested, Type 1A</li> <li>Emisia in Greece</li> <li>Don't meet applicable regulations</li> <li>STA ref: TSV 2021-9836</li> </ul>
11-HMM-5	<ul style="list-style-type: none"> <li>Qualified for ISC-2020/2021</li> <li>Testing completed 2021</li> <li>Statistical folder <b>PASS</b></li> <li>RDE test on a vehicle with approved results</li> </ul>	<ul style="list-style-type: none"> <li>4 vehicles tested, Type 1+1A</li> <li>1 failed test, high NOx, Type 1+1A</li> <li>Tested by AVL in Sweden</li> <li>Statistical folder <b>PASS</b></li> </ul>	
11-HMM-6	<ul style="list-style-type: none"> <li>Qualified for ISC-2020</li> <li>Testing completed 2021</li> <li>Statistical folder <b>PASS</b></li> <li>RDE test on a vehicle with approved results</li> </ul>		
11-HMM-8	<ul style="list-style-type: none"> <li>Qualified for ISC-2020/2021</li> <li>Testing completed 2021</li> <li>Statistical folder <b>PASS</b></li> <li>RDE test on a vehicle with approved results</li> </ul>	<ul style="list-style-type: none"> <li>4 vehicles tested, Type 1+1A</li> <li>1 failed test, high NOx, Type 1A urban part</li> <li>Tested by AVL in Sweden</li> <li>Statistical folder <b>PASS</b></li> </ul>	
11-HMM-10	<ul style="list-style-type: none"> <li>Qualified for ISC-2020</li> <li>Testing completed 2021</li> <li>Statistical Folder <b>PASS</b></li> </ul>		
11-HMM-11	<ul style="list-style-type: none"> <li>Qualified for ISC-2020</li> <li>Testing completed 2021</li> <li>Statistical Folder <b>PASS</b></li> </ul>		
11-HMM-12	<ul style="list-style-type: none"> <li>Qualified for ISC-2020</li> <li>Testing completed 2023</li> <li>Statistical Folder <b>PASS</b></li> </ul>		
11-HMM-14	<ul style="list-style-type: none"> <li>Qualified for ISC-2020</li> <li>Testing completed 2023</li> <li>Statistical Folder <b>PASS</b></li> </ul>		

### Annex III – Hyundai Motor Manufacturing Czech s.r.o, Final\_rev02 Report ISC-2021

11-HMM-15	<ul style="list-style-type: none"> <li>• Qualified for ISC-2020/2021</li> <li>• Testing completed 2023</li> <li>• Statistical Folder <b>PASS</b></li> </ul>		
11-HMM-16	<ul style="list-style-type: none"> <li>• Not qualified for ISC 2020/2021</li> </ul>		<ul style="list-style-type: none"> <li>• 1 vehicle tested, RDE</li> <li>• DTI in Denmark</li> <li>• Meet applicable regulations</li> <li>• STA ref: TSV 2021-3868</li> </ul>
5-HMM-2	<ul style="list-style-type: none"> <li>• Not qualified for ISC 2020/2021</li> </ul>		<ul style="list-style-type: none"> <li>• 1 vehicle tested, RDE</li> <li>• Emisia in Greece</li> <li>• Meet applicable regulations</li> <li>• STA ref: TSV 2021-9829</li> </ul>
5-HMM-18	<ul style="list-style-type: none"> <li>• Not qualified for ISC 2020/2021</li> </ul>		<ul style="list-style-type: none"> <li>• 1 vehicle tested, RDE</li> <li>• Emisia in Greece</li> <li>• Meet applicable regulations</li> <li>• STA ref: TSV 2021-9839</li> </ul>

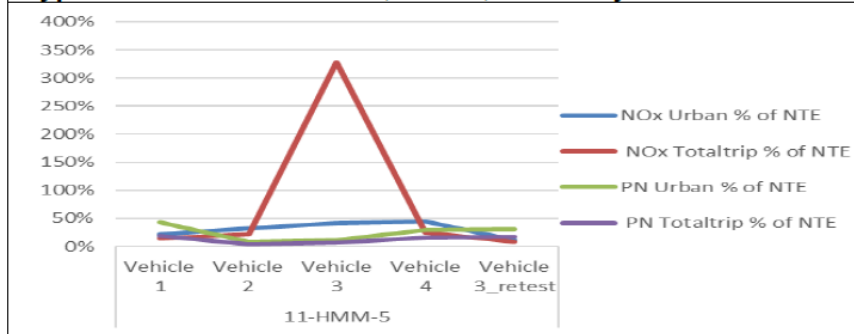


# Annex III – Hyundai Motor Manufacturing Czech s.r.o, Final\_rev02 Report ISC-2021

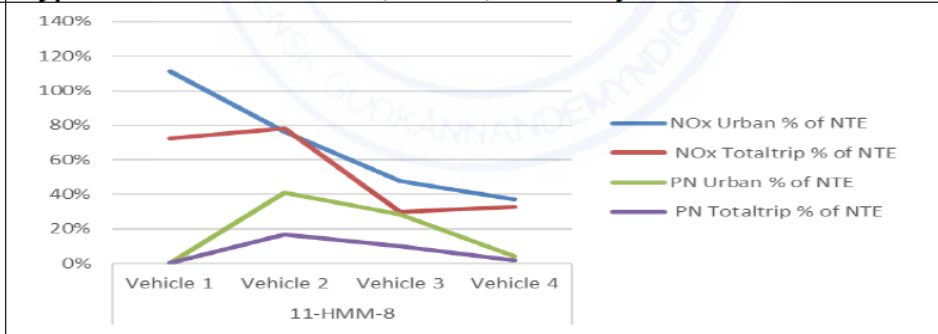
## Detailed Type 1A (RDE) data from STA test (D), Ki included

ISC-Family	STA ref	EmissionTypeApproval	Limit CO NTE (mg/km)	Limit NOx NTE (mg/km)	Limit PN NTE (#/km)	CO Totaltrip (mg/km)	NOx Totaltrip (mg/km)	NOx Totaltrip % of NTE	PN Totaltrip (#/km)	PN Totaltrip % of NTE	CO Urban (mg/km)	NOx Urban (mg/km)	NOx Urban % of NTE	PN Urban (#/km)	PN Urban % of NTE
11-HMM-5	Vehicle 1	e5*715/2007*2018/1832DG*1248*01	N/A	126,0	9,0E+11	2575,5	17,7	14%	1,6E+11	18%	3210,7	28,4	23%	3,9E+11	43%
11-HMM-5	Vehicle 2	e5*715/2007*2018/1832DG*1248*01	N/A	126,0	9,0E+11	379,6	27,3	22%	3,9E+10	4%	163,5	41,1	33%	7,2E+10	8%
11-HMM-5	Vehicle 3	e5*715/2007*2018/1832DG*1248*01	N/A	126,0	9,0E+11	110,1	414,3	<b>329%</b>	5,7E+10	6%	69,4	52,9	42%	1,0E+11	11%
11-HMM-5	Vehicle 3_retest	e5*715/2007*2018/1832DG*1248*01	N/A	126,0	9,0E+11	1628,4	11,3	9%	1,5E+11	17%	2029,6	14,1	11%	2,8E+11	31%
11-HMM-5	Vehicle 4	e5*715/2007*2018/1832DG*1248*01	N/A	126,0	9,0E+11	1003,8	32,2	26%	1,4E+11	16%	1317,1	56,6	45%	2,6E+11	29%
11-HMM-8	Vehicle 1	e5*715/2007*2018/1832DG*1254*01	N/A	168,0	9,0E+11	95,3	121,6	72%	3,1E+09	0%	202,9	187,0	<b>111%</b>	4,2E+09	0%
11-HMM-8	Vehicle 2	e5*715/2007*2018/1832DG*1255*01	N/A	168,0	9,0E+11	0,4	131,7	78%	1,5E+11	17%	0,0	128,4	76%	3,7E+11	41%
11-HMM-8	Vehicle 3	e5*715/2007*2018/1832DG*1253*02	N/A	168,0	9,0E+11	95,4	50,2	30%	8,9E+10	10%	238,1	80,4	48%	2,6E+11	28%
11-HMM-8	Vehicle 4	e5*715/2007*2018/1832DG*1255*01	N/A	168,0	9,0E+11	39,4	54,5	32%	1,6E+10	2%	89,9	62,2	37%	3,7E+10	4%

Type 1A results 11-HMM-5, Petrol, Direct Injection



Type 1A results 11-HMM-8, Diesel, Direct Injection

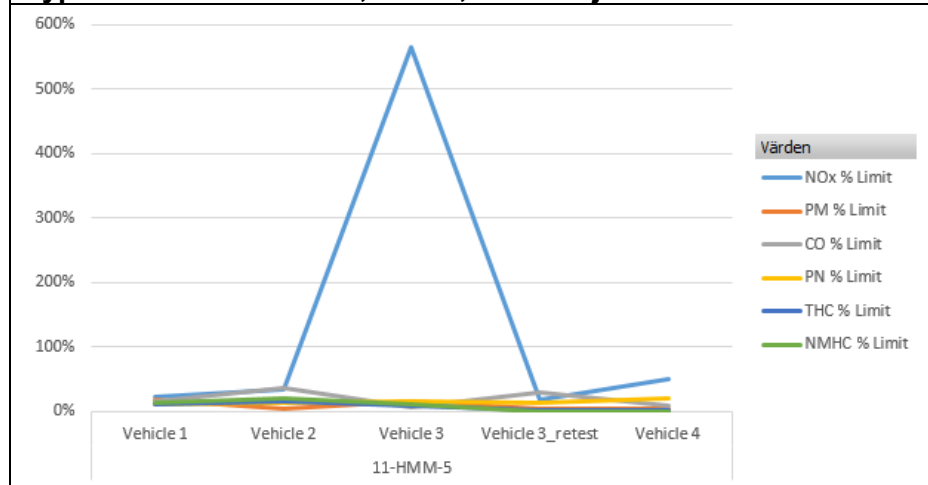


# Annex III – Hyundai Motor Manufacturing Czech s.r.o, Final\_rev02 Report ISC-2021

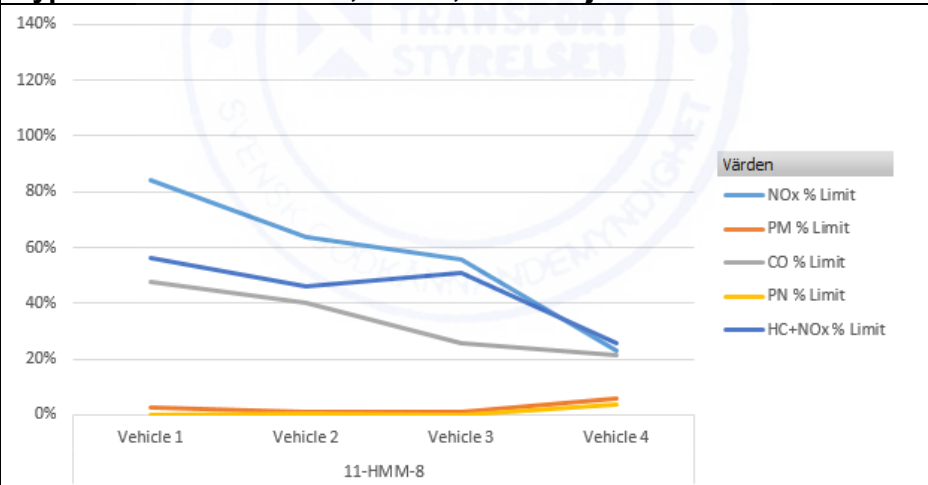
## Detailed Type 1 (WLTP) data from STA test (D), Ki included

ISC-family	STA ref	Emission Type Approval	CO (mg/km)	Limit CO (mg/km)	CO % of Limit	THC (mg/km)	Limit THC (mg/km)	THC % of Limit	NMHC (mg/km)	Limit NMHC (mg/km)	NMHC % of Limit	NOx (mg/km)	Limit NOx (mg/km)	NOx % of Limit	THC+NOx (mg/km)	Limit THC+NOx (mg/km)	THC+NOx % of Limit	PM (mg/km)	Limit PM (mg/km)	PM % of Limit	PN (#/km)	Limit PN (#/km)	PN % of Limit
11-HMM-5	Vehicle1	e5*715/2007*2018/1832DG*1248*01	154,6	1000	15%	10,3	100	10%	9,3	68	14%	13,8	60	23%				0,84	4,5	19%	6,2E+10	6E+11	10%
11-HMM-5	Vehicle2	e5*715/2007*2018/1832DG*1248*01	366,1	1000	37%	15,6	100	16%	14,2	68	21%	20,6	60	34%				0,20	4,5	4%	8,3E+10	6E+11	14%
11-HMM-5	Vehicle3	e5*715/2007*2018/1832DG*1248*01	77,0	1000	8%	9,4	100	9%	8,5	68	12%	338,6	60	564%				0,70	4,5	15%	8,9E+10	6E+11	15%
11-HMM-5	Vehicle3_retest	e5*715/2007*2018/1832DG*1248*01	286,0	1000	29%	1,1	100	1%	0,0	68	0%	11,6	60	19%				0,2	4,5	5%	8,8E+10	6E+11	15%
11-HMM-5	Vehicle4	e5*715/2007*2018/1832DG*1248*01	93,2	1000	9%	1,0	100	1%	0,0	68	0%	29,7	60	50%				0,20	4,5	4%	1,2E+11	6E+11	20%
11-HMM-8	Vehicle1	e5*715/2007*2018/1832DG*1254*01	238,7	500	48%							68,8	80	86%	95,8	170,0	56,4%	0,20	4,5	4%	6,4E+08	6E+11	0%
11-HMM-8	Vehicle2	e5*715/2007*2018/1832DG*1255*01	201,3	500	40%							52,6	80	66%	78,4	170,0	46,1%	0,13	4,5	3%	1,6E+09	6E+11	0%
11-HMM-8	Vehicle3	e5*715/2007*2018/1832DG*1253*02	130,2	500	26%							46,0	80	58%	86,4	170,0	50,8%	0,13	4,5	3%	1,1E+09	6E+11	0%
11-HMM-8	Vehicle4	e5*715/2007*2018/1832DG*1255*01	108,7	500	22%							19,9	80	25%	44,1	170,0	25,9%	0,35	4,5	8%	2,2E+10	6E+11	4%

Type1 results 11-HMM-5, Petrol, Direct Injection



Type1 results 11-HMM-8, Diesel, Direct Injection



**Annex III – Hyundai Motor Manufacturing Czech s.r.o, Final\_rev02 Report ISC-2021**

**Additiv Ki**

ISC-family	CO (mg/km)	THC (mg/km)	NMHC (mg/km)	NOx (mg/km)	THC+NOx (mg/km)	PM (mg/km)	PN (mg/km)
11-HMM-8	0,4269	3,0922		1,4608		0,0856	



**Annex IV – Jaguar Land Rover Limited, Final\_rev02 Report ISC-2021**

ISC year: 2021  
Manufacturer: Jaguar Land Rover Limited  
Report status: Final\_rev02  
Report number: ISC-2021-04  
Issue date: 2023-03-10



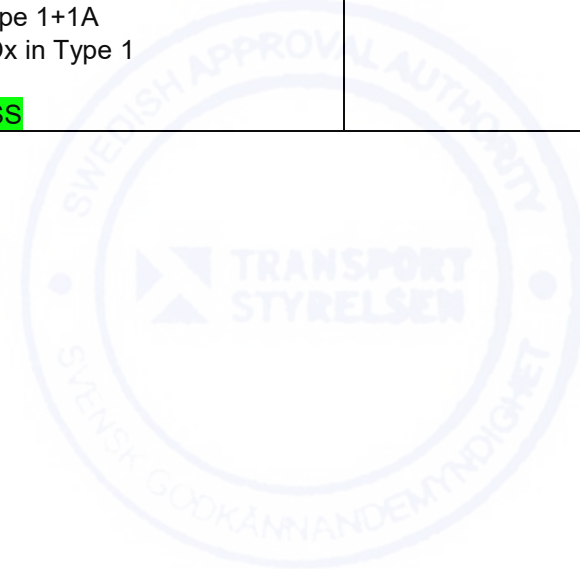


## Annex IV – Jaguar Land Rover Limited, Final\_rev02 Report ISC-2021

Jaguar Land Rover Limited is according to STA interpretation not qualified to ISC testing because sales for the previous year is less than 5000 vehicles. Nevertheless STA has chosen to test Jaguar Land Rover Limited according to Annex II, Part B, of Regulation (EU) 2017/1151, as amended by 2018/1832, §4. “Granting type approval authority may randomly choose ISC families to test”.

### Test overview on Jaguar Land Rover Limited

ISC Family	Manufacturer (Section B) 2020 / 2021	STA (Section D) ISC-2021	3 <sup>rd</sup> parties (Section C) 2021
11-SAJ-001	<ul style="list-style-type: none"> <li>Qualified for ISC-2020</li> <li>Testing completed 2020</li> <li>Statistical folder <b>PASS</b></li> </ul>	<ul style="list-style-type: none"> <li>4 vehicles tested, Type 1+1A</li> <li>1 failed test, high PN in Type 1A</li> <li>Extra vehicle tested</li> <li>Statistical folder <b>PASS</b></li> </ul>	
11-SAL-005	<ul style="list-style-type: none"> <li>Not qualified for ISC-2020/2021</li> </ul>	<ul style="list-style-type: none"> <li>4 vehicles tested, Type 1+1A</li> <li>1 failed test, high NOx in Type 1</li> <li>Extra vehicle tested</li> <li>Statistical folder <b>PASS</b></li> </ul>	

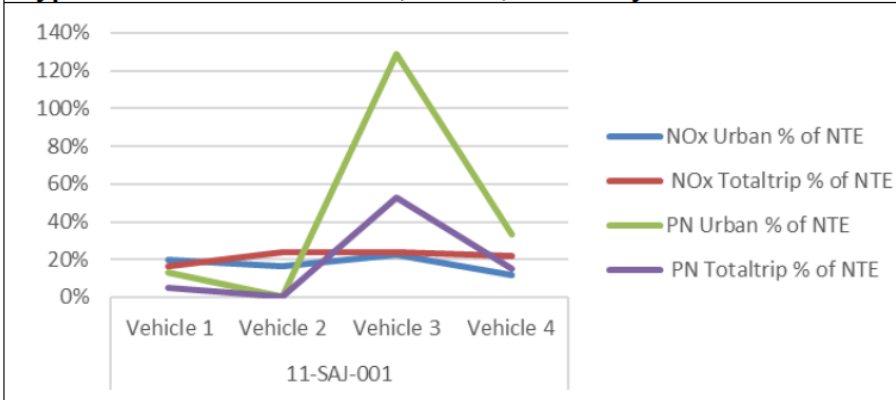


# Annex IV – Jaguar Land Rover Limited, Final\_rev02 Report ISC-2021

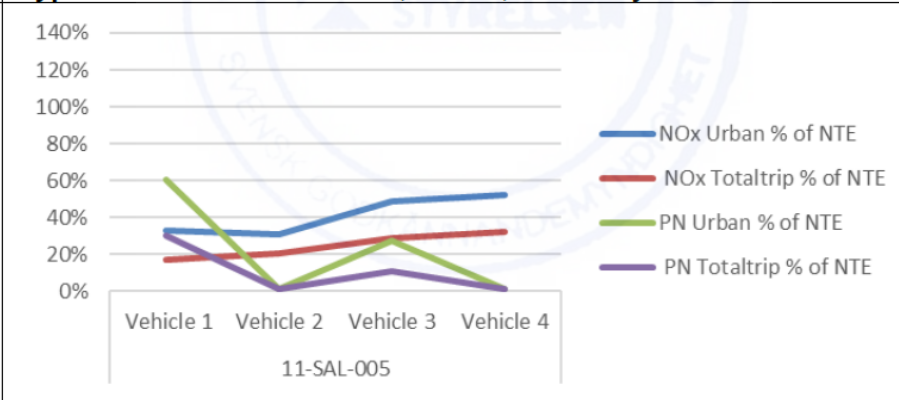
## Detailed Type 1A (RDE) data from STA test (D), Ki included

ISC-Family	STA ref	EmissionTypeApproval	Limit CO NTE (mg/km)	Limit NOx NTE (mg/km)	Limit PN NTE (#/km)	CO Totaltrip (mg/km)	NOx Totaltrip (mg/km)	NOx Totaltrip % of NTE	PN Totaltrip (#/km)	PN Totaltrip % of NTE	CO Urban (mg/km)	NOx Urban (mg/km)	NOx Urban % of NTE	PN Urban (#/km)	PN Urban % of NTE
11-SAJ-001	Vehicle 1	e5*715/2007*2018/1832DG*0225*00*Corr01	N/A	168,0	9,0E+11	52,4	27,7	17%	4,4E+10	5%	51,1	32,9	20%	1,2E+11	13%
11-SAJ-001	Vehicle 2	e5*715/2007*2018/1832DG*1202*00	N/A	168,0	9,0E+11	20,1	40,1	24%	5,7E+09	1%	48,4	27,2	16%	5,6E+09	1%
11-SAJ-001	Vehicle 3	e5*715/2007*2018/1832DG*1202*00	N/A	168,0	9,0E+11	40,4	40,0	24%	4,8E+11	53%	100,0	38,1	23%	1,2E+12	<b>129%</b>
11-SAJ-001	Vehicle 4	e5*715/2007*2018/1832DG*1202*00	N/A	168,0	9,0E+11	30,0	36,1	22%	1,4E+11	15%	29,8	20,0	12%	3,0E+11	33%
11-SAL-005	Vehicle 1	e5*715/2007*2018/1832DG*0528*00 Corr01	N/A	168,0	9,0E+11	27,2	29,0	17%	2,8E+11	31%	55,6	55,0	33%	5,5E+11	61%
11-SAL-005	Vehicle 2	e5*715/2007*2018/1832DG*0528*00 Corr01	N/A	168,0	9,0E+11	70,7	34,7	21%	1,4E+10	2%	100,3	51,9	31%	1,3E+10	1%
11-SAL-005	Vehicle 3	e5*715/2007*2018/1832DG*0528*00 Corr01	N/A	168,0	9,0E+11	45,3	48,7	29%	9,7E+10	11%	80,3	81,5	49%	2,5E+11	28%
11-SAL-005	Vehicle 4	e5*715/2007*2018/1832DG*0528*00 Corr01	N/A	168,0	9,0E+11	71,8	54,6	33%	9,5E+09	1%	113,8	88,0	52%	1,1E+10	1%

**Type 1A results 11-SAJ-001, Diesel, Direct Injection**



**Type 1A results 11-SAL-005, Diesel, Direct Injection**

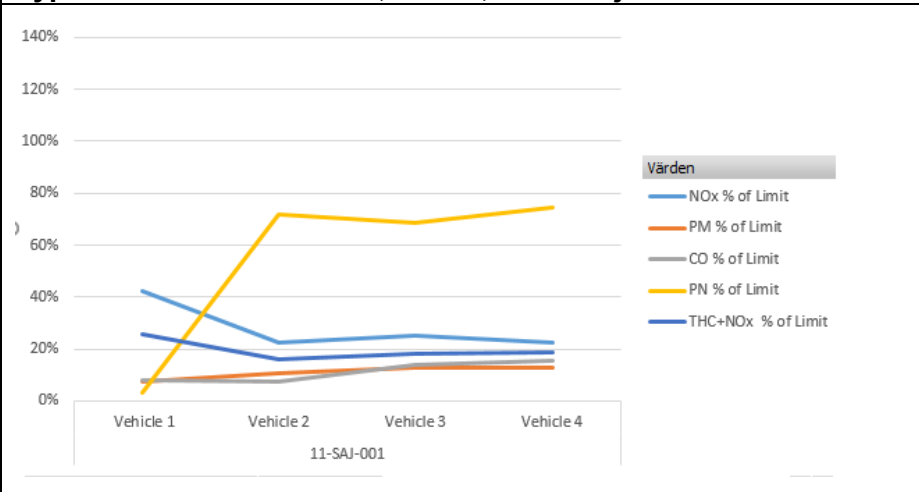


# Annex IV – Jaguar Land Rover Limited, Final\_rev02 Report ISC-2021

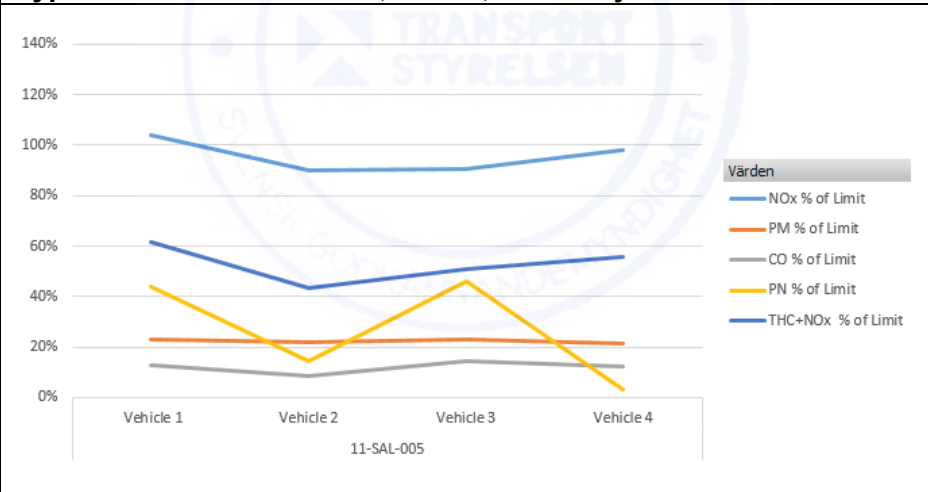
## Detailed Type 1 (WLTP) data from STA test (D), Ki included

ISC-family	STA ref	Emission Type Approval	CO (mg/km)	Limit CO (mg/km)	CO % of Limit	NOx (mg/km)	Limit NOx (mg/km)	NOx % of Limit	THC+NOx (mg/km)	Limit THC+NOx (mg/km)	THC+NOx % of Limit	PM (mg/km)	Limit PM (mg/km)	PM % of Limit	PN (#/km)	Limit PN (#/km)	PN % of Limit
11-SAJ-001	Vehicle 1	e5*715/2007*2018/1832DG*0225*00*Corr01	41,2	500	8%	33,8	80	42%	44,0	170	26%	0,3	4,5	7%	1,9E+10	6E+11	3%
11-SAJ-001	Vehicle 2	e5*715/2007*2018/1832DG*1202*00	37,7	500	8%	18,0	80	22%	27,2	170	16%	0,5	4,5	11%	4,3E+11	6E+11	72%
11-SAJ-001	Vehicle 3	e5*715/2007*2018/1832DG*1202*00	70,3	500	14%	20,0	80	25%	30,9	170	18%	0,6	4,5	13%	4,1E+11	6E+11	69%
11-SAJ-001	Vehicle 4	e5*715/2007*2018/1832DG*1202*00	77,9	500	16%	18,0	80	23%	31,4	170	18%	0,6	4,5	13%	4,5E+11	6E+11	74%
11-SAL-005	Vehicle 1	e5*715/2007*2018/1832DG*0528*00 Corr01	64,7	500	13%	83,2	80	104%	104,8	170	62%	1,0	4,5	23%	2,6E+11	6E+11	44%
11-SAL-005	Vehicle 2	e5*715/2007*2018/1832DG*0528*00 Corr01	41,8	500	8%	72,0	80	90%	73,8	170	43%	1,0	4,5	22%	8,7E+10	6E+11	15%
11-SAL-005	Vehicle 3	e5*715/2007*2018/1832DG*0528*00 Corr01	71,9	500	14%	72,4	80	91%	86,2	170	51%	1,0	4,5	23%	2,8E+11	6E+11	46%
11-SAL-005	Vehicle 4	e5*715/2007*2018/1832DG*0528*00 Corr01	61,5	500	12%	78,3	80	98%	95,1	170	56%	1,0	4,5	21%	1,8E+10	6E+11	3%

Type 1 results 11-SAJ-001, Diesel, Direct Injection



Type 1 results 11-SAL-005, Diesel, Direct Injection



# Annex IV – Jaguar Land Rover Limited, Final\_rev02 Report ISC-2021

## Additive Ki

ISC-family	CO (mg/km)	THC (mg/km)	NMHC (mg/km)	NOx (mg/km)	THC+NOx (mg/km)	PM (mg/km)	PN (mg/km)
11-SAJ-001	26,2401	4,2231		0,4951	4,7182	0,0785	
11-SAL-005	6,2597	1,8219		9,8681	11,69	0,5477	



**Annex V – Kia Motor Corporation, Final\_rev02 Report ISC-2021**

ISC year: 2021  
Manufacturer: Kia Motor Corporation  
Report status: Final\_rev02  
Report number: ISC-2021-05  
Issue date: 2023-03-10



## Annex V – Kia Motor Corporation, Final\_rev02 Report ISC-2021

### Test overview on Kia Motor Corporation

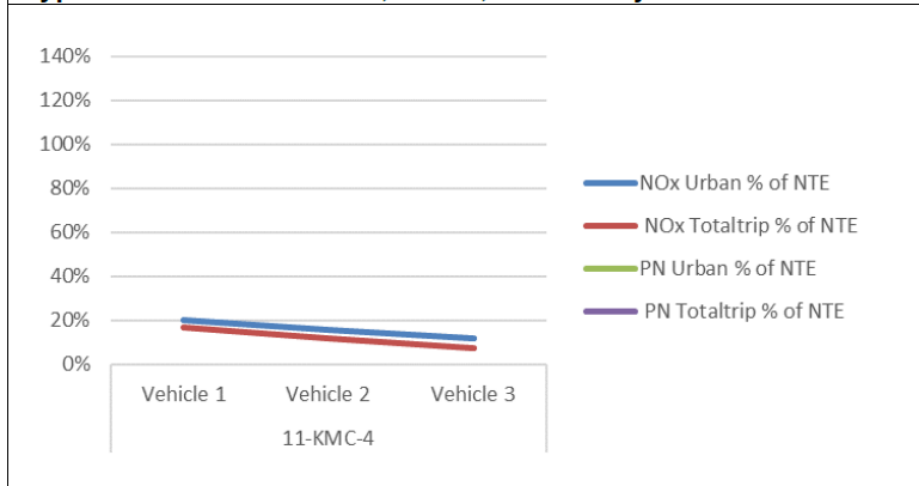
ISC Family	Manufacturer (Section B) 2020 / 2021	STA (Section D) ISC-2021	3 <sup>rd</sup> parties (Section C) 2021
11-KMC-4	<ul style="list-style-type: none"> <li>• Qualified for ISC-2021</li> <li>• Completed before end of 2022</li> <li>• Statistical Folder UND</li> </ul>	<ul style="list-style-type: none"> <li>• 3 vehicles tested, Type 1+1A</li> <li>• Tested by AVL in Sweden</li> <li>• Statistical folder <b>PASS</b></li> </ul>	
11-KMC-5	<ul style="list-style-type: none"> <li>• Qualified for ISC-2021</li> <li>• Completed before end of 2022</li> <li>• Statistical Folder UND</li> </ul>		
11-KMC-7	<ul style="list-style-type: none"> <li>• Qualified for ISC-2020/2021</li> <li>• Statistical Folder <b>PASS</b></li> </ul>		
11-KMC-8	<ul style="list-style-type: none"> <li>• Qualified for ISC-2020/2021</li> <li>• Statistical Folder <b>PASS</b></li> </ul>	<ul style="list-style-type: none"> <li>• 3 vehicles tested, Type 1+1A</li> <li>• Tested by AVL in Sweden</li> <li>• Statistical folder <b>PASS</b></li> </ul>	<ul style="list-style-type: none"> <li>• 1 vehicle tested Type 1A</li> <li>• Tested by Emisia in Greece</li> <li>• Meet applicable regulations</li> <li>• STA ref: TSV 2021-4387</li> </ul>
5-KMC-14	<ul style="list-style-type: none"> <li>• Qualified for ISC-2021</li> <li>• Completed before end of 2022</li> <li>• Statistical Folder UND</li> </ul>		

# Annex V – Kia Motor Corporation, Final\_rev02 Report ISC-2021

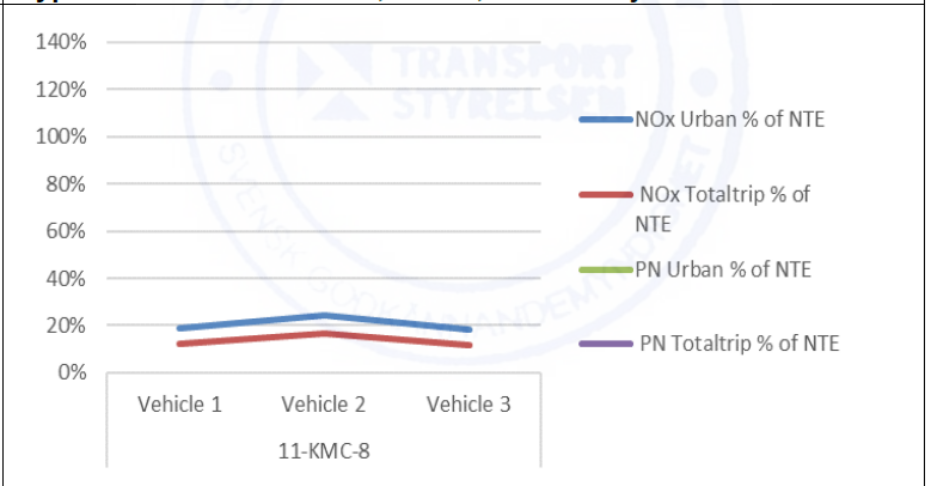
## Detailed Type 1A (RDE) data from STA test (D)

ISC-Family	STA ref	EmissionTypeApproval	Limit CO NTE (mg/km)	Limit NOx NTE (mg/km)	Limit PN NTE (#/km)	CO Totaltrip (mg/km)	NOx Totaltrip (mg/km)	NOx Totaltrip % of NTE	PN Totaltrip (#/km)	PN Totaltrip % of NTE	CO Urban (mg/km)	NOx Urban (mg/km)	NOx Urban % of NTE	PN Urban (#/km)	PN Urban % of NTE
11-KMC-4	Vehicle 1	e5*715/2007*2018/1832DG*1278*00	N/A	126,0	N/A	3088,6	20,8	17%			523,0	25,6	20%		
11-KMC-4	Vehicle 2	e5*715/2007*2018/1832DG*1280*00	N/A	126,0	N/A	390,2	15,0	12%			364,8	19,9	16%		
11-KMC-4	Vehicle 3	e5*715/2007*2018/1832DG*1280*00	N/A	126,0	N/A	120,6	9,6	8%			141,9	14,6	12%		
11-KMC-8	Vehicle 1	e5*715/2007*2018/1832DG*1264*00	N/A	126,0	N/A	1306,3	15,4	12%			1609,5	24,0	19%		
11-KMC-8	Vehicle 2	e5*715/2007*2018/1832DG*1264*00	N/A	126,0	N/A	492,5	21,1	17%			673,6	30,8	24%		
11-KMC-8	Vehicle 3	e5*715/2007*2018/1832DG*1264*00	N/A	126,0	N/A	308,2	14,6	12%			305,6	23,4	19%		

**Type 1A results 11-KMC-4, Petrol, Indirect injection**



**Type 1A results 11-KMC-8, Petrol, Indirect Injection**



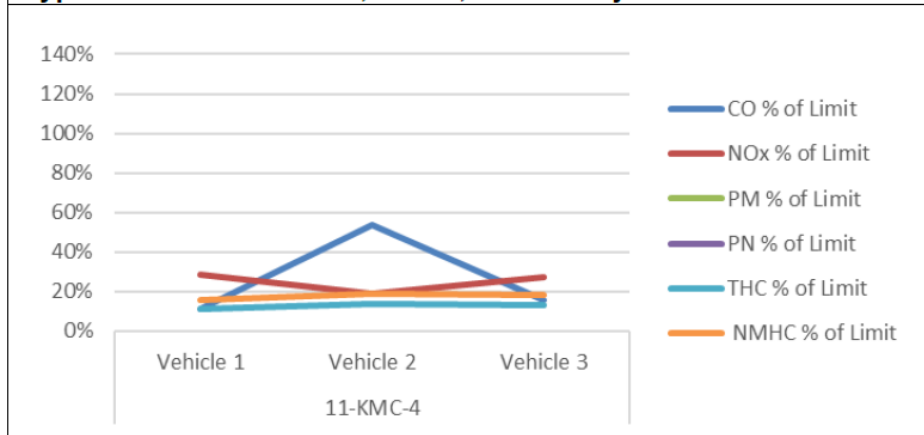


# Annex V – Kia Motor Corporation, Final\_rev02 Report ISC-2021

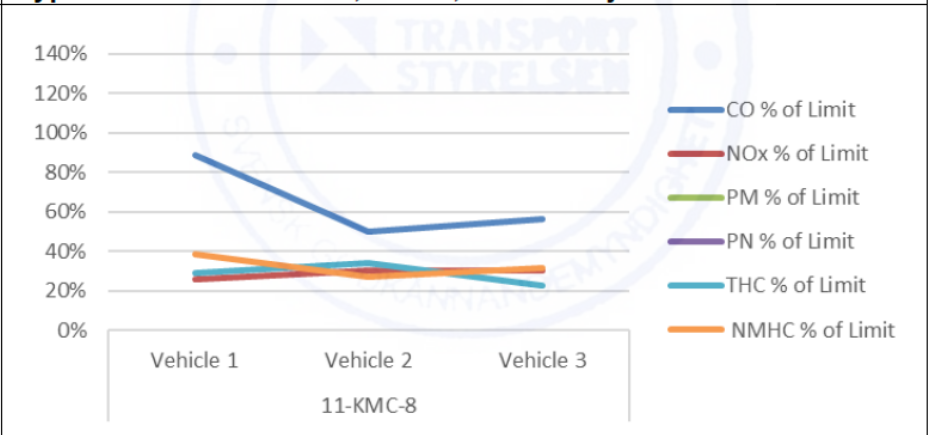
## Detailed Type 1 (WLTP) data from STA test (D)

STA ref	Emission Type Approval	CO (mg/km)	Limit CO (mg/km)	CO % of Limit	THC (mg/km)	Limit THC (mg/km)	THC % of Limit	NMHC (mg/km)	Limit NMHC (mg/km)	NMHC % of Limit	NOx (mg/km)	Limit NOx (mg/km)	NOx % of Limit	PM (mg/km)	Limit PM (mg/km)	PM % of Limit	PN (#/km)	Limit PN (#/km)	PN % of Limit
Vehicle 1	e5*715/2007*2018/1832DG*1278*00	110,5	1000	11%	11,2	100	11%	10,5	68	16%	17,1	60	28%		N/A			N/A	
Vehicle 2	e5*715/2007*2018/1832DG*1280*00	534,6	1000	53%	13,7	100	14%	12,7	68	19%	11,2	60	19%		N/A			N/A	
Vehicle 3	e5*715/2007*2018/1832DG*1280*00	157,0	1000	16%	13,1	100	13%	12,3	68	18%	16,4	60	27%		N/A			N/A	
Vehicle 1	e5*715/2007*2018/1832DG*1264*00	883,9	1000	88%	28,7	100	29%	26,3	68	39%	15,3	60	26%		N/A			N/A	
Vehicle 2	e5*715/2007*2018/1832DG*1264*00	496,5	1000	50%	33,8	100	34%	18,2	68	27%	18,2	60	30%		N/A			N/A	
Vehicle 3	e5*715/2007*2018/1832DG*1264*00	565,3	1000	57%	22,5	100	22%	21,2	68	31%	18,0	60	30%		N/A			N/A	

Type 1 results 11-KMC-4, Petrol, Indirect injection



Type 1 results 11-KMC-8, Petrol, Indirect Injection



**Annex VI – Kia Motors Slovakia s.r.o, Final\_rev02 Report ISC-2021**

ISC year: 2021  
Manufacturer: Kia Motors Slovakia s.r.o  
Report status: Final\_rev02  
Report number: ISC-2021-06  
Issue date: 2023-03-10



## Annex VI – Kia Motors Slovakia s.r.o, Final\_rev02 Report ISC-2021

### Test overview on Kia Motors Slovakia s.r.o

ISC Family	Manufacturer (Section B) 2020 / 2021	STA (Section D) ISC-2021	3 <sup>rd</sup> parties (Section C) 2021
11-HMM-5	<ul style="list-style-type: none"> <li>Qualified for ISC-2020/2021</li> <li>Statistical Folder: <b>PASS</b></li> <li>1 vehicle tested, RDE</li> </ul>	<ul style="list-style-type: none"> <li>Selected for ISC-2021</li> <li>No vehicles found for test</li> <li>Statistical Folder UND</li> </ul>	
11-HMM-6	<ul style="list-style-type: none"> <li>Qualified for ISC-2020/2021</li> <li>Statistical Folder: <b>PASS</b></li> <li>1 vehicle tested, RDE</li> </ul>		<ul style="list-style-type: none"> <li>1 vehicle tested Type 1+1A</li> <li>Tested by JRC in Italy</li> <li>TSV 2021-3007</li> <li>Meets applicable regulations</li> </ul>
			<ul style="list-style-type: none"> <li>1 vehicle tested Type 1A</li> <li>Tested by Emisia in Greece</li> <li>TSV 2021-7042</li> <li>Meets applicable regulations</li> </ul>
11-HMM-8	<ul style="list-style-type: none"> <li>Qualified for ISC-2020/2021</li> <li>Statistical Folder: <b>PASS</b></li> <li>1 vehicle tested, RDE</li> </ul>		
11-HMM-15	<ul style="list-style-type: none"> <li>Qualified for ISC-2020/2021</li> <li>To be completed before end of 2021</li> <li>Statistical Folder UND</li> </ul>	<ul style="list-style-type: none"> <li>Selected for ISC-2021</li> <li>No vehicles found for test</li> <li>Statistical Folder UND</li> </ul>	<ul style="list-style-type: none"> <li>1 vehicle tested Type 1A</li> <li>Tested by Emisia in Greece</li> <li>Don't meet applicable regulations</li> <li>TSV 2021-3005</li> </ul>

## **Annex VI – Kia Motors Slovakia s.r.o, Final\_rev02 Report ISC-2021**

### **Detailed Type 1A (RDE) data from STA test (D)**

No tests performed.

### **Detailed Type 1 (WLTP) data from STA test (D)**

No tests performed.



**Annex VII – Volvo Cars Corporation, Final\_rev02 Report ISC-2021**

ISC year: 2021  
Manufacturer: Volvo Cars Corporation  
Report status: Final\_rev02  
Report number: ISC-2021-07  
Issue date: 2023-03-10



## Annex VII – Volvo Cars Corporation, Final\_rev02 Report ISC-2021

### Test overview on Volvo Cars Corporation

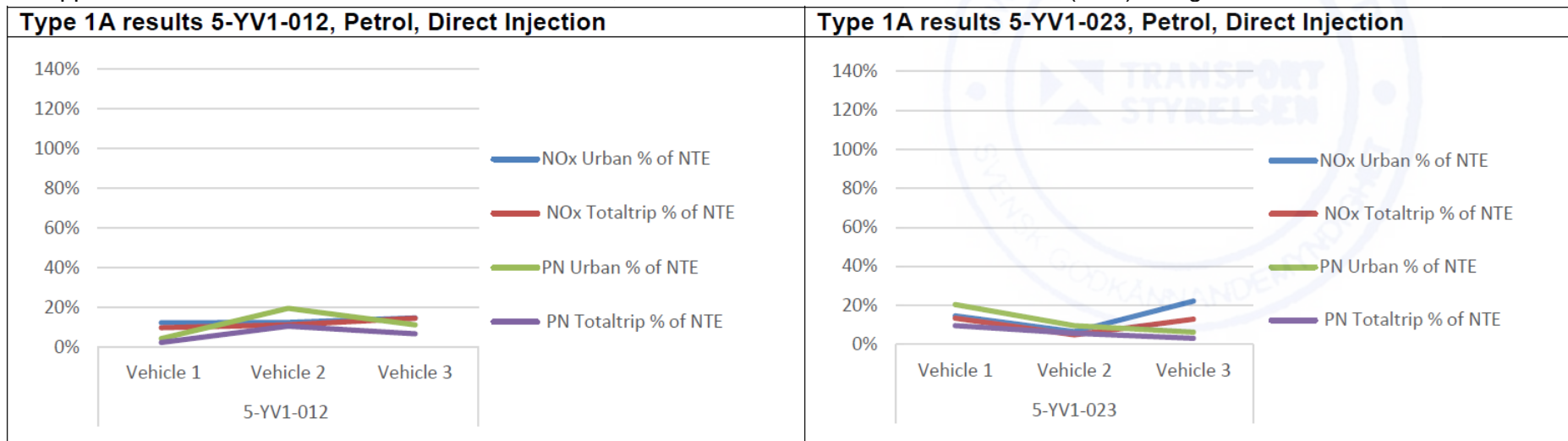
ISC Family	Manufacturer (Section B) 2020 / 2021	STA (Section D) ISC-2021	3 <sup>rd</sup> parties (Section C) 2021
5-YV1-012	<ul style="list-style-type: none"> <li>Qualified for ISC-2020/2021</li> <li>Statistical folder <b>PASS</b></li> </ul>	<ul style="list-style-type: none"> <li>3 vehicle tested, Type 1+1A</li> <li>Tested by AVL Sweden</li> <li>Statistical folder <b>PASS</b></li> </ul>	
5-YV1-016	<ul style="list-style-type: none"> <li>Qualified for ISC-2020/2021</li> <li>Statistical folder <b>PASS</b></li> </ul>		
5-YV1-020	<ul style="list-style-type: none"> <li>Qualified for ISC 2021</li> <li>Statistical folder UND</li> </ul>		
5-YV1-021	<ul style="list-style-type: none"> <li>Qualified for ISC-2021</li> <li>Statistical folder <b>PASS</b></li> </ul>		
5-YV1-022	<ul style="list-style-type: none"> <li>Qualified for ISC-2021</li> <li>Statistical folder UND</li> </ul>		
5-YV1-023	<ul style="list-style-type: none"> <li>Qualified for ISC-2021</li> <li>Statistical folder <b>PASS</b></li> </ul>	<ul style="list-style-type: none"> <li>3 vehicle tested, Type 1+1A</li> <li>Tested by AVL Sweden</li> <li>Statistical folder <b>PASS</b></li> </ul>	<ul style="list-style-type: none"> <li>1 vehicle tested, Type 1A</li> <li>Test by DTI, Denmark</li> <li>Meets applicable regulations</li> <li>TSV 2021-4452</li> </ul>
5-YV1-026	<ul style="list-style-type: none"> <li>Qualified for ISC-2021</li> <li>Statistical folder UND</li> </ul>		
5-YV1-027	<ul style="list-style-type: none"> <li>Qualified for ISC-2021</li> <li>Statistical folder <b>PASS</b></li> </ul>		

# Annex VII – Volvo Cars Corporation, Final\_rev02 Report ISC-2021

## Detailed Type 1A (RDE) data from STA test (D)

ISC-Family	STA ref	EmissionTypeApproval	Limit CO NTE (mg/km)	Limit NOx NTE (mg/km)	Limit PN NTE (#/km)	CO Totaltrip (mg/km)	NOx Totaltrip (mg/km)	NOx Totaltrip % of NTE	PN Totaltrip (#/km)	PN Totaltrip % of NTE	CO Urban (mg/km)	NOx Urban (mg/km)	NOx Urban % of NTE	PN Urban (#/km)	PN Urban % of NTE
5-YV1-012	Vehicle 1	e5*715/2007*2018/1832DG*0140*02	N/A	126,0	9,0E+11	67,8	12,2	10%	2,0E+10	2%	82,8	15,4	12%	3,8E+10	4%
5-YV1-012	Vehicle 2	e5*715/2007*2018/1832DG*0238*00	N/A	126,0	9,0E+11	79,6	14,1	11%	9,4E+10	10%	96,2	15,6	12%	1,8E+11	19%
5-YV1-012	Vehicle 3	e5*715/2007*2018/1832DG*0135*01	N/A	126,0	9,0E+11	99,2	18,2	14%	5,9E+10	7%	129,2	18,4	15%	1,0E+11	11%
5-YV1-023	Vehicle 1	e5*715/2007*2018/1832AP*0584*03	N/A	85,8	9,0E+11	265,0	11,5	13%	8,7E+10	10%	344,4	12,6	15%	1,8E+11	20%
5-YV1-023	Vehicle 2	e5*715/2007*2018/1832AP*0587*03	N/A	85,8	9,0E+11	306,3	4,2	5%	5,1E+10	6%	370,7	5,6	7%	8,6E+10	10%
5-YV1-023	Vehicle 3	e5*715/2007*2018/1832AP*0579*03	N/A	85,8	9,0E+11	295,0	11,1	13%	2,8E+10	3%	405,4	19,1	22%	5,7E+10	6%

For approvals with emission character AP in 5-YV1-023, Maximum declared RDE values in COC (48.2) = Legislation limit



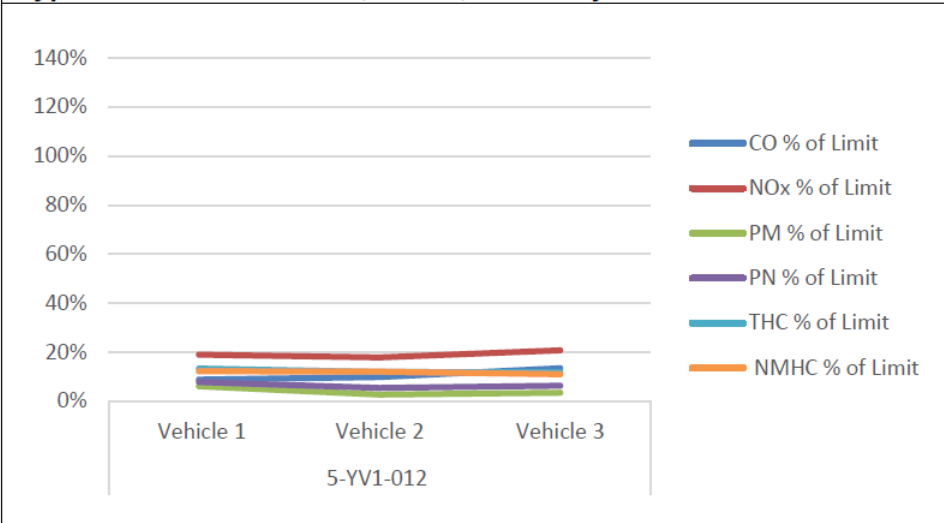


# Annex VII – Volvo Cars Corporation, Final\_rev02 Report ISC-2021

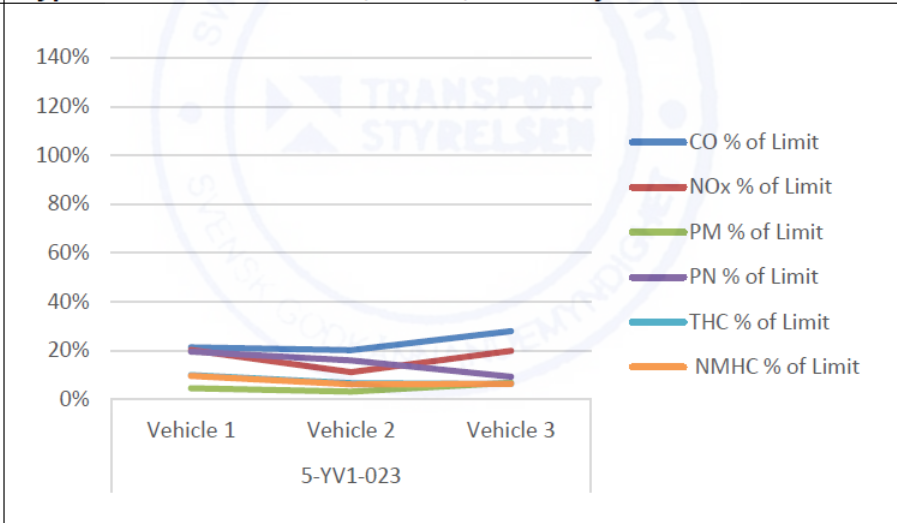
## Detailed Type 1 (WLTP) data from STA test (D)

ISC-family	STA ref	Emission Type Approval	CO (mg/km)	Limit CO (mg/km)	CO % of Limit	THC (mg/km)	Limit THC (mg/km)	THC % of Limit	NMHC (mg/km)	Limit NMHC (mg/km)	NMHC % of Limit	NOx (mg/km)	Limit NOx (mg/km)	NOx % of Limit	PM (mg/km)	Limit PM (mg/km)	PM % of Limit	PN (#/km)	Limit PN (#/km)	PN % of Limit
5-YV1-012	Vehicle 1	e5*715/2007*2018/1832DG*0140*02	88,1	1000	9%	13,3	100	13%	8,3	68	12%	11,4	60	19%	0,3	4,5	6%	4,7E+10	6E+11	8%
5-YV1-012	Vehicle 2	e5*715/2007*2018/1832DG*0238*00	98,7	1000	10%	12,0	100	12%	8,2	68	12%	10,7	60	18%	0,1	4,5	3%	3,2E+10	6E+11	5%
5-YV1-012	Vehicle 3	e5*715/2007*2018/1832DG*0135*01	134,5	1000	13%	11,8	100	12%	7,5	68	11%	12,4	60	21%	0,2	4,5	3%	3,8E+10	6E+11	6%
5-YV1-023	Vehicle 1	e5*715/2007*2018/1832AP*0584*03	212,2	1000	21%	9,9	100	10%	6,5	68	10%	12,1	60	20%	0,2	4,5	5%	1,2E+11	6E+11	20%
5-YV1-023	Vehicle 2	e5*715/2007*2018/1832AP*0587*03	201,0	1000	20%	6,6	100	7%	4,1	68	6%	6,7	60	11%	0,1	4,5	3%	9,6E+10	6E+11	16%
5-YV1-023	Vehicle 3	e5*715/2007*2018/1832AP*0579*03	278,9	1000	28%	6,2	100	6%	4,3	68	6%	11,9	60	20%	0,3	4,5	7%	5,5E+10	6E+11	9%

Type 1 results 5-YV1-012, Petrol, Direct Injection



Type 1 results 5-YV1-023, Petrol, Direct Injection



**Annex VIII – Ford Motor Company of Australia Ltd, Final\_rev02 Report ISC-2021**

ISC year: 2021  
Manufacturer: Ford Motor Company of Australia Ltd  
Report status: Final\_rev02  
Report number: ISC-2021-08  
Issue date: 2023-03-10



## Annex VIII – Ford Motor Company of Australia Ltd, Final\_rev02 Report ISC-2021

### Test overview on Ford Motor Company of Australia Ltd

ISC Family	Manufacturer (Section B) 2020 / 2021	STA (Section D) 2021	3 <sup>rd</sup> part (Section C) 2021
5-6FP-D32	<ul style="list-style-type: none"> <li>Qualified for ISC-2021</li> <li>Statistical Folder UND</li> </ul>	<ul style="list-style-type: none"> <li>3 vehicles tested, Type 1+1A</li> <li>Tested by AVL in Sweden</li> <li>Statistical folder <b>PASS</b></li> </ul>	
5-6FP-D33	<ul style="list-style-type: none"> <li>Qualified for ISC-2021</li> <li>Statistical Folder UND</li> </ul>	<ul style="list-style-type: none"> <li>3 vehicles tested, Type 1+1A</li> <li>Tested by AVL in Sweden</li> <li>Statistical folder <b>PASS</b></li> </ul>	

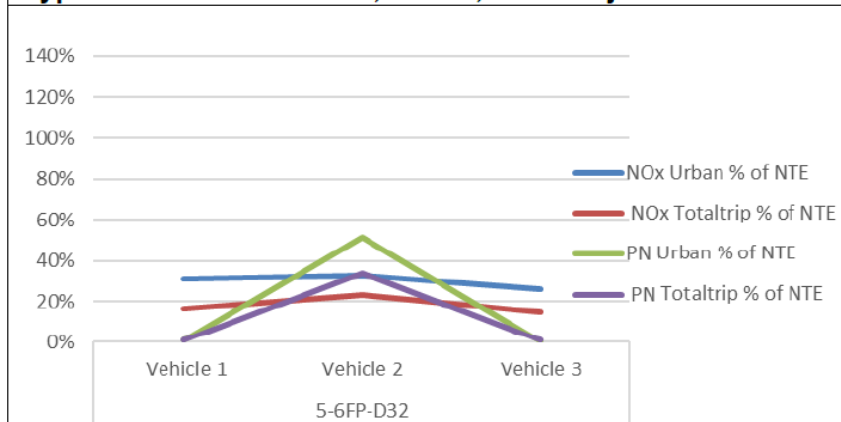


# Annex VIII – Ford Motor Company of Australia Ltd, Final\_rev02 Report ISC-2021

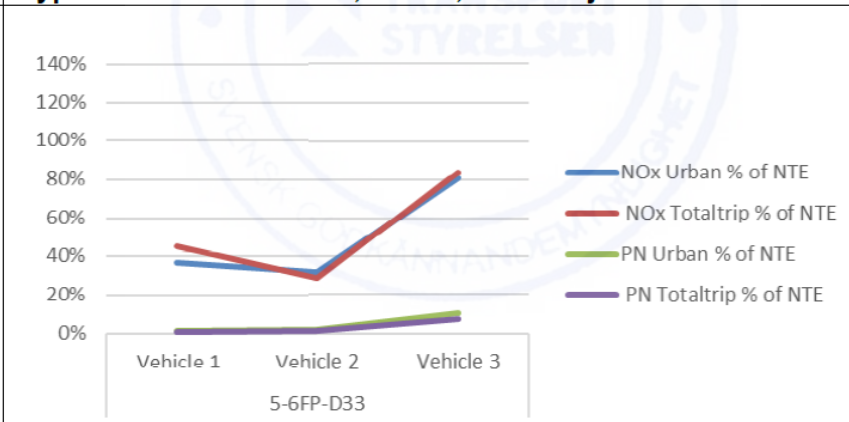
## Detailed Type 1A (RDE) data from STA test (D), Ki included

ISC-Family	STA ref	EmissionTypeApproval	Limit CO NTE (mg/km)	Limit NOx NTE (mg/km)	Limit PN NTE (#/km)	CO Totaltrip (mg/km)	NOx Totaltrip (mg/km)	NOx Totaltrip % of NTE	PN Totaltrip (#/km)	PN Totaltrip % of NTE	CO Urban (mg/km)	NOx Urban (mg/km)	NOx Urban % of NTE	PN Urban (#/km)	PN Urban % of NTE
5-6FP-D32	Vehicle 1	e5*715/2007*2018/1832CI*0218*02	N/A	262,5	9,0E+11	70,6	43,3	16%	6,1E+09	1%	78,8	81,5	31%	6,6E+09	1%
5-6FP-D32	Vehicle 2	e5*715/2007*2018/1832CI*0216*02	N/A	262,5	9,0E+11	78,1	61,3	23%	3,1E+11	34%	222,0	85,8	33%	4,6E+11	51%
5-6FP-D32	Vehicle 3	e5*715/2007*2018/1832CI*0218*02	N/A	262,5	9,0E+11	32,5	38,6	15%	7,5E+09	1%	0,0	69,0	26%	4,6E+09	1%
5-6FP-D33	Vehicle 1	e5*715/2007*2018/1832CI*0213*03	N/A	262,5	9,0E+11	66,0	117,5	45%	6,1E+09	1%	58,1	95,6	36%	1,4E+10	2%
5-6FP-D33	Vehicle 2	e5*715/2007*2018/1832CI*0213*03	N/A	262,5	9,0E+11	32,5	75,4	29%	1,1E+10	1%	0,0	83,4	32%	1,9E+10	2%
5-6FP-D33	Vehicle 3	e5*715/2007*2018/1832CI*0214*04	N/A	262,5	9,0E+11	140,5	220,6	84%	6,9E+10	8%	216,5	212,2	81%	9,3E+10	10%

Type 1A result 5-6FP-D32, Diesel, Direct Injection



Type A result 5-6FP-D33, Diesel, Direct Injection

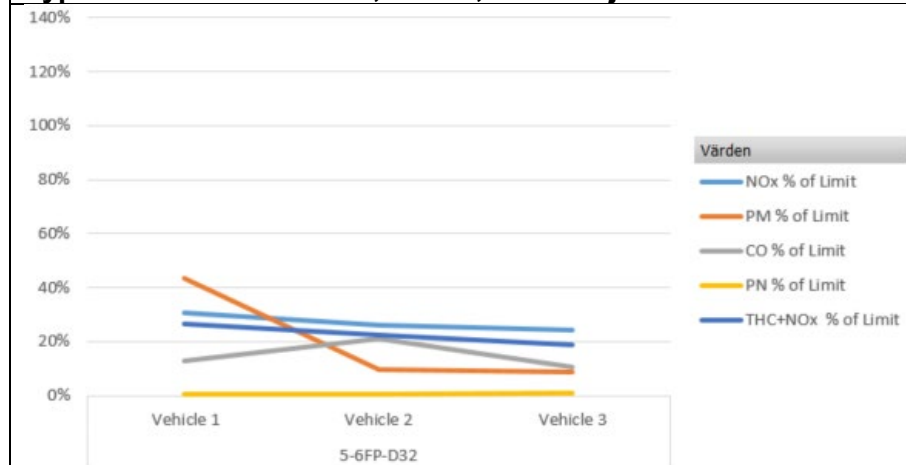


# Annex VIII – Ford Motor Company of Australia Ltd, Final\_rev02 Report ISC-2021

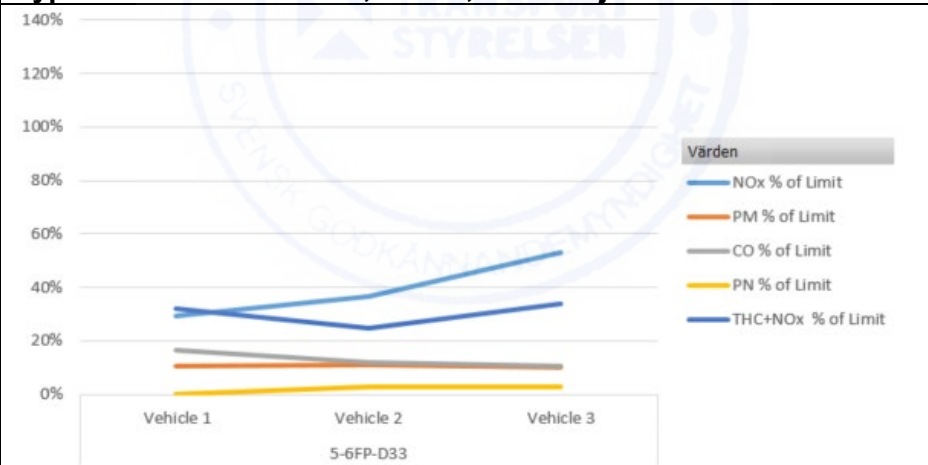
## Detailed Type 1 (WLTP) data from STA test (D), Ki included

ISC-family	STA ref	Emission Type Approval	CO (mg/km)	Limit CO (mg/km)	CO % of Limit	NOx (mg/km)	Limit NOx (mg/km)	NOx % of Limit	THC+NOx (mg/km)	Limit THC+NOx (mg/km)	THC+NOx % of Limit	PM (mg/km)	Limit PM (mg/km)	PM % of Limit	PN (#/km)	Limit PN (#/km)	PN % of Limit
5-6FP-D32	Vehicle 1	e5*715/2007*2018/1832CI*0218*02	95,7	740	13%	38,6	125	31%	57,0	215	27%	1,96	4,5	44%	3,5E+09	6E+11	1%
5-6FP-D32	Vehicle 2	e5*715/2007*2018/1832CI*0216*02	155,3	740	21%	32,4	125	26%	48,2	215	22%	0,43	4,5	9%	2,5E+09	6E+11	0%
5-6FP-D32	Vehicle 3	e5*715/2007*2018/1832CI*0218*02	78,5	740	11%	30,2	125	24%	40,1	215	19%	0,39	4,5	9%	4,8E+09	6E+11	1%
5-6FP-D33	Vehicle 1	e5*715/2007*2018/1832CI*0213*03	120,2	740	16%	36,4	125	29%	69,3	215	32%	0,47	4,5	10%	1,1E+09	6E+11	0%
5-6FP-D33	Vehicle 2	e5*715/2007*2018/1832CI*0213*03	87,5	740	12%	45,5	125	36%	53,4	215	25%	0,49	4,5	11%	1,7E+10	6E+11	3%
5-6FP-D33	Vehicle 3	e5*715/2007*2018/1832CI*0214*04	78,3	740	11%	66,3	125	53%	73,1	215	34%	0,45	4,5	10%	1,6E+10	6E+11	3%

Type 1 results 5-6FP-D32, Diesel, Direct Injection



Type 1 results 5-6FP-D33, Diesel, Direct Injection



**Annex VIII – Ford Motor Company of Australia Ltd, Final\_rev02 Report ISC-2021**

**Additive Ki**

ISC-family	CO (mg/km)	THC (mg/km)	NMHC (mg/km)	NOx (mg/km)	THC+NOx (mg/km)	PM (mg/km)	PN (mg/km)
5-6FP-D32	32,5324	4,6482		6,4258	11,0739	0,1339	
5-6FP-D33	32,5324	4,6482		6,4258	11,0739	0,1339	



**Annex IX –BMW AG, Final\_rev02 Report ISC-2021**

ISC year: 2021  
Manufacturer: BMW AG  
Report status: Final\_rev02  
Report number: ISC-2021-09  
Issue date: 2023-03-10



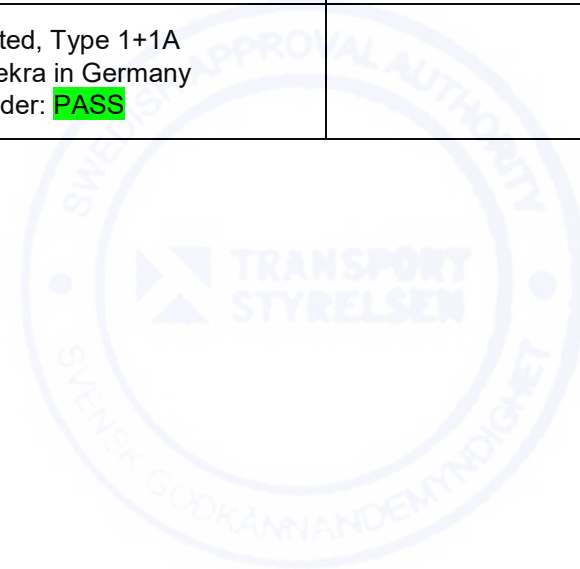


## Annex IX –BMW AG, Final\_rev02 Report ISC-2021

BMW AG is according to STA interpretation not qualified to ISC testing because sales for the previous year is less than 5000 vehicles. Nevertheless STA has chosen to test BMW AG according to Annex II, Part B, of Regulation (EU) 2017/1151, as amended by 2018/1832, §4. "Granting type approval authority may randomly choose ISC families to test".

### Test overview for BMW AG

ISC Family	Manufacturer (Section B) 2020 / 2021	STA (Section D) ISC-2021	3 <sup>rd</sup> parties (Section C) 2021
5-WBA-O21	<ul style="list-style-type: none"><li>Not qualified for ISC 2020/2021</li></ul>	<ul style="list-style-type: none"><li>3 vehicle tested, Type 1+1A</li><li>Tested by Dekra in Germany</li><li>Statistical folder: <b>PASS</b></li></ul>	
5-WBA-O35	<ul style="list-style-type: none"><li>Not qualified for ISC 2020/2021</li></ul>	<ul style="list-style-type: none"><li>3 vehicle tested, Type 1+1A</li><li>Tested by Dekra in Germany</li><li>Statistical folder: <b>PASS</b></li></ul>	

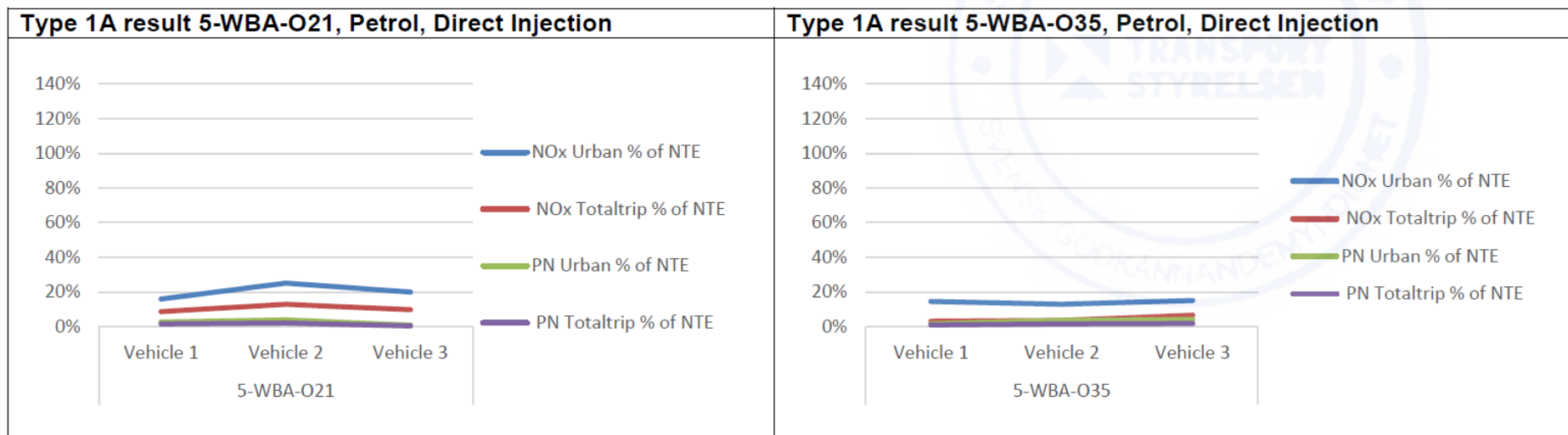


# Annex IX –BMW AG, Final\_rev02 Report ISC-2021

## Detailed Type 1A (RDE) data from STA test (D).

ISC-Family	STA ref	EmissionTypeApproval	Limit CO NTE (mg/km)	Limit NOx NTE (mg/km)	Limit PN NTE (#/km)	CO Totaltrip (mg/km)	NOx Totaltrip (mg/km)	NOx Totaltrip % of NTE	PN Totaltrip (#/km)	PN Totaltrip % of NTE	CO Urban (mg/km)	NOx Urban (mg/km)	NOx Urban % of NTE	PN Urban (#/km)	PN Urban % of NTE
5-WBA-O21	Vehicle 1	e5*715/2007*2018/1832AP*0732*00	N/A	85,8	9,0E+11	99,8	7,5	9%	1,5E+10	2%	125,4	13,7	16%	2,5E+10	3%
5-WBA-O21	Vehicle 2	e5*715/2007*2018/1832AP*0731*01	N/A	85,8	9,0E+11	167,7	11,1	13%	1,9E+10	2%	250,3	21,6	25%	3,5E+10	4%
5-WBA-O21	Vehicle 3	e5*715/2007*2018/1832AP*0731*01	N/A	85,8	9,0E+11	120,1	8,4	10%	4,0E+09	0%	127,1	17,2	20%	8,3E+09	1%
5-WBA-O35	Vehicle 1	e5*715/2007*2018/1832AP*00741*00	N/A	85,8	9,0E+11	224,6	2,7	3%	9,4E+09	1%	175,7	12,5	15%	1,6E+10	2%
5-WBA-O35	Vehicle 2	e5*715/2007*2018/1832AP*00741*00	N/A	85,8	9,0E+11	215,2	3,2	4%	1,6E+10	2%	169,3	11,1	13%	3,3E+10	4%
5-WBA-O35	Vehicle 3	e5*715/2007*2018/1832AP*00741*00	N/A	85,8	9,0E+11	155,6	5,7	7%	1,7E+10	2%	121,9	13,0	15%	3,7E+10	4%

For approvals with emission character AP, Maximum Declared RDE values in COC (48.2) = Legislation limit

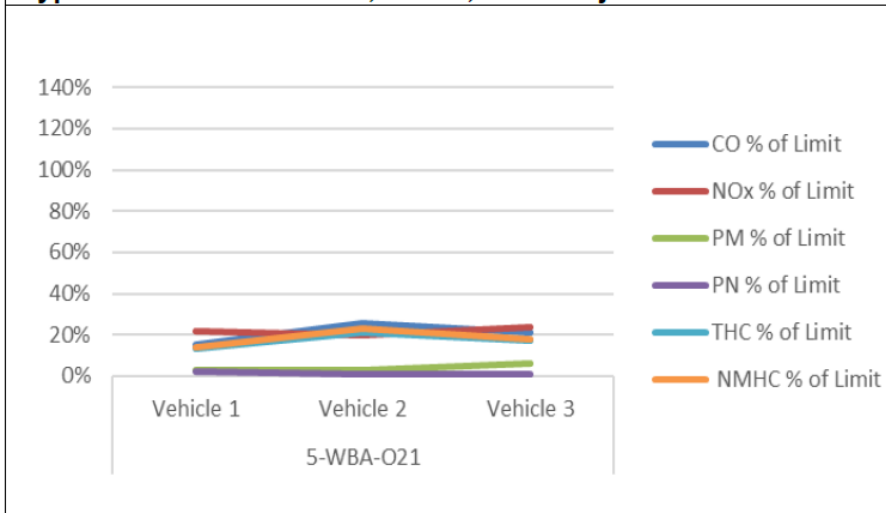


# Annex IX –BMW AG, Final\_rev02 Report ISC-2021

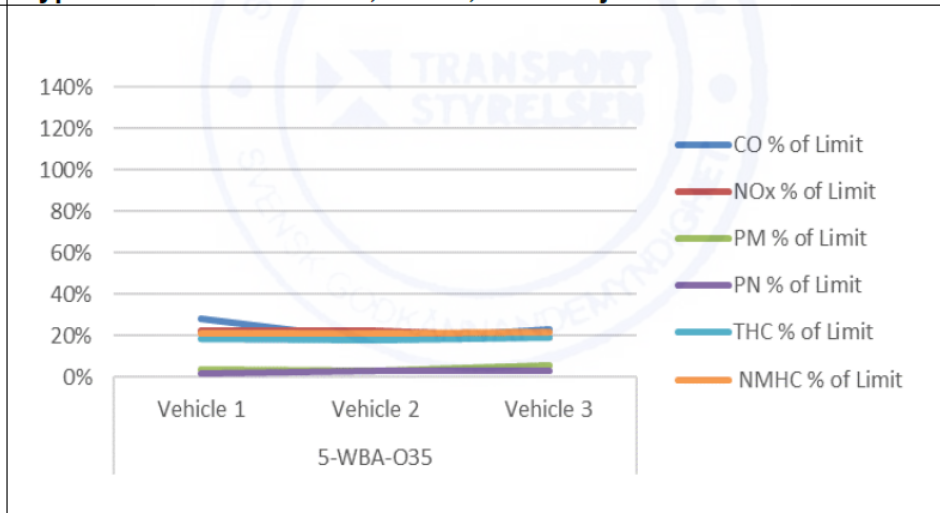
## Detailed Type 1 (WLTP) data from STA test (D)

ISC-family	STA ref	Emission Type Approval	CO (mg/km)	Limit CO (mg/km)	CO % of Limit	THC (mg/km)	Limit THC (mg/km)	THC % of Limit	NMHC (mg/km)	Limit NMHC (mg/km)	NMHC % of Limit	NOx (mg/km)	Limit NOx (mg/km)	NOx % of Limit	PM (mg/km)	Limit PM (mg/km)	PM % of Limit	PN (#/km)	Limit PN (#/km)	PN % of Limit
5-WBA-O21	Vehicle 1	IP-0000609-WBA-1	151,7	1000	15%	13,1	100	13%	9,4	68	14%	13,2	60	22%	0,2	5,5	3%	1,2E+10	6E+11	2%
5-WBA-O21	Vehicle 2	IP-0000580-WBA-1	254,3	1000	25%	21,4	100	21%	15,5	68	23%	12,0	60	20%	0,1	4,5	3%	5,7E+09	6E+11	1%
5-WBA-O21	Vehicle 3	IP-0000580-WBA-1	210,4	1000	21%	17,1	100	17%	12,2	68	18%	14,2	60	24%	0,3	4,5	6%	5,6E+09	6E+11	1%
5-WBA-O35	Vehicle 1	IP-0000619-WBA-1	279,7	1000	28%	18,3	100	18%	14,4	68	21%	13,5	60	22%	0,2	4,5	4%	9,6E+09	6E+11	2%
5-WBA-O35	Vehicle 2	IP-0000619-WBA-1	179,2	1000	18%	18,2	100	18%	14,4	68	21%	13,5	60	22%	0,1	4,5	3%	1,9E+10	6E+11	3%
5-WBA-O35	Vehicle 3	IP-0000619-WBA-1	231,3	1000	23%	19,5	100	19%	14,9	68	22%	11,6	60	19%	0,3	4,5	6%	1,6E+10	6E+11	3%

Type 1 result 5-WBA-O21, Petrol, Direct Injection



Type 1 result 5-WBA-O35, Petrol, Direct Injection



**Annex X – 3<sup>rd</sup> party, Final\_rev02 Report ISC-2021**

ISC year: 2021  
Manufacturer: 3rd party  
Report status: Final\_rev02  
Report number: ISC-2021-10  
Issue date: 2023-03-10



## Annex X – 3<sup>rd</sup> party, Final\_rev02 Report ISC-2021

### Test overview third part tests

Test	TSV-Ref	Manufacturer	ISC-Family	Technical service	Test type	Status
1	2021-3005	Kia Motors Slovakia	11-HMM-15	Emisia	RDE	FAILED
2	2021-3007	Kia Motors Slovakia	11-HMM-6	JRC	RDE / WLTP	PASS
3	2021-3868	Hyundai Motor Manufacturing Czech	11-HMM-16	DTI	RDE	PASS
4	2021-4386	Ford-Werke GmbH	5-WF0-P34	TNO	RDE	PASS
5	2021-4387	Kia Motor Corporation	11-KMC-8	Emisia	RDE	PASS
6	2021-4452	Volvo Cars	5-YV1-023	DTI	RDE	PASS
7	2021-4606	Hyundai Assan Otomotiv	11-HAO-1	Emisia	RDE	PASS
8	2021-7042	Kia Motors Slovakia	11-HMM-6	Emisia	RDE	PASS
9	2021-7791	Ford-Werke GmbH	11-WF0-P8	DTI	RDE	PASS
10	2021-8243	Ford-Werke GmbH	5-WF0-D14	VVT	RDE	PASS
11	2021-8517	Ford-Werke GmbH	5-WF0-D13	DTI	RDE	PASS
12	2021-9829	Hyundai Motor Manufacturing Czech	5-HMM-2	Emisia	RDE	PASS
13	2021-9836	Hyundai Motor Manufacturing Czech	11-HMM-4	Emisia	RDE	FAILED
14	2021-9839	Hyundai Motor Manufacturing Czech	5-HMM-18	Emisia	RDE	PASS

## Annex X – 3<sup>rd</sup> party, Final\_rev02 Report ISC-2021

### Detailed Type 1A (RDE) data from STA test (D)

Test	ISC-family	STA ref	EmissionTypeApproval	Limit CO NTE (mg/km)	Limit NOx NTE (mg/km)	Limit PN NTE (#/km)	CO Totaltrip (mg/km)	NOx Totaltrip (mg/km)	NOx Totaltrip % of NTE	PN Totaltrip (#/km)	PN Totaltrip % of NTE	CO Urban (mg/km)	NOx Urban (mg/km)	NOx Urban % of NTE	PN Urban (#/km)	PN Urban % of NTE
1	11-HMM-15	TSV 2021-3005	e5*715/2007*2018/1832DG*0198*01	N/A	168	9,00E+11	75	171	102%	1,30E+09	0%	225	255	152%	6,90E+08	0%
2	11-HMM-6	TSV 2021-3007	e5*715/2007*2018/1832DG*1302*02	N/A	126	9,00E+11	376	24	19%	8,97E+10	10%	316	20	16%	7,49E+10	8%
3	11-HMM-16	TSV 2021-3868	e5*715/2007*2018/1832DG*0525*01	N/A	168	9,00E+11	39	69	41%	1,60E+10	2%	63	116	69%	3,70E+10	4%
4	5-WFO-P34	TSV 2021-4386	e5*715/2007*2018/1832AP*0635*00	N/A	86	9,00E+11	402	13	15%	1,55E+10	2%	384	19	23%	2,29E+10	3%
5	11-KMC-8	TSV 2021-4387	e5*715/2007*2018/1832DG*1265*00	N/A	126		4456	28	22%			629	23	18%		
6	5-YV1-023	TSV 2021-4452	e5*715/2007*2018/1832AP*0579*00	N/A	86	9,00E+11	239	6	7%	5,12E+10	6%	370	10	11%	9,21E+10	10%
7	11-HAO-1	TSV 2021-4606	e5*715/2007*2018/1832DG*1326*00	N/A	126		65	22	18%			72	17	13%		
8	11-HMM-6	TSV 2021-7042	e5*715/2007*2018/1832DG*1303*01	N/A	126	9,00E+11	202	11	9%	7,09E+10	8%	264	18	15%	8,94E+10	10%
9	11-WFO-P8	TSV 2021-7791	e5*715/2007*2018/1832DG*1080*01	N/A	168	9,00E+11	381	10	6%	7,08E+10	8%	458	28	17%	4,40E+10	5%
10	5-WFO-D14	TSV 2021-8243	e5*715/2007*2018/1832CI*1539*00	N/A	179	9,00E+11	0	75	42%	5,08E+09	1%	5	140	78%	9,47E+09	1%
11	5-WFO-D13	TSV 2021-8517	e5*715/2007*2018/1832CI*1462*00	N/A	263	9,00E+11	0	97	37%	4,04E+09	0%	0	141	54%	6,16E+09	1%
12	5-HMM-2	TSV 2021-9829	e5*715/2007*2018/1832AP*00707*01	N/A	86	9,00E+11	23	22	25%	8,35E+10	9%	39	26	30%	4,93E+10	5%
13	11-HMM-4	TSV 2021-9836	e5*715/2007*2018/1832AP*00750*00	N/A	114	9,00E+11	85	131	115%	1,20E+09	0%	68	201	176%	1,90E+09	0%
14	5-HMM-18	TSV 2021-9839	e5*715/2007*2018/1832AP*0627*01	N/A	86		117	24	28%			116	48	56%		

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## Detailed Type 1 (WLTP) data from STA test (D)

ISC-family	STA ref	Emission Type Approval	CO (mg/km)	Limit CO (mg/km)	CO % of Limit	THC (mg/km)	Limit THC (mg/km)	THC % of Limit	NMHC (mg/km)	Limit NMHC (mg/km)	NMHC % of Limit	NOx (mg/km)	Limit NOx (mg/km)	NOx % of Limit	THC+NOx (mg/km)	Limit THC+NOx (mg/km)	THC+NOx % of Limit	PM (mg/km)	Limit PM (mg/km)	PM % of Limit	PN (#/km)	Limit PN (#/km)	PN % of Limit
11-HMM-6	TSV 2021-3007	e5*715/2007*2018/1832DG*1302*02	633	1000	63%	32	100	32%	26	68	38%	22	60	37%				0,10	4,50	2%	5,00E+10	6,00E+11	8%

