

**THE NETHERLANDS**  
(N E D E R L A N D)



**ANNUAL IN-SERVICE CONFORMITY REPORT**

According to Commission Regulation (EU) 2018/1832, Annex 2, Appendix 4

**Report number: RDW-ISC-2021-03**

Manufacturer : Hyundai Motor Company  
Type : OS 1.6P GDI HEV  
Commercial name : Kona, Kuai  
PEMS family : 4-HMC-12-1  
EVAP family : EV-150003-KMH-1

WVTA : e4\*2007/46\*1259\*12  
Type approval number : e4\*715/2007\*2018/1832AP\*1177\*05

A. Quick overview and main conclusions

The selection of the ISC families was in line with section 5 of this report and the selected family is shown on the first page.

Main conclusions

The two vehicles produced by Hyundai Motor Company submitted to in-service conformity tests (Type 1 and Type 1a) comply with the requirements. The third vehicle is scheduled to be tested for Type 1 and Type 1a but due to laboratory equipment failures the aforementioned tests are delayed. The elaborated test results can be found in section D, point 6.

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

(1) Information gathering by manufacturer

*N/A responsibility for manufacturer*

(2) ISC testing (including planning and selection of families tested, and final results of tests)

*N/A*

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

(3) Information gathering and risk assessment

*N/A responsibility for accredited laboratories or technical services*

(4) ISC testing (including planning and selection of families tested, and final results of tests)

*N/A*

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

(5) Information gathering and risk assessment

The leading principles we apply to gather information and carry out a comprehensive risk assessment are:

- Gathering relevant information on possible emission non-compliances relevant for deciding which ISC families to check in a particular year.
- Conducting initial risk assessment based on gathered information to choose the ISC to be tested.

The steps we undertook to gather the relevant information and select the ISC families for testing.

1. Identifying relevant parameters to start collecting the information;
2. Gathering the information from e4 type approvals;
3. Collecting relevant data from e4 certificate holders (sales, ISC families, motor type, available ISC and CoP (WLTP) test results from OEM, eligible vehicles' availability);
4. Creating a database to collect and organize the relevant vehicle data.
5. Selecting the ISC families for testing.

(6) ISC testing (including planning and selection of families tested, and final results of tests)

Based on gathered information as explained in section 5 we have selected ISC families and produced a ISC test plan.

Our annual test scope and test plan was based on the 3 subjects:

1. Minimum amount of vehicles to be tested.
2. Minimum amount of ISC tests to be carried out.
3. Selected ISC families for testing.

Final test results

OEM	ISC family	Fuel	Vehicle	Tests	Test status
Hyundai Motor Company	4-HMC-12-1	petrol	V1	type1	done
				type 1a	done
				type 4 (evap)	not
				type 6 (cold)	not
			V2	type 1	done
				type 1a	done
			V3	type 1	done
				type 1a	done

Figure 1. Overview of tests performed for this ISC family.

Type 1 (WLTC)	Emissions	CO [mg/km]	THC [mg/km]	NMHC [mg/km]	NO <sub>x</sub> [mg/km]	THC+NO <sub>x</sub> [mg/km]	PM [mg/km]	PN [#·10 <sup>11</sup> /km]
	Limit values	1000	100	68	60	n.a.	4,5	6,0
Vehicle #1	Final values	91,7	16,1	14,2	2,2	--	0,10	0,63
	Final result	Pass						
Vehicle #2	Final values	93,8	20,7	16,8	5,5	--	0,14	0,52
	Final result	Pass						
Vehicle #3	Final values	78,2	15,5	13,7	1,2	--	0,13	0,88
	Final result	Pass						

Figure 2. Test results of Type 1 test

Type 1a (RDE)	Vehicle #1			Vehicle #2			Vehicle #3		
Emissions	NOX [mg/km]	CO [mg/km]	PN [#·10 <sup>11</sup> /km]	NOX [mg/km]	CO [mg/km]	PN [#·10 <sup>11</sup> /km]	NOX [mg/km]	CO [mg/km]	PN [#·10 <sup>11</sup> /km]
Urban trip conformity factors	0,03	n.a.	0,08	0,17	n.a.	0,14	0,07	n.a.	0,29
Total trip conformity factors	0,10	n.a.	0,07	0,63	n.a.	0,13	0,14	n.a.	0,18
Limit values conformity factors	2,1	n.a.	1+0,50	2,1	n.a.	1+0,50	2,1	n.a.	1+0,50
Final results	Pass			Pass			Pass		

Figure 3. Test results of Type 1a test

THC [g]	Hot soak	Diurnal day 1	Diurnal day 2	Final value
Measured values	--	--	--	--
Limit values				2,0
Pass/Fail decision				--

Figure 4. Test results of Type 4 test (EVAP)

Emissions	CO [g/km]	THC [g/km]
Measured values	--	--
Limit values	15,0	1,8
Pass/Fail decision	--	--

Figure 5. Test results of Type 6 test (COLD)

(7) Detailed investigations

Based on the obtained test results, the tested vehicles from ISC family OS κ-1.6GDI HEV Euro6d-ISC-FCM did not require further detailed investigations.

(8) Remedial measures

Based on the obtained test results, the tested vehicles from ISC family OS κ-1.6GDI HEV Euro6d-ISC-FCM did not require any remedial measures.

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

*N/A assessment will not be performed due to the answers provided in chapter 8 “Remedial measures”*

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

When collecting the relevant vehicle documents for testing purposes, we learned about the necessity of having information such as vehicle CoC and transparency lists, independently from the manufacturer prior to testing. In practice we had to reach out to the manufactures to obtain these data.

G. Report of other invalid tests

*N/A There are no reports with invalid test results*

Date : 15-03-2022

Place : Zoetermeer

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