

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



IN-SERVICE CONFORMITY REPORT

According to Commission Regulation (EU) no 2018/1832, annex II

Report number: RDW-ISC-2021-05

Manufacturer : Hyundai Motor Company
Type : TM
Commercial name : Santa Fe
PEMS family : 4-HMC-9-0
EVAP family : N/A

WVTA : e4*2007/46*1318*02
Type approval number : e4*715/2007*2018/1832DG*1022*02

A. Quick overview and outcome of Statistical Procedure

With the Annex II of Commission Regulation (EU) 2017/1151 in its current form {(EU) 2018/1832} a new method for testing of vehicles in service is introduced (ISC).

This report describes the outcome of the Statistical Procedure for the selected PEMS family 4-HMC-9-0 (Hyundai Santa Fe).

In-Service Conformity tests (Type 1 and Type 1a) performed on five vehicles produced by the manufacturer, mentioned above, showed 'Intermediate Outliers' for 2 vehicles. Based on Chapter 5.10.5 of (EU) no 2018/1832, Annex II, this results in a 'Fail' as outcome of the Statistical Procedure. This means detailed investigations will be started together with the manufacturer, according Chapter 6 of the aforementioned regulation. The elaborated test results can be found in section B, point 3 of this report below.

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

(1) Information gathering and risk assessment

The leading principles the RDW applies 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 families to be tested.

The steps the RDW 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;

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

Based on gathered information as explained in section 1 we have selected the ISC family and executed an ISC test plan in accordance with regulation (EU) no 2018/1832, annex II.

(3) Test results

Since tested vehicles showed fail results, more than the minimum of three vehicles had to be tested in order to get a result for the Statistical Procedure. After 5 vehicles tested, 2 of them showed results of exceeding the applicable limit by more than 30%, so called ‘intermediate outliers’. This means the outcome of the Statistical Procedure is ‘fail’, like described in Chapter 5.10.5 of the mentioned regulation.

OEM	ISC family	Fuel	Vehicle	Tests	Test status
HYUNDAI MOTOR CORPORATION	4-HMC-9-0	diesel	V1	type1	done
				type 1a	done
			V2	type 1	done
				type 1a	done
			V3	type 1	done
				type 1a	done
			V4	type 1	done
				type 1a	done
			V5	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 _x [mg/km]	THC+NO _x [mg/km]	PM [mg/km]	PN [#·10 ¹¹ /km]
	Limit values	500	--	--	80	170	4,5	6,0
Vehicle #1	Final values	25,9	23,0	--	43,4	66,5	0,32	3,99
	Final result	Pass						
Vehicle #2	Final values	83,7	--	--	55,5	76,2	0,22	0,0625
	Final result	Pass						
Vehicle #3	Final values	68,7	--	--	45,3	80,2	0,30	0,0457
	Final result	Pass						
Vehicle #4	Final values	44,5	--	--	31,3	55,2	0,40	0,102
	Final result	Pass						
Vehicle #5	Final values	84,1	--	--	40,5	69,8	0,45	0,0624
	Final result	Pass						

Figure 2. Test results of Type 1 test

Type 1a (RDE)	Vehicle #1			Vehicle #2			Vehicle #3			Vehicle #4			Vehicle #5		
Emissions	NOX [mg/km]	CO [mg/km]	PN [#·10 ¹¹ /km]	NOX [mg/km]	CO [mg/km]	PN [#·10 ¹¹ /km]	NOX [mg/km]	CO [mg/km]	PN [#·10 ¹¹ /km]	NOX [mg/km]	CO [mg/km]	PN [#·10 ¹¹ /km]	NOX [mg/km]	CO [mg/km]	PN [#·10 ¹¹ /km]
Urban trip conformity factors	1,2	n.a.	0,6	2,9	n.a.	0	2,7	n.a.	0	0,8	n.a.	0	3,7	n.a.	0,1
Total trip conformity factors	0,6	n.a.	0,6	1,8	n.a.	0	1,3	n.a.	0	0,5	n.a.	0	2,2	n.a.	0,1
Limit values conformity factors	2,1	n.a.	1,5	2,1	n.a.	1,5	2,1	n.a.	1,5	2,1	n.a.	1,5	2,1	n.a.	1,5
Final results	Pass			Fail			Fail			Pass			Fail		

Figure 3. Test results of Type 1a test

(4) Detailed investigations

Based on the obtained test results, the vehicle family as mentioned above, is declared as 'fail' and will require further detailed investigations. The detailed investigations shall take no more than 60 working days after the start of the investigations by the granting type approval authority.

(5) Remedial measures

Within the deadline set out in point 4, the granting type approval authority shall take a decision on the compliance and the need to apply remedial measures for the ISC family covered by the detailed investigations and shall notify it to the manufacturer.

Place : Zoetermeer

Date : 13-Oct-2022