

Real Drive Emissions

Status Update from India



Indian Delegation
1st / 2nd April 2019
4th RDE IWG Meeting
Venue: JASIC Office ,Tokyo
Japan

Indian RDE Regulation



First Announcement- Ministry of Road Transport & Highways, Govt. of India

Govt. Notification, GSR 889(E), dtd. 16th Sep 16

During type approval and COP applicable from 1st April, 2020, real world driving cycle emission measurement using PEMS shall be carried out for data collection and from 1st April, 2023 real world driving cycle emission conformity shall be applicable. The detailed procedure is laid down in AIS137 and as amended from time to time.

Indian RDE Formulation (Test Procedure for Light Duty Vehicles) - Highlights

- Dec 2016: Technical Committee Constituted
- Nov 2018: Detailed Report submitted to Ministry of Road Transport & Highways, Govt. of India
- Dec 2018: First Draft India RDE Test Procedure released
- Mar 2019: Final Draft India RDE Regulation released

Final Regulation for India RDE is expected before mid 2019.

Indian RDE Regulation – Draft



#	Items	M Category	N1 Category	M1 & N1 (Low Powered) (PMR < 22kw/ Ton & Max. Designed Speed ≤ 70 kmph)
Environment Boundary Conditions				
1	Temperature	Moderate: $10 \leq T \leq 40$, Extended: $40 < T \leq 45$; $8 \leq T < 10$		
2	Altitude	Moderate: $A \leq 700$ m , Extended: $700 < A \leq 1300$ m		
Trip Requirements				
1	Speed Ranges	Phase1: $V < 45$ km/h Phase2: $45 \leq V < 65$ km/h Phase3: $V \geq 65$ km/h $V > 75$ km/h for min 5 min	Phase1: $V < 40$ km/h Phase2: $40 \leq V < 60$ km/h Phase3: $V \geq 60$ km/h $V > 70$ km/h for min 5 min	Phase1: $V < 45$ km/h Phase2: $V \geq 45$ km/h $V > 55$ km/h for min 5 min
2	Trip distance share	Phase 1: 34 % ($\pm 10\%$) Phase 2: 33 % ($\pm 10\%$) Phase 3: 33 % ($\pm 10\%$) (Same for M / N1)		Phase 1: 50 % ($\pm 10\%$) Phase 2: 50 % ($\pm 10\%$)
3	Maximum vehicle velocity	For M1: Wherever legal max speed limit permits , the vehicle velocity can exceed 100 km/h for not more than 3 % of the time duration of the Phase 3 driving, maximum up to 120km/hr. For N1: Restricted to 80km/h. For LP M1/N1: Restricted to 70 km/h		
4	Phase 1 Average Speed	15-30 km/h		
5	Total trip duration	90 – 120 min		

Indian RDE Regulation – Draft



Sr. No	Points	M Category	N1 Category	M1 & N1 (Low Powered) (PMR < 22kw/ Ton & Max. Designed Speed ≤ 70 kmph)
6	Minimum Distance	16km for each Phase (Phase 1, Phase 2, Phase3) (Same for M1/N1)		24 km for each Phase (Phase 1, Phase 2)
7	Stop periods	<ul style="list-style-type: none"> • 6 to 30% of Phase -1 duration • May contain several stop periods of 10 seconds or longer. • Single stop period must not exceed 5 Mins. • Vehicle should not be driven continuously below 20 km/h for more than 20 minutes. 		
Trip Dynamics				
8	Number of Acceleration points	Minimum 150 for each for Phase1, Phase2 Minimum 100 for Phase3		Minimum 150 for Phase 1 Minimum 100 for Phase 2
9	Relative Positive Acceleration (RPA)	$(V \leq 55.9 \text{ km/h})$ $Y = -0.001825 X + 0.1755$ $(V > 55.9 \text{ km/h})$ $Y = -0.0011 X + 0.1350$	$Y = -0.0016x + 0.1406$	$(V \leq 54.76 \text{ km/h})$ $Y = -0.0022X + 0.1271$ $(V > 54.76 \text{ km/h})$ $Y = 0.0066$
10	V*Apos	$(V \leq 56.9 \text{ km/h})$ $Y = 0.0467X + 12.2490$ $(V > 56.9 \text{ km/h})$ $Y = 0.1665 X + 5.4352$	$(V \leq 51.40 \text{ km/h})$ $Y = -0.0614X + 6.9439$ $(V > 51.40 \text{ km/h})$ $Y = 0.0045X + 9.8664$	$Y = 0.0142X + 4.6214$

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Sr. No	Points	M Category	N1 Category	M1 & N1 (Low Powered) (PMR < 22kw/ Ton & Max. Designed Speed ≤ 70 kmph)
Post Processing				
11	Reference Cycle	MIDC (Cold Start) as per Emission Type Approval Procedure		
12.	CO2 Multiplication Factor	1.1,1.1	1.05,1.05	1.05,1.05
12	Moving Avg. Window Speed Bins	35,55	35,55	35
13	CO2 Weightage for MAW Window	100 % CO ₂ (Grams) of MIDC Cycle		
14	Normality / Completeness	Normality – 50% Completeness – 10%		

Indian RDE Implementation Timelines are fixed → 4/2020 Monitoring ; 4/2023 Compliance
 Conformity Factor Decision – Plan under discussion

Information required from GRDE IWG



- Data Contribution from India → What data and which format ?
- How data contributed from all CP's will be analyzed ?
- JRC is requested to share detailed procedure for calculating PEMS uncertainty.

Thank You