

[TO BE PUBLISHED IN THE GAZETTE OF INDIA, EXTRAORDINARY, PART II, SECTION 3, SUB-SECTION (i)]

GOVERNMENT OF INDIA
MINISTRY OF ROAD TRANSPORT AND HIGHWAYS

NOTIFICATION

New Delhi, the 27th November, 2015.

G.S.R__(E).- The following draft of certain rules further to amend the Central Motor Vehicles Rules, 1989, which the Central Government proposes to make in exercise the powers conferred by section 110 of the Motor Vehicles Act, 1988 (59 of 1988), is hereby published as required by sub-section (1) of section 212 of the said Act for information of all persons likely to be affected thereby; and notice is hereby given that the said draft rules will be taken into consideration after the expiry of sixty days from the date on which the copies of this notification as published in the Gazette of India, are made available to the public;

The objections or suggestions which may be received from any person with respect to the said draft rules before the expiry of the period aforesaid will be considered by the Central Government;

Objections and suggestions to these draft rules, if any, may be sent to the Joint Secretary (Transport), Ministry of Road Transport and Highways, Transport Bhawan, Parliament Street, New Delhi-110 001.

DRAFT RULES

1. (1) These rules may be called the Central Motor Vehicles (____Amendment) Rules, 2015
(2) Save as otherwise specifically provided, they shall come into force on the date of their final publication in the Official Gazette.
2. In the Central Motor Vehicles Rules, 1989(hereinafter referred to as the said rules), in rule 115,
 - (a) In the first proviso of clause (i) in sub-rule (2), for the words "Bharat Stage-IV" substitute with "Bharat Stage IV / Bharat Stage V/ Bharat Stage VI ".
 - (b) In the title of the 2nd Table, in clause (i) of sub-rule(2), for the words "Bharat Stage-IV" substitute with "Bharat Stage IV / Bharat Stage V/ Bharat Stage VI ".

- (c) For the words "Bharat Stage-IV" in Sl. No. 1. and 2. of column (2) of the 2nd Table, in clause (i) of sub-rule(2), substitute with "Bharat Stage IV/Bharat Stage V/Bharat Stage VI".
- (d) For the words "Bharat Stage-IV" in Sl. No. 2. of column (2) of the 1st Table, in clause (ii) of sub-rule(2), substitute "Bharat Stage IV / Bharat Stage V/ Bharat Stage VI".
- (e) For the words "Bharat Stage-IV" in the proviso of sub-rule (7), substitute with "Bharat Stage IV / Bharat Stage V/ Bharat Stage VI".

3. In the Central Motor Vehicle Rules, 1989(hereinafter referred to as the said rules), in rule 115, after sub-rule (XX), the following sub-rules shall be inserted :-

(XX) Mass emission standards for Bharat Stage V (BS-V) Norms for Category M&N Vehicles

(ii) The Mass emission standards for Bharat Stage-V, in respect of M & N category vehicles having Gross vehicle weight exceeding 3,500 kg, manufactured on or after 1st April 2019 for new models and on or after 1st April 2020 for existing models, shall be as under:-

Table 1 – Limit values for M&N category vehicles with Compression Ignition engines: BS-V

Limit values for Type Approval (TA) as well as (COP)				
Engine Steady State Cycle (ESC) test				Engine Load response (ELR) test
CO (g/kWh)	HC (g/kWh)	NOx (g/kWh)	PM (g/kWh)	Smoke (m ⁻¹)
1.5	0.46	2.0	0.02	0.5

Table 2 – Limit values for M&N category vehicles with Compression Ignition (CI) engines or Positive Ignition (PI) engines: BS-V

Engine Transient Cycle (ETC) test				
CO (g/kWh)	NMHC ⁽¹⁾ (g/kWh)	CH ₄ ⁽²⁾ (g/kWh)	NOx (g/kWh)	PM ⁽³⁾ (g/kWh)
4.0	0.55	1.1	2.0	0.03
<p>(1) A manufacturer may choose to measure the mass of total hydrocarbons (THC) instead of measuring the mass of non-methane hydrocarbon (NMHC). In this case, the limit for mass of THC should be same as for the NMHC.</p> <p>a. For test on LPG mode, the provision of Rule 115 C shall not be applicable. For test on LPG mode, THC shall be replaced with Reactive Hydrocarbon (RHC), where RHC shall be measured as follows-</p> <p>(i) If commercial LPG fuel is used as test fuel, RHC shall be estimated by the formula, RHC = 0.5 x THC, where THC = Total Hydrocarbons measured during</p>				

- test on LPG mode.
- (ii) If reference LPG fuel is used as test fuel, RHC shall be as measured by the analyser
- b. For test on Compressed Natural Gas (CNG) and dual fuel mode, the provision of Rule 115 B shall not be applicable. For test on dual fuel mode the limits shall be as specified in AIS 137/Part IV/2015 as amended from time to time. For measurement of NMHC in CNG and Dual Fuel Mode, following shall apply-
- (i) If commercial CNG fuel is used as test fuel, Non-methane Hydro Carbon (NMHC) shall be estimated by the formula, $NMHC = 0.3 \times THC$, where THC = Total Hydrocarbons measured during test on CNG mode.
- (ii) If reference CNG fuel is used as test fuel, NMHC shall be as measured by the analyser.
- (2) For Compressed Natural gas (CNG) engines only.
- (3) For Compression Ignition (C.I.) engines only

For M1, N1, M2 & N2 category vehicles with a reference mass not exceeding 2840 kg, at the manufacturer's request, type approval may be granted as per the sub-rule (18) of this rule.

If a vehicle is tested for type approval on Chassis Dynamometer having Reference Mass up to 2610 kg, manufacturer may seek type approval extensions up to reference mass of 2840 kg for its variants exceeding GVW of 3500 kg. In such cases mass emission testing on Engine Dynamometer shall not be required.

Table 3 – Applicability of Test Requirements for BS-V

	Positive Ignition engines				Compression Ignition engines			Dual fuel engines
	Gasoline	CNG / Bio-methane	LPG	E85	Diesel	Ethanol (ED95)	Biodiesel blends exceeding 5% as declared by manufacturer	Diesel + (CNG/LNG)
Gaseous pollutants	Yes	Yes	Yes	Yes	Yes	Yes	Yes (with B5 reference fuel only)	Yes**
Particulate Mass	-	-	-	-	Yes	Yes	Yes (with B5 reference fuel only)	Yes**
Smoke	-	-	-	-	Yes	Yes	Yes (with B5 reference fuel only)	Yes**

Durability	Yes	Yes	Yes	Yes	Yes	Yes	Yes (with B5 reference fuel only)	Yes**
OBD	Yes	Yes	Yes	Yes	Yes	Yes	Yes (with B5 reference fuel only)	Yes**
In-Service Monitoring	Yes	Yes	Yes	Yes	Yes	Yes	Yes (with B5 fuel only)	Yes**

** The test applicability requirements are depending on the Gas Energy Ratio (GER) measured over the ETC test-cycle. GER classification will be as per AIS 137/Part IV/2015 as amended from time to time.

Notes:-

- 1) The test shall be done on engine dynamometer.
- 2) In case of vehicles equipped with Compression Ignition engines, the gaseous and particulate emissions shall be as per Engine Steady State Cycle (ESC) and Engine Transient Cycle (ETC) and smoke test shall be as per Engine Load Response (ELR) cycle as per procedure described in AIS 137/Part IV/2015 as amended from time to time.
- 3) In case of vehicles equipped with Positive Ignition engines, the gaseous emissions are to be determined only on the Engine Transient Cycle (ETC) test as per procedure described in AIS 137/Part IV/2015 as amended from time to time.
- 4) Reference fuels:
 - The reference diesel fuel used in diesel vehicles, diesel-biodiesel blend vehicles and dual fuel vehicles shall be as specified in Annexure IV-T.
 - ED95 reference fuel used in ED95 ethanol vehicles shall be as specified in Annexure IV-R.
 - Reference natural gas fuel used in CNG/Bio-methane vehicles shall be as per Annexure IV-L (G20, G23 and G25) and reference LPG fuel used in LPG vehicles shall be as per Annexure IV M (Fuel A and Fuel B), however, in case of non-availability of reference fuels for CNG / LPG, the commercially available CNG / LPG shall be used for the purpose of Type Approval and Conformity of Production.
 - E85 reference fuel used in E85 Flex-fuel ethanol vehicles shall be as specified in Annexure IV-Q.
 - Reference gasoline fuel used in gasoline vehicles shall be as specified in Annexure IV-S.
- 5) There shall be no relaxation of norms for Conformity of Production (COP) purposes.
- 6) The Conformity of Production (COP) testing procedure shall be as described in AIS 137 /Part IV/ 2015 as amended from time to time .
- 7) The vehicle specified in this subclause shall meet Conformity of In Service requirement as per the procedure laid down in AIS 137 / Part IV / D1 / September 2015 and as amended from time to time.
- 8) The Conformity of Production (COP) frequency and samples
 - i. The conformity of Production period for each engine model including its variant(s) shall be

once a year.

- ii. Where production volume in six month is less than 250 per model including its variant(s), the provisions contained in the provisosto rule 126-A shall apply.

9) Commercial fuels:

- i) The commercial Diesel fuel shall be as per Annexure IV-V
ii) Specification for commercial CNG and LPG shall be as per IS 15958:2012 and IS 14861:2000 respectively and shall be as notified from time to time.
iii) Biodiesel used in commercial Diesel-Bio-diesel blended fuel with biodiesel exceeding 5% biodiesel shall be as per IS 15607 as amended from time to time
iv) Commercial gasoline fuel shall be as per Annexure IV-U. Specifications for commercial E85 and ED95 shall be as specified in Indian Standards.

10) For CI engine vehicles, the emission of visible pollutants (smoke) shall not exceed the limit value of smoke density, as per Annexure I to sub-rule (9) of rule 115. These smoke limits are without correction factor and engines are to be tested with conditioned air supplied to the engine to maintain atmospheric factor of 0.98 to 1.02.

11) In the case of vehicles powered by PI & CI engines, the engine power shall be measured on engine dynamometer and the measured power shall conform to the power specified in AIS 137/Part IV/2015 as amended from time to time, when tested as per procedures described in AIS 137/Part IV/2015 as amended from time to time.

12) Idle emissions & Smoke Density:

- i) The PI vehicles specified in this sub-rule shall comply with the provisions of clause (i) of sub-rule (2) of rule 115.
ii) All CI Vehicles specified in this sub-rule shall comply with the provisions of clause (ii) of sub-rule (2) of rule 115.

13) The specifications of NOx reduction agent AUS 32 (Aqueous Urea Solution) shall conform to Part 1 and Part 2 of ISO 22241-2006(refer Annexure – Y).

14) The extension of type approval to engine family & engine after treatment system family shall be as per AIS 137/Part IV/2015 as amended from time to time

15) Deterioration Factors:

- i) Deterioration factor shall be as given in the Table below:

Table 4 – Deterioration Factors for BS-V

Engine type	Test cycle	CO	HC	NMHC	CH4	NOx	PM
CI Engine	ESC	1.1	1.05	-	-	1.05	1.1
	ETC	1.1	1.05	-	-	1.05	1.1
PI Engine	ETC	1.1	1.05	1.05	1.2	1.05	-

- ii) Alternatively, the vehicle manufacturers may opt for evaluation of deterioration factor as per AIS 137/Part IV/2015 and as amended from time to time for minimum service accumulation

period given in Table below.

Category of vehicle in which engine will be installed	Minimum service accumulation period
Category N1 vehicles	100,000 km
Category N2 vehicles	125,000 km
Category N3 Vehicles with GVW equal to or less than 16,000 kg	125,000 km
Category N3 Vehicles with GVW above 16,000 kg	167,000 km
Category M2 vehicles	100,000 km
Category M3 Vehicles with GVW equal to or less than 7,500 kg	125,000 km
Category M3 Vehicles with GVW above 7,500 kg	167,000 km

The above ageing test for evaluation of deterioration factors shall be carried out by the approved test agency specified in rule 126

- 16) The vehicles specified in this sub-rule shall be equipped with an On-Board Diagnostic system (BS-V OBD) for emission control which shall have the capability of identifying the likely area of the malfunctions by means of fault codes stored in computer memory, and communicating that information off-board, as per procedure described in AIS137/Part IV/ D1/ Sept 2015 as amended from time to time .

Table 5: OBD threshold limits: (BS-VOBD).

	NOx (g/kWh)	PM (g/kWh)
CI engines	7.0	0.1
PI engines	7.0	-

- 17) Fuel Quality Audit at retail outlets & Fuel quality reporting system as per AIS 137/Part III/2015 as amended from time to time, shall be implemented on or before 1st April 2019.
- 18) Inspection & Maintenance requirements shall be implemented across country as per procedure described in AIS 137/ Part III/2015 as amended from time to time on or before 1st April 2019.
- 19) In-Service monitoring requirements for family of models shall be as per procedure described in AIS 137/Part IV/2015 as amended from time to time.

(XX) Mass emission standards for Bharat Stage VI (BS-VI) Norms for Category M&N Vehicles

- (iii) The Mass emission standards for Bharat Stage VI, in respect of M & N category vehicles having Gross vehicle weight exceeding 3,500 kg, manufactured on or after 1st April 2021 for new models and on or after 1st April 2022 for existing models, shall be as under:-

Table 1 – Limit values for M&N category vehicles: BS-VI

	<i>Limit values</i>							
	<i>CO</i> (mg/kWh)	<i>THC⁽¹⁾</i> (mg/kWh)	<i>NMHC⁽¹⁾</i> (mg/kWh)	<i>CH₄⁽²⁾</i> (mg/kWh)	<i>NO_x</i> (mg/kWh)	<i>NH₃</i> (ppm)	<i>PM mass</i> (mg/kWh)	<i>PM number</i> (numbers/kWh)
WHSC (CI)	1500	130			400	10	10	8.0×10^{11}
WHTC (CI)	4000	160	-----	----	460	10	10	$6.0 \times 10^{11(3)}$
WHTC (PI)	4000	---	160	500	460	10	10	$6.0 \times 10^{11(3)}$

Notes:

PI = Positive Ignition

CI = Compression Ignition

- (1) Limits of THC are not applicable for test on dual fuel mode (Diesel+CNG). A manufacturer may choose to measure the mass of total hydrocarbons (THC) instead of measuring the mass of non-methane hydrocarbon (NMHC). In this case, the limit for mass of THC should be same as for the NMHC.
- a. For test on LPG mode, the provision of Rule 115 C shall not be applicable. For test on LPG mode, NMHC shall be replaced with Reactive Hydrocarbon (RHC), where RHC shall be measured as follows-
- (i) If commercial LPG fuel is used as test fuel, RHC shall be estimated by the formula, $RHC = 0.5 \times THC$, where THC = Total Hydrocarbons measured during test on LPG mode.
 - (ii) If reference LPG fuel is used as test fuel, RHC shall be as measured by the analyser
- b. For test on Compressed Natural Gas (CNG) and dual fuel mode, the provision of Rule 115 B shall not be applicable. For test on dual fuel mode the limits shall be as specified in AIS 137/Part IV/2015 as amended from time to time. For measurement of NMHC in CNG and Dual Fuel Mode, following shall apply-
- (i) If commercial CNG fuel is used as test fuel, Non-methane Hydro Carbon (NMHC) shall be estimated by the formula, $NMHC = 0.3 \times THC$, where THC = Total Hydrocarbons measured during test on CNG mode.
 - (ii) If reference CNG fuel is used as test fuel, NMHC shall be as measured by the analyser.
 - (iii) For test on dual fuel mode, THC shall be replaced by NMHC.
- (2) For Compressed Natural gas (CNG) engines only.
- (3) The limit value shall be applicable for vehicles manufactured on or after 1st April 2025 for new models and on or after 1st April 2026 for existing models. However, type approval may be granted in compliance to this limit value at the request of the manufacturer prior to implementation of this limit value.

For M1, N1, M2 & N2 category vehicles with a reference mass not exceeding 2840 kg, at the manufacturer's request, type approval may be granted as per the sub-rule (18) of this rule.

If a vehicle is tested for type approval on Chassis Dynamometer having Reference Mass up to 2610 kg, manufacturer may seek type approval extensions up to reference mass of 2840 kg for its variants exceeding GVW of 3500 kg. In such cases mass emission testing on Engine Dynamometer shall not be required.

Table 2 – Applicability of Test Requirements for BS-VI.

	Positive-ignition engines				Compression-ignition engines			Dual fuel engines
	Gasoline	CNG / Bio-methane	LPG	E85	Diesel	Ethanol (ED95)	Biodiesel blends exceeding 7% as declared by manufacturer	Diesel + (CNG/LNG)
Gaseous pollutants	Yes	Yes	Yes	Yes	Yes	Yes	Yes (with B7 reference fuel only)	Yes*
Particulate Mass	Yes	Yes	Yes	Yes	Yes	Yes	Yes (with B7 reference fuel only)	Yes*
PM number	--	--	--	--	Yes	Yes	Yes (with B7 reference fuel only)	Yes*
Durability	Yes	Yes	Yes	Yes	Yes	Yes	Yes (with B7 reference fuel only)	Yes*
OBD	Yes	Yes	Yes	Yes	Yes	Yes	Yes (with B7 reference fuel only)	Yes*
Off Cycle Emissions (WNTÉ)	--	--	--	--	Yes	Yes	Yes (with B7 fuel only)	Yes*
PEMS Demonstration test at Type Approval	--	--	--	--	Yes	Yes	Yes (with B7 fuel only)	Yes*
In-Service Conformity	Yes	Yes	Yes	Yes	Yes	Yes	Yes (with B7 fuel only)	Yes*

*The test applicability requirements for dual fuel engine is depending on the Gas Energy Ratio (GER) measured over the hot part of the WHTC test-cycle. GER classification will be as per AIS 137/Part IV/2015.

Notes:-

- 1) The test shall be done on engine dynamometer.
- 2) In case of vehicles equipped with Compression Ignition engines, the gaseous and particulate emissions shall be measured as per WHSC and WHTC cycles as per procedure described in AIS 137/Part IV/2015 as amended from time to time.
- 3) In case of vehicles equipped with positive Ignition engines, the gaseous and particulate emissions shall be measured as per WHTC cycle as per procedure described in AIS 137/Part IV/2015 and as amended from time to time.
- 4) Reference fuels:
 - The reference diesel fuel used in diesel vehicles, diesel-biodiesel blend vehicles and dual fuel vehicles shall be as specified in Annexure IV-X.
 - ED95 reference fuel used in ED95 ethanol vehicles shall be as specified in Annexure IV-R.
 - Reference natural gas fuel used in NG/Bio-methane vehicles shall be as per Annexure IV-L (G20, G23 and G25) and reference LPG fuel used in LPG vehicles shall be as per Annexure IV-M (Fuel A and Fuel B), however, in case of non-availability of reference fuels for CNG / LPG, the commercially available CNG / LPG shall be used for the purpose of Type Approval and Conformity of Production.
 - E85 reference fuel used in E85 Flex-fuel ethanol vehicles shall be as specified in Annexure IV-Q.
 - Reference gasoline fuel used in gasoline vehicles shall be as specified in Annexure IV-W.
- 5) There shall be no relaxation of norms for Conformity of Production (COP) purposes.
- 6) The Conformity of Production (COP) testing procedure shall be as described in AIS 137/Part IV/2015 as amended from time to time.
- 7) The Conformity of Production (COP) frequency and samples
 - i. The conformity of Production period for each engine model including its variant(s) shall be once a year.
 - ii. Where production volume in six month is less than 250 per model including its variant(s), the provisions contained in the provisos to rule 126-A shall apply.
- 8) Commercial Fuels:
 - i. The commercial Diesel fuel shall be as per Annexure IV-V
 - ii. Specification for commercial CNG and commercial LPG shall be as notified from time to time
 - iii. Biodiesel used in commercial Diesel-Bio-diesel blended fuel with biodiesel exceeding 7% biodiesel shall be as per IS 15607 as amended from time to time
 - iv. Commercial gasoline fuel shall be as per Annexure IV-U. Specifications for commercial E85 and ED95 shall be as specified in Indian .
- 9) For CI engine vehicles, the emission of visible pollutants (smoke) shall not exceed the limit value of smoke density, as per Annexure I to sub-rule (9) of rule 115. These smoke limits are without correction factor and engines are to be tested with conditioned air supplied to the engine to

maintain atmospheric factor of 0.98 to 1.02.

- 10) In the case of vehicles powered by PI & CI engines, the engine power shall be measured on engine dynamometer and the measured power shall conform to the power specified in AIS 137/Part V/2015 as amended from time to time, when tested as per procedures described in AIS 137/Part V/2015 as amended from time to time.
- 11) Idle emissions and Smoke Density:
- The vehicles equipped with PI engine specified in this sub- rule shall comply with the provisions of clause (i) of sub-rule (2) of rule 115.
 - The Vehicles equipped with CI engine specified in this sub- rule shall comply with the provisions of clause (ii) of sub-rule (2) of rule 115.
- 12) The specification of NOx reduction agent AUS 32 (Aqueous Urea Solution) shall conform to Part 1 and Part 2 of ISO 22241-2006(refer Annexure – Y).
- 13) The vehicles specified in this sub-rule shall meet WorldNot-To-Exceed (WNTE) Off-cycle laboratory testing limits for gaseous and particulate exhaust emissions, as per procedure described in AIS 137/ Part IV/ 2015 and as amended from time to time.

Test cycle	CO mg/kWh	THC mg/kWh	NOx mg/kWh	PM mg/kWh
WNTE	2000	220	600	16

14) Deterioration Factors:-

- Deterioration factors shall be as given in the Table below:

Table 3 – Deterioration Factors for BS-VI

Test cycle	CO	THC ¹	NMHC ²	CH ₄ ²	NO _x	NH ₃	PM mas s	PM number
WHTC	1.3	1.3	1.4	1.4	1.15	1.0	1.05	1.0
WHSC	1.3	1.3	---	---	1.15	1.0	1.05	1.0

Notes:

1 Applies in case of a compression ignition engine.

2 Applies in case of a positive ignition engine.

- Alternatively, the vehicle manufacturers may opt for evaluation of deterioration factor as per procedure described in AIS 137(Part IV): 2015 and as amended from time to time for minimum service accumulation period given in Table below.

The evaluation of deterioration factor test shall be carried out by the approved test agency specified in rule 126

Table 4 – Minimum service accumulation period – BS-VI

Category of vehicle in which engine will be installed	Minimum service accumulation period
Category N1 vehicles	160,000 km
Category N2 vehicles	188,000 km
Category N3 Vehicles with GVW equal to or less than 16,000 kg	188,000 km
Category N3 Vehicles with GVW above 16,000 kg	233,000 km
Category M2 vehicles	160,000 km
Category M3 Vehicles with GVW equal to or less than 7,500 kg	188,000 km
Category M3 Vehicles with GVW above 7,500 kg	233,000 km

15) The vehicles specified in this sub-clause shall meet conformity of in-service vehicles/engines requirements, as per procedure laid down in AIS 137/ Part IV/D1/Sept 2015 and as amended from time to time.

Maximum allowed conformity factors for in-service conformity emission testing.

<i>Pollutant</i>	<i>Maximum allowed conformity factor</i>
CO	1.50
THC	1.50
NMHC	1.50
CH ₄	1.50
NO _x	1.50
PM mass	-
PM number	-

16) The vehicles specified in this sub-clause shall meet PEMS demonstration test at type approval, as per procedure laid down in AIS 137/ Part IV/D1/Sept 2015 and as amended from time to time.

The vehicle used for the PEMS demonstration test shall be representative for the vehicle category intended for the installation of the engine system. The vehicle may be a prototype vehicle or an adapted production vehicle.

For PEMS demonstration test at type approval, vehicle shall meet the requirements of in-service compliance.

17) The vehicles specified in this sub-clause shall meet World Not-To-Exceed (WNTE) Off-cycle laboratory testing limits for gaseous and particulate exhaust emissions, as per procedure laid down in AIS 137/ Part IV/D1/Sept 2015 and as amended from time to time.

Test cycle	CO mg/kWh	THC mg/kWh	NOx mg/kWh	PM mg/kWh
WNTE	2000	220	600	16

18) The vehicles specified in this sub-clause shall be equipped with an On-Board Diagnostic system shall have the capability of detecting malfunctions, of indicating their occurrence by means of a malfunction indicator, of identifying the likely area of the malfunctions by means of information stored in computer memory, and communicating that information off-board., as per procedure laid down in AIS 137/ Part IV/D1/Sept 2015 and as amended from time to time.

19) The vehicles specified in this sub-clause shall have the capability of assessing the in-use performance of on-board diagnostic, as per procedure laid down in AIS 137/ Part IV/D1/Sept 2015 and as amended from time to time.

20) The vehicles specified in this sub-clause fitted with engine, which rely on the use of a reagent in order to reduce emissions, shall ensure the correct operation of NOx control measures, as per procedure laid down in AIS 137/ Part IV/D1/Sept 2015 and as amended from time to time.

21) The vehicles specified in this sub- rule shall be equipped with an On-Board Diagnostic system (BS VI -1 OBD& BS-VI-2OBD) for emission control which shall have the capability of identifying the likely area of the malfunctions by means of fault codes stored in computer memory and communicating that information off-board, as per procedure described in AIS 137/Part IV/2015 as amended from time to time, when that failure results in an increase in emission above the limits given in Tables below:-

i) BSVI-1 OBDthreshold for BS VI vehicles manufactured on or after 1st April 2021 for new models and manufactured on or after 1st April 2022 for existing models shall be as given below:

Table 6: OBD threshold Limits: (BS-VI-1 OBD)

	Limit in mg/kWh	
	NOx	PM Mass
Compression ignition engines	1500	Performance Monitoring ⁽¹⁾
All gas fuelled engines and Positive Ignition engines fitted to vehicles belonging to category M3, to N2 vehicles having a maximum permissible mass exceeding 7.5t, and to N3 vehicles	1500	--

(1) Performance monitoring as per AIS-137/Part-IV/2015 (for wall-flow Diesel Particulate Filter).

ii) BS-VI-2OBD threshold for BS VI vehicles manufactured on or after 1st April 2026 for new models and manufactured on or after 1st April 2027 for existing models shall be as given below:

Table 7: OBD thresholdLimits: (BS-VI-2 OBD)

	Limit in mg/kWh		
	NOx	PM Mass	CO
Compression ignition engines	1200	25 ⁽¹⁾	---
All gas fuelled engines and Positive Ignition engines fitted to vehicles belonging to category M3, to N2 vehicles having a maximum permissible mass exceeding 7.5t, and to N3 vehicles	1200	--	7500 ⁽¹⁾

(1) The limits of PM & CO to be reviewed at later stage, because with OBD monitoring conditions, meeting these limits may be difficult.

At the manufacturer's request type approval may be granted for compliance to BS-VI-2OBD requirements before its implementation

22) The vehicles specified in this sub- rule shall have the capability of assessing the in-use performance of on-board diagnostic, as per procedure described in AIS 137/ Part IV/2015 as amended from time to time.

23) The vehicles specified in this sub- rule shall meet PEMS demonstration test at type approval, as per procedure described in AIS 137/ Part IV/2015 as amended from time to time. The vehicle used for the PEMS demonstration test shall be representative for the vehicle category intended for the installation of the engine system. The vehicle may be a prototype vehicle or an adapted production vehicle.

24) Fuel Quality Audit at retail outlets & Fuel quality reporting system as per AIS 137/Part III/2015 as amended from time to time, shall be implemented on or before 1st April 2019.

25) Inspection & Maintenance (I & M) requirements shall be implemented across the country as per procedure described in AIS 137/ Part III/2015 as amended from time to time on or before 1st April 2019

26) In-Service Conformity requirements for family of models shall be as per procedure described in AIS 137/Part IV/2015 as amended from time to time.

27) Conformity factor requirements shall be formulated based on BS V In-Service Monitoring, Fuel Quality Audit and I & M data. They shall be as described in AIS 137/Part IV/2015 as amended from time to time.

4. In the principal rules, after ANNEXURE IV-R, the following Annexures shall be inserted, namely:-

"ANNEXURE IV-T

[See rule 115]

Technical specifications of the reference fuel – Diesel (B5)

Parameter	Unit	Limits ¹		Test method
		Minimum	Maximum	
Cetane number ²		52.0	54.0	EN-ISO 5165
Density at 15 °C	kg/m ³	833	837	EN-ISO 3675
Distillation:				
- 50 % point	°C	245	-	EN-ISO 3405
- 95 % point	°C	345	350	EN-ISO 3405
- Final boiling point	°C	-	370	EN-ISO 3405
Flash point	°C	55	-	EN 22719
CFPP	°C	-	- 5	EN 116
Viscosity at 40 °C	mm ² /s	2.3	3.3	EN-ISO 3104
Polycyclic aromatic hydrocarbons	% m/m	2.0	6.0	EN 12916
Sulphur content ³	mg/kg	-	10	EN ISO 20846 /EN ISO 20884
Copper corrosion		-	Class 1	EN-ISO 2160
Conradson carbon residue (10 % DR)	% m/m	-	0.2	EN-ISO 10370
Ash content	% m/m	-	0.01	EN-ISO 6245
Water content	% m/m	-	0.02	EN-ISO 12937
Neutralisation (strong acid) number	mg KOH/g	-	0.02	ASTM D 974
Oxidation stability ⁴	mg/ml	-	0.025	EN-ISO 12205
Lubricity (HFRR wear scan diameter at 60 °C)	µm	-	400	EN ISO 12156
Oxidation stability at 110 °C ^{4,6}	h	20.0		EN 14112
FAME ⁵	% v/v	4.5	5.5	EN 14078

¹ The values quoted in the specifications are "true values". In establishment of their limit values the terms of ISO 4259 Petroleum products – Determination and application of precision data in relation to methods of test have been applied and in fixing a minimum value, a minimum difference of 2R above zero has been taken into account; in fixing a maximum and minimum value, the minimum difference is 4R (R = reproducibility).
Notwithstanding this measure, which is necessary for technical reasons, the manufacturer of fuels shall nevertheless aim at a zero value where the stipulated maximum value is 2R and at the mean value in the case of quotations of maximum and minimum limits. Should it be necessary to clarify whether a fuel meets the requirements of the specifications, the terms of ISO 4259 shall be applied.

² The range for cetane number is not in accordance with the requirements of a minimum range of 4R. However, in the case of a dispute between fuel supplier and fuel user, the terms of ISO 4259 may be used to resolve such disputes provided replicate measurements, of sufficient number to archive the necessary precision, are made in preference to single determinations.

³ The actual sulphur content of the fuel used for the Type I Test shall be reported.

⁴ Even though oxidation stability is controlled, it is likely that shelf life will be limited. Advice shall be sought from the supplier as to storage conditions and life.

⁵ FAME content to meet the specification of EN 14214.

⁶ Oxidation stability can be demonstrated by EN-ISO 12205 or by EN 14112. This requirement shall be reviewed based on CEN/TC19 evaluations of oxidative stability performance and test limits.

ANNEXURE IV-X

[See rule 115]

Technical specifications of the reference fuel – Diesel (B7)

Parameter	Unit	Limit ⁽¹⁾		Test method
		Minimum	Maximum	
Cetane Index		46.0		EN ISO 4264
Cetane number ⁽²⁾		52.0	56.0	EN ISO 5165
Density at 15 °C	kg/m ³	833	837	EN ISO 3675 EN ISO 12185
Distillation:				
- 50% point	°C	245		EN ISO 3405
- 95% point	°C	345	350	EN ISO 3405
- Final boiling point	°C		360	EN ISO 3405
Flash point	°C	55		EN 22719
CFPP	°C		-5	EN 116
Viscosity at 40 °C	mm ² /s	2.3	3.3	EN ISO 3104
Polycyclic aromatic hydrocarbons	% m/m	2.0	4.0	EN 12916
Sulphur content	mg/kg		10	EN ISO 20846/ EN ISO 20884
Copper corrosion (3h at 50 °C)	Rating		Class 1	EN ISO 2160
Conradson carbon residue (10% DR)	% m/m		0.2	EN ISO 10370
Ash content	% m/m		0.01	EN ISO 6245
Total contamination	mg/kg		24	EN 12662
Water content	% m/m		0.02	EN ISO 12937
Neutralization (strong acid) number	mg KOH/g		0.10	ASTM D 974
Oxidation stability ⁽³⁾	mg/ml		0.025	EN ISO 12205
Lubricity (HFRR wear scar diameter at 60 °C)	µm		400	EN ISO 12156
Oxidation stability at 110 °C ⁽³⁾	H	20.0		EN 15751
FAME ⁽⁴⁾	% v/v	6.0	7.0	EN 14078

Notes:

(1) The values quoted in the specifications are "true values". In establishment of their limit values the terms of ISO 4259 Petroleum products – Determination and application of precision data in relation to methods of test have been applied and in fixing a minimum value, a minimum difference of 2R above zero has been taken into account; in fixing a maximum and minimum value, the minimum difference is 4R (R = reproducibility). Notwithstanding this measure, which is necessary for technical reasons, the manufacturer of fuels shall nevertheless aim at a zero value where the stipulated maximum value is 2R and at the mean value in the case of quotations of maximum and minimum limits. Should it be necessary to clarify whether a fuel meets the requirements of the specifications, the terms of ISO 4259 shall be applied.

(2) The range for cetane number is not in accordance with the requirements of a minimum range of 4R. However, in the case of a dispute between fuel supplier and fuel user, the terms of ISO 4259 may be used to resolve such disputes provided replicate measurements, of sufficient number to archive the necessary precision, are made in preference to single determinations.

(3) Even though oxidation stability is controlled, it is likely that shelf life will be limited. Advice shall be sought from the supplier as to storage conditions and life.

(4) FAME content to meet the specification of EN 14214.

ANNEXURE IV - V

[See rule 115]

Specification of Commercial Diesel Fuel

S No.	Attribute	Unit	Proposed BS-V&BS-VI
1	Density @ 15 °C	kg/m ³	820-845
2	Distillation T ₉₅	°C max	360
3	Sulphur	ppm max	10
4	Cetane No	min.	51
5	Cetane Index	min.	46
6	Flash Point	°C min.	42
7	Viscosity @ 40 °C	cSt	2.0-4.5
8	PAH	% wt. max	11
9	Total Contaminants	mg/kg max	24
10	RCR on 10% Residue	% wt. max	0.3
11	Water Content	mg/kg max	200
12	Lubricity, Corrected Wear Scar Diameter (WSD) @ 60 °C	Microns, max	460
13	Ash	% wt. max	0.01
14	Cold Filter Plugging Point a) Summer, max b) Winter, max	°C °C	18 6
15	Oxidation stability	g/m ³ , max	25
16	Copper strip corrosion for 3 hrs. @ 50 °C, max	Rating	Class 1

ANNEXURE IV-Y

Properties for ADBLUE as per Part 1 and Part 2 of ISO 22241-2006 Standard.

Parameter	MIN Limit	MAX Limit	Unit
Urea Content	31.8	33.2	% by weight
Density at 20°C	1.0870	1.0930	g/cm ³
Refracting Index at 20°C	1.3814	1.3843	
Alkalinity as NH ₃		0.2	%
Biuret		0.3	%
Aldehyde		5	mg/kg
Insolubles		20	mg/kg
Phosphate(PO ₄)		0.5	mg/kg
Calcium		0.5	mg/kg
Iron		0.5	mg/kg
Copper		0.2	mg/kg
Zinc		0.2	mg/kg
Chromium		0.2	mg/kg
Nickel		0.2	mg/kg
Aluminium		0.5	mg/kg
Magnesium		0.5	mg/kg
Sodium		0.5	mg/kg
Potassium		0.5	mg/kg

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(Abhay Damle)

Joint Secretary to the Government of India.

Note :- The principal rules were published in the Gazette of India , Extraordinary, Part II, section 3, sub-section (i) vide G. S. R. 590(E) dated the 2nd June, 1989 and last amended vide G.S.R. 677(E) dated the 03/09/15.