

BS-VII Vehicle Emission Standards

Mains: GSIII - Environment| Economic Development

Why in News?

The Ministry of Road Transport and Highways proposed BS-VII emission standards in October 2026, introducing real-world emissions testing, brake and tyre pollution controls, and EV battery durability requirements, with phased implementation from April 2029.

What are Bharat Stage (BS) Emission Standards?

- **Bharat Stage Standards** - These are government-prescribed norms regulating emissions from motor vehicles to control air pollution.
- **Current Standards** - India implemented BS-VI standards nationwide in April 2020, tightening limits on pollutants such as nitrogen oxides (NOx) and particulate matter (PM).
- **Objective** - Reduce vehicular pollution, improve air quality and promote cleaner vehicle technologies.

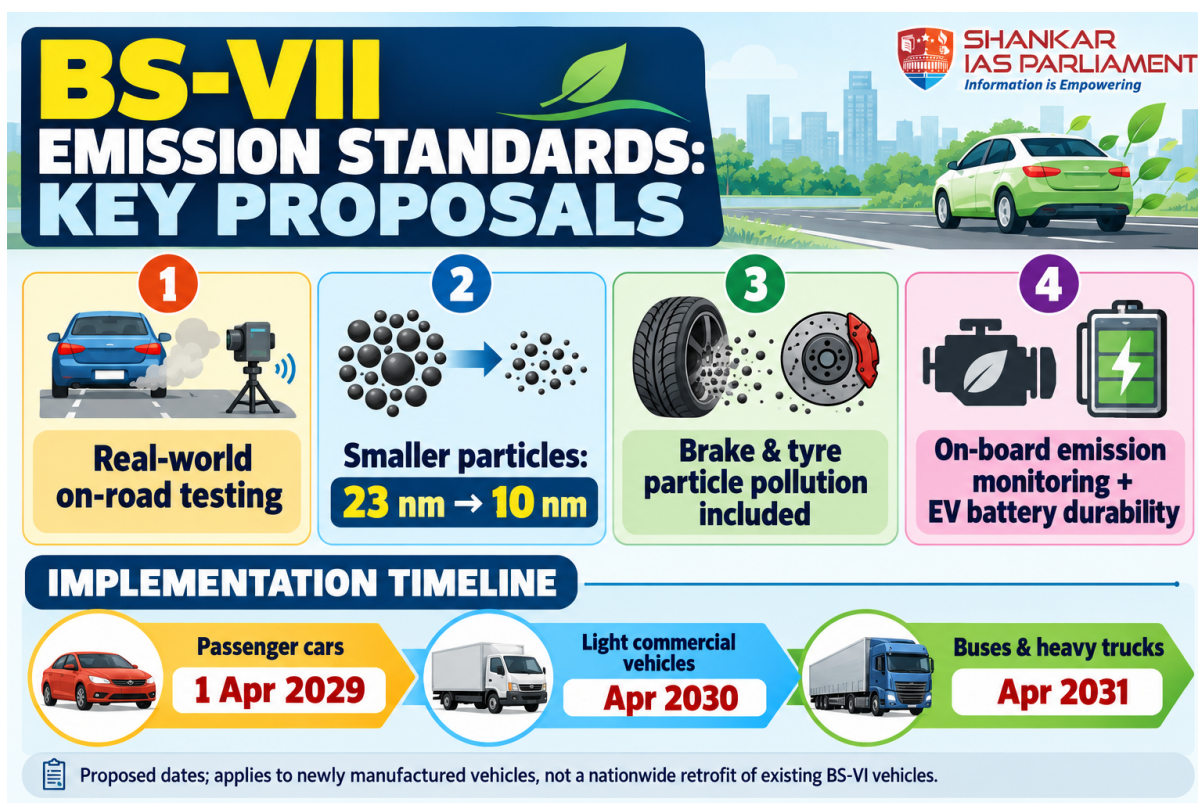
What are the Key Changes Proposed under BS-VII?

- **Real-World Emissions Testing** - Vehicles would undergo on-road emissions testing using portable equipment, in addition to laboratory testing.
- **Smaller Particles** - The particle-number measurement threshold would be reduced from 23 nanometres to 10 nanometres.
- **Brake and Tyre Pollution** - The standards would regulate particulate pollution caused by brake wear and tyre abrasion, beyond exhaust emissions.
- **Emission Monitoring** - On-board monitoring systems would detect specified emissions exceedances and track emission-control performance.
- **Battery Durability** - Electric vehicles (EVs) and plug-in hybrids would have to meet battery-energy retention benchmarks.
- **Environmental Vehicle Passport** - A proposed passport would provide information on fuel consumption, battery health and pollutant emissions.

Proposed Implementation Timeline

Vehicle category	Proposed implementation
Passenger cars	April 1, 2029
Light commercial vehicles	April 2030
Buses and heavy trucks	April 2031

The draft does not propose a nationwide programme to retrofit or replace existing BS-VI vehicles. The new standards would apply to vehicles manufactured from the specified implementation dates.



What are the Major Emission Control Provisions?

- **Tailpipe Emissions** – For passenger cars, the draft retains the principal limits for carbon monoxide (CO), nitrogen oxides (NO_x) and particulate matter (PM).
- **Proposed Limits for Cars** –

Pollutant	Petrol cars	Diesel cars
Carbon monoxide	1,000 mg/km	500 mg/km
Nitrogen oxides	60 mg/km	80 mg/km
Particulate matter	4.5 mg/km	4.5 mg/km

- **Brake Particles** – Limits for passenger cars are proposed from April 2031, with a common limit of 3 mg/km across powertrains from April 2035.
- **Tyre Abrasion** – Requirements are proposed from April 2031, with numerical limits to be notified separately.
- **Emission Durability** – Passenger-car compliance would be assessed up to 160,000 km or eight years, followed by an additional period extending to 200,000 km or 10 years.
- **Battery Durability Requirements for EVs** – EVs and plug-in hybrids would be required to retain
 - At least 75% of original battery capacity after five years or 1,00,000 km.
 - At least 67% after eight years or 1,60,000 km.

What is the Significance of BS-VII Standards?

- **Cleaner Air** - Reduces exhaust emissions and non-exhaust pollution from brakes and tyres.
- **Better Monitoring** - On-road testing and onboard systems improve the assessment of actual vehicle emissions.
- **Sustainable Mobility** - Battery-durability requirements encourage greater accountability for EV performance.
- **Technological Advancement** - Promotes improvements in emission-control systems, sensors and vehicle software.
- **Lifecycle Approach** - Extends the focus from emissions at manufacture to vehicle performance over time.

What are the Challenges in Implementation?

- **Higher Costs** - Advanced emission-control technologies, testing and certification may increase vehicle prices.
- **Technological Complexity** - Manufacturers may need to upgrade sensors, engine controls and exhaust-treatment systems.
- **Implementation Timeline** - Automakers have raised concerns about limited preparation time and have reportedly sought a later rollout.
- **EV Development Trade-off** - Compliance-related engineering requirements could compete with resources allocated to EV development.
- **Regulatory Uncertainty** - Brake, tyre and battery requirements need detailed limits and testing procedures before finalisation.

What Could Be Done?

- **Phased Implementation** - Provide adequate lead time and introduce standards gradually to help manufacturers adapt.
- **R&D Support** - Encourage investment in affordable emission-control technologies, cleaner engines and durable EV batteries.
- **Testing Infrastructure** - Strengthen vehicle testing centres and on-road emission monitoring facilities.
- **Industry Collaboration** - Coordinate with automakers, research institutions and regulators to finalise practical standards and ensure effective compliance.

What lies ahead?

- The BS-VII standards represent a shift from conventional exhaust-emission control towards an approach covering real-world emissions, and battery durability.
- Their success will depend on clear technical regulations, adequate preparation time for manufacturers and effective enforcement without compromising cleaner mobility goals.

Reference

[The Hindu| India's proposed BS-VII vehicle emission rules](#)



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