

STRUCTURE OF CATEGORY B AND C VEHICLES AND THEIR MAINTENANCE SERVICES

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Annotation: This article analyzes the structure of Category B and C vehicles and the importance of maintenance services in ensuring road safety and vehicle efficiency. The study examines the main mechanical systems of vehicles, including engines, transmission, braking systems, and electrical components. Furthermore, the article highlights modern diagnostic technologies and preventive maintenance methods used in automotive service centers.

Keywords: Category B vehicles, Category C vehicles, vehicle structure, maintenance service, automotive engineering, diagnostics, transportation safety, engine system.

The rapid development of the automotive industry has significantly increased the number of vehicles used for passenger and cargo transportation worldwide. Category B vehicles mainly include passenger cars with a maximum authorized mass of up to 3.5 tons, while Category C vehicles refer to heavy trucks designed for cargo transportation. The technical condition of these vehicles directly affects transportation safety, fuel efficiency, and environmental sustainability. Therefore, understanding vehicle structure and implementing proper maintenance services are essential for ensuring safe and reliable transportation systems. Main Structure of Category B and C Vehicles The structure of modern automobiles consists of several interconnected systems that ensure the proper operation of the vehicle.

1. Engine

System

The engine is considered the “heart” of the vehicle. It converts fuel energy into mechanical power. Most Category B vehicles use gasoline or hybrid engines, while Category C trucks commonly operate with diesel engines due to their high torque and fuel efficiency. The engine system includes:

- cylinder block;
- pistons;
- crankshaft;
- fuel injection system;
- cooling system;
- lubrication system.

Proper engine maintenance increases performance and reduces fuel consumption.

2. Transmission

System

The transmission system transfers engine power to the wheels. It consists of:

- clutch;
- gearbox;
- driveshaft;
- differential.

Modern vehicles may use manual, automatic, or continuously variable transmissions (CVT). In Category C trucks, heavy-duty transmission systems are necessary because of the large cargo load.

3.Brake System.The brake system is one of the most important safety components of any vehicle. It allows drivers to reduce speed or stop the vehicle completely. The braking system includes:

- brake pads;
- brake discs;
- hydraulic system;
- ABS (Anti-lock Braking System).

Regular inspection of braking components is necessary to prevent accidents and maintain road safety.

4.Suspension and Steering Systems

The suspension system improves driving comfort and vehicle stability. It absorbs shocks caused by uneven road surfaces. The steering system helps drivers control the direction of the vehicle accurately.

Damaged suspension parts may lead to poor vehicle control and increased accident risk.

5.Electrical and Electronic Systems

Modern vehicles are equipped with advanced electronic technologies, such as:

- electronic control units (ECU);
- sensors;
- GPS systems;
- automatic lighting systems;
- parking assistance technologies.

Electrical system maintenance ensures reliable vehicle operation and improves driver convenience.

Maintenance Services for Category B and C Vehicles

Vehicle maintenance services are divided into preventive and corrective maintenance.Preventive Maintenance

Preventive maintenance aims to avoid technical failures before they occur.It includes:

- engine oil replacement;
- filter replacement;
- brake inspection;
- tire pressure control;
- battery testing.

Regular maintenance extends vehicle lifespan and reduces repair costs.

Corrective maintenance is performed after detecting a malfunction. This process may involve:

- engine repair;
- transmission replacement;
- electrical diagnostics;
- brake system repair.

Professional automotive technicians use computerized diagnostic equipment to identify faults accurately.

Importance of Modern Diagnostic Technologies

Modern automotive service centers increasingly use digital diagnostic tools. These technologies help technicians detect problems quickly and improve repair efficiency.

Examples include:

- OBD-II diagnostic systems;
- computerized scanning tools;

•electronic engine analyzers. Such technologies reduce maintenance time and improve vehicle reliability.Environmental and Safety Considerations Poorly maintained vehicles contribute to environmental pollution and road accidents. Proper servicing reduces harmful emissions and ensures safer transportation. Governments and transportation authorities encourage regular technical inspections to improve environmental protection and public safety.In conclusion, the structure and maintenance of Category B and C vehicles play a significant role in modern transportation systems. Proper understanding of vehicle components and regular maintenance services ensure road safety, fuel efficiency, and long-term vehicle performance. The integration of modern technologies into automotive servicing has further improved diagnostic accuracy and maintenance quality.

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