

**BUREAU OF INDIAN STANDARDS**

*Draft Indian Standard*

**VEHICLES FOR COLLECTION OF MUNICIPAL SOLID WASTES  
PART 2 GUIDELINES FOR MAINTENANCE**

*(First Revision)*

**नगरपालिका के ठोस अपशिष्ट संग्रह के लिए वाहन  
भाग 2 रखरखाव की मार्गदर्शिका  
(पहला पुनरीक्षण)**

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ICS 43.160; 43.180

Solid Wastes Management Sectional Committee,  
CHD 33

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**FOREWORD**

*(Formal clauses added to be later)*

Longer the refuse is allowed to accumulate, the greater is its deterioration and nuisance value. Efficient and expeditious removal of garbage is, therefore, an important function of any solid waste management operation.

The means of transportation form the very back-bone of such operation. Transportation implies conveyance of the waste from the point of collection to the point of disposal. For supplying an efficient and economic system for disposal of solid wastes, particular attention has to be paid to the maintenance aspect of the vehicles used for transportation.

This first revision has been taken up to update the ICS no. and editorial changes have also been done to bring the standard in the latest style and format of Indian Standards.

## **1 SCOPE**

This standard prescribes the guidelines for maintenance of vehicles for collection and transportation of urban solid wastes for processing at disposal site.

## **2 TYPES OF VEHICLES**

Different types of vehicles used for collection and transportation of refuse are as follows:

- a) Closed body vehicles;
- b) Open body conventional vehicles of different make, tipping and non-tipping;
- c) Tractors;
- d) Tractor-trailer system, mechanical unloading and manual loading;
- e) Compactors;
- f) Carrier containers on truck chassis; and
- g) Dumper placer or load lodger equipment.

## **3 MAINTENANCE**

**3.1** For maintenance system of different refuse vehicles due consideration may be given of the followings:

- a) Layout and condition of roads,
- b) Frequency of collection,
- c) Number of shifts and their duration per day during which a vehicle is required to perform,
- d) Number of trips per shift and the distance from the different points of collection to the point of disposal,
- e) Pay load that may be collected and carried per trip,
- f) Method of loading and unloading,
- g) Regional transport authorities' requirements,
- h) Requirements from hygiene and aesthetic point of view,
- j) Generation of refuse at each collection point,
- k) Condition of the roads at the land-fill site,
- m) Geographical and topographical condition of the city, and
- n) Nature of solid wastes.

### **3.2 Maintenance System**

Generally the maintenance system is divided into following:

- a) Preventive maintenance, and
- b) Accident/Break-down maintenance.

### **3.2.1 Break-Down Maintenance System**

Repairs or maintenance of vehicles shall be carried out after the break-down/failure of the vehicles or vehicles meeting with an accident. It shall be seen that the overall cost of repair charge shall not exceed the depreciation cost of vehicle under repair otherwise, such vehicles shall be disposed off. Repairing of such vehicles shall be attended on top priority basis. This system is disadvantageous in places where the size of fleet is small and inadequate to meet the requirement. The break-down of even one vehicle may result in delay of removal of garbage, thereby, keeping a particular area in insanitary condition.

### **3.2.2 Preventive Maintenance System**

#### **3.2.2.1 Daily maintenance**

Daily maintenance of vehicles includes checking the vehicles before they are taken out for trips. Such types of checks are performed by drivers. Separate check list to be followed by drivers before proceeding on daily routine jobs is given in Annex A.

The fuel tank shall be checked every day and filling shall be done periodically up to the filler neck. This enables the user to know the exact quantity of consumption of fuel. Check all the tyres and inflate them with required quantity of air. Top up radiator water and note the vehicles which consume more quantity of water. Check engine oil in the engine and replenish to the full mark on the dipstick and note the vehicles which consume more quantity of oil. Check all the lights as well as batteries by running the engine and attend to the defects, if any. Check by driver's reports and get the defects attended. Make proper entries in the register. Wash 1/7th of the total number of vehicles used every day thoroughly.

#### **3.2.2.2 Periodical maintenance**

Normally these are carried out at the garage levels and by the drivers as per the recommendations. Normally the schedule of the checks is provided with every vehicle to be observed at the garage level and at the workshop level. This maintenance is generally specified by the vehicle manufacturer in their workshop manual. It differs from the manufacturer to manufacturer. However, there shall be a general schedule for a fleet owner as:

- a) 2000 km maintenance schedule,
- b) 4000 km maintenance schedule,
- c) 8000 km maintenance schedule,
- d) 24000 km maintenance schedule, and
- e) 96000 km maintenance schedule.

All the vehicle manufacturers specify detail maintenance system under the above schedule. This should be properly and strictly followed to avoid break-down of vehicles. Well trained, skilled staff shall be engaged for such maintenance job and proper record shall be maintained for evaluation of cost of repairs for each vehicle.

### **3.2.3 Monsoon Attention to Refuse Vehicles**

All the vehicles shall be checked for broken or missing wiper blades, window or fixed glasses and leak roofs, canopies in case of tractors. Fuel tank cap shall be checked to ensure that it is properly secured. Wipers shall be kept in good working condition. Anticorrosive paint coating shall be applied on the under

chassis members, flooring and inside the refuse compartment, and the water drainage holes provided on the flooring or refuse compartment should be thoroughly cleaned.

### **3.2.4 Summer Attention to Refuse Vehicles**

During all the periodical maintenance schedule, water (or coolant) circulation system shall be thoroughly checked and attended to; wherever necessary fan belts and radiator hoses shall be replaced. The radiator hoses on all the vehicles shall be blown with compressed air from the engine side to remove the dust particles, etc.

Besides checking and topping up of radiators at the workshops, the driver shall be instructed to refill the water (or coolant) inside the radiator to ensure the correct water level in the radiator at the intermediate point or disposal site.

## **4 UNIT OVERHAULING SYSTEM**

**4.1** The float units of any vehicle, such as engine, gearbox, clutch and pressure plates, radiators, water pumps, fueling section pump nozzles, starters, dynamo, air-compressor, voltage regulators, hydraulic cylinders, unloader valves, etc. require skilled, specialized and trained staff for overhauling. These units are overhauled separately and kept as standby for replacement during failure. This is essential for major fleet especially in case of refuse removal service.

**4.2** The main advantages of this system are:

- a) The downtime of the vehicle is reduced to minimum,
- b) The inventory of spare parts maybe limited,
- c) The performance of the float units may be judged separately,
- d) Overall efficiency of the vehicle is increased, and
- e) Vehicles are utilized more effectively.

## **5 LAYOUT OF TRANSPORT WORKSHOP FOR MAINTENANCE AND REPAIRS**

**5.1** For systematic maintenance of vehicles, it is essential to have proper layout of transport workshop.

**5.1.1** There shall be separate area for repair shed and parking. The size of plot for a workshop is related to the washing bay, service pits, repair sheds, painting sheds, welder room, tyre room, battery room, oil room, stores, office, etc. The entire workshop plot shall be paved with concrete. Masonry compound wall up to 2 to 2.5 m height shall be provided around the boundary of the workshop plot with proper security arrangement near the gate as well as in the premises. Work shed shall be as per Statutory Acts and Rules applicable to it. Diesel pump shall be provided inside the workshop plot preferably near the gate and shall be away from the repair shed. The height of the repair shed and width of each shed shall be suitable for size of the vehicles used. This shed shall not be facing the direction of rain during monsoon.

### **5.2 Facilities — Inside the Workshop**

**5.2.1** For better maintenance, it is desirable to have certain extra facilities inside the workshop. All the tools and implements/equipment required for maintenance of vehicles shall be provided. For example, air compressor, welding equipment, washing machine, servicing and greasing equipment, workshop machinery, tools, etc. Lockers, uniforms, canteen facility, rest-rooms, etc. shall be provided for the workers

inside the garage. Furniture and fixtures for office, rest -rooms, stores, etc. shall be provided. Proper records and registers shall be maintained and utilized through trained supervisory and engineering personnel for effective utilization of vehicles.

**5.2.2** All the premises including the working sheds and parking areas shall be cleaned twice a day. The surrounding area shall be kept green by planting various types of trees. This helps in minimizing the level of air pollution by vehicular movement inside the workshop.

**5.2.3** *Spare Parts Inventory in Stores*

The workshop should have a store where required spare parts are stored. The inventory in the stores should be adequate for at least three months. The spare should be grouped into fast and slow moving parts and storage should be in bins with appropriate colour coding. A perpetual inventory record system should be adopted and reserve stock maintained.

**ANNEX A**

*(Clause 3.2.2.1)*

**CHECK-LIST FOR DRIVERS TO BE FOLLOWED DAILY BEFORE PROCEEDING ON DAILY ROUTINE JOBS**

**A-1** The following are some of the important checks to be checked by drivers before proceeding on daily routine jobs for better maintenance of vehicle:

- a) All dash board instruments and control levers and knobs;
- b) Engine oil pressure gauge or engine oil level by dipstick;
- c) Water temperature gauge;
- d) Fuel gauge meter;
- e) Condition of the charge in the battery;
- f) Water level in radiator;
- g) Distilled water level in battery cell and condition of electrolyte;
- h) Lubrication on accessories;
- j) Braking mechanism and steering control for efficient road operation;
- k) Radiator fan belt tension and hoses, if necessary;
- m) Electrical system such as, head light, battery terminal condition for lightness, parking lights, etc;
- n) Blocking up of stone pieces jammed in between two tyres of rear sides, nails, etc. and remove;
- p) Tyre pressure in wheels;
- q) Tipping mechanism by starting engine and engaging the power take off lever and

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r) Vehicle log book shall be completed up to previous day regarding issue of fuel, oil, sundry materials, kilometre travelled, number of trips performed, tonnage transported, area covered, etc. with the signature of the controlling officer.