



Introduction to Vehicle Maintenance and Servicing



17969CH06

INTRODUCTION

Automobiles need maintenance from time to time. Like humans are required to maintain hygiene, similarly automobiles also need to be kept clean. Automobiles have to run on dirty roads and in a polluted environment. They run on uneven roads with potholes and other obstructions, and are therefore subjected to loads which damage them. Therefore, there is a need for regular maintenance and servicing of automobiles, which is usually done in auto workshops or auto service stations.

In this Unit, you will understand the concept of vehicle maintenance and servicing.

SESSION 1: IMPORTANCE OF VEHICLE MAINTENANCE AND SERVICING

As you may be aware, there is an increase in the number of vehicles, such as motorcycle, scooter, bus, car, jeep, tempo, truck, tanker, etc., running in the cities.

Every new vehicle comes with a vehicle maintenance manual. The owner of the vehicle is expected to read and use this manual, as it mentions vehicle maintenance

tips during driving. It has been noticed that after getting a car or vehicle, the owners do not care much about a regular car or vehicle maintenance.

Even if the owners regularly service their vehicle, the vehicle maintenance tips given in the vehicle maintenance manual increases the longevity or life of the vehicle to a great extent.

Vehicle maintenance and servicing is carried out when the vehicle completes certain kilometres on its normal running or when the vehicle does not give proper performance. It is suggested that the vehicle owners carry out regular and periodical checks on their vehicle, some of which are mentioned below.

Daily Inspection (DI)

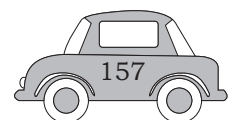
It is the responsibility of a driver or owner of a vehicle to carry out the following inspection and checks daily, before starting the engine, to avoid any type of breakdown on the road.

- (i) Check tyre pressure in all the tyres visually or by hitting the tyre wall with the help of a stone and judge the sound
- (ii) Check the radiator's coolant level
- (iii) Check the fan belts for looseness
- (iv) Check the level of engine oil
- (v) Check the windscreen, rear-view mirror and rear-window glass for their cleanliness

Maintenance Check-up

When one plans a long distance travel, it is necessary to carry out a routine check-up. One should read the vehicle maintenance manual for clarity. Some important check-ups are done for better maintenance (see Fig. 6.1).

- (i) Topping of oil level
- (ii) Proper tension of belt
- (iii) Battery for cleanliness and level of electrolyte (add only distilled water for topping of electrolyte water)
- (iv) Brakes
- (v) Topping up of coolant, if required, in the coolant reservoir



- (vi) Checking the serviceability of cooling system hoses
- (vii) Proper tyre inflation pressure
- (viii) Air conditioning



Fig. 6.1: Service centre

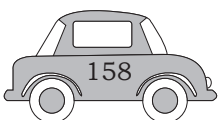
Vehicle maintenance is generally done at a vehicle service centre. You could make a visit to a nearby vehicle service centre to see how a vehicle is maintained and what all checks are carried out by service mechanic. Some important check-ups are discussed here.



Fig.6.2: Checking oil levels

Check or Top-up All Vehicles' Oil Levels

Service mechanic, with the help of a measuring stick, checks the engine oil, coolant, brake oil and water. During routine check-up, oil, water and coolants are topped up or otherwise they are changed (Fig. 6.2).



Belt Check-up

Checking of belt is very important. If it is loose or broken, then it needs to be replaced immediately.

Battery

It is a very important component of a vehicle. It should be checked regularly. Battery electrolyte (distilled water) is checked by removing the battery caps and looking inside. If the level is low, it is topped up with distilled water. Nowadays, batteries are maintenance-free which means they have sealed caps and require no checking. But, some batteries though said to be maintenance-free, do have removable caps. These should be checked in the usual manner (Fig. 6.3).

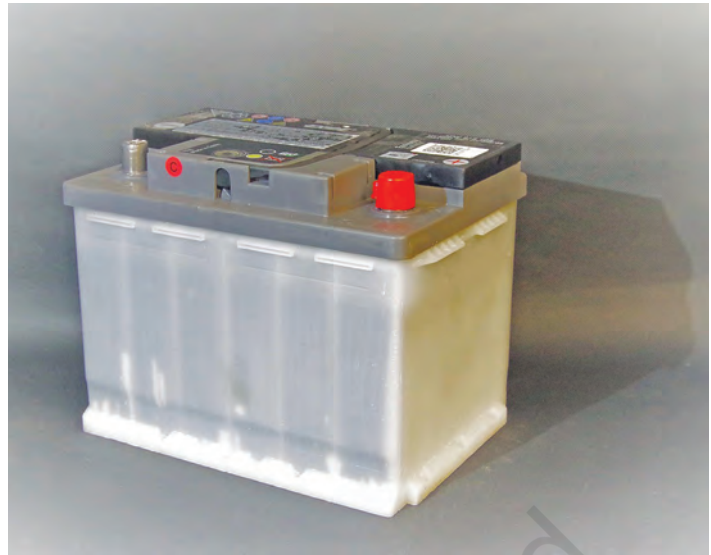


Fig. 6.3: Battery

Brakes

The service mechanic checks the brake by pushing the pedal. If there is need of servicing, the service mechanic informs the customer accordingly (Fig. 6.4).

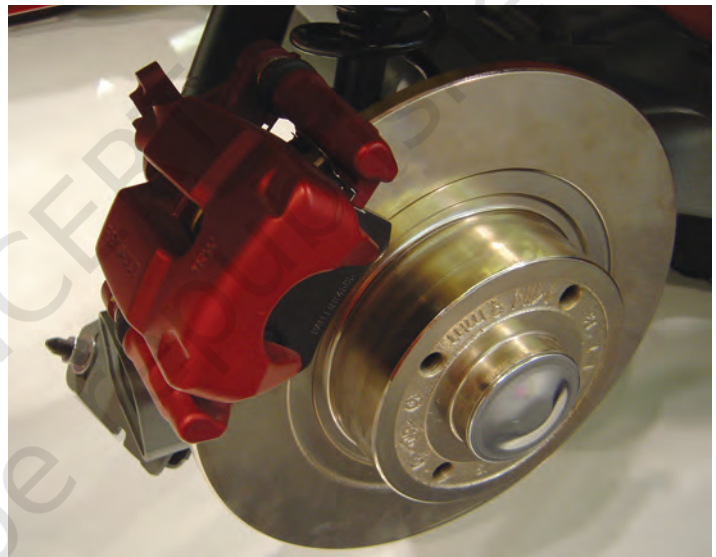


Fig. 6.4: Wheel brakes

Cooling System

The technician checks the cooling system by topping up the coolant. The cooling system should be refilled with the correct coolant, and not with water alone (Fig. 6.5).



Fig.6.5: Cooling system

Air Conditioning

The service mechanic checks cooling and heating by examining if the airflow is coming from all appropriate vents.



Fig. 6.6: Tyre

Tyres

The mechanic at the service station (see Fig. 6.7) examines the tyres by checking correct tyre pressure, and also checks whether there is any external damage (Fig. 6.6).

The safety rules to be followed during servicing of vehicle include:

- (i) Always select appropriate tools for a specific job. An inapt tool could damage the part being worked on and could cause one to get hurt
- (ii) Keep tools and equipment under control
- (iii) Wipe excess oil and grease off hands and tools so that one can get a good grip on tools or parts
- (iv) Work quietly and with full concentration
- (v) Keep jack handles out of the way. Stand the creeper against the wall when not in use
- (vi) Do not put sharp objects, such as screwdrivers, in one's pocket. One could cut oneself or get stabbed, or could damage the seat
- (vii) Make sure that the technician's clothes are right for the job and one wears full leather safety shoes
- (viii) If oil, grease, or any liquid spills on the floor, clean it up to avoid falls
- (ix) Always wear eye protection when using a grinding wheel or welding equipment, or while working with chemicals, such as solvents
- (x) While using a jack, place it properly to avoid slip
- (xi) Never run an engine in a closed garage or service station that does not have proper ventilation system. The exhaust gases contain carbon monoxide, a colourless, odourless, tasteless poisonous gas that can be toxic.

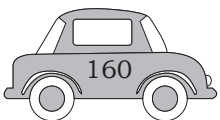




Fig. 6.7: Service station

Practical Exercise

Activity 1

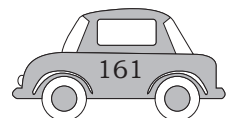
List the steps carried out during the pre-checkup activity of a vehicle.

S. No.	Steps of Pre-checkup activity
1.	
2.	
3.	
4.	
5.	

Check Your Progress

A. Fill in the blanks

1. Vehicle maintenance and servicing is carried out when the vehicle completes _____ kilometres.
2. After overhauling, the vehicle regains its _____.
3. When you plan a long-distance travel, take some time to make sure that your _____ is ready to take you outside.



4. During pre-check-up, items like vital fluids, battery, _____, air conditioning, _____, belt, hoses and cooling system should be checked.

B. Multiple choice questions

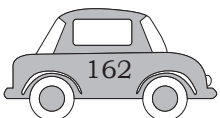
1. Before starting the engine the driver or owner of the vehicle must inspect the _____.
 - (a) tyre pressure
 - (b) radiator coolant
 - (c) engine oil
 - (d) All of the above
2. The exhaust gases contain _____.
 - (a) carbon monoxide
 - (b) carbon oxide
 - (c) carbon dioxide
 - (d) hydrocarbon
3. If the battery electrolyte level is low it can be topped-up using _____.
 - (a) pure water
 - (b) distilled water
 - (c) sea water
 - (d) None of the above
4. Coolant is used in _____.
 - (a) engine oil
 - (b) brake oil
 - (c) cooling system
 - (d) battery

C. Short answer questions

1. List the safety rules to be followed during servicing of a vehicle.
2. Why is it important to employ the right tool for the right job?

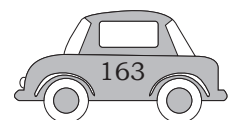
SESSION 2: TIPS TO EXTEND THE LIFE OF A VEHICLE

Care and maintenance keep a vehicle running in good condition.



The following suggestions help in better maintenance of a vehicle, and must be observed in day-to-day life.

- (i) Drive the vehicle with care every day
- (ii) Be patient during the accident or breakdown of a vehicle, call helpline number of vehicle
- (iii) Buy petrol from reputed and trustworthy service stations
- (iv) Do not fill up fuel if your vehicle is parked around an oil tanker
- (v) Car keychain should be light
- (vi) Preserve the car during long-term storage
- (vii) Clean the inside too
- (viii) Clean dash gauges carefully
- (ix) Preserve door and window seals
- (x) Do not carry too much load
- (xi) Use upholstery cleaners on soiled seats
- (xii) Place a towel under baby seats
- (xiii) Protect car paint from the sun by parking it in a spot that is out of direct sunlight. You can also apply high-quality wax as it prevents sun damage to car paint from ultraviolet radiation
- (xiv) Maintain proper tire inflation
- (xv) Check for uneven wear
- (xvi) Rotate your tyres
- (xvii) Get wheel alignment checked
- (xviii) Top off brake fluid
- (xix) Care for anti-lock brakes
- (xx) Check engine oil at every other fill-up
- (xxi) Change oil frequently
- (xxii) Do not mix coolants
- (xxiii) Avoid hose hassles
- (xxiv) Check drive-belt tension
- (xxv) Clean your engine
- (xxvi) Keep the AC functional, even occasionally during winters
- (xxvii) Maintain your car's battery
- (xxviii) Seal a leaky radiator
- (xxix) Dilute your coolant



Practical Exercises

Activity 1

List some important safety tips of a vehicle.

S. No.	Tips
1.	
2.	
3.	
4.	
5.	

Check Your Progress

A. Fill in the blanks

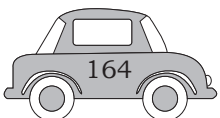
1. Clean dash gauges _____.
2. It is important to maintain proper _____ inflation.

B. Multiple choice questions

1. During the breakdown of a vehicle we may call _____.
(a) police
(b) hospital
(c) helpline of service centre
(d) None of the above
2. Wax is used to protect the car's _____.
a) life
b) paint job
c) engine
d) battery

C. Short answer questions

1. Why is it necessary to service a vehicle?
2. List some tips for maintaining a tyre.



SESSION 3: INTRODUCTION TO VEHICLE SERVICE PROCEDURE

You may have noticed that authorised automobile service centres adopt certain procedures during the service of a vehicle. In this session, we will discuss the common activities done in the service centre. One of the most important part is job card and its filling procedure.

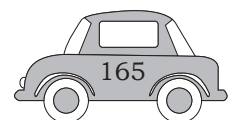
Common Activities in the Workshop

- (i) Job card and its filling procedure
- (ii) Washing of vehicle and Washing Procedure
- (iii) Engine minor tune up
- (iv) Oil replacement
- (v) Checking of battery—electrolyte level and top-up
- (vi) Clutch and brake-free play and their adjustment
- (vii) Lighting system, its various parts and their checking
- (viii) Identification of greasing points of wheelers and procedure of greasing
- (ix) Checking of tyre inflation and procedure of inflation

Job Card and Its Filling Procedure

When a vehicle owner enters the service centre, he or she is attended by the supervising engineer. The customer informs about the vehicle defect. After getting feedback from the vehicle owner or driver regarding defects of the vehicle, the supervising engineer in a service station or workshop inspects it. The defects pointed out or listed are noted down in a standard format, which is called the job card or work order.

In order to indicate his satisfaction with the diagnosis made by the supervising engineer, the customer of the vehicle signs the job card before the repairs on the vehicle are started. Work is then assigned to the concerned person to carry out repairs and the supervisor signs the job card too. The work order or job card is prepared in duplicate.

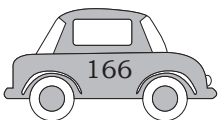


Contents of a Standard Job Card


- (i) Job card number
- (ii) Name, address and phone number of the service centre
- (iii) Name, address and phone number of the customer
- (iv) Details of vehicle, such as make, model, registration number, chassis number, engine number, date of sale, kilometres' reading, receiving date and time, delivery date and time by the service centre
- (v) Checklist before trial
- (vi) Customer's observation
- (vii) Job to be done
- (viii) Estimated cost in rupees for the customer and insurance company
- (ix) Labour required
- (x) Name of the mechanic
- (xi) Name and signature of the supervisor
- (xii) Customer's authorisation for repair and their signature
- (xiii) Acknowledgement

Filling the Job Card


Almost all the information must be properly filled in the job card (Fig. 6.8) by the supervisor with their signature and the customer also needs to sign on the authorisation for work column. Then the repairing or servicing job on the vehicle is taken over.



A standard job card is shown below. The student must practise to fill the same.



JOB CARD NO. 14050




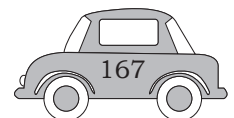
<p>SETCO 09/2-A, Industrial Area, Nazafgarh Road, Near Hans Motors, Behind Moti Nagar Bus stand, New Delhi-110 018 Tel. : 011-64644400, 9268564445 Branch 1 : 947/2, Main Mata Chowk, Vasant Vihar Road, Mahipalpur, New Delhi-110 037 Tel. : 011-64644401, 9268573335 Branch 2 : C-240, Near Radha Krishna Mandir, Pandav Nagar, Delhi-110 092 Tel. : 011-22483501, 9268573337 E-mail : services@setco.biz</p>	Name : Address : Phone : Res. : Office : Mobile :	Model : Regn. No. : Chassis No. : Engine No. : Date of Sale : Kms. Reading : Receiving Date & Time : Delivery Date & Time :				
Free Service No. <input type="text"/>	Protection Plus <input type="checkbox"/>	Paid <input type="checkbox"/>	Warranty <input type="checkbox"/>	FOC <input type="checkbox"/>	Accidental <input type="checkbox"/>	Complain <input type="checkbox"/>
Coupon No. <input type="text"/>						
CHECK LIST	OK	Not OK	Customer's Observation	Job to be Done	Estimated Cost Rs.	
Check Before Trial Engine : Idle RPM <input type="checkbox"/> <input type="checkbox"/> Engine Oil Qty. <input type="checkbox"/> <input type="checkbox"/> Electrical : Battery <input type="checkbox"/> <input type="checkbox"/> Horn <input type="checkbox"/> <input type="checkbox"/> Type Pressure : Front / Rear PSI <input type="checkbox"/> <input type="checkbox"/> Clutch Lever Free Play <input type="checkbox"/> <input type="checkbox"/> Brake Lever Free Play <input type="checkbox"/> <input type="checkbox"/> Brake Pedal Free Play <input type="checkbox"/> <input type="checkbox"/> Damage & Shortages-Yes No Lights (HL/TL/BL/Win/Pilot) Rear View Mirror (L/R) Dent (D) / Scratches (s) : Choke Cap : Yes/No Tool Kit : Yes/No Accessories : Fuel Level  Others (if any) :						
Note : 1) Please advice Customer on "Not OK" points. 2) Please verify Customer Observation.				LABOUR		
				TOTAL		
Mechanic Name :			Supervisor's Sign :			
CUSTOMER AUTHORIZATION						
I hereby Authorise the above jobs to be done & parts, if required it will be at my cost. Any additional jobs or parts required shall be at my cost. Vehicle is stored, repaired, tested and driven at my risk. Estimate given above for the labour charges and parts is only approximate.						
Customer Signature			Date :			
Job Card No. SETCO 09/2-A, Industrial Area, Behind Moti Nagar Bus Stand Tel. : 011-64644400, 9268564445 Branch 1 : 947/2, Mahipalpur, Tel. : 011-64644401, 9268573335 Branch 2 : C-240, Pandav Nagar Tel. : 011-22483501, 9268573337 E-mail : services@setco.biz	Acknowledgment			Date		
	Regn. No. :		Chassis No.			
	Receiving Date		Delivery Date/Time			
	Model :		Supervisor's Signature			

Fig. 6.8: Job card sample



Practical Exercises

Activity 1

List some important service procedures of a vehicle.

S. No.	Vehicle service procedure
1.	
2.	
3.	
4.	
5.	

Check Your Progress

A. Fill in the blank

1. Job card is used for filling _____ of a vehicle.

B. Multiple choice questions

1. Defects pointed out are noted down in a standard format which is known as _____.
 - (a) complaint book
 - (b) rule book
 - (c) job card
 - (d) register
2. What type of vehicle information is required to be mentioned in a job card?
 - (a) Chassis No.
 - (b) Engine No.
 - (c) Model No.
 - (d) All of the above
3. The acknowledgement form must have the signature of the _____.
 - (a) supervising engineer
 - (b) mechanic
 - (c) owner of service centre
 - (d) None of the above

C. Short answer questions

1. What is a job card?
2. What all is done during the service of a vehicle?

