

Automotive

UNIT-6 Reading of Service Manual

Class X Level – 2

Study Material

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Service Manual

Introduction

As you are aware, presently there is high demand of Automobiles. Due to this demand, there is an expansion in the number of all types of vehicles like cars, bikes, transport vehicles, multi utility vehicles, trucks etc. running on the roads. These automobiles need service from time to time. For support in vehicle care and service every original equipment manufacturer publishes several types of manuals for a specific vehicle. Out of these we shall be describing here two types of manuals:

- i) Service Manual
- ii) Owner's/ User's Manual.

MANUALS	
SERVICE MANUAL	USER'S MANUAL
Service Manuals are required by technicians for servicing and maintenance of a specific Vehicle. It includes all technical information, precautions related to service and maintainability of a vehicle.	Owner's Manual is an instructional booklet provided with every new vehicle. It contains general information about the vehicle, vehicle care, warranty terms & conditions and also helps in maintaining service records of the vehicle.

In this Unit, you will develop an understanding of the content of Service Manual and Owner's Manual and it's utility.

SESSION-1: SERVICE MANUAL

Relevant Knowledge

Service Manual or Repair Manual contains all necessary and technical information in detail of the vehicle with its parts. This service manual is available at the service center which is provided by the manufacturer of the vehicle. The original manufacturer publishes separate service manuals for its different models of his brand. The manual gives information about vehicle specifications, service limits of the components, precaution taken while servicing the vehicle, dismantling and assembling procedures, tightening torque values, recommendation of consumables used and replacement interval. Automobiles contain a large number of complex parts. This requires regular services to maintain originality and reliability in performance, appearance, controls, safety and long life. At the time when a vehicle requires repairs for critical defects, the technician of an authorized service station refers the service manual of that model.

In addition to the Service manual, Service circulars released by the Original Equipment Manufacturers from time to time keep the technicians up to date with new developments, events, new changes, new technical data and information etc. Service manual helps the automobile service technicians to work on the vehicle safely and systematically to solve the problems. It helps in maintaining the tolerances for smooth working of components or assembly. The manual includes special notes, important points, service data, precautions that are needed for the maintenance, adjustments, service, removal and installation of Engine and other aggregate components.

The modern vehicles have numerous electrical, electronic devices which work properly only at specified parameters. The service manual also gives circuit diagrams with color codes. It helps the technicians navigate vehicle electrical systems, sub-systems, individual circuits, and component interconnections.

Technician should know and understand the content of the manual before starting actual work on the vehicle. The copy of the manual should be kept in a handy place on the shop floor for quick and easy reference.



Fig 6.1 Service Manual

Exercise: Assignment

1. List the types of manual:

S. No.	Types of manual

2. Prepare a poster showing Service manual:

3. Fill in the blanks:

- a) Every original equipment manufacturer issues _____ types of manuals.
- b) _____ Manual is required by a technician for servicing and maintenance of a specific Vehicle.
- c) _____ Manual is an instructional booklet provided with every new vehicle.
- d) Service manual contain all necessary and _____ information in detail of a vehicle with its parts.
- e) Service manual is available at the _____ center which is provided by the manufacturer of a vehicle.

Checklist for Assessment Activity

Use the following checklist to see if you've met all the requirements for assessment activity.

Part A

Role of Service manual.

Part B

Discuss in class the following:

- Types of Manual?
- What is service manual?
- Why service manual necessary for a service technician?
- Who develops service manual?
- How service manual helps the technician to check electrical devices.

SESSION 2: CONTENT AND USE OF THE SERVICE MANUAL

Relevant Knowledge



We are now aware that the Automobile Service Manual is very important to help the service technician. The technician must know how to read and use the service manual for maintaining and servicing a vehicle. Each manufacturer-provides his own content related to his vehicle.

Content of Service Manual:

1. Index and Page No.
2. Instructions to use service manual.
3. Expanded view of assembly
3. Scheduled maintenance tasks.
4. Standard shop practices and safety.
5. Complete detail of spare parts including their part number.
6. Dismantling and assembly sequences and procedure of all systems like engine, transmission, differential, brake etc.
7. Standard tolerances, adjustment and serviceability of each component
8. Use of special purpose tools and equipment
9. Testing procedure of aggregates and components for their expected performance.

The technicians should refer to and follow the instructions given in the Service Manual while doing any service work on the vehicle.

Generic symbols commonly used in a service manual.

Sr. No.	Symbol	Meaning	Description
1	L	Lubricate	Function of Lubricate is to reduce friction, wear results in increase part life.
2	R	Replace or Change	While Tuning of System it is mandatory to replace or change the wear components. So that system works in an effective manner.
3	C	Clean	Clean the parts to remove dirt and other foreign materials.
4	A	Adjust	To bring the parts to a true relative position to avoid looseness
5	T	Tighten to specified Torque	A torque wrench is used to apply a specific torque to fasteners such as a nut, bolt, or lag screw.
6	I	Inspect	To look carefully. View closely and critically to inspect every part
7	O	Rotate	Rotate the part. Periodically change the tires from one position to another.
8	!	Warning	An early signal that something bad or dangerous might happen.
9		Don't Do This	The general prohibition means you must not proceed.
10		Caution	Caution sign means to take care in order to avoid possible danger.

Abbreviations used in a service manual.

Sr. No.	ABBREVIATIONS	FULL FORM
1	ABS	ANTI-LOCK BRAKE SYSTEM
2.	A/T	AUTOMATIC TRANSMISSION
3.	A/F	AIR FUEL MIXTURE RATIO
4.	A/C	AIR CONDITIONING
5.	CKT	CIRCUIT
6.	CMP SENSOR	CAMSHAFT SHAFT POSITION SENSOR
7.	CKP SENSOR	CRANKSHAFT POSITION SENSOR
8.	DTC	DIAGNOSTIC TROUBLE CODE
9.	VIN	VEHICLE IDENTIFICATION NUMBER
10.	OBD	ON BOARD DIAGNOSTIC

Exercise

1. List the content of service manual:

Sr. No.	Content of Service Manual
1.	
2.	
3.	
4.	
5.	

2. Prepare a poster showing Generic symbols commonly used in a service manual:

3. Fill in the blanks:

- a) Each _____ provides his own's content related to his vehicle.
- b) _____ must know how to read and use the service manual for maintaining, servicing of a vehicle.
- c) Function of Lubricate is to reduce _____, wear results in increase part life.
- d) _____ is the full form of ABS.
- e) _____ is the full form of OBD.

Checklist for Assessment Activity

Use the following checklist to see if you've met all the requirements for assessment activity.

Part A

- Role of Generic symbols used in a service manual.

Part B

Discuss in class the following:

- Content of Service manual.
- Generic symbols used in a service manual.
- Importance of Generic symbols.
- Different Abbreviations used in a service manual.

Performance standards/criteria covered by this assessment

Performance standards	Yes	No
Able to explain Content of Service Manual		
Able to explain Abbreviations used in a service manual.		

Session 3: Content and use of the owner manual

Relevant Knowledge

Owner Manual also known as user manual and service booklet is an instructional book on safety, operation, specifications, vehicle care and for maintaining service records of newly purchased vehicles.

Before driving, owners should read the Owner's manual carefully and familiarize themselves with their vehicle. For their own safety and a longer vehicle life, they must follow the instructions, 'Warnings', 'Cautions' and 'Notes' given in the manual. Ignoring them could result in damage to the vehicle or personal injury to them or others.

The Owner's manual is an important document and should always be kept in the vehicle. If they sell the vehicle, always pass on the documents to the new owner.



Fig 6.2 Owner's Manual

Content of owner Manual

1. How to use the manual
2. Safety features of the vehicle
3. Features of the vehicle
4. Warranty Policy
5. Vehicle at a glance
6. Driving the car
7. Emergency Assistance or what to do in an emergency.
8. Vehicle Care or maintenance
9. Technical Information/Specifications of the Vehicle.
10. Vehicle Service Records
11. Service Network

Maintaining service records of Vehicle

1. Recommended Service
2. Date
3. Distance/Odometer Reading in Kms
4. Service Order No.
5. Details of repair done
6. Name of servicing dealer/workshop

Exercise

Q1: Content of Owner Manual

Sr. No.	Content of Owner Manual
1.	
2.	
3.	
4.	
5.	
6.	

2. Prepare a poster showing Owner manual:

3. Fill in the blanks:

- a) Owner Manual is also known as _____ manual.
- b) _____ is an instructional book on safety, operation, specifications, vehicle care and for maintaining service records of new purchased vehicle.
- c) Service booklet comes with every _____ vehicle.
- d) Service booklet is also known as _____ manual.
- e) Owner manual is used to maintain _____ record of the vehicle.

Checklist for Assessment Activity

Use the following checklist to see if you've met all the requirements for assessment activity.

Part A

Role of Owner's manual.

Part B

- Discuss in class the following:
- Use of Owner's manual
- Content of Owner's manual.
- Importance of Maintaining Service record of vehicle.
- Difference between Owner's manual and service manual.

Performance standards/criteria covered by this assessment

Performance standards	Yes	No
Able to explain the content of Owner Manual.		

Suggested Reading Books

Automobile Engineering Vol I Kirpal Singh Standard Publishers

Automobile Engineering Vol II Kirpal Singh Standard Publishers

Text Book of Automobile Engineering R K Rajput Laxmi Publications

Automobile Engineering R K Singal S. K. Kataria and Sons