

An **Automotive** **Repair** **Book**



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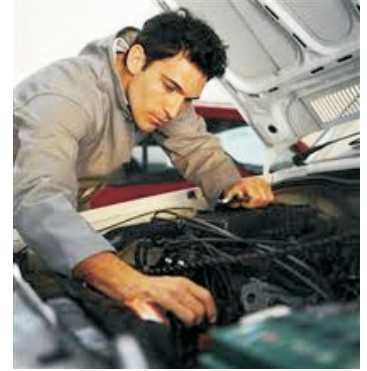
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Chapter 1 : The Basics Of Automotive Repairs

If you are having your own personal vehicle, then you must know about its basic working. An automotive is a person's one of the most invaluable assets and if you are talking about the brands, then your knowledge will never have a limit. The costlier the brand, the more complex will be the automotive, which means you will require more in depth knowledge about it.



An automobile can also be easily compared with a human's body since both of them need regular maintenance for their prolonged life. However, basic car maintenance techniques must be followed by the car owners to stay from the conspiracies of the mechanics. It is commendable that people keep browsing internet for the well being of their vehicle and try to be up-to-date with the latest technology. Additionally some also surf about the estimates of the car repair worrying about getting charged excessively unnecessarily.

Nevertheless, when getting the solution of the problem goes beyond your limits then the motor mechanic will always be the last choice. In this case, the owner should be very careful, as the statements given by the repairman could be a way to make huge money for small repair. Don't give him a chance to make a fool out of you. Since you are having a fair idea of your car, mechanic will think twice before giving an incorrect estimate.



1. Check for the authenticity of any sparse noise coming from your car. For Instance if the owner is getting any shrieking noise from under the hood, it might be an indication that the pulley belt needs a replacement. However if the plight is of shifting the gear, then the solution may come out by looking into the transmission. If the owner has the curiosity to look into the problem, then the first step should be browsing internet and typing the symptoms existing in your motor car. You will get a number of documents stating solution out there. Cautiously go through each one and find out the reason behind all this.

2. Frequently, do a self servicing of various parts of your car electronics like LED, daylight running lights, car monitor, head radio, GPS Navigation, car charger, headlight, tail light etc. In many cases, car battery is the major reason however in many countries residents attend battery related issues by themselves.

3. Auto repair books are also the best option to check out the ailment. It can be availed through any good book store or even online. They can provide you a proportional vision and also tell you the time duration it will take to examine, repair, along with the budget, which is sometimes difficult to decide.

4. Internet is the best place to look for the prices of the replacement parts. They can provide you a comparative study on prices as well since different companies have different prices. In most of the cases, the spare parts on the internet are cheaper than the market prices. Sometimes you may be charged take shipping costs but in few cases eye-catching discounts are also available with some of the products.

Chapter 1 : The Basics Of Automotive Repairs

Automotive repair is a very challenging endeavor as owner has the option to save his car by changing old parts with updated and fresh equipments. Sometimes, DIY doesn't work and then the technical part is referred to the customer service so that the problem is diagnosed by the specialists.

Auto repair service involves frequent maintenance like oil changes, rotation of tires, transmission services, alignments, checking of engines, light services etc. Spending little time can make your life prosperous in terms of saving money, time and energy. So, make a list of your preferences in terms of the regular automotive servicing. Huge number of auto service centers provides tune ups, wheel alignments, paint works for scratches, mufflers and exhaust systems, body work parts, tires automobile electrifications, windshields, oil changes, all over computer diagnostics, engine repairs and battery charging. They also facilitate working on exhaust system, power steering, brakes, shocks and air conditioning and suspension. Some specialized shops work only on certain renowned brands of vehicles or automobiles from some continents of the world.



Brakes lines are more prone to damage because of its every moment exposure. Braided stainless steel system is more effective as compared to system fitted with flexible rubber hoses with close elimination of hose expansion. Brake lines are sensitive to leakage, rusting and brittleness hence brakes need timely maintenance. Always use quality parts, but also keep in mind that the life of the brakes depends on driving conditions as well. One of the vital factors to prolong brake's life is reducing brake shudder and braking noises. Do check your brakes and change the oil every time after covering a distance of 3000 miles.

For detailed knowledge, a learner of automotive repairs can go through the online resources, books, computer printouts, professional reviews as well as contacts with featured schools. In the metric system the students will learn how quickly and precisely mechanical defects can be diagnosed. They will also understand the basic skills, crafts and masteries for the set up.

Transmission is a fascinating subject in auto repair, as it can create a big blunder for a small reason. Small leakage or the residual of the left liquid could be the reason for this. Complete car transmission may stop working if the gaskets collapse because of the excess of the heat produced. Most cars have a lot of sensors in the transmission linked to the cars computer which is helpful if there's a problem. If you have a difficulty in shifting the transmission or the checking whether the engine light is on, then contact the nearest automobile centre. For more information on internet, you can go to "auto repair reference centre ", which has the most comprehensive collection of automobile repair reference information. Since 1945, it's covering fairly 37000 vehicles and gives approximately 110,000 technical service publications by renowned manufacturer. One can even view about 180,000 wiring diagrams with printouts .as it has a nice user friendly interface. So get yourself a reliable automobile service centre with a sound knowledge about your car. Nevertheless, if anytime something goes seriously wrong in the middle of the road, you should have sufficient knowledge to drag your car to the service centre.



Chapter 2 : Do it Yourself Automotive Repair Tips

Does vehicle maintenance gives worries to you ?

Follow some tips in this chapter and drive down carefree on the road with a complete ease. Many people get a command over their vehicles and do fundamental repairing themselves. Only the thing, that needed is some equipments, perseverance and little time. If you are good in surfing, some footage on the web would be a good help for this. Also you can go for the books that illustrate your problems with solutions in details. However, it could give torque specifications, if any spare part has to be replaced.



To start with the basics you must go for the essential servicing like oil changes and air filter changes. Only this step would give a big boost in the gas mileage and the performance of the car. If you think sensibly, if the oil has debris or any kind of contaminations, it will hinder the lubrication of the engine making it overloaded with the extra heat. It will be over pressurized to maintain its cooling resulting into the blockages of the air flow to the engine.



Now, the next is checking the air pressure in the tire as one mile per gallon is depleted for every 2' psi' under inflated tires. Look into the vehicle owner's booklet in the placement area to check the oil level, air pressure and air filter commendations.

Moreover, as you go deeper a digital camera will be a good option in case you forget the track. The pictures in the camera will help you in memorizing the bolts to lose and tighten. You must always keep in mind to be precise, if it is your beginning. Do not disturb the parts which are already in their original position. See carefully, how the parts come out of the machine

when you unscrew them. Do replace the seal properly, as it can impose dangers when not adjusted correctly. Do not make extra tight fittings otherwise it can be as fatal as one that has not been fitted tight properly.

Bolts are tested by their tensile strength and the more no. of slash pockmarks on its head. Remember, the torque specifications should be low in number for bolts as it is used for lubrication than the dry bolts. According to Webster, Torque is a turning or twisting force. Over-tightening of the bolts can take longer for the repair. Parts can be easily wrapped, especially when they are made up of aluminum. Under such circumstances gaskets and seals can have a break down. Always hold the bolts in your hands and then figure it out and move the materials around. Sometimes the burden of the parts can make the bolts to become tight but finally, by frequent DIY maintenance attempts you will become efficient mechanic of your own car.



Always "A" grade fastener should be used, go and buy a repair manual from the market. They are available on most of the stores or can be ordered through the web. These can even be availed free online.

Do have separate containers for the oil change or purchase it from the market. Never trench the oil anywhere on the ground. Mostly the general maintenance is easy to operate if you actually enjoy doing it.

Chapter 2 : Do it Yourself Automotive Repair Tips



Before initiating the repair, make sure that you have arranged all the equipments and tools otherwise running to the market in between can spoil your work, time and energy. It becomes an annihilating chore when you are out for the purchase of the spare parts every now and then. If an organized work is performed like arranging the manuals, checking the prices online, arrangement of the digital camera, handy tools and equipments, oil containers, nuts & bolts bag etc. then the repair work becomes an independent and happy job. Buying products online, is economical in most of the cases as it provides attractive discounts and the shipping parts are also reasonable. Spending time in bargaining is saved because you just have to go for a comparative evaluation and buy the spare parts.

The ultimate factor is safety which means you must always perform the repairs that are within your limits. Many complexities may arise in the spare parts substituting involving heavy lifting, crawling under the automobile, laying, performing in peculiar angles, reaching, bending, twisting, tugging, pulling, pushing, straining or jerking. If you have a weak back, arthritis or any joints disorder or low physical strength, just hire a mechanic.



At all times use a jack stand if you are working under the car. You may also use a support stand under the vehicle to avoid its falling down. Never use blocks of wood, bricks, boxes, wheels or anything like this for support as they may slip and with the vehicle you may also get injuries.

Don't forget to use wear glasses to save your eyes from fumes, corrosive chemicals and aberrant metal particles. Do not wear loose attires, jewelry, bulky gloves or chains as it may entangle in pulleys and can be fatal.

Remember to disconnect the battery prior to working near the wiring. If you don't do so, you will get an unpleasant sensation in your arms.

Smoking should be banned when you are working on carburetor, fuel pump, fuel injectors, fuel tanks or fuel lines, i.e. on any fuel related component. Do- not - smoke as the batteries contain highly explosive hydrogen gas. Take precautionary measures while working on fuel lines on the fuel injected system. Have a 'B' and 'C' ratings fire extinguisher just in case of emergency.

Air bags are very expensive to replace, crossing the wrong wires may set-off the air bag when the batteries are not disconnected.

Don't give electrical shocks around the engine or on a heated engine, never open the radiator cap. Use outdoor extension cord which is properly grounded and has perfect ampere rating.



**Take your time and moreover,
have patience while performing Do-it-yourself automotive repair task!**

Chapter 3 : Tools required for repairs and maintenance

Before you start your journey into the world of auto repairs, be sure you have all the equipments to make it a hassle free experience. There are a great number of kits available in the market to make this experience easy. Craftsman offer a huge selection of tools at affordable budget as well.

Each mechanic owns a list of the tools which are important for him. Given below are some tools which will help in the repairs and maintenance of your vehicle.



WRENCHES

Combination end wrenches are essential for engine work as they prove to be worth in a great deal of applications. Though not common, a torque wrench is required for fine tuning of calibration. Torque wrench torques the spark plug and other bolts, to the specification of the manufacturer. Preferably a torque wrench with a reading of 150ft lbs is used and it is also necessary during the replacing of the coil springs. If your car requires serious work, then this wrench is a must in your tool kit. Combination wrench remove bolts that are required to access oil drain plug and oil filter. Oil filter band wrench is used for the removal and installation of oil filter in cars. If you plan to make oil changes on your own, this toll is highly recommended. Crescent wrench is required to properly hang the muffler. Prices of wrenches vary from \$2 to \$20 apiece. They are also available in sets with an amount range of \$25.

SOCKET SET

Socket is one of the equipments which are used for even basic repairs. It comes in sizes ranging from 2" to 24". While you buy a socket, be sure to get flex joints as well as a set. Flex joints combined with extensions really make a great device. Their prices range from \$3 to \$15. Torx bit socket helps to remove oil drain plug and oil filter socket are used to access the cartridge filters in sealed units.

PLIERS

Pliers are equipments which can't be overlooked. Most common pliers needed are needle nose, channel locks, lineman's pliers and slip joints. These pliers can be brought in a set. Adjustable locking pliers can be used to hold things with great force to free your hands for other jobs. Cost of pliers depends upon the usage kit you purchase depending upon your needs. Prices range from \$15 to \$20.

VOLTMETER

It is used for the testing of voltage and is used so that you may not end up cutting the wrong wire.

BALL PEN HAMMER

It's a good tool for loosening up the stuck parts with also other functions too.

PRY BARS

It gives you the leverage to pull up something that doesn't move.

SCREWDRIVERS

A great variety of screwdrivers are essential for repair work. Most commonly square head or flathead drivers are used. They are best available in sets ranging from \$2 to \$10 apiece.

FEELER GAUGE

During the measurement of spark plug gap or valve clearance, this tool is essential. This device is very precise and accurate and gives the precise machine thickness. A micrometer is like the feeler gauge only that it measures distances. Even though not so common these devices provide great help.

Chapter 3 : Tools required for repairs and maintenance

REPAIR MANUAL

It is one of the most important tools for automotive repair. It gives all information regarding the repair works and is available at all local parts stores. One can save a great deal of money by conducting self repairs.

Besides repair it's also very important to maintain your vehicle. Given below are few methods for your vehicles maintenance.

TIRE MAINTENANCE

Maintaining your tires is an important job which includes changing them from time to time, patching them when punctures occur etc. all these works require tools which will ease the task. Common tire maintenance tools include tire iron, T-Handle probe and needle tools, car jack, air compressors and tire plugs. Tires tend to wear out with passage of time and hence it's very important to rotate them once in a while like after a few thousand miles. This rotation job can be made a lot easier with the availability of proper tools, like the usage of tire stands during the removals of tires. An air compressor is a good accessory during the inflation of your car tires.

MUFFLER MAINTENANCE

Mufflers are equipments in cars which redirect the hot exhaust gases to the back of the engine through the tail pipe. Its maintenance requires the car to be lifted which requires a jack stand. Hangers help to hold the mufflers in place. Muffler maintenance kits include bandage, wire fastener and metal heat shield. These kits are best for short- term repairs. If the muffler is troublesome then cutting tools are required to cut them off from attachments.

SUSPENSION REPAIRS

It is one of the specialized areas for auto repair. You would require wrenches sockets and screwdrivers for this purpose. Spring compressor is used for the replacement of coil springs. Hydraulic puller is equipment used for the removal of wheel bearings. CV boot tool helps you in the replacement of the CV of your tire without taking the entire joint apart. While taking out shock absorbers, you need to hold it in place and strut nuts play their role here by holding them. Tie rod puller is a tool used during the replacement of the tie rods.

RADIATOR MAINTENANCE

Radiator keeps the vehicles engine cool, so it is very essential to see that it is properly maintained. A radiator flush is necessary from time to time for this purpose. A radiator hose tool is required to check the quality of your hose. It tells you whether you vehicle's hose are in good shape or not. A drain plug checks the proper flow of water throughout the radiator system. A radiator bleed tool drains out the excess water in your radiator. A can of sealing material is highly useful if your radiator has developed a leak. All these tools are available in cars repairs shop.

So these were some of the best ways for maintenance of your vehicle as well as for its repair in need. The tools mentioned are assured to make your job easier giving a hassle free experience.



Chapter 4 : 10 Easy Tips to Avoid Major Automotive Repairs

With the time, expenses are soaring high and the proverb "It's better to be safe than sorry" implies with the automotive repair as well. You too can save yourself from various repairs just have a glance over 10 holdings where you can manipulate your budget:



1. OIL CHANGE: Changing oil frequently is better than changing the whole engine. Dirt and metal fillings lowers the lubrication of your car engine. Oil change costs around \$ 29.95, while if you have to change your engine the expenses would be around \$5000. Hence changing the oil after travelling for 3000 miles is always suggested by the experts. Some automobiles require synthetic oil for branded cars like 2000-2009 Audi and Volkswagen but if you use non-synthetic oil, then discrepancies would start appearing in their engines.

2. TRANSMISSION FLUSH: Second most important unit to avoid repair is changing transmission flush every two years or every 30,000 miles. On an average replacing transmission fluid costs around \$100 but sometimes it costs \$1,500-\$4,000. There are 5 ways you can check when your transmission needs a change. They are

- a. When your transmission is grinding or making strange noise. Stop your car while the engine is still running and check the noise.
- b. When you see a sluggish response where the vehicle changes gears too quickly or too slowly.
- c. When the fluid level of the transmission is full or nearly full, and the contaminations are blocking the fluid flow.
- d. When the transmission flush is not proper, the car may face surging and tends to show backward and forward movement for no reason
- e. The vehicle stalls with delayed movement after being put in gear.

3. COOLANT FLUSH: It removes litter and phosphate scale and is formed when the additives found in automotive coolant mixes with the mineral found in tap water. In that case, the freeze point and the PH level become insufficient with the time and needs servicing. It costs around \$79.95; however replacing the whole radiator requires \$500.

4. FUEL INJECTION SERVICE: This service averts replacing of the injectors which are very costly. Carbon is produced in the engine and needs to be eliminated after a regular interval of time. This will help in preserving the gas mileage, which is deteriorated with the time. If you don't shield, the maintenance would be around \$500.

5. FUEL FILTER SERVICE: It gives an added advantage to the fuel pump by prolonging its life and working miraculously. The fuel filter may be choked with debris and dirt, so it needs a regular maintenance. This service costs around \$40 and ignorance may cost you \$200-\$500. Do change your fuel filter after every 10,000 miles. A slight indication of its clogging is, when the car starts decently, but shows sputtering at a low speed and in some cases the car starts roughly and stalls out at stoppages.

6. DIFFERENTIAL SERVICE: In two wheelers, four wheelers, pick up trucks, SUV's and the rear wheel vehicles, periodic replacement of gear oil is specified. The axil oil in these systems is same as the oil used in the engine; however it is not changed as frequently as the engine oil. Differential service costs around \$40 and of course ignorance will charge you \$300.

Chapter 4 : 10 Easy Tips to Avoid Major Automotive Repairs

7. AIR FILTER SERVICE: Air filter service is a must for your health and the health of your family. It will help the engine to use clean air for combustion and will maintain the gas mileage. Opting for a new air filter every 15,000 miles or once a year will make an individual's journey and life a happier one. Spend \$15 and increase your gas mileage otherwise, it will give you a headache of engine power and higher vehicles emissions. Sometimes dealers offer free multipoint inspection. GO Nissan Southwest in Littleton, completes the air filter replacements in just 30 minutes by participating at express service dealership. It does not require any previous appointment.

8. CABIN AIR FILTER CHANGES: If your car is endowed with cabin air filters, then replace it with new ones every 12 months or after 12,000 miles to 18,000 miles. These filters keeps away the dirt material, pollution smokes, soot, smog, mildew, pet dander, fungus, pollen, mold spores and the tobacco smoke coming from outside into your car. Nowadays you can also replace your old cabin filters with a new Purolator. Breathe Easy cabin filter or if you or somebody in your family is planning to buy a new car, then go for the cars where cabin filters are equipped already.

9. POWER STEERING SERVICE: Check for the level of the power steering fluid or any leakage. Before you take out the rag you must clean the nearby area completely. In fact any hydraulic system should be cleaned neatly and cautiously tightened the caps before you start your travel. Precautionary maintenance will cost around \$80 and alternatively ignorance will cost around \$300. This service will abstain from making any whining sound and increase the life of power steering.

10. FUEL TREATMENT: With the regular cleaning of fuel injectors and a complete system flush, go for a fuel treatment after every 3000 miles to stop the reoccurrence of the carbon. Lucas deep system cleaner reduces the Nox emission; eliminating the need for higher octane fuel. It costs as low as \$10 however it can increase the gas mileage. It entirely cleans the fuel system and the combustion chamber.



By keeping a thorough check on different spare parts, you can make your journey pleasant all the time. However before starting the servicing of your vehicle, make sure what exactly needs to be done. How much will be the entire cost, including the extras because in most of the cases the mechanics wiggle at the end of the servicing, in order to cheat and earn extra money. Make sure you get the list of the services in writing and sometimes some shop retailers sell you the items that you don't need at all. In other cases the mechanic fixes the wrong problem, where the problem is not solved and they disturb the perfectly working spare part. The worst part is when you are caught in a shop, where you have never been before, and they just change the engine oil on the name of servicing.

So, follow above tips to stay away from major auto repairs and getting fooled by service hubs as well!

Chapter 5 : How to Choose Automotive Repairs Shop

What should you look for when selecting a repair center for your vehicle?

The first thought that instantly comes to our mind is how to choose a reputed and reliable auto repair center. For this purpose recommendations from friends and neighbors can be a perfect beginning of advice. Choose a store that employs ASE-certified technicians. Automotive Maintenance Excellence or ASE empowerment is achieved exclusively after stringent preparation and testing, and shows a grooming sincerity on the construct of the mechanics. This way you abstain being rushed into a last-minute selection. How long the store has been running is also an important factor to be considered while opting for an auto repair center. Fake repair centers won't last in a long run in today's age of fast communication.



Do not worry if you are walking into a small or independent automotive repair workshop. Many of the sporty, big-chain repair stores make money on intensity, not quality of their work, and they usually prefer to hire less trained workers for them. A fake store would guarantee you the best work at higher prices and the work would also not be worth satisfying. Instead a small self-owned shop will assure you the best repair service with comfortable prices simply because they are much more interested in satisfying their customer for long

term relationship. Selecting an independent store is actually a smart choice as the technician would be having the knowledge of every model he has worked on in his career. Additionally, this could make him a well-experienced mechanic allowing him to do the best at his place.

What would be your choice while selecting a restaurant to have your meal? You would prefer some kind of neat, clean and hygienic restaurant or a nearby dirty and stinking area? Obviously, you would want the neat and clean restaurant to have your meal satisfactorily. But the cleanliness point is also only the big thing to consider every time, the point of good quality service and impression of the management on their customers is also important.

Do not select a repair shop which simply examines the vehicle for a while, does the possible judgments and somehow make it manageable to run. If they do so, simply drive from that center to any other one for the second testing.

Therefore, it's also suggested that you should never have a single selected auto repair center rather keep a second or third choice available with you. That is not difficult at all, if you are doing with your research for some repair centers for you.

Without any doubt, go on with your friend's or neighbor's suggestion and if those repair centers employ the ASE-trained workers then they will not cheat you for sure. Also, such centers are likely to be there in the market from quite long known as reputed and trusted centers which satisfy their customers without giving them any chance of complaining.

While selecting an auto repair shop some most important things that come to a smart mind are, that the technician should be loyal, well- trained, curious to do work with complete satisfaction, has a loyal boss, constantly keep on updating his knowledge, knows about every model and also works for an honest business.

Chapter 5 : How to Choose Automotive Repairs Shop

It's advisable before picking the repair center you should take a short interview of the shop owner on the following questions, if possible:

- **You can ask him about his center's warranty and pricing policies.**
- **You can ask him if he has the knowledge of mark-ups of the parts of the vehicle.**
- **You can ask him about the credit policy.**
- **You can also ask the basis of selection of their technicians for their centre.**

Although, considering your vehicle's user manual is a best choice to avoid such complications. Doing this will help you and your technician to avoid small problems to become severe ones. Never hesitate to clear any doubt running in your mind related to such problems before wasting your money and efforts.



Always remember that a good technician is a trained one who understands you and your vehicle's need more than you. Satisfaction is the most important factor for a customer and honesty for a dealer, if both are not present or even a single factor is missing then there is no reason of dealing with that shop.

Lastly, A Few Points To Remember While Opting For A Best Auto Repair Shop:

- Familiarize yourself with your owner's manual and continue with the manufacturer's suggested service schedule. An automobile owner's manual includes riches of information and therefore, it is a wise decision to carefully go through it.
- Referrals from friends and colleagues can invariably be a smart choice. The old-fashioned viva-voce reputation continues to be most sage advice you can count on.
- All browse policies including labor costs, guarantees, methods of commercialism, etc., should be in ingenuous examine to the public.
- Look for a neat, well-organized motorcar improvement hub with cars in their parking lot.
- It's a good thought to look for an auto repair center when you actually need it.
- Don't just simply opt for the one you discover as some extra research in this direction will help you to save your pennies and direct you to a better choice.

Devote a bit of extra efforts and explore more, which will reward you with best future repair service and pocket friendly maintenance work!