International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 3 Mar 2022, pp: 398-413 www.ijaem.net ISSN: 2395-5252

Periodic Maintenance of Toyota Vehicle: Bangladesh Perspective

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Submitted: 01-03-2022 Revised: 10-03-2022 Accepted: 12-03-2022

ABSTRACT

Periodic maintenance refers to the regular, routine maintenance services that should be completed on vehicle to prevent untimely breakdowns and avoid the potentially gargantuan repair bills. It is simple an ounce of Periodic maintenance is worth several pounds of cure. Periodic maintenance services include testing, inspections, lubrication, adjustments, cleaning, and replacing worn parts. It is described as performing service, replacement and inspection, testing of a vehicle at specified intervals according to the maintenance schedule in owner's manual. The service interval for scheduled maintenance is determined by odometer reading or time interval, whichever comes first. Proper maintenance will help ensure maximum performance, greater reliability and longer life of Toyota vehicle. To maintain Toyota vehicle in top driving condition, it is important to have it inspected and serviced periodically in accordance with the maintenance services listed in Owner's Manual. Preventative maintenance include engine, engine coolant, brake fluid, fuel filter, air filter, transmission oil, spark plugs, tightening nuts and bolts on body and chassis, steering, suspension, brakes, electrical components, chassis and body, change of engine oil and oil filter, road tests and a detailed inspection Proper maintenance will ensure higher performance, better reliability with better fuel economy, longer life and better chance to get higher resale value.

Keywords: Periodic Maintenance, Toyota, Vehicle, Automobile, Hybrid, Manual, Performance, Production engineering, Bangladesh.

NOMENCLATURE

ODO	Odometer
TDC	Top Dead Center
BDC	Bottom Dead Center
VVT-i	Variable Valve Timing Intelligence
R-134a	1,1,1,2-Tetrafluoroethane
rpm	Revolution per minute
Km/hr	Kilometer per hour
psi	Pressure per square inch
kms	kilometers
SUV	Sports utility vehicle
CO	Carbon monoxide
SOx	Sulphur oxide
NOx	Nitric oxide
HC	Hydrocarbons

1 INTRDUCTION

Vehicles of recent times have developed trends to reduce pollution, specific fuel consumption, vehicle weight, noise and to improve aerodynamic profiles and stability of vehicles [1]. Periodic maintenance schedule is a time-based series of activities performed on equipment to maintain the smooth operation of the vehicle. The purpose of periodic maintenance or time-based maintenance is to maintain smooth operation of a

International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 3 Mar 2022, pp: 398-413 www.ijaem.net ISSN: 2395-5252

machine or other asset. Prevention is better than cure, that's why for hassle and worry-free driving always follow the recommended periodic maintenance intervals for vehicle [2].

An automobile company provides quality assurance service based on warranty period, which includes duration and distance driven. The concerned automobile company provides a warranty that begets quality assurance costs in case an accident occurs during this time [3]. Every Toyota model has recommended, scheduled maintenance that should be performed at 5,000 miles or 6 months, 15,000 miles or 18 months and 30,000 miles or 36-month intervals [4]. During periodic maintenance service, vital parts and lubes are inspected and if necessary, replaced, to prevent vehicle breakdown. Regular maintenance is the easiest way to ensure the safety and long-term durability of Toyota vehicle [5].

Bangladesh is one of the most important textiles and garment exporters countries within the world [6]. Vehicles make it easier to improve the country's textiles and garment exporters business. Toyota vehicles are the most common usable vehicle in the road of the country. Toyota vehicles are intricate machines that require regular maintenance to ensure all parts are working together properly. If one forgot routine auto service, risk experiencing issues down the road, which can lead to the need for expensive repairs. Routine maintenance not only keeps Toyota car, truck, or SUV in running smoothly, but it also saves money. Anyone can also save time and money by learning what to look for under one's hood or finding out how to change a tire [7].

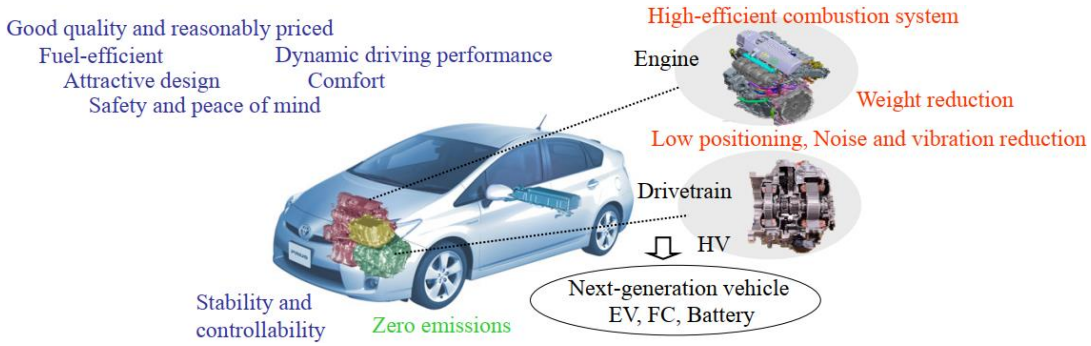

Figure 1: *Definition of a good car [8].*

Figure 1 shows the general requirements to make a good car. However, the definition of a good car differs depending on the era, the person, and the country, and there are certainly various other criteria besides the items shown in *Figure 1*.

Figure 2: *Engine oil check and change (Navana Toyota 3S Center).*

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Routine maintenance is the key to keeping vehicle running smoothly without the need for major and expensive repairs. This study will help insure maximum performance, excellent running condition, better fuel economy, longer vehicle life, higher resale value greater reliability and longer life for Toyota vehicle.

2 PURPOSES OF PERIODIC MAINTENANCE

Toyota have a good performance, reflected in the cost, profitability, unique competitive advantage and so on. Japan, represented by hybrid vehicles in the world have been commercialized, Toyota hybrid car sales in the world more than 700 million, with the same or even stronger than the traditional car. The success of the Toyota business model mainly in the following aspects:

(1) People oriented, good quality. Toyota car from the appearance to the inside of the accessories are all selected excellent material, and even into the United State market is taking into account the American figure in the United States to redesign the body of the car space. So that Toyota quickly in the United States to establish a high-quality reputation.

(2) Service quality, customer satisfaction is high. One of Toyota's sales strategies is to seek the implementation of management, service and spare parts supply integration, quality of customer service to dispel concerns about the use of Toyota. Customer satisfaction can be greatly influenced by word of mouth, and it also affects the customer's loyalty to the product.

(3) Brand effect projection. Toyota multinational manufacturing enterprises through the pursuit of quality, insist on customer satisfaction in the first place to consider, from the shape of the "Made in Japan" in the big brands to have international influence and visibility [9].

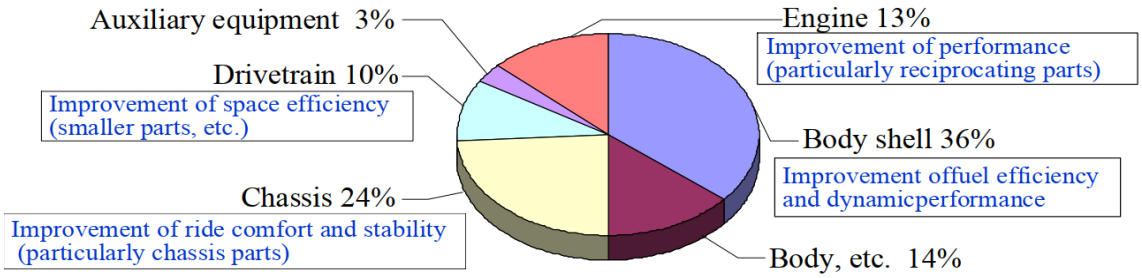

Figure 3: *Weight ratio of parts and expected performance improvement [8].*

Toyota's aim is to make better cars that exceed the customer's expectations and that are more advanced than cars from other manufacturers. Toyota also aims to deploy new technologies outside Japan after a period of maturity in the Japanese domestic market. Sustaining these activities into the future should also alleviate concerns about the hollowing out of Japanese domestic manufacturing [8].

An automobile is constructed from a large number of parts, which can become worn down, weakened or corroded to lower the performance, depending on the conditions or the length of use. Constructed parts, which can be estimated that performance goes down, are needed to have a periodic maintenance, then adjust or replace to maintain the performance.

By carrying out periodic maintenance, the following results can be achieved, ensuring the customer's trust and peace-of-mind:

a) Much larger problems with the vehicle that may occur later can be avoided.
b) The vehicle can be maintained in a state which is in adherence to legal regulations.
c) The life of the vehicle can be extended.
d) The customer can enjoy an economic and safe driving experience.

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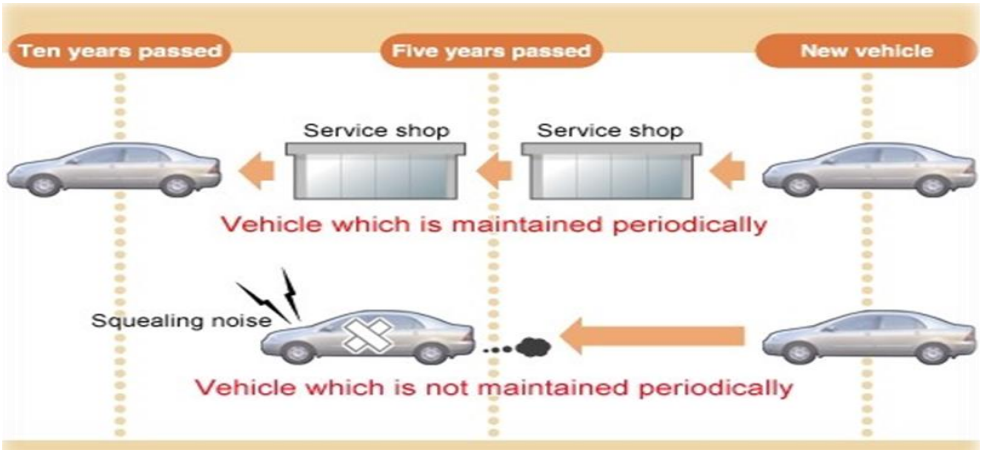

Figure 4: *Periodic Maintenance of Toyota vehicle.*

2.1 Hybrid Synergy Drive (HSD)

Toyota has developed its own hybrid system that is used in all of the company's hybrid vehicles, called Hybrid Synergy Drive (HSD). This system is a series-parallel hybrid system, which is shown by *Figure 5* [10].

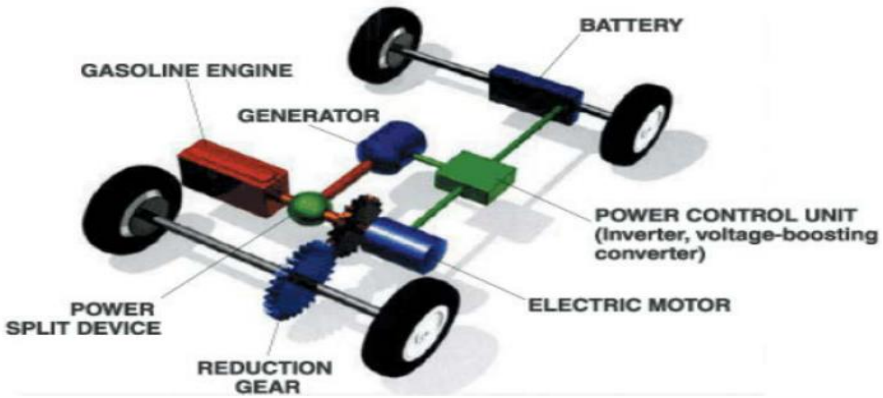

Figure 5: *Toyota's Hybrid Synergy Drive (HSD) configuration [11].*

There are two main operation modes in Hybrid: Electric Vehicle (EV) mode and full hybrid mode. In full hybrid mode, theelectric motor and ICE works together; while in Electric Vehicle mode, only the electric motor drives the vehicle. Electric Vehicle mode inHybrid can be used only if the vehicle is traveling up to 45 km/h [12]. Above that speed, the system'scomputer will start the ICE and the vehicle enters full hybrid mode.

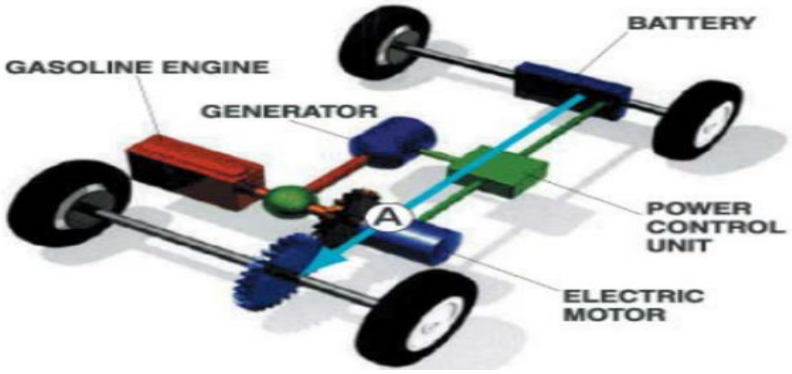

Figure 6: *Hybrid Synergy Drive (HSD) operation in Electric Vehicle (EV) mode [11].*

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Figure 6 shows how Hybrid Synergy Drive (HSD) works during start andlow to mid-range speeds. In these conditions, the engine stops when in an inefficient range, such as start-up and inlow to mid-range speeds. The vehicle runs on the motor alone [11].

2.2 Catalytic Converter

The emissions from vehicles are increases with the increasing of populations. This world more concerned about the environmental pollution due to the automobile pollution exhaust. In 1951 the total number of vehicles present in India is 310,000 and it increases up to 8,900,000 at the end of year 2005–06 [13], [14]. The major source of pollution produces from the internal combustion engine which are carbon monoxide (CO), hydrocarbons (HC), nitric oxide (NOx) and small amounts of sulfur oxide (SOx), lead (Pb) and particulate matter. The internal combustion engine is operated by the burning of fossil fuels. The emissions from vehicles are responsible for the two-third of air pollution in the urban area. Automobile pollution is one of the major problems of most country around the world. This is responsible for causing respiratory diseases, asthma, cancers, chronic disease and other serious health effects [15], [16].

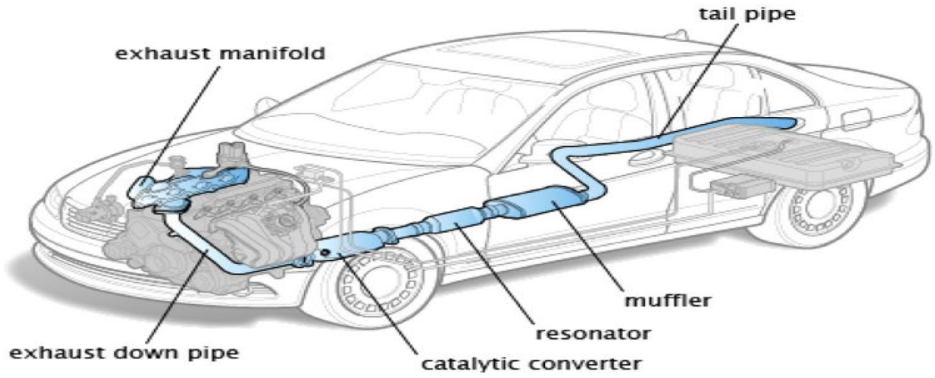

Figure 7: *Catalytic converter [17].*

Automobile pollution is responsible for such a serious problem like acid rain and global warming. For running a vehicle, the internal combustion engine required the mixture of fuels and air. It depends upon the air–fuel ratio. In the lean mixture conditions, the vehicle produce less CO, less HC and more NOx gases but in the rich mixture conditions the vehicle produce more CO, more HC and less NOx gases. In comparison between petrol engine and diesel engine, the petrol engine produces more CO, HC but less produce NOx and particulate matter [18], [19].

A catalytic converter is an automobile pollution control device. It converts more toxic pollutants produced from the automobile vehicles exhaust into the less toxic pollutants. The United States Clean Air Act required a 75% decrease in emissions of all the new model vehicles after 1975, a decrease to be carried out with the use of catalytic converters. Without catalytic converters, vehicles release HC, CO and NOx. A catalytic converter is placed in the internal combustion engine of vehicles. The catalytic converter is divided into three parts:

(1) Two-way catalytic converter.
(2) Three-way catalytic converter.
(3) Four-way catalytic converter.

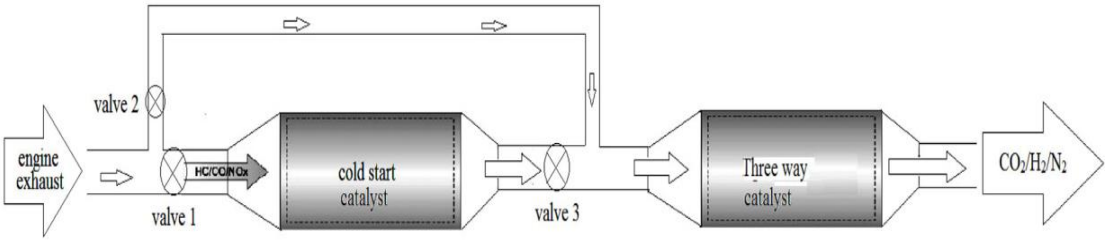

Figure 8: *Schematic diagram of a catalytic converter [17].*

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The two-way catalytic converter is converting CO and HC into CO_2 and H_2O. The three-way catalytic converter is shown in *Figure 8*. It also uses for the reduction of NOx. The four-way catalytic converter has ability to converts CO, HC, NOx and particulate matter on a single support [20], [21]. Catalytic converters are used in the internal combustion engines fueled by either gasoline or diesel includes lean-burn engines as well as kerosene heaters and stoves. A catalytic converter is a simple device that uses basic redox reactions to reduce the pollutants emitted from vehicles. It converts the harmful pollutants produced from the car engine into less harmful gases.

2.3 Maintenance Schedule

The items for servicing of the periodic maintenance and the service interval of the vehicle are stated in the maintenance schedule chart of the Owner's Manual, Owner's Manual Supplement or Warranty Booklet etc.

The maintenance schedule is stipulated by these factors: model, age, country in which is used, or how to use (state) of the vehicle.
T, R, I, A, L stand for symbols of maintenance operation.
T=Tighten to specified torque
R=Replace or change
I=Inspect and correct or replace as necessary
A=Check and/or adjust as necessary
L=Lubricate

Table 1: *Maintenance schedule of Toyota vehicle.*
Maintenance operations: A= Check and/ or adjust as necessary; I= Inspect and correct or replace as necessary; R= Replace or change; T= Tighten to specified torque

SERVICE INTERVAL : Odometer reading										Months
(Odometer reading or month, whichever comes first)	×1000 km	1	10	20	30	40	50	60	70	80	
	×1000 miles	0.6	6	12	18	24	30	36	42	48	
BASIC ENGINE COMPONENTS											
1 Timing belt (diesel engine)		Replace every 100000 km (60000 miles)									
2 Valve clearance											
Vehicle with a three-way catalytic converter (See note 1)		•	•	•	•	•	•	•	•	I	96
Vehicle without a three-way catalytic converter											
2NZ-FE engine		A	•	A	•	A	•	A	•	A	24
1NZ-FE, 1ZZ-FE and 2ZZGE engines (See note 1)		•	•	I	•	I	•	I	•	I	24
3C-E engine (See note 2)		•	•	•	•	A	•	•	•	A	48
3 Drive belts											
Gasoline engine		•	•	I	•	I	•	I	•	I	24
Diesel engine		•	•	I	•	R	•	I	•	R	I = 24 R = 48
4 Engine oil											
Gasoline engine (API SG or SH or ILSAC)		•	R	R	R	R	R	R	R	R	12
Diesel engine (API CD or better) (See note 3)		Change every 5000 km (3000 miles) or 6 months.									
5 Engine oil filter		•	R	R	R	R	R	R	R	R	12

NOTE :
1. Inspect the tappet noise and engine vibration and adjust if necessary.
2. Inspect valve clearance and adjust if necessary.
3. If it is impossible to get API CD or better grade, you may use API CC.

2.4 Service Intervals

Service intervals are decided according to the distance travelled and the period elapsed since the previous service. For example, if the maintenance schedule for a particular part is stated as 40,000 km or 24 months, maintenance falls due at the point at which either of these conditions is met. The vehicle is therefore due for service after either:

Driving 40,000 km/12 months
a) after its previous service, or driving 5,000km/24 months.
b) after its previous service.

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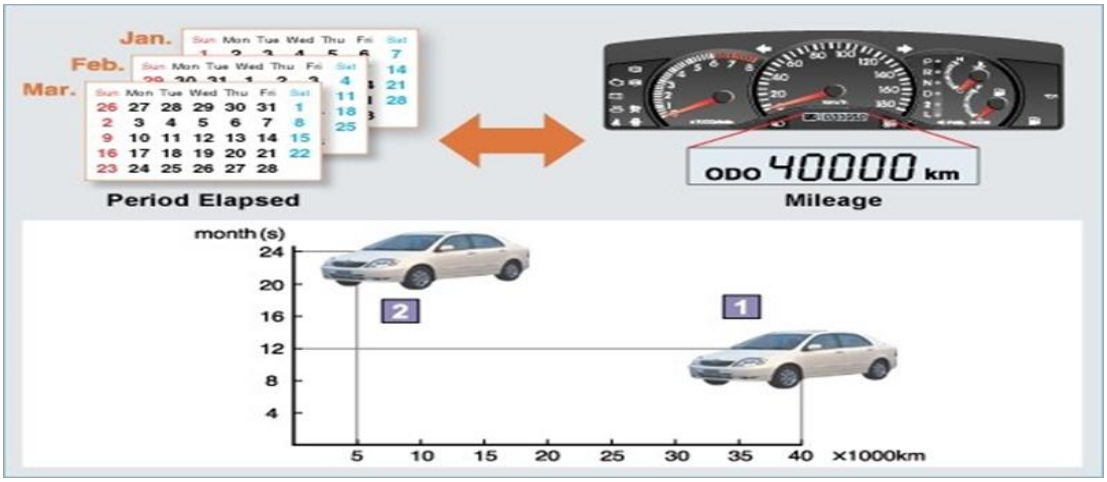

Figure 9: *Service interval maintenance schedule.*

3 MAINTENANCE ACTIVITIES

a) Read technical manuals to understand engine components and controls.
b) Disassemble engine and components when there is a problem.
c) Repair or replace broken or malfunctioning engine components.
d) Perform tests to make sure that the engine is running smoothly.
e) Adjust and calibrate engine and components.

Maintenance consists of:

i. Inspection
ii. Maintenance
iii. Repair

3.1 Standards Maintenance

Schedule Maintenance: Here mainly engine is checked on the basis of a fixed schedule of time. Different engine parts are opened, cleaned, lubricated, gauged and replaced if necessary.

Predictive Maintenance: This type includes maintenance of engine parts on the basis of suspicion that they consist problem and will cause greater problem in future.

Figure 10: *Engine Overhauling (Navana Toyota 3S Center).*

The most common preventative maintenance services we perform include [22]:

1. Oil Change
2. Air Filter Change
3. Comprehensive Vehicle Inspection
4. Windshield Wiper Blade Replacement
5. Tire Rotation
6. Brake Pad Replacement
7. Belt & Hose Checks
8. Spark Plug Replacement

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9. Fluid Inspections

3.2 Schedule Maintenance of IC Engine

Daily Maintenance

→ Lube Oil Check
→ Cooling Water Level Check
→ Coolant Level Check
→ Battery Connection check

Weekly Maintenance

→ Air Filter Cleaning
→ Spark Plug Cleaning
→Engine Dust Cleaning

After 3 months Maintenance

→ Air Filter Change
→ Oil Filter Change
→ Spark Plugs Change
→ Lube oil Change

3.3 General Toyota Maintenance Checklist

Low oil levels can have a disastrous effect on Toyota's engine, so it will need to check that level the most often [23]. Following the guidelines below of items to check (but not necessarily change), can rest assured that have all of bases covered:

- Check the engine oil and coolant levels every time fill the fuel tank.
- Check the transmission and brake fluid levels about once a month.
- Check tire pressure every month, since the pressure inside the tire can change when the air temperature outside the car changes.
- Every month, check to make sure all of lights are working properly.

3.4 Periodic Maintenance Items by Mileage

3.4.1Basic Services

Every 3,000 Miles

Every three months or 3,000 miles, make sure to perform the following vehicle maintenance checks:

- Automatic transmission, power steering, wiper fluid levels.
- Engine oil and air filter.
- Belts, exhaust, and hoses.
- All lights inside and out.
- Fuel filter.
- Tire pressure, tread condition, and wear and tear.

Every 5,000 Miles

- Check Installation of driver's floor mat.
- Check State Inspection Expiration Date.
- Check for Open Campaigns/Recalls.
- Replace Engine Oil & Filter.
- Rotate tires & check condition (tread depth).
- Set tire pressures to correct PSI.
- Check that all exterior light bulbs are functioning.
- Inspect front & rear brake components.
- Inspect and top off fluid levels.
- Inspect wiper blades.
- Perform multi-point inspection with print-out.
- Road test of vehicle.
- Visually inspect brake linings/drums and brake pads/discs.

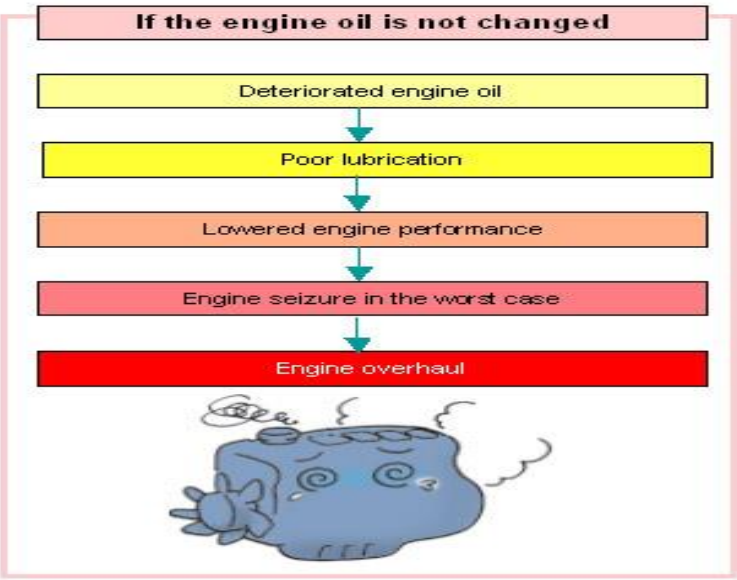

Figure 11: *Engine oil replacement every 5,000 kms. for mineral diesel and gasoline engine oil [24].*

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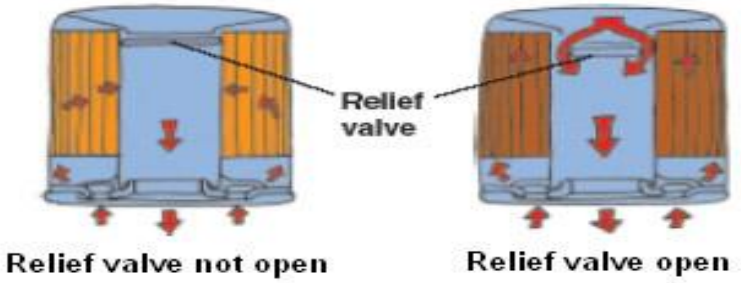

Figure 12: *Replacement the engine oil filter must be replaced every 5,000 kms [24].*

Every 6,000 Miles
In addition to the maintenance listed above, should want to do these checks every six months or 6,000 miles:

- Car battery and cables
- Chassis lubrication
- Windshield wipers
- Polish vehicle

*10,000 Miles for Synthetic Oil

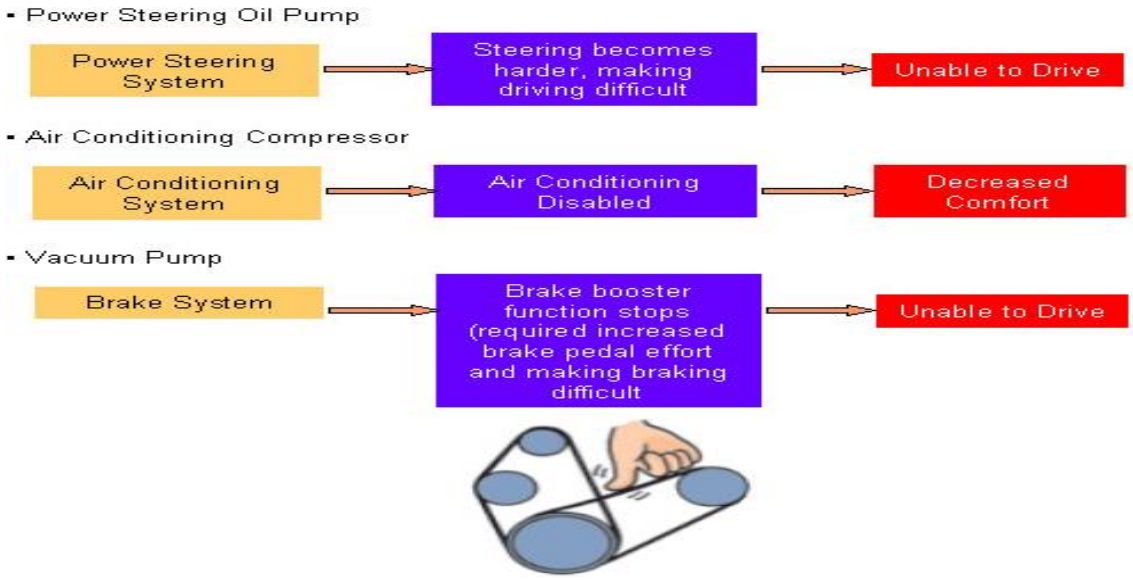

Figure 13: *Belt-driven systems and symptoms of a torn belt and replace drive belts every 10,000 kms [24].*

Every 12,000 Miles
In addition to the three-month and six-month services, should get these car maintenance checks every year [7]:

- Brake system
- Coolant levels
- Transmission fluid levels
- Steering and suspension

3.4.2 Intermediate Services

Every 15,000 Miles
Includes Basic Service if applicable, plus:

- Inspect condition of drive axle boots.
- Check condition of brake fluid.
- Check transfer case & differential fluids.
- Check operation of cooling system and/or indication of coolant leak.
- Complete inspection of steering & suspension components.
- Complete inspection of exhaust system.
- Inspect air filter.
- Inspect wiper inserts/blades.
- Inspect cabin air filter (if applicable).
- Inspect fuel lines & charcoal canister.
- Reset maintenance/tire pressure warning lights.
- Vehicle Alignment.
- Clean &adjust rear brakes & parking brake.

*10,000 Miles for Synthetic Oil.

3.4.3 Major Services

Every 25,000 Miles

- Engine Oil and Filter Change.
- Rotate Tires.

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- Multi-Point Inspection.
- Inspect and Adjust Fluid Levels.

Every 30,000 Miles
Includes Basic & Intermediate Services if applicable, plus:
- Replace air filter.
- Replace cabin air filter (if applicable).
- Inspect ignition wires & distributor cap.
- Resistor spark plug change (if applicable).
- Inspect valve clearance (if applicable).
- Replace spark plugs (if applicable).
- Inspect or replace drive belts (if applicable).
- 4X4 Service, Replace transfer case, front & rear differential fluids (if applicable).

Every 45,000 Miles
- Replace engine coolant.
- Replace brake fluid.

*10,000 Miles for Synthetic Oil.

3.4.3 Major Services

Every 60,000 Miles
Includes Basic, Intermediate and 30K mile Major Service if applicable, plus:
- WSF (World Standard Fluid) Transmission Service.
- Brake Flush.
- Power Steering Flush.
- Fuel Injection Flush.
- Replace spark plugs.
- Inspect or replace drive belts.

Every 75,000 Miles
- Replace engine coolant.

Every 90,000 Miles
- Change brake fluid.
- Replace air filter.
- Replace spark plugs.
- Replace drive belts.
- Change transmission fluid.

*10,000 Miles for Synthetic Oil [25].

Table 2: *Standards maintenance schedule.*

SL No	Parts of Maintenance	Time of distance	Work to be done
01	Air Filter	1 week	Clean Air Filter
02	Lube Oil Filter	3 Months	Oil Filter Change
03	Lube Oil	Daily	Lube Oil Checking
04	Lube Oil	3 Months	Lube Oil Change
05	Spark Plugs	3 Weeks	Spark Plugs Cleaning
06	Brake Lift Drive	1 Month	Check oil level
07	All types of belts	1 Month	Cleaning, tension checking and condition check
08	Radiator	Daily	Water level check
09	Battery	Daily	Battery connection check
10	Fuel line	1 Month	Check, leakage identify

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Figure 14: *Maintenance of internal combustion engine (Navana Toyota 3S Center).*

Table 3: *Some problem inspection and solution.*

Problems	Solutions
Engine knocking	1. Adjusted idle speed 2. Adjusted the gas quantity 3.Adjusted the pickup screw 4. Cleaned air filter 5. Cleaned injector 6. Cleaned throttle body 7. Changed the idle speed control sensor 8. Ok
Engine so hot	1. Serviced Radiator 2. Changed thermostatic valve 3. Changed water pump 4. Replaced gasket 5. Changed water temperature sensor 6. Ok
Engine suddenly stop	1. Checked ignition system 2. Checked all fuses 3. Adjusted idle speed 4. Changed MAP sensor 5. Ok
Self-run but Engine not start	1. Checked the ignition system 2. Checked the fuel system 3. Changed Ignition main switch 4. Ok
Engine miss fired	1. Kept Engine stop

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	2. Opened spark plug 3. Cleaned spark plug 4. Reinstalled spark plug 5. Engine started, tested 6. Ok
Exhaust gas so black	1. Checked the Engine gasket 2. Opened Engine head 3. Replaced gasket 4. Engine stared, tested 5. Ok

4 REGULAR MAINTENANCE

There are numerous reasons it's important to bring in Toyota for regularly scheduled service, whether drive a Prius, a Tundra, or any of the models in between [26]. Here are just a few of the services that are essential to have done on a consistent basis:

- **Oil & Filter Changes** – Getting oil changed on time is critical to keep engine running in good condition and preventing it from overheating or even worse.
- **Brake Checks** – It's important to get brakes checked in order to make sure the pads haven't worn down. Not checking brakes could result in damaged discs and put ones and those around in danger.
- **Fluid Inspection** – Using the correct fluid is extremely important. During Multipoint Inspection all fluids (coolant, brake, power steering, windshield washer and transmission) will be checked and replenished at no additional charge [27].
- **Fluid Changes** – There are a variety of fluids that needs to be checked and changed from time to time in order to maintain a healthy level of performance in car.
- **Tire Rotations** – Tires should be rotated with some regularity in order to ensure an even tread surface. This helps optimize performance and give a longer lifespan to the tires themselves.
- **Tires Checks** –Tires are at the front line against the driving conditions face day in and day out. Since they won't last forever, it's important to keep an eye on wear, pressure, and alignment. Expert technicians can tire alignments, tire rotations every six months or so, and regular tread and pressure checks.
- **Battery Checks** –Winter and summer introduce seasonal extremes that can wreak havoc on a battery's ability to hold a charge. In Vehicle for battery checks in the fall and spring to ensure battery is as effective as it needs to be.
- **Check engine light** – Dashboard warning lights should also be taken seriously. Check engine light, don't try to diagnose the problem or wait too long. Should bring vehicle to Toyota dealership service center or expert certified service center so that technicians can determine if a loose gas cap or a more serious engine issue is the cause [28].
- **Car Wash and Wax** – Keeping up with regular washes and waxes may seem time-consuming, but it actually offers many benefits to overall condition. Washing vehicle regularly prevents exterior debris from ruining the paint. Waxing acts as a barrier to these same exterior contaminants. Waxing also leaves Toyota with a shiny gloss, making it look new again. Should be washing Toyota at least once per week and waxing four times per year [29].

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Figure 15: *Print Spray and Baking Both (Navana Toyota 3S Center).*

- **Multi-Point Inspection** – Regular maintenance is essential to obtaining the highest level of performance, safety and reliability from Toyota. It can also increase vehicle's resale value. With proper maintenance and care, vehicle will last longer and deliver more dependable, economic performance. Researchers are concentrating on the improvement of the performance of heat exchangers having a high degree of surface compactness and optimal overall thermal-hydraulic performance [30]. In addition to scheduled maintenance, vehicle requires ongoing general maintenance such as fluid checks and visual inspection. Following the manufacturer's recommendations will allow to enjoy maximum reliability and peace of mind from Toyota for many years to come [31].

Table 4: *Periodic maintenance of Toyota vehicle.*

Periodic Maintenance (Toyota)								
SL No	Service Name	Gasoline	Diesel	Kilometers	Miles	Months	Engine Model	Consider My Country KM/Months
01	Engine Oil = Gasoline	√	-	10,000	3to0	12	1NZ-FE,1ZR-FE, 2ZR-FE & 1ZZ-FE Engine	5,000
02	Engine Oil = Diesel	-	√	5,000		6	2C Engine 1NZ-FE,1ZR-FE, 2ZR-FE & 1ZZ-FE Engine	3,000
03	Oil Filter = Gasoline	√	-	10,000		12		
04	Oil Filter = Diesel	-	√	10,000		12	2C Engine	
05	Timing Belt	-	√	10,0000			2C Engine	
06	Engine Coolant	√	√	1,60,000			1NZ-FE,1ZR-FE,2ZR-FE,	

							1ZZ-FE & 2C Engine	
07	Spark Plug	√					1NZ,1GR-FE,2UZ-FE, All Cor, Land, Hiace	
08	Fuel Filter							
09	Air Cleaner Filter	√	√	40,000		48		
10	Fuel Filter=Gasoline	√		80,000				
11	Fuel Filter=Diesel	-	√	20,000		12	2C Engine	

If the vehicle is being used under any of the following conditions, frequent maintenance will be necessary:

Road Conditions

Rough or extremely muddy roads, roads on which snow has melted, extremely dusty roads.

Driving Conditions

Vehicles used for towing a trailer, or for pulling a camper or car-top carrier:

(1) Vehicles used on repeated short trips of 8 km or less at temperatures below freezing.
(2) Vehicles being used as police patrol cars, taxis or in door-to-door calls, which are left idling for long periods or run extended distances at low speeds.
(3) Vehicles being driven for over 2 hours at high speeds (80% speed through the maximum speed of the vehicle).

5 CONCLUSIONS

Regularly scheduled maintenance is the backbone of all automotive services. Based on the results obtained from this study, the conclusion is drawn that the proper maintenance will help insure maximum performance, excellent running condition, better fuel economy, longer vehicle life, higher resale value greater reliability and longer life for Toyota vehicle. Observing a regular car care schedule is also the most responsible way to ensure Toyota parts are functioning as effectively and safely as they should. Driving routine, weather extremes and time all impact how vehicle performs. But routine maintenance can help to address wear issues early. Preventive maintenance can keep Toyota running efficiently and will ensure that it holds its value throughout the years. Additionally, preventive maintenance prevents costly mechanical problems from occurring with vehicle.

AKNOWLAGDEMENT

The authors would like to express their gratitude to the Navana Toyota 3S Center at Tejgaon, Dhaka-1208, Bangladesh for their cooperation. This study was funded by Hazi Md. Shajahan Bhuiyan Foundation (HMSBF) through the Najmun Nahar.

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