

Effects of Poor Practices on Engine Oil Change by Filling Station Attendants and Local Garages Mechanics

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Abstract

Engine lubrication cannot be overlooked in the automobile industry since it is the life blood of vehicle engines. In Ghana about 80% of oil service is carried out by fuel filling stations attendants and mechanics in local garages. Most of them lack the necessary skills needed to go about their work. It has therefore become necessary to investigate the effects of poor practices offered by filling station attendants and local garages mechanics during servicing of an engine.

This research was undertaken to ascertain the level of knowledge of filling station attendants and local garages mechanics on engine lubrication and also ascertain the various equipment and tools used during oil service. Assessment was carried out in Accra and its environs. In all, one hundred questionnaires were distributed and ninety three were received.

Analysis of the results indicated that even though some of the respondents had had some form of training they still need to be retrained to upgrade their knowledge and the training received should be standardized in the nation.

Keywords: engine oil change, filling station attendants, local garages mechanics, automobile industry

1. Introduction

The primary objective of lubrication is to reduce friction and its resulting wear between bearing surfaces. Lubrication accomplishes this requirement by interposing a film of oil between the sliding surfaces. The most important single property of lubricating oil is its viscosity. Viscosity is the internal resistance of a fluid as one layer is moved in relation to another layer. The viscosity of oil must be sufficient to support an oil film between a bearing and its journal. However, excessive viscosity causes unnecessary power consumption.

A satisfactory engine lubricating oil must have certain characteristics or properties. It must:

- Have viscosity.
- Resist oxidation, carbon formation, corrosion, rust, extreme pressure and foaming.
- Act as a good cleaning agent.
- Pour at low temperature and must have good viscosity at very high and low temperature.

The engine lubricating oil:

- Lubricates moving parts to minimize wear.
- Lubricates moving parts to minimize power loss from friction.
- Removes heat from engine parts by acting as a cooling agent.
- Absorbs shocks between bearings and other engine parts, reducing engine noise and extending engine life.
- Forms a good seal between piston rings and cylinder walls.
- Acts as a cleaning agent.

Servicing of the engine is not just a matter of changing only the oil but also to examine some parts of the entire vehicle such as the expansion tank to check the coolant level, the tyres to check on the tyre pressure, battery, brake pads etc.. It is therefore necessary to find out more from these filling station attendants and mechanics to know the level of their technical know-how and how best their skills could be improved.

2. Specific Objectives

- To ascertain the level of knowledge of filling station attendants and local garages operators in oil service.
- To ascertain the various equipment and tools used for oil service.

3. Research Methodology

The researcher adopted a quantitative research method which involves the use of self-administered structured questionnaires. Alongside, the questionnaire respondents were also interviewed in order to ascertain their indebt knowledge on the topic at hand. In all, one hundred (100) questionnaires were administered to some selected filling stations and local garages in Accra and its environs. Ninety-three (93) of the questionnaires were filled

and returned. The results of the questionnaires were brought together and the data presented in a tabular form for easy correlation. The response to each of the research questions was analyzed using frequency counts and percentages. The results are represented in tables below.

4. Results and Discussions

(A) Background Information

Table 1.0 Number of filling stations and garages

	Frequency	Percentages
Filling Stations	60	64.5
Garages	33	35.5
Total	93	100

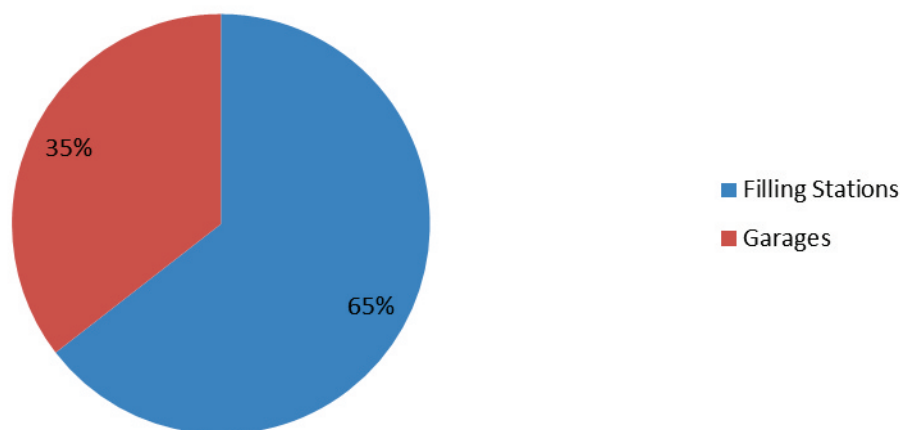


Fig.1: Number of filling stations and garages

In all 60 respondents representing 64.5% were received from filling stations and 33 respondents representing 35.5% from local garages.

Table 1.1 Educational background

Institutions	Frequency	Percentages
Junior High School	22	23.6
Senior High School	42	45.2
Middle School	2	2.1
National Vocational Training Institute	8	8.6
Technical Institutes	13	14.0
Higher National Diploma	6	6.5
Total	93	100

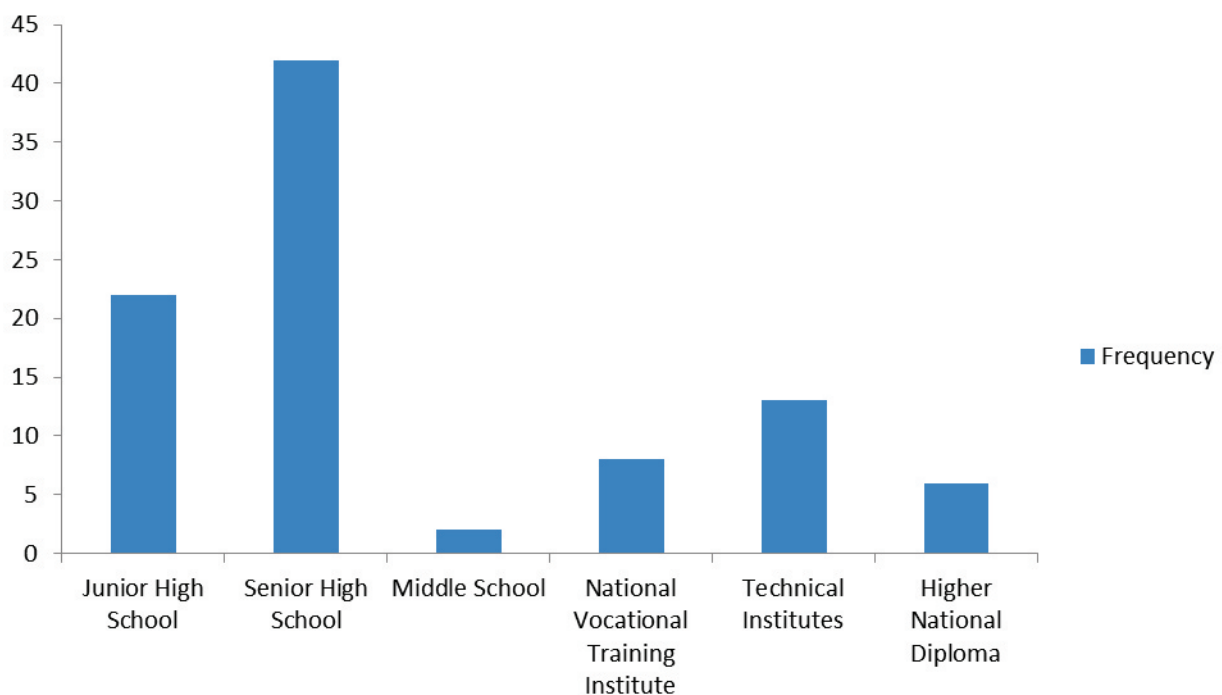


Fig.2: Educational Background

Out of the 93 respondents, 22 of them representing 23.6% had only junior high school education, 42 of the respondents representing 45.2% had completed senior high school, 2.1% had middle school leaving certificates, 8.6% had completed National Vocational Training Institute, 14% had had technical education and only 6.5% had Higher National Diploma certificate as shown in fig.2. It could be noticed that most respondents after junior high school and senior high school engage themselves in the automobile industry.

Table 1.2 Mode of Training

Responses	Frequency	Percentages
Yes	61	65.6
No	32	34.4
Total	93	100

65.5% respondents were trained by organizations such as Mobile Oil, Total and Goil Ghana. 32 respondents representing 34.4 % had no training by an organization. Training of these respondents is very vital, in that it will enable them to receive the necessary skills that will enhance their work.

Table 1.3 Training periods

Length of Training	Frequency	Percentages
3 months - 5 months	51	54.8
6 months – 1 year	13	14.0
2 years – 4 years	26	28.0
Not trained	3	3.2
TOTAL	93	100

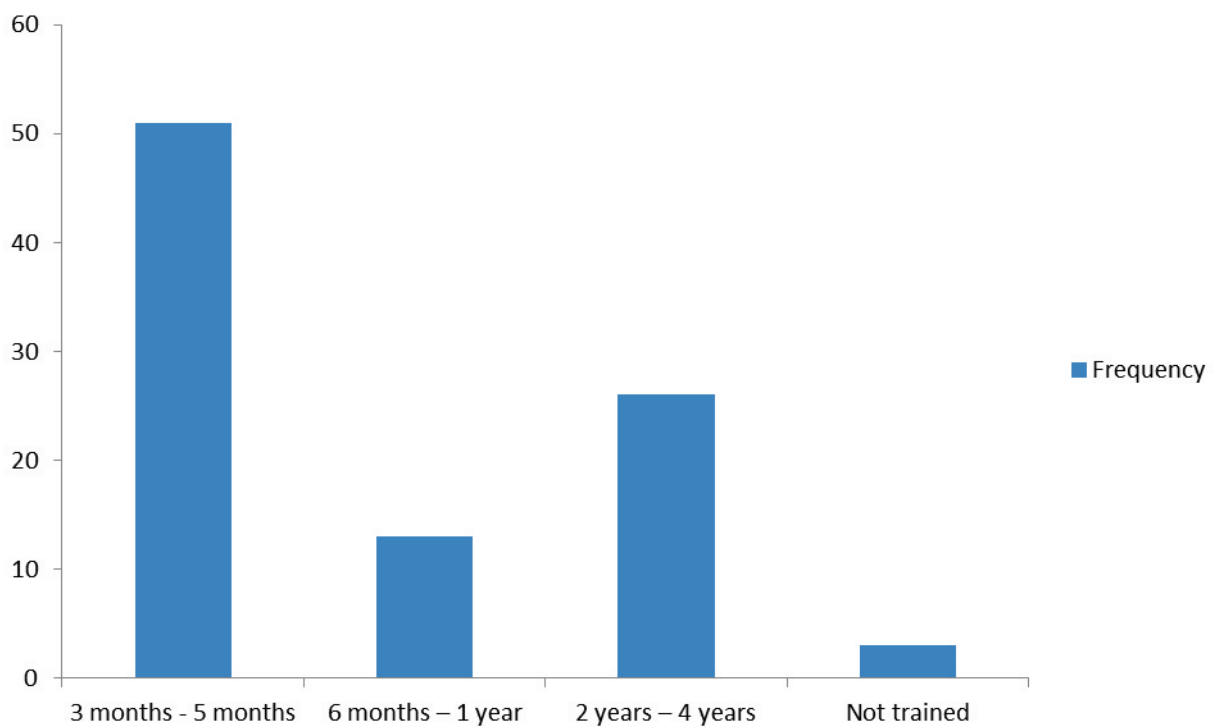


Fig.3: Training period of Respondents

Table 1.3 shows the training period of the respondents. Those trained by the organizations had their training between three months to one year representing 68.8%. Those from the local garages were trained for longer periods between 2-4 years because they learn other skills in addition apart from oil change.

(B) Information on oil change

Table 1.4 Period for changing engine oil

Period	Frequency	Percentages
1 month or 2,000 Km	38	40.9
2 months or 3,000 Km	25	26.9
6 months or 5,000 Km	21	22.6
Abstention(depending on type of oil used)	9	9.6
Total	93	100

From table 1.4, 40.9% of respondents were of the view that engine oil should be changed 1 month or 2000 Km any of which comes first, 26.9% mentioned two months or 3000 Km and 22.6% agreed to six months or 5000 Km.

With the new synthetic oil in the oil market respondents should be able to choose the best oil for their customers so as to help them save money. It is quite unfortunate that most respondents in the various garages advise their customers to change their engine oil at the end of every month. Of late most garages change oil at 5000km or three to six months any of which comes first depending on the type of engine oil used.

Table 1.5 Reuse of oil filter

Responses	Frequency	Percentages
Yes	11	11.8
No	82	88.2
Total	93	100

Concerning the reuse of the oil filter, only 11 respondents representing 11.8% agreed to that. It is encouraging to note that 88.2% did not agree to its reuse. This is a good idea since the oil filters need not to be reused since they normally become clogged with grit and dirt if used for a longer period hence unable to filter the oil as expected.

Table 1.6 Period for changing oil filter

Period	Frequency	Percentages
At every oil change	88	94.6
At every other oil change	3	3.2
As and when you think is necessary	2	2.2
Total	93	100

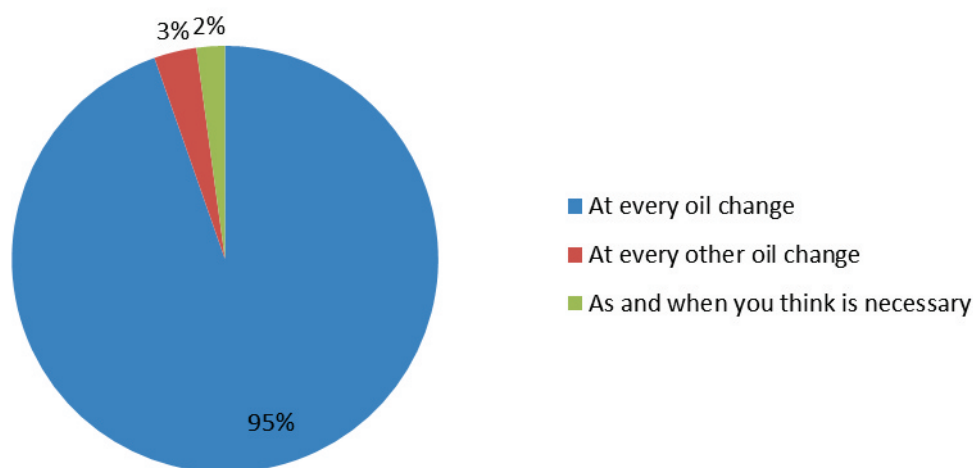


Fig.4: Time period for changing oil filter

As shown on the pie chart (fig.4) it was encouraging to note that 94.6% knew that the oil filter should be changed at every oil change. 3.2% of the respondents thought it could be changed at every other oil change. Only 2.2% thought that it could be changed as and when it becomes necessary. The oil filter needs to be changed at every oil change since it becomes clogged with grit and dirt.

Table 1.7 Type of oil used for diesel engines

Type of Oil	Frequency	Percentages
SAE 30	6	6.4
SAE 40	50	53.8
SAE 50	37	39.8
Total	93	100

Table 1.8 Type of oil used for petrol engines

Type of Oil	Frequency	Percentages
SAE 30	38	40.9
SAE 40	44	47.3
SAE 50	11	11.8
Total	93	100

In order to find out the type of oil used for diesel engines 6.4% were in favour of SAE 30, 53.8% chose SAE 40 while 39.8% were in favour of SAE 50. On petrol engines 40.9% chose SAE 30, 47.3% went in for SAE 40 and 11.8% of the respondent went in for SAE 50.

Of late, most diesel vehicles used SAE 40 and SAE 50 while the petrol engines use SAE 30 and SAE 40 depending on the type of diesel engine or petrol engine being used. From the results, it could be noticed that

some of the respondent needs some training on how to choose the right engine oil for both the petrol and diesel engines since the engine oil is the life blood of vehicle engines.

(C) Information on fuel filter and air filter

Table 1.9 Period for changing air filter

Period	Frequency	Percentages
After 5,000 Km	51	54.8
After 10,000 Km	29	31.2
After 20,000 Km	13	14.0
Total	93	100

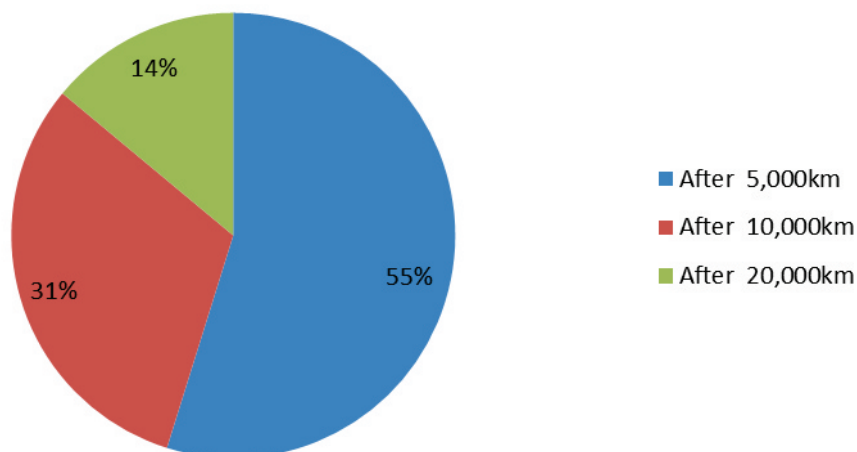


Fig.5: Period for changing air filter

The air filter is changed after every 20,000 Km unless it is being used very dusty condition. 51 of the respondents representing 54.8% were with the notion that it should be changed at 5000 Km meaning that at every oil change. 31.2% opted out for 10,000 Km. Only 14% were with the view that it could be changed at 20,000 Km.

Table 2.0 Period for changing fuel filter for petrol engines

Period	Frequency	Percentages
After 5,000 Km	53	57.0
After 10,000 Km	29	31.2
After 20,000 Km	11	11.8
Total	93	100

With the petrol engine, the fuel filter is normally changed at 80,000 Km, but only 11.8% were aware of this fact. 57% said after every 5000 Km and 31.2% of the respondents said after 10,000 Km. This means that 57% of the respondents are changing fuel filter for the petrol engine at every oil change which renders it very costly for customers.

Table 2.1 Period for changing fuel filter for diesel engines

Period	Frequency	Percentages
After 5,000 Km or any time oil is changed	59	63.4
After 10,000 Km	20	21.5
After 80,000 Km	14	15.1
Total	93	100

Diesel engines fuel filters are changed at every oil change. 63.4% of the respondents affirmed to that whiles 21.5% and 15.1% of the respondents mentioned 10,000 Km and 80,000 Km respectively as shown in table 2.1. The diesel fuel filter should be changed at every oil change so as to prevent any dust particles blocking the injector nozzle.

Table 2.2 Method used in blowing the air filter

Methods	Frequency	Percentages
Inside out	51	54.8
Outside in	35	37.6
Hit on the floor	4	4.3
No idea	3	3.3
Total	93	100

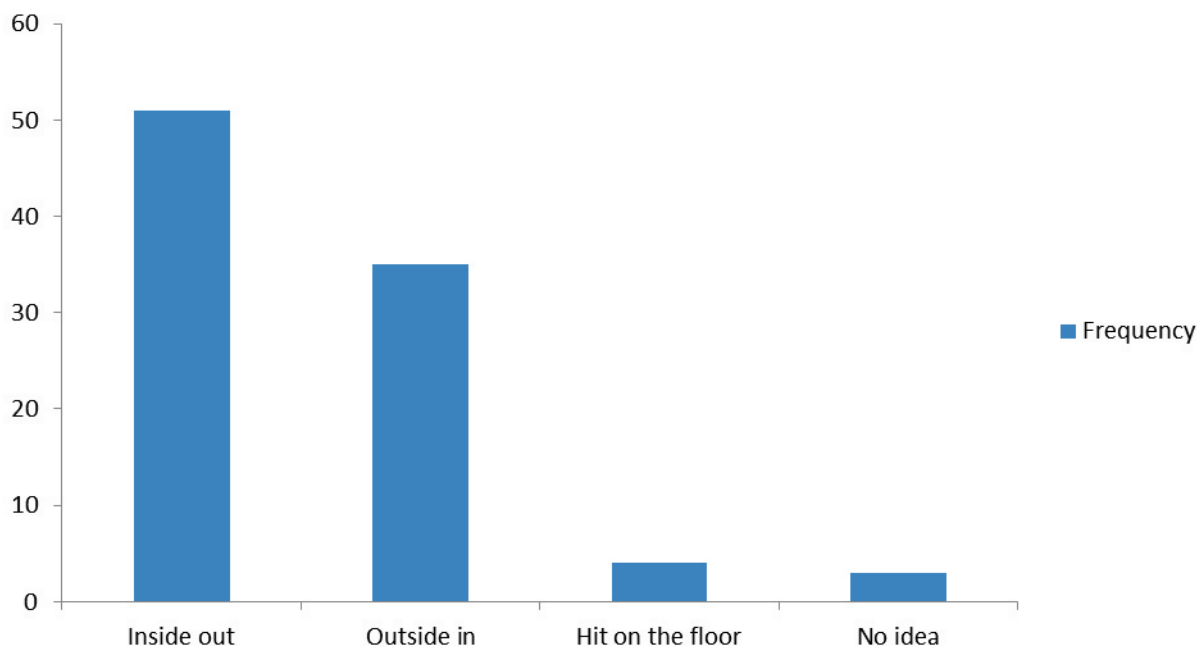


Fig.6: Method used in blowing the air filter

From the bar graph shown in fig.6 above 51 of the respondents representing 54.8% said the oil filter is blown inside-out, 35 respondents representing 37.6% said outside-in and 4.3% were with the view that by hitting the filter on the floor was enough for the dirt particles to be removed.

When the filter is blown outside-in, the dirt particles settle in the filter. It should always be blown inside-out. Hitting the filter on the floor does not remove the accumulated dirt and may have effect on the performance of the engine.

(D) Information on equipments and tools

Table 2.3 Type of equipment used in blowing the air filter

Equipment	Frequency	Percentages
Air Compressor	78	83.9
No idea	15	16.1
Total	93	100

It was encouraging to note that 83.9% of respondents were of the view that the air compressor was the equipment used in blowing the air filter but 16.1% had no idea. This indicates that some of the filling station attendants as well as some of the mechanics in local garages do not normally blow the air filter.

Table 2.4 Type of tools used in removing the oil filter

Tools	Frequency	Percentages
Strap wrench	78	83.9
Screw driver	15	16.1
Total	93	100

On the type of tools used in removing the oil filter, 16.1% agreed on using the screw driver representing 15 respondents, while the remaining 78 respondents decided on the strap wrench which is the appropriate tool for the removal of the oil filter.

Table 2.5 Type of liquid used in the radiator

Liquid	Frequency	Percentages
Water	15	16.1
Coolant	78	83.9
Total	93	100

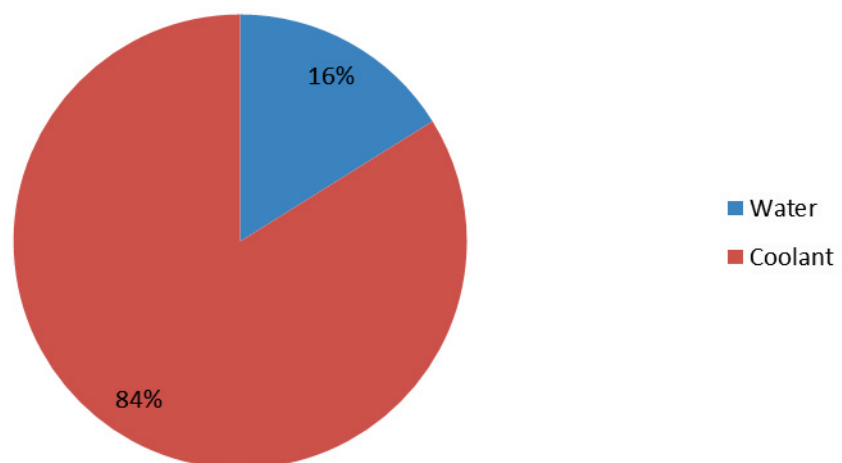


Fig.7: Type of liquid used in the radiator

It was found out that 16.1% of respondents use ordinary water in the radiator for cooling purposes, while 83.9% used a coolant as shown on the pie chart in fig 7. Ordinary water produces scums which with time clogs the radiator. It also causes rust formation in the radiator which leads to leakages.

(E) General Information

Table 2.6 Do you normally check on or inspect the following items?

Items	Frequency	Percentages
Coolant level	87	93.6
Brake fluid in brake pot	89	95.7
Brake fluid in clutch pot	87	93.6
Steering pot oil	89	95.7
Gear box oil	89	95.7
Tyre pressure	70	75.3
Thread depth and tyre wear	65	69.9
Spare tyre	77	82.8
Battery	82	88.2
Wind screen wiper and wiper operations	72	77.4
Washer operation and top it up	70	75.3
Brake pad and shoes for wear and damage	82	88.2

The listed items in table 2.6 do not form part of the oil change but it is very important that they are considered. They are supposed to be checked any time an oil change is undertaken so as to advise the customer accordingly based on the findings.

Table 2.7 Carryout road test as a post service action

Responses	Frequency	Percentages
Yes	67	72.0
No	26	28.0
Total	93	100

When respondents were asked whether they carryout road test, it was found out that only 72% normally carry out road test as a post service action while the remaining 28% do not. Road test is very necessary because it will enable the respondent to ascertain the actual performance of the vehicle and advise the customer.

5. Conclusion

Lubrication is the heart beat of any vehicle therefore it must be attended to with all the seriousness it requires in the automobile industry. The research had revealed that even though most of the respondents had been trained one way or the other, the technical know-how and skills of some of the respondents are nothing to write home about. Most customers rely solely on oil change as a maintenance schedule for their vehicles hence the right things need to be done always to avoid the frequent breakdowns as well as accidents on our roads.

6. Recommendations

Based on the findings the following recommendations have been made.

- Skills development should be taken seriously by the nation as a whole.
- Standardized training in this field should be instituted by the Ministry of Education
- Workers should be well trained by recognized institutions like National vocational Training institute, Technical Schools as well as the Polytechnics .irrespective of their background
- Periodic training should be instituted so as to enable workers upgrade their skills.

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