

ANALYSING THE IMPACT OF AUTOMOBILE SPARE PARTS SELLERS IN GHANA. (A CASE STUDY AT SIWIDO KOKOMPE AT CAPE COAST).

FESTUS MOTEY

MSc ENGINEERING

HEAD, MECHANICAL ENGINEERING DEPARTMENT

CAPE COAST POLYTECHNIC

P.O.BOX AD 50

CAPE COAST

festusmot@yahoo.com

0547587641

Absract

Sales of parts to service providers at the best convenience are very important, because benefactors of such services always want them as early as possible. Thus the cluster of mechanics at Siwdo in Cape Coast needs automobile parts readily available and in good condition to buy immediately for quick replacement. Therefore the sale of spare parts at Siwdo was very beneficial to the automobile mechanics since they could quickly buy the parts for replacement. Also the sale of these parts contributes to the economic development through the payment taxes. Some of the spare parts that are being sold are carburetors, fuel injection system, spring valves, belts, motors, steering, clutch, brake, pumps, cylinder heads, connecting rods, shafts, suspension systems, piston rings among others. Quantitative data was obtain through administering of structured questionnaires to justify conclusions. Conclusively, most of the parts sold are in good condition and available. The activities of these sellers must be improve through education.

Key words: Spare – parts, engine, automobile, Maintenance, Available

1. INTRODUCTION

Currently, there is an identifiable clear role played by the sellers of automobile spare parts at Siwdo Kokompe in Cape Coast towards the development of the automobile industry in Ghana. The sellers and owners of these

stores (automobile spare parts) that sell these parts might be of different profession but have basic or fundamental knowledge about almost all the parts they buy and sell. All these stores are privately operated andtheir activities makes the practices of automobile engineering more convenient at Siwdo Kokompe in Cape Coast. Thus the automobile mechanics can easily buy parts for quick replacement. Sources at these stores at Siwdo reveals there have never being any form of documentation as well as analysis of their activities towards the development of automobile industry in particular and the nation's economy as a whole. Therefore this research is done do begin documentation analysis, throw more light as well as drawing public attention to their problems and draw attention to the fact that graduates from the nation's (Ghana) tertiary institutions could enter into this venture (establishing stores to sell automobile parts) for self employment to reduce the pressure of graduate unemployment on the government. Automobile supply accessories stores as well as stores for the sale of automobile engines and parts if well develop could employ skilled automobile technicians and engineers who graduate from tertiary institutions for their services or effective operation.

2. HISTORY AND LOCATION OF SIWDO KOKOMPE

Automobile mechanics working on all aspects of automobiles were formally located of the present day Ewin Nurses flat at the Kotoraba in the central business center of Cape Coast in the Central Regional Capital. At that time the area has seen springing up of cluster of workshops of craftsman who does various types of repairs and services on automobile. At this location at that time, there were stores selling very thing on automobiles. These craftsmen or artisans were automobile electricians, sprayers, vulcanizes, welders and mechanics. These craftsmen were relocated in the year 1968 to their present premises at Siwdo Kokompe to pave way for the construction of the Ewin Nurse Flat. The Siwdo cluster of craftsmen is located between the Adisadel Estate and the Robert Mensah Sport Stadium, thus on the right side of the John Mensah Sarbah dual carriage road when going to the stadium from the Pedu Junction. Initially a little over fourty shops can be seen at the place including machines shops, wind screen repairs shops, upholstery shops, black smith shops and iron casting shops.

Light and heavy duty automobile mechanics as well as specialized automobile mechanics were also located at Siwdo. These specialized mechanics includes automatic gear box specialist, carburetor specialist among others. On the average, about 300 vehicles visit Siwdo on daily basis for all types of automobile works. These activities are welding, spraying, electrical works, fabricating, vulcanizing, black smithing among others.

3. REVIEWED LITERATURE.

Basically, there are five types of garages/shops and automobile service business in Ghana, these are:

New – car dealers' garages

Independent garages/shops

Specialty garages /shops

Service stations or garages

Fleet garages /shops

3.1 New car dealers' garages

Some of the new – car dealer garages in Ghana are Toyota Ghana limited, Japan motor, Mitsubishi Ghana among others. The operations and number of these companies are relatively few.

3.2 Independent garages/shops

These types of garages or shops are common at Siwdo at Cape Coast and automobile mechanics of these garages buy parts of at Siwdo. These garages/shops offer services such as oil and filter changes, changing lubrications, tune – ups, brake repairs, engines and transmission overhauls among others.

3.4 Specialty garages /shop

These types of garages or shops are also common at Siwdo at Cape Coast and patronize the automobile spare parts stores contributing towards the economic viability of these stores. These garages concentrate only on few automobile engineering services such as brake maintenance and repairs, tum-ups, lubrication, cooling systems, fuel systems, drive trains, chassis maintenance among others.

3.5 Service station shops

These are small shops or garages attached to petroleum product filling stations in Cape Coast as well as the whole country. They also buy spare parts from privately owned automobile spare parts seller stores at Siwdo. The maintenances and repairs they normally undertake are purging, changing oil and filters, brake, clutch as well as replacement of minor mechanical parts.

3.6 Fleet garages

The main operations of such garages are total mechanical maintenance and repair of fleet of automobiles. Such garages are found the Siwdo and they also buy automobile spare parts from the privately owned spare parts seller stores at Siwdo. Business, financial and academic institutions, governmental as well as non governmental agencies have fleet of automobiles so they depend on such garages for their services.

3.7 The automobile

Mechanically, the automobile consist of many different parts that work together to provide motion. The social functions of the automobile are conveying of goods and people. The basic assemblies of the automobile consist of:

Engine

Chassis

Drive train (brake, clutch, suspension and steering system)

Body

3.7.1 The engine

The engine provides power which is transferred into driving through series of parts known as drive trains. The engine also functions by converting chemical energy to mechanical energy for motion. The most common type of engine in automobiles is the internal combustion engines. Thus for this type of engine, the combustion process (burning of air – fuel mixture) takes place exclusively in the combustion chamber. This engine is also the reciprocating piston type and consists mainly of the following components:

Carburetor

Injector

Motors

Pumps

Value springs

Connecting rods

Pistons/piston rings

Crank shaft

Camshaft

Drive shaft

3.7.1.1 Carburetor

A carburetor is a device on the automobile that enriches gas by combining the gas with fuel for combustion internally. The basic circuits of the carburetor are float, idle and low speed accelerator, pumps, main metering enrichment and choke. The float circuit contains a float bowl which serves as reservation for fuel. The constant level of fuel needed to supply the engine during operation is in this bowl. Depending on the fuel consumption, a needle valve opens to allow the flow of fuel into the bowl. Idling refers to engine operation without the acceleration pedal being depressed. Also an enrichment circuit moves a metering rod or tapered needle to allow more fuel to be drawn through the main metering circuit. The choke plate is a value located on top of the carburetor bore that ensures enough supply of vapourize fuel for starting and warming – up purpose when the engine is cold leading to fuel condensation. Manufactures have given modern carburetors additional devices such as temperature – controlled devices, fuel bowl vent, attitude – compensation valve, throttle return dashpot, vacuum vent, throttle positioned solenoid and electronic control devices to solve problems of fuel economy as well as emission control. Metering is the act of adding specific required volumes (metered) of fuel to the air steam passing through the barrel of the carburetor. Some factors that influence this metering are engine temperature, load and speed. The process of making the fuel into droplets is known as atomization. These tiny droplets of fuel are converted from the liquid state to the vapour state by the process of vaporization.

The automobile mechanics at Siwdo perform the following preventive maintenance on carburetors.

Filters replacement

Leakage checks

Cleaning

Choke adjustment or replacement

The common carburetor problems that these mechanics normally solve are:

Flooding

Driveability

Lack of fuel in carburetor

Gummy automatic choke

The driverability problems are dieseling, detonation, stalling, rough idle, cutting out, hesitation, surging, sponginess, missing and poor gas mileage. Air fuel leakage normally occurs between connections of the carburetor and external parts. By performing the above maintenance practices, these mechanics buy parts mention above from these stores. Parts may crack or distort due to improper over tightening of screws and fasteners. Chokes are service by spraying with carburetor spray cleaners bought from these stores. The problems of lack of fuel flooding and percolation may be detected by observing the fuel flow vent as the engine is cranked for fuel to gush out of the vent. These problems are solve by these mechanics by removing the air horn, inspecting, cleaning, replacing the needle value, float part and accelerator pumps as well as properly reinstalling the air horn. They also buy the above mention parts from these spare parts seller stores at Siwdo. At Siwdo over hauling by these mechanics involves the following procedures below:

Carburetor identification

Disconnecting attachment

Carburetor removal

Cleaning and inspection

Carburetor disassembly

Part and gasket replacement

Checking leakage of hoses, tubes and fuel lines

Electrical connections reassembly, adjustment and replacement.

The above procedures lead to these mechanics buying spare parts from the spare parts stores at Siwdo for replacement.

3.7.1.2 Fuel injection

The main advantage of the fuel injection systems over the carburetors are:

Increase volumetric efficiency (correct air fuel ratio)

More efficient combustion

Better fuel economy

More power

Less harmful exhaust gases, efficient load, speed and temperature conditions. The basic components of the fuel injection systems that these mechanics buy from the spare stores at Siwdo are:

Fuel tank and connecting lines

Fuel pumps

Fuel pressure regulator

Fuel filters

Fuel injectors

Sensors

The tanks and connecting lines are similar or the same as those of carbureting systems. Diaphragm, rotary roller and turbine pumps are the common types of pumps use to transfer fuel. Fuel pressure regulator is use to maintain the required pressure for uniform spray from the injector with filters mounted in the injection system to eliminate contaminants. Electronics control module (ECM) or electronic control unit (ECU) is mounted at areas on the vehicles where there is no heat or vibration. The ECM receiver signals from sensors on the engine so as determine timing and amount of fuel to be injected. The amount to be injected is input to the computer and signal form from the sensor. Selective sensor also provide information to the computer about battery voltage, emission control, temperatures, throttle speed and engine load. The computer is programmed as a control system to issue commands to solve such problems. Injectors control fuel inflow into the combustion chamber by opening and closing within milliseconds. Fundamentally, preventive maintenance for fuel injection systems are adjustment checks, repairs and replacements where appropriate.

The automobile mechanics check for following:

Fuel and air leaks

Loose, corroded or grounded electrical connections

Loose broken, cracked, kinked or disconnected vacuum hoses

Loose or improperly supported fuel rail, lines and injectors

Dirty fuel and air filters

In-correct idle speed and mixture.

Most of the above practices by these automobile mechanics at Siwdo are similar to those of carburetor so they buy similar parts from the spare parts store operators at Siwdo. Hoses, electrical connections, filters, lines, rails and other components of injection systems are subject to heat and pressure variations so they get dry, corroded, cracked and deteriorated. Therefore these mechanics buy these parts from the automobile spare parts selling stores at Siwdo. Modern advanced trouble shooting for fuel injection systems is not common at Siwdo but these automobile mechanics are able to solve some of the similar problems.

3.7.1.3 Fuel system

The fuel system consists of the following components:

Fuel tank

Connecting lines

Fuel filter

Fuel pump

Air filter

Fuel metering and atomization system

The connecting lines consist of small diameter metal tubing and synthetic rubber hoses which connect the fuel tank to the pump. Where vibration results to cracks and bends, synthetic hoses are used instead of metallic pipes. Pumps, both electrical and mechanical are use to draw fuel from the tank to supply to the carburetor or injection system. Fuel filters are located between the tank and injectors or carburetors to prevent contaminant passage. Also, contaminants in the air passage are remove by air filters. Preventive maintenance as done by these mechanics for fuel systems involves checking, repairing leaks, inspection and replacement. Leakage problems are at the following points:

Filter cap

Fuel tank seams

Metal and synthetic rubber

Vapour line

Fuel pump

Vapour canister

Injection pump seals

Intake manifold gasket

Fuel neck connection to tank

Fuel and vapour line connection

Fuel filter

Carburetor

Fuel injection lines and injectors

The repairs and replacement of the above components leads to the mechanics buying these parts from the automobile spare parts stores at Siwdo.

3.7.1.4 Lubricating system

All parts and components that circulate fluid which reduce friction, wear and tear between all moving parts in contact is known as the lubrication system. Some parts of the engines where friction occurs are:

Camshaft journals

Camshaft lobes

Piston and piston rings

Cylinder walls

Crank shafts

Bearing

There are two ways basically by which lubricant loses occurs, thus by leakages and burning in the combustion chamber. Common areas that leakages occur are:

Oil pan gasket

Crankshaft seals

Oil pressure sending unit

Timing cover gasket and seal

Fuel pump gasket

Distributor drive O-ring gasket

The oil pan serves as the reservoir for the lubricant and has a drain plug below it. When the drain plug is removed the lubricant drains out. The lubricant oil filter helps in eliminating contaminants in the lubricating system. The automobile mechanics at Siwdo conduct maintenance of lubricating systems by replacing all the parts mention by buying these parts from the automobile spare parts seller stores at Siwdo.

3.7.1.4 Cooling systems

The basic components or parts of cooling systems of vehicles that normally come to Siwdo are:

Coolant

Radiator

Water pump

Fan

Water jacket

Thermostat

Temperature warning systems

Radiator pressure cap

Coolant recovery systems

Connecting hoses

Heater coil

Oil cooler

To prevent acidic build up, rust, corrosion and electrolysis of cooling systems, a mixture of antifreeze (ethylene ctycol) and water in their required quantities which forms the coolant are use in the cooling systems. The radiator and its cooling fins are made of good conductors of heat such as brass, copper or aluminum that conduct the heat from the engine through the water away. Water pumps are operated by belts (V belts) from electric motors. Cooling fans can be driven by electricity or by engine power. Electric fans, belt driven fans and viscous driven fans are fan types that are normally use to blow air over the radiator fins. The thermostat is a valve that closes and opens in response to the heat of coolant to maintain stable temperature. Some of the cooling system parts that the automobile mechanics at Siwdo check, replace, repair as well as buy from the spare parts selling stores at Siwdo are:

Drive belts

Hoses

Gaskets

Soft plugs

Thermostat

Water pumps

These mechanics also do the following preventive maintenance.

Flash old coolant and refill the system with fresh coolant.

Check and repair leaks, replace drive belts and thermostat.

Check coolant mixture strength.

Belt drives transmit energy from a power source or motors to points where the energy is needed.

Common areas of leakages for which these mechanics work on are:

Hoses

Gaskets

Radiator

Heater cure and heater control valve

Water pump

Soft plug

Hoses are made of rubber and cloth, so they deteriorate due heat, vibration and vapours.

3.7.1.5 Engine servicing

The automobile mechanics at Siwdo inspect, repair and replace the following

Loose mounting belts, studs and nuts

Warm lubes

Piston, piston rings and connecting rod

Cylinder heads

Valve seats

Damaged valve train parts

Warn rocker arms or rocker followers

Broken valve springs

Bent push rods

Improper seated valve locks and retainers

Missing or damaged valve stem seals

Belts

In performing the above task, the automobile mechanics buy the above parts form the automobile spare parts sellers at Siwdo. The mechanics also buy and replace the following spare parts from the spare parts sellers at Siwdo;

Connecting rod bearings

Timing gear and chain

Flywheel

Oil pump

Oil pan

3.8 Drive Train

3.8.1 Suspension system

One of the main components of the suspension systems are springs. These springs are located at the four corners of the automobile. Springs support the automobile frame, body, engine and drivetrain. Springs enable or aids shock absorbing, upward as well as downward motions.

Coil springs

Torsion bars

Air springs

Leaf springs

The device that works with the springs to control movements of the automobile body, axle and wheel is the shock absorber. There are four shock absorbers at each corner of the automobile and there are also modern automatic control shock absorbers. Each of the wheel assemblies at the front have their separate or independent suspension systems. These suspension systems for modern automobiles are designed to allow each wheel to move up and down separately and are made of the following components given below:

Control arms

Wheel spindle

Ball joint

Stabilizer bars

Maintenance of suspension systems mainly consist of lubrication and replacement of the parts mention above. As a result this maintenance, the mechanics buy these parts from the automobile spare parts sellers at Siwdo.

3.8.2 Steering system

The steering system consist of the following:

Steering shaft

Steering gears

Steering linkage

Steering wheels

Extension from the steering gear box is the pitman arm and it transmits gear movement towards the front wheels. The relay rod or center link or drag link transmits steering movement towards the front wheels. The idler arm serves as a connection between the relay rod and the automobile frame and also supports the relay rod end opposite to the pitman arm. land steering arm. The tie rods assist in steering. The steering arm transmits movement to the turning wheel and is the last connection in the steering linkage system.

Power steering is the situation where hydraulic pressure aids steering. The main components of power steering are:

Pump

Reservoir

Hydraulic lines

Special gear box

The hydraulic fluid for the power steering system is stored in the reservoir and is pushed under pressure through pipes and hoses to the steering system. Excess is controlled by the relief valve. Maintenance of steering system as done by these mechanics involves lubrication, adjustment, and replacement of all parts if appropriate They also normally inspect areas around bushings, gear boxes, arms, ball joints, axles, mounting among others.

3.8.3 Brake system

All types of braking systems have the following basic components:

Brake fluid

Master cylinder

Brake lines

Wheel cylinders

Friction materials

Stop light switch

The master cylinder consists of the cylinder piston system which serves as a reservoir for brake fluid as well as force multiplying facility. The brake lines serves as channels for the flow of hydraulic fluid from the master cylinder to the wheel cylinders. These are the steel tube and hoses. The wheel cylinders are the activators of the brake assemblies and they receive fluid pressure from the master cylinder; thus this activation enables the automobile to stop. Asbestos is the common type of friction material or brake linings used. Asbestos is preferable use because it resists heat and friction. An alternative to the asbestos is fiberglass compound. In between the master cylinder and brake paddle, is fixed stop light switch. This switch is activated to illuminate the stop lights whenever the brake paddle moves downwards. Automobile bake systems are normally of two types namely disk brakes and drum brakes or both, disk brakes uses disk action and drum brakes use drum action while their combination use both actions. Servicing of brake systems as done by these automobile mechanics are toping and refilling the brake fluid, replacing of valves, disc, drum, hoses, pipes, rotor, shoe, calipers, bearings, bushings, seals, master cylinder as well as asbestos. By replacing the above parts, these mechanics buy most of these parts from the automobile spare parts dealer at Siwdo.

3.8.4 Clutch system

Clutch assembly enables drivers to disconnect or connect power from the engine to the transmission as well as to shift smoothly and to start the engine. This assembly is located between the transmission and engine and consists of the following parts

Flywheel

Clutch disc

Pressure plate assembly

Throughout bearing

Clutch fork

Clutch assembly is housed in a bell shaped metal protective case known as bell housing except the linkage and paddle. The small shaped end of the bell housing is connected to the transmission housing whiles the large end to the lower part of the engine block. The flywheel rear surface is smooth which provides a good grip for effective clutch operation. Energy from the flywheel is sent to the transmission through the clutch or clutch plate. This disc is made of steel, covered with friction material and is driven. The function of the pressure plate assembly is to press and release the clutch disc against the flywheel. The pressure plate is made of nodular iron. It is heavy and grips. The pressure plate assembly consists of cover, pressure plate, release levers and springs.

Maintenance of clutch assembly as done by the automobile mechanics at Siwdo involves lubrication, replacement and repair of the following parts:

Flywheel

Disc plate

Drum

Gasket

Washers

Shafts

Cables

Lines

Towboat bearing

Push rod

Clutch fork

Pressure plate

Springs

These automobile mechanics buy these parts from the automobile spare parts dealers at Siwdo which is a prove of the sellers contribution to the development of the vehicle industry in Ghana.

4. METHODOLOGY

This research was done at Siwdo because of the large cluster of automobile mechanics in that area. Thus the collection of quantitative and qualitative data for analysis to substantiate the conclusion was possible. The methodology adopted for the research was the quantitative approach since analysis must be made to throw light on the activities of these automobile spare parts sellers. The target group was these spare parts sellers. The quantitative data approach involves the use of structured questionnaire and interviews. In all twenty three questionnaires representing ninety nine percent (99%) of these sellers were administered.

SHOP NAMES	SHOP OWNERS
ARAFAT MOTORS	MR. ARAFAT
BLACKIE MOTORS	MR. YAW ASH
BEN JAMBO ENTERPRISE	MR. BEN
STEP BY STEP MOTORS	MR. ISAAC
YESU NTI MOTORS	MR. KWABENA
NES OFOSU SPARE PARTS SHOP	MR. KWES OFOSU
DUBUISTEE VENTURES	MR. DANIEL BOISON
EKOW MOTORS	MR. CHARLES
RANSFORD SPARE PARTS SHOP	MR. ERIC
CHARLES AUTO PARTS	MR. ABAKA
ERIC SPARE PARTS	MR. GEORGE BONY
ABAKA AMD SONS	NANA ARHIN BORSAH
BONY AUTO PARTS	MR. ANDREWS SACKEY
ORSAH'S BUSINESS ENTERPRISE	MASTER OBENG
	MR. DANIEL INKOOM
	MRS. OBENEWAA DADZIE
	MR. ANTHONY ACKON

ANDREWS SACKEY ENTERPRISE	MR. ERIC MENSAH
OBENG BOAT VENTURES	MR. PHILIP WIRED
OKYESO NYAME SPARE PARTS	MR. MAURICE DANKYI
BIG DADDY SPARE PARTS	MR. ISAAC BONSU
TONY MOTORS	
EDDEY SPARE PARTS SHOP	
GYE NYAME MOTORS	

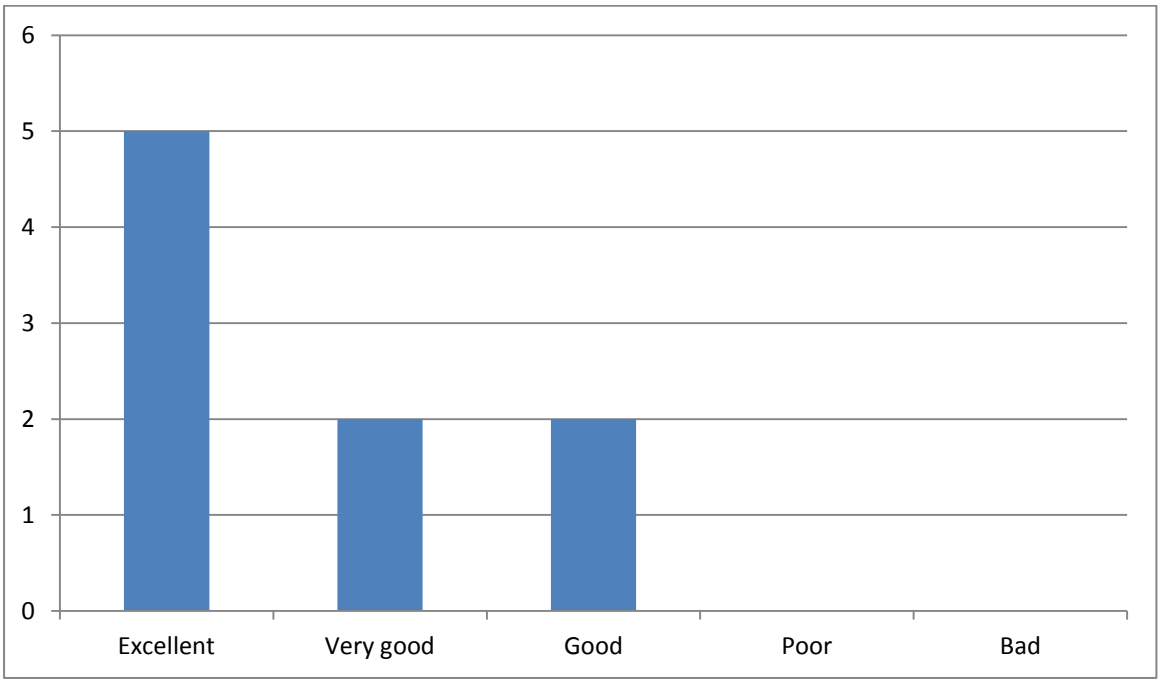
Table 1

Table 2: Carburetors

STATEMENT	RESPONSE	FREQUENCY	PERCENTAGE (%)
Conditions and availability of carburetors for selling	Excellent	5	55.56
	Very good	2	22.22
	Good	2	22.22
	Poor	0	0.00
	Bad	0	0.00
Total		**9**	**100.00**

Source: Author's Field Work (2012)

Figure 2: Carburetors



Response

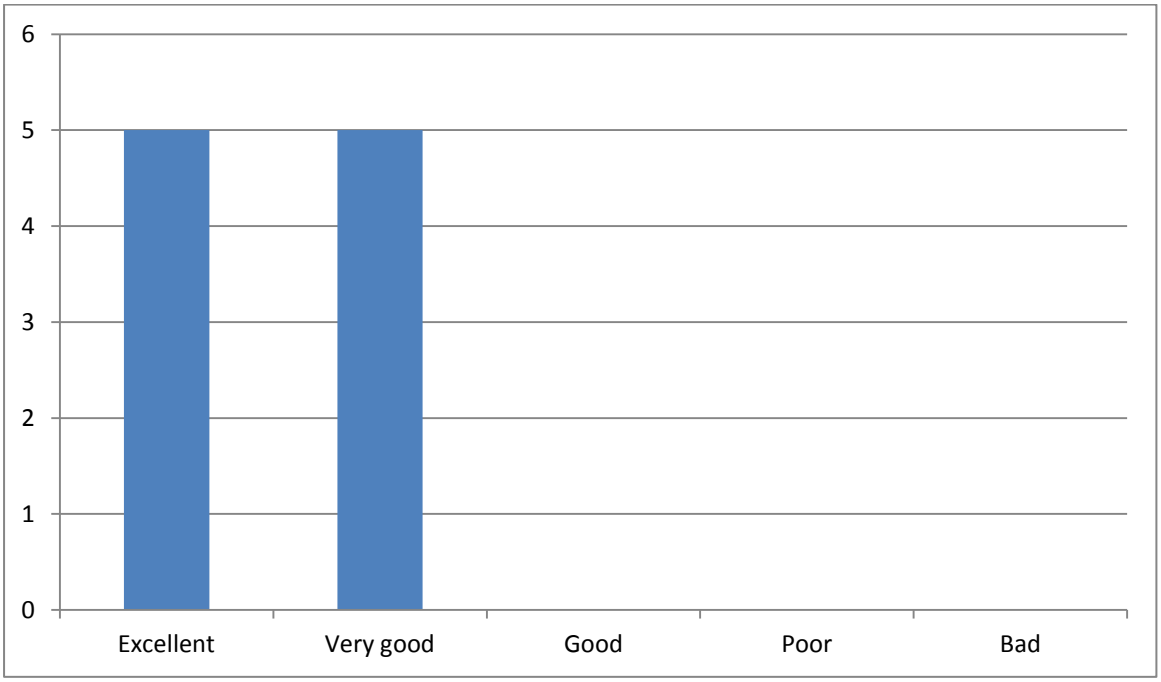
Source: Author's Filed Work (2012)

Table 3: Injection system parts

STATEMENT	RESPONSE	FREQUENCY	PERCENTAGE (%)
Conditions and availability of injection system parts for selling	Excellent	5	50.00
	Very good	5	50.00
	Good	0	0.00
	Poor	0	0.00
	Bad	0	0.00
Total		**10**	**100.00**

Source: Author's Field Work (2012)

Figure 3: Injection system parts



Response

Source: Author's Field Work (2012)

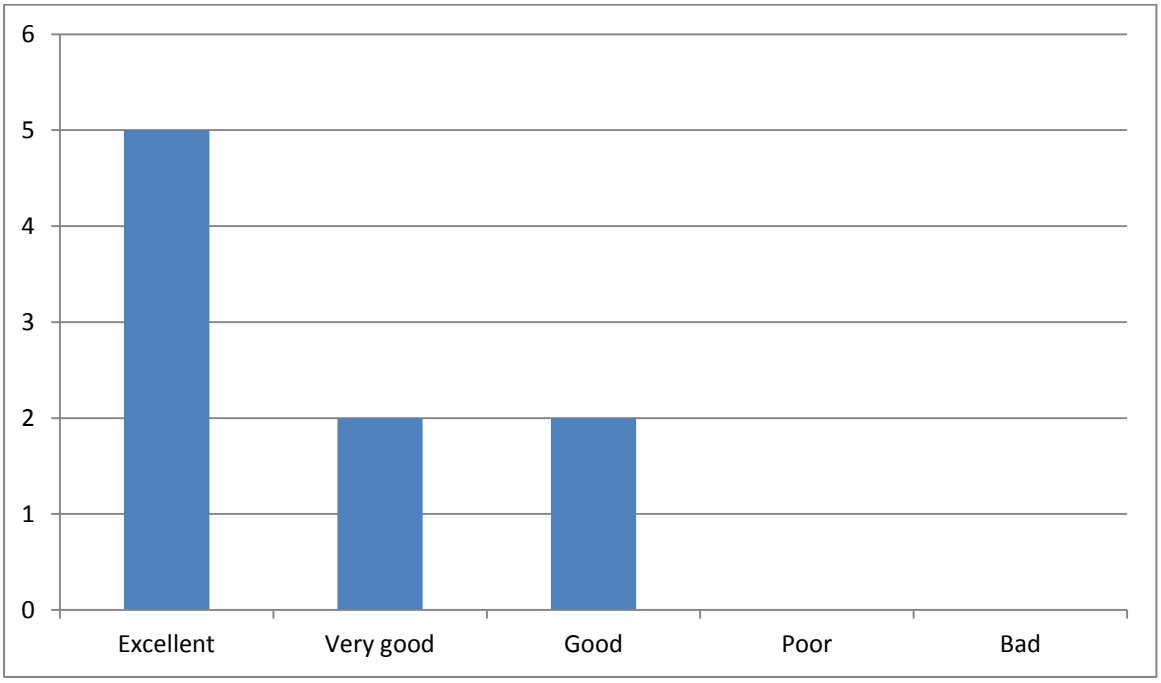
Table 4: Fan belts

STATEMENT	RESPONSE	FREQUENCY	PERCENTAGE (%)
Conditions and availability of fan belts for selling	Excellent	11	61.11
	Very good	5	27.78
	Good	2	11.11
	Poor	0	0.00
	Bad	1	0.00
Total		**19**	**100.00**

Source: Author's Field Work (2012)

Figure 4: Fan belts

Frequency



Response

Source: Author's Field Work (2012)

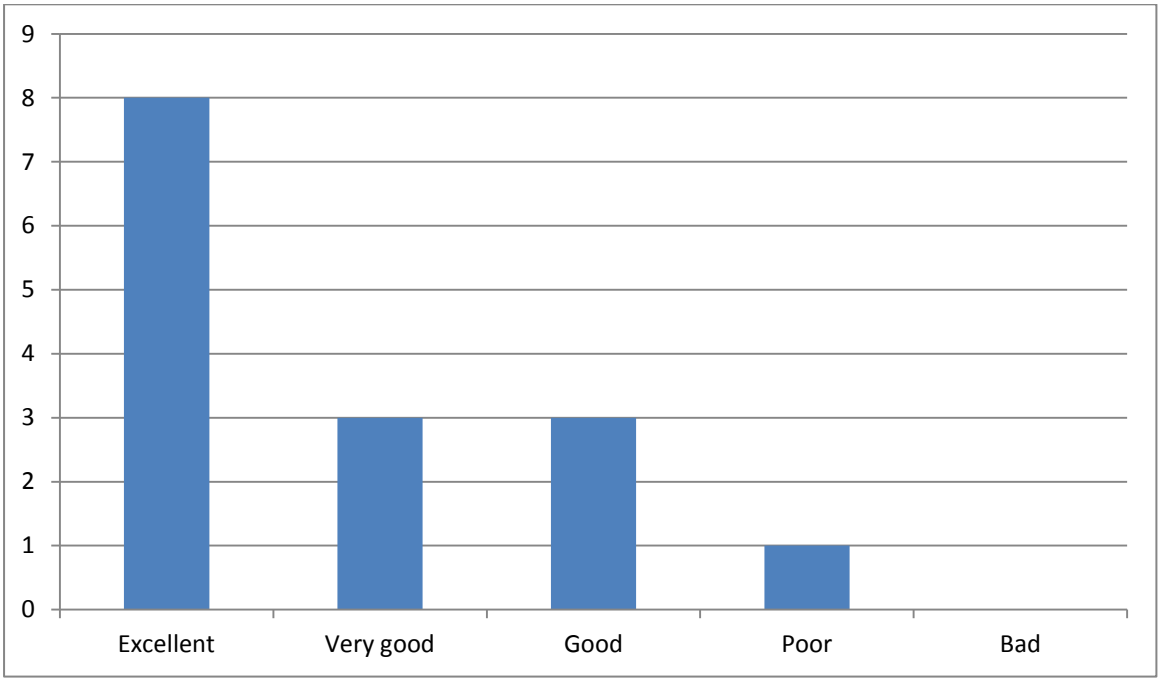
Table 5: Electric motors

STATEMENT	RESPONSE	FREQUENCY	PERCENTAGE (%)
Conditions and availability of electric motors for selling	Excellent	8	53.33
	Very good	3	2.00
	Good	3	2.00
	Poor	1	6.67
	Bad	0	0.00
Total		**15**	**100.00**

Source: Author's Field Work (2012)

Figure 5: Electric motors

Frequency



Response

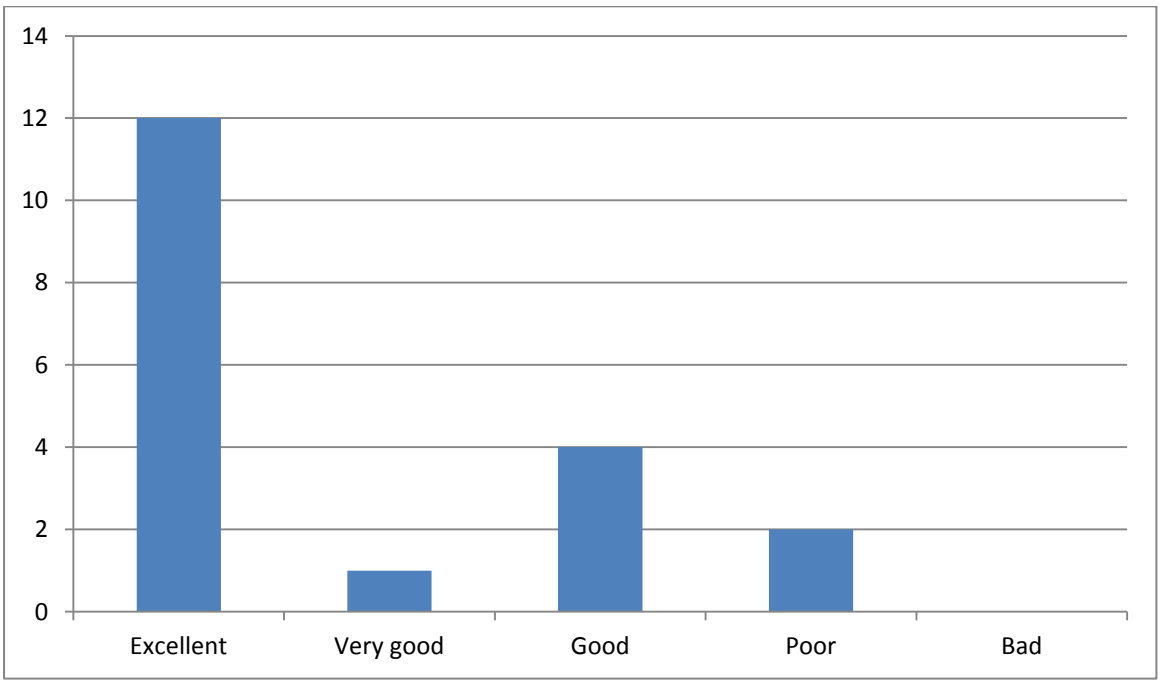
Source: Author's Field Work (2012)

Table 6: Pumps

STATEMENT	RESPONSE	FREQUENCY	PERCENTAGE (%)
Conditions and availability of Pumps for sale	Excellent	12	63.16
	Very good	1	5.26
	Good	4	21.05
	Poor	2	10.53
	Bad	0	0.00
Total		**19**	**100.00**

Source: Author's Field Work (2012)

Figure 6: Pumps



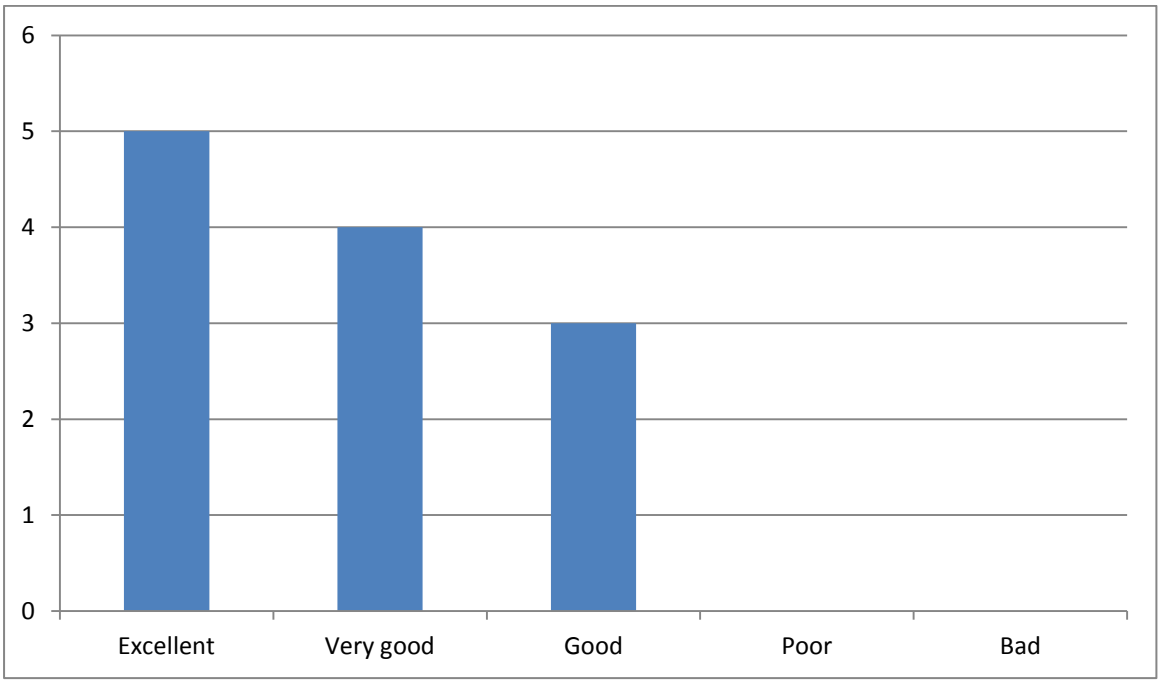
Source: Author's Field Work (2012)

Table 7: Cylinder heads

STATEMENT	RESPONSE	FREQUENCY	PERCENTAGE (%)
Conditions and availability of Cylinder heads selling	Excellent	5	41.67
	Very good	4	33.33
	Good	3	25.00
	Poor	0	0.00
	Bad	0	0.00
Total		**12**	**100.00**

Source: Author's Field Work (2012)

Figure 7: Cylinder heads



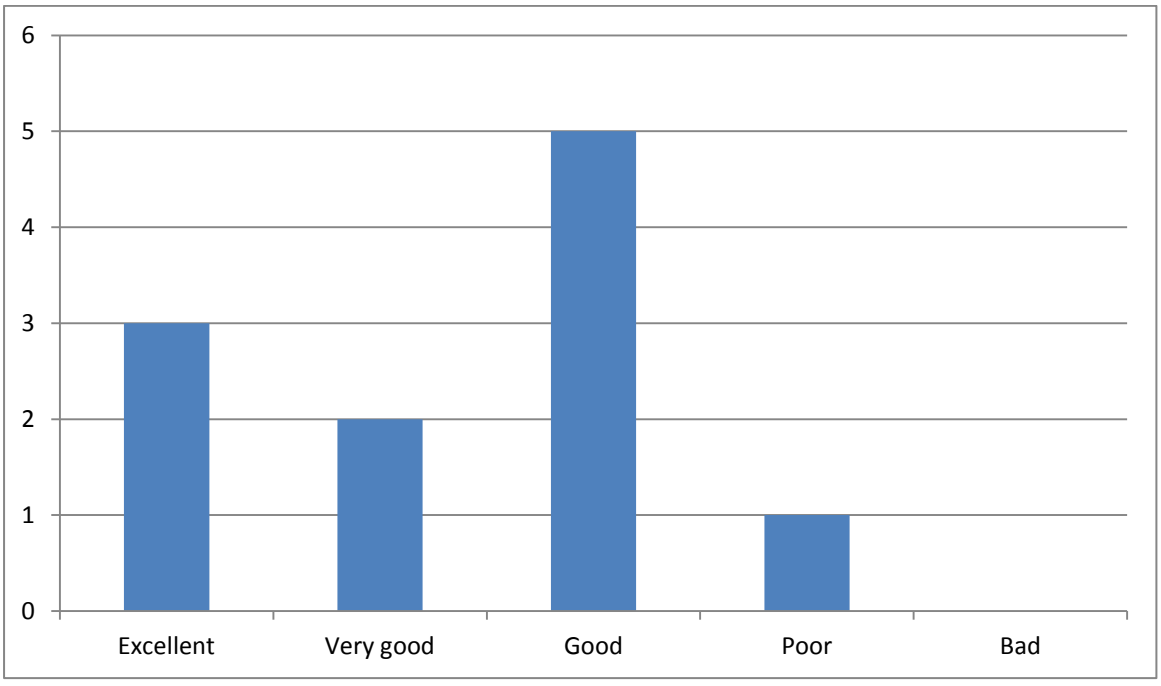
Source: Author's Field Work (2012)

Table 8: Valve springs

STATEMENT	RESPONSE	FREQUENCY	PERCENTAGE (%)
Conditions and availability of Valve Springs selling	Excellent	3	27.27
	Very good	2	18.18
	Good	5	45.46
	Poor	1	9.09
	Bad	0	0.00
Total		**11**	**100.00**

Source: Author's Field Work (2012)

Figure 8: Valve springs



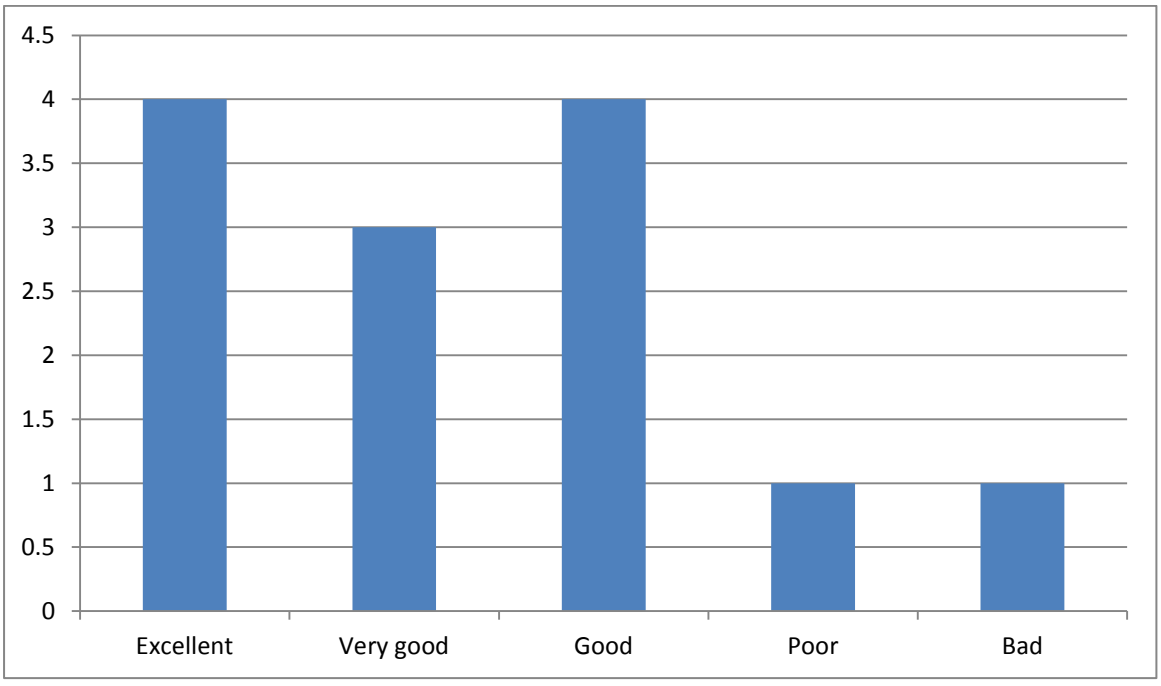
Source: Author's Field Work (2012)

Table 9: Connecting rod

STATEMENT	RESPONSE	FREQUENCY	PERCENTAGE (%)
Conditions and availability of Connecting rod selling	Excellent	4	30.77
	Very good	3	23.08
	Good	4	30.77
	Poor	1	7.69
	Bad	1	7.69
Total		**13**	**100.00**

Source: Author's Field Work (2012)

Figure 9: Connecting rod



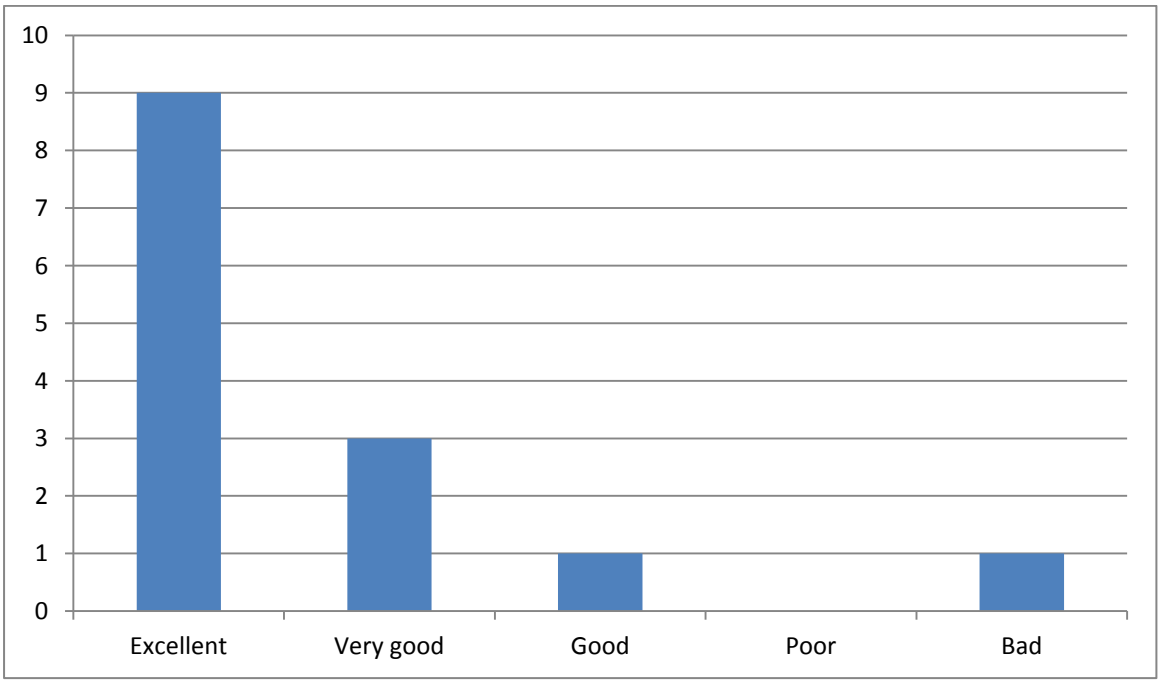
Source: Author's Field Work (2012)

Table 10: Piston rings

STATEMENT	RESPONSE	FREQUENCY	PERCENTAGE (%)
Conditions and availability of Piston ring for selling	Excellent	9	64.29
	Very good	3	21.43
	Good	1	7.14
	Poor	0	0.00
	Bad	1	7.14
Total		**14**	**100.00**

Source: Author's Field Work (2012)

Figure 10: Piston rings



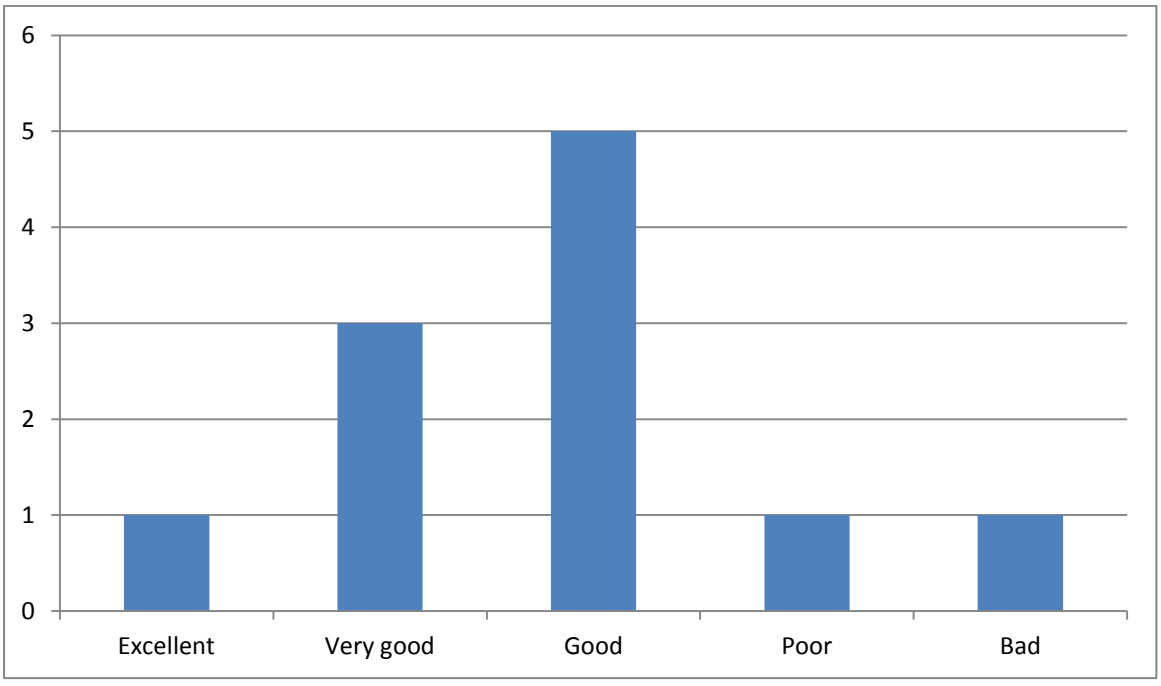
Source: Author's Field Work (2012)

Table 11: Crankshaft

STATEMENT	RESPONSE	FREQUENCY	PERCENTAGE (%)
Conditions and availability of Crankshaft for sale	Excellent	1	27.27
	Very good	3	18.18
	Good	5	45.46
	Poor	1	9.09
	Bad	1	9.09
Total		**11**	**100.00**

Source: Author's Field Work (2012)

Figure 11: Crankshaft



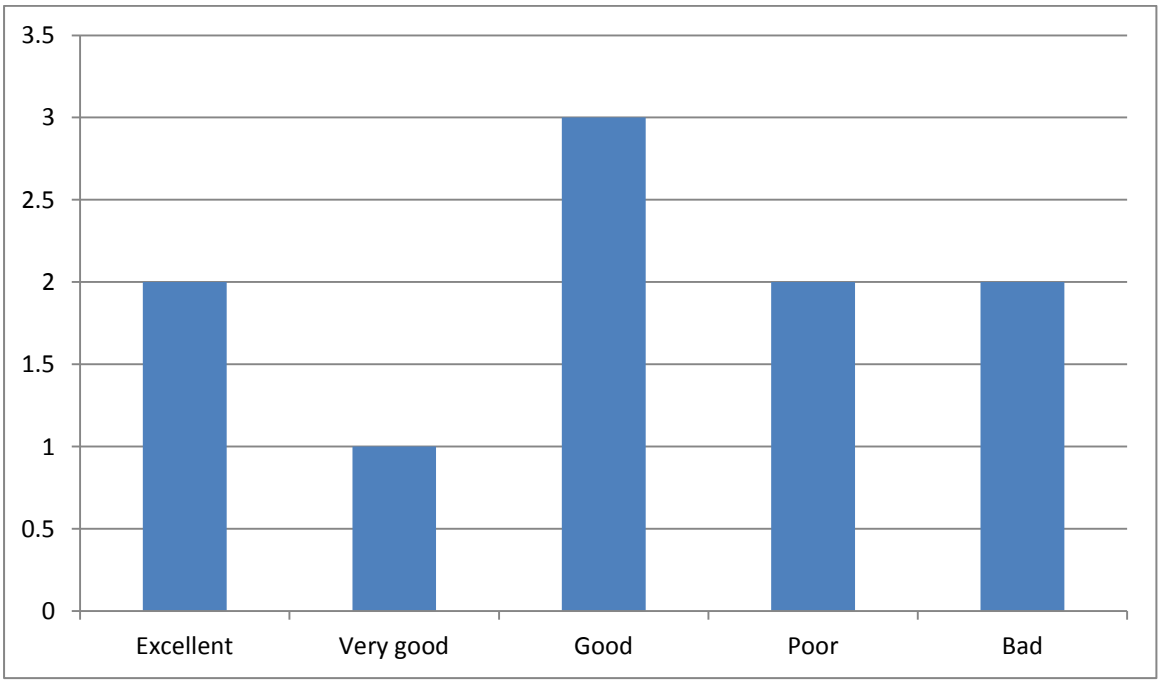
Source: Author's Field Work (2012)

Table 12: Camshaft

STATEMENT	RESPONSE	FREQUENCY	PERCENTAGE (%)
Conditions and availability of Camshaft for selling	Excellent	2	20.00
	Very good	1	10.00
	Good	3	30.00
	Poor	2	20.00
	Bad	2	20.00
Total		**10**	**100.00**

Source: Author's Field Work (2012)

Figure 12: Camshaft



Source: Author's Field Work (2012)

Table 13: Drive shaft

STATEMENT	RESPONSE	FREQUENCY	PERCENTAGE (%)
Conditions and availability of Drive shaft for selling	Excellent	4	30.77
	Very good	3	23.08
	Good	4	30.77
	Poor	2	15.39
	Bad	0	0.00
Total		**11**	**100.00**

Source: Author's Field Work (2012)

Figure 13: Drive shaft

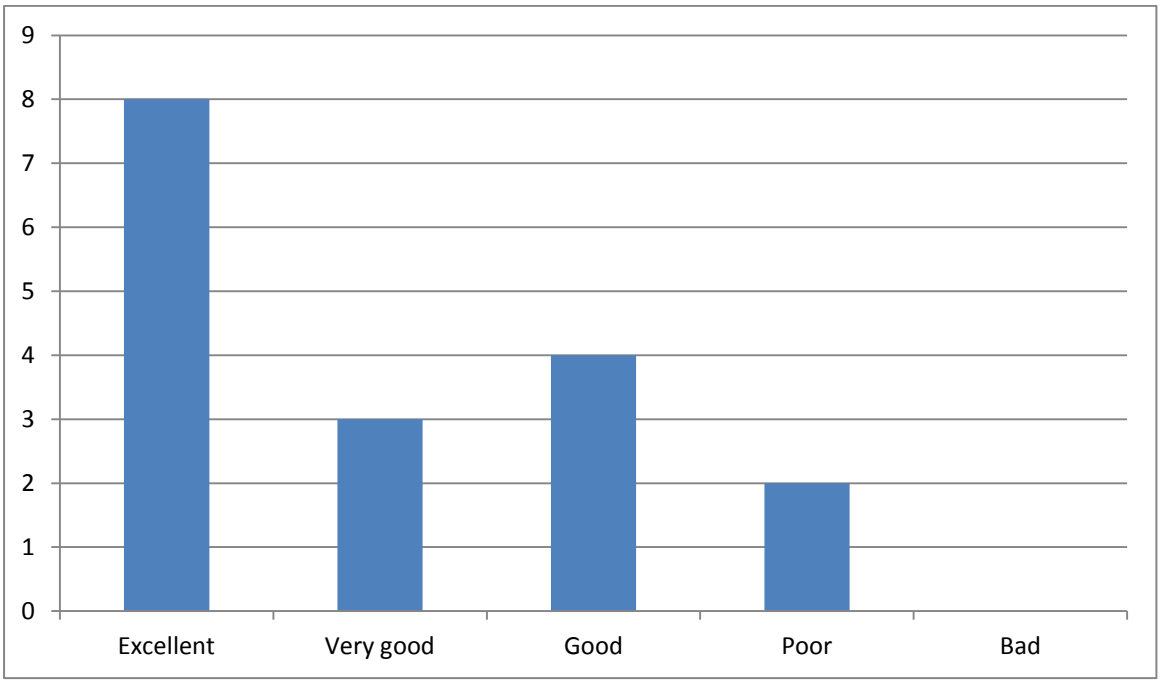
Source: Author's Field Work (2012)

Table 14: Clutch parts

STATEMENT	RESPONSE	FREQUENCY	PERCENTAGE (%)
Conditions and availability of Clutch Parts for selling	Excellent	8	47.06
	Very good	3	17.65
	Good	4	23.53
	Poor	2	11.75
	Bad	0	0.00
Total		**17**	**100.00**

Source: Author's Field Work (2012)

Figure 14: Clutch parts



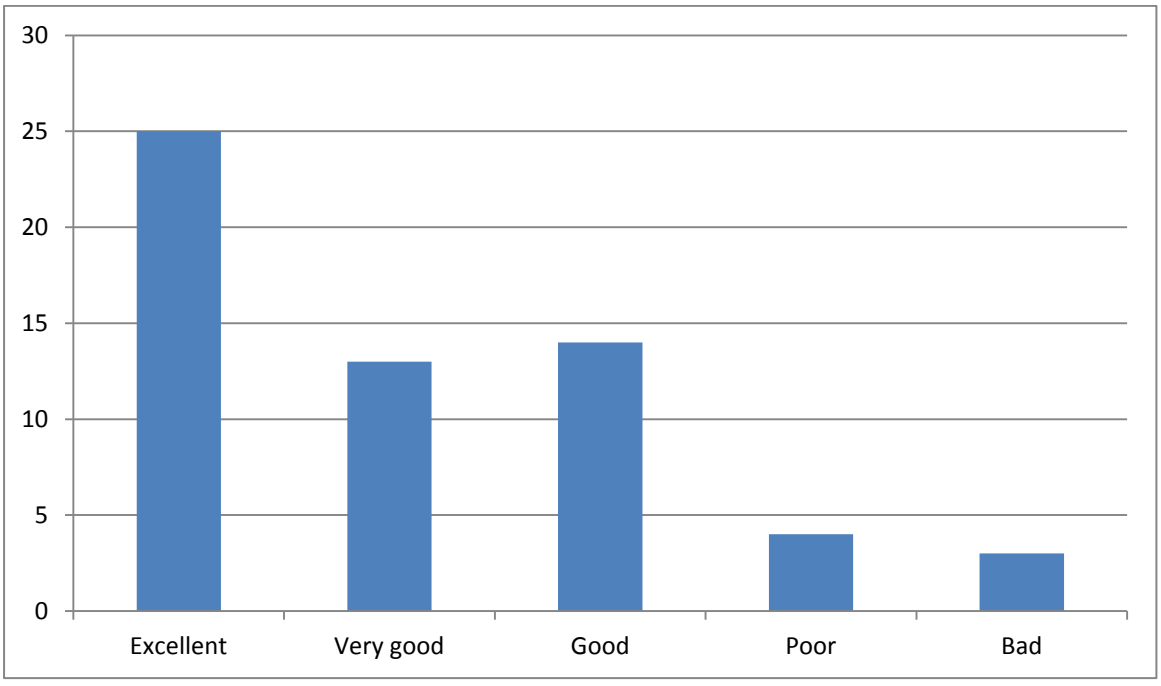
Source: Author's Field Work (2012)

Table 15: Brake parts

STATEMENT	RESPONSE	FREQUENCY	PERCENTAGE (%)
Conditions and availability of Brake Part for selling	Excellent	25	46.30
	Very good	13	14.82
	Good	14	16.67
	Poor	4	7.41
	Bad	3	5.56
Total		**54**	**100.00**

Source: Author's Field Work (2012)

Figure: 15: Brake parts



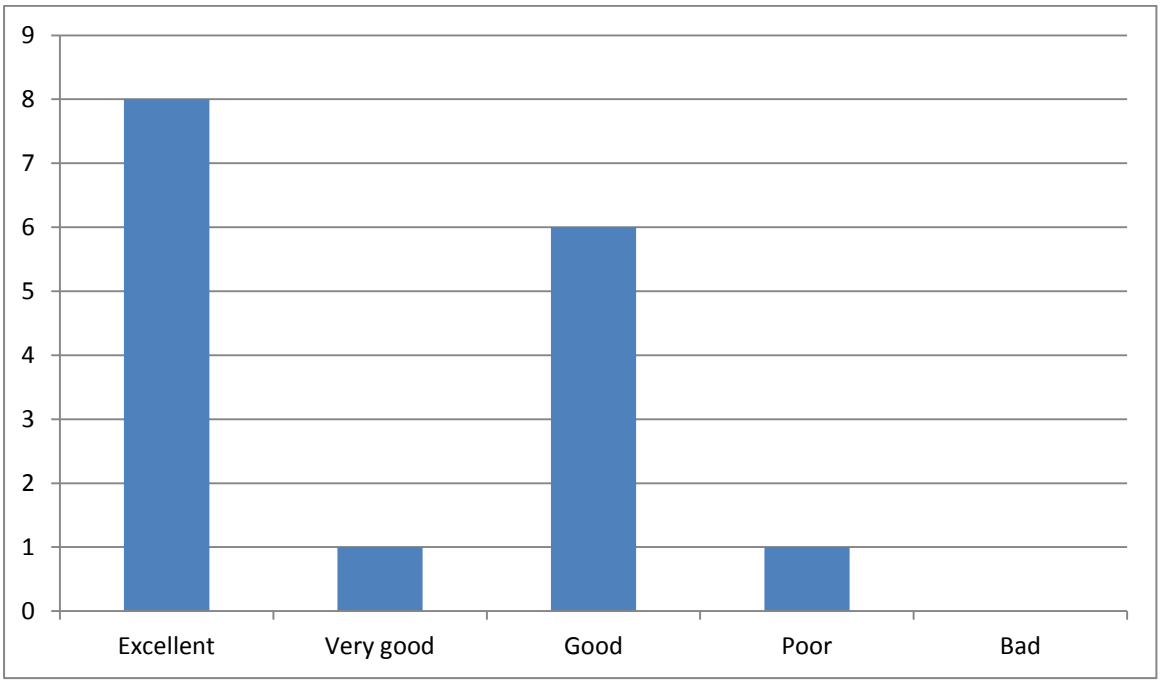
Source: Author's Field Work (2012)

Table 16: Steering parts

STATEMENT	RESPONSE	FREQUENCY	PERCENTAGE (%)
Conditions and availability of Steering Part for selling	Excellent	8	50.00
	Very good	1	6.25
	Good	6	37.50
	Poor	1	6.25
	Bad	0	0.00
Total		**16**	**100.00**

Source: Author's Field Work (2012)

Figure 16: Steering parts



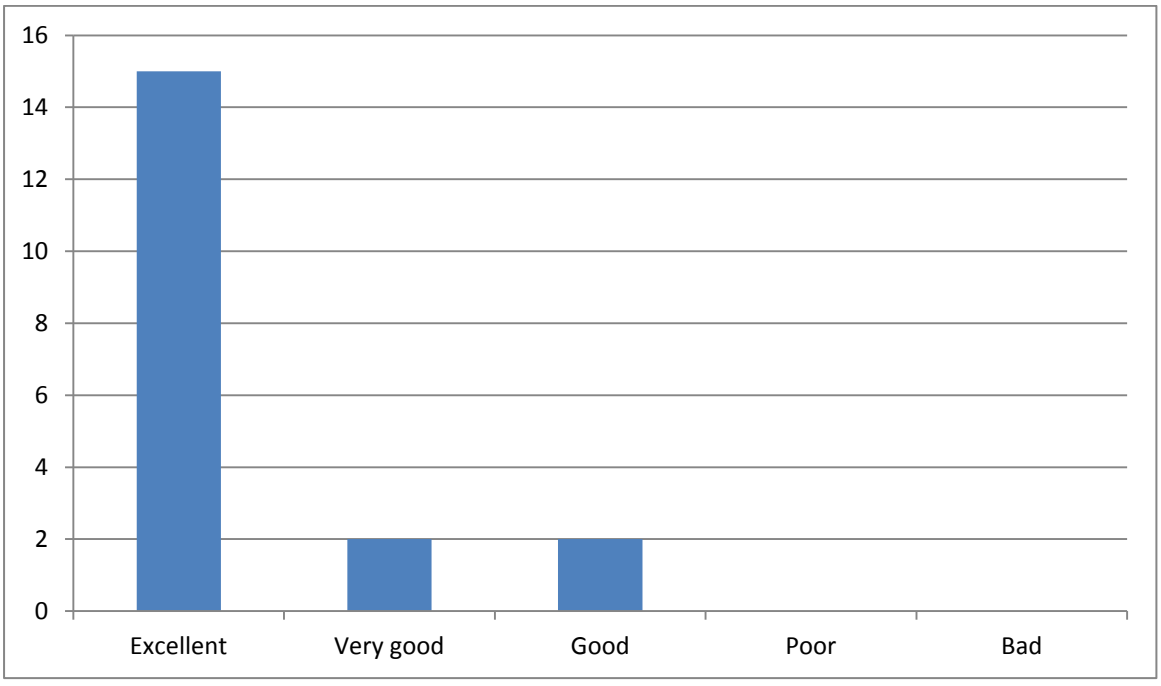
Source: Author's Field Work (2012)

Table 17: Shock absorbers

STATEMENT	RESPONSE	FREQUENCY	PERCENTAGE (%)
Conditions and availability of Shock Absorbers for selling	Excellent	15	50.00
	Very good	2	6.25
	Good	2	37.50
	Poor	0	6.25
	Bad	0	0.00
Total		**54**	**100.00**

Source: Author's Field Work (2012)

Figure 17: Shock absorbers



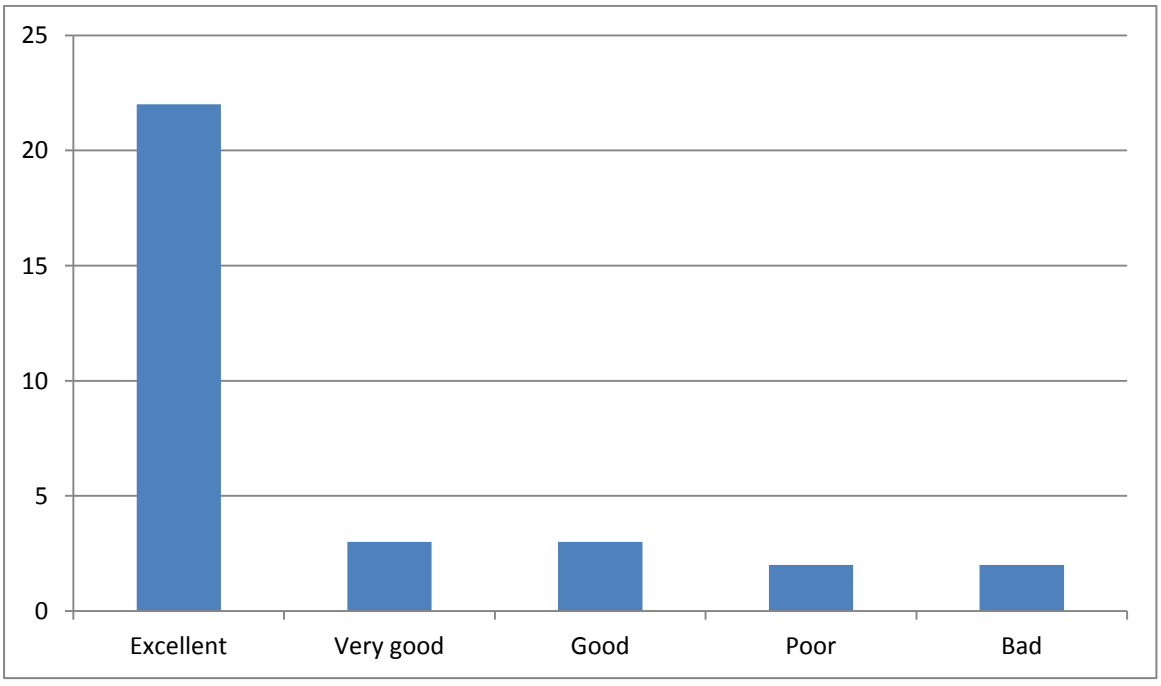
Source: Author's Field Work (2012)

Table 18: Suspension parts

STATEMENT	RESPONSE	FREQUENCY	PERCENTAGE (%)
Conditions and availability of Suspension parts for selling	Excellent	22	68.75
	Very good	3	7.38
	Good	3	9.38
	Poor	2	6.25
	Bad	2	6.25
Total		**32**	**100.00**

Source: Author's Field Work (2012)

Figure 18: Suspension parts



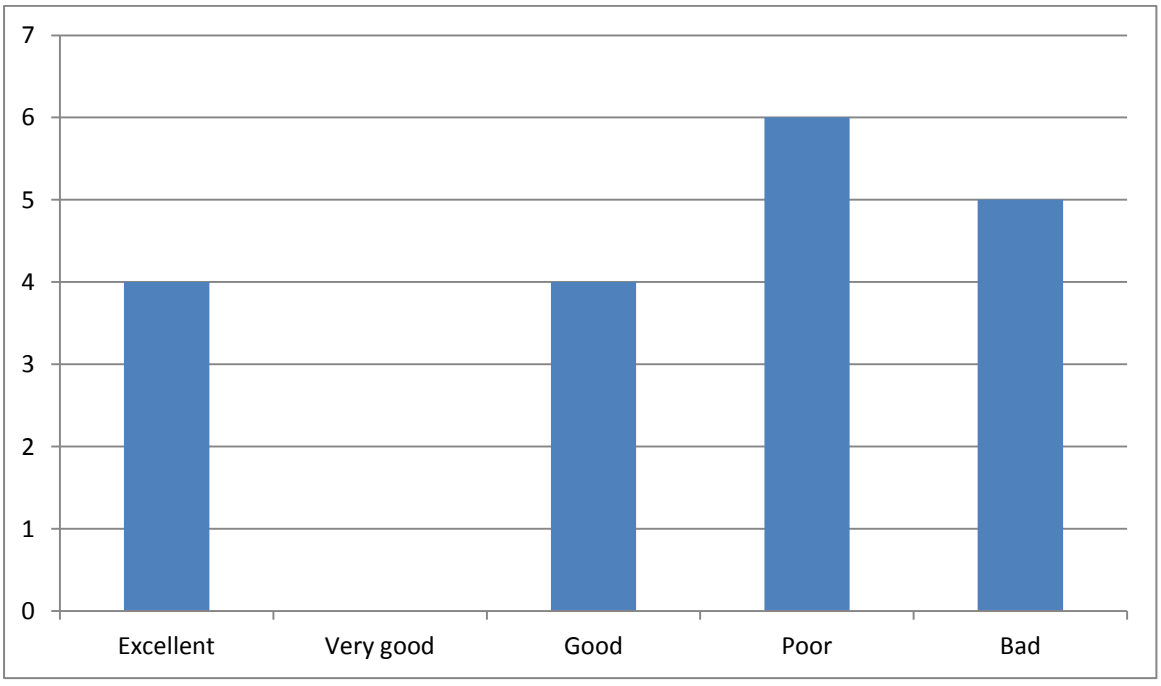
Source: Author's Field Work (2012)

Table 19: Train and Transaxle parts

STATEMENT	RESPONSE	FREQUENCY	PERCENTAGE (%)
Conditions and availability of Train and Transaxle Parts for selling	Excellent	4	16.67
	Very good	0	0.00
	Good	4	22.22
	Poor	6	33.33
	Bad	5	27.78
Total		**18**	**100.00**

Source: Author's Field Work (2012)

Figure 19: Train and Transaxle parts



Source: Author's Field Work (2012)

5. DISCUSSIONS

More than 50% of the carburetors selling are in the category of excellent for condition and availability whiles the rest are in very good and good categories. Relatively, there are no carburetors in poor and bad state for conditions and availability. Comparatively, all the injection system parts selling on grounds of conditions and availability are in excellent and very good state. 11% for good, 27.78% for very good and 61.11% for excellent are the condition and availability distribution for the fan belts. Conditions and availability of electric motors are 6.67% poor, 2% each for good and very good as well as 53.33% for excellent. Availability and conditions for pump are 63.16% excellent, 5.26% very good, 21.05% good, and 10.53% poor and 0.00% bad. Conditions and availability of cylinder heads selling are 41.67% excellent, 33.33% very good, 25.00% good, 0% each for both poor and bad. Valve springs have conditions and availability distribution as 27.27% excellent, 18.18% very good, 45.46% good, 9.09% poor and 0% bad, an indication that valve springs selling are better. Connecting rods have 7.69% each for poor and bad for conditions and availability, 30.77% good, 23.00% very good and 30.77% excellent. Piston rings have 64.29% excellent for conditions and availability 21.43% very good, 0% poor 7.14% each for both good and bad. Distribution of conditions and availability for crankshaft are 27.27% excellent, 18.18% very good, 45.46% good, 9.09% each for both poor and bad. Camshaft have 20% for excellent, 10% for very good 30% for good, 20% each for poor and bad. Relatively, drive shaft have 0.% bad for conditions and availability, 15.39% poor, 30.77% good, 23.08% very good and 30.77% excellent. Clutch conditions and availability are 47.05% excellent, 17.65% very good, 23.53% good, 11.75% poor and 0% bad. Brake parts condition and availability are 46.30% excellent, 14.82% very good, 16.6% good, 7.41% poor and 5.56% bad. Conditions and availability for steering parts are 50% excellent, 6.25% very good, 37.50% good, 6.25% poor and 0% bad. Distribution for conditions and availability with reference to suspension parts are 68.75% excellent, 9.33% each for good and very good as well as 6.25% each for both poor and bad. Train and transaxle parts have conditions and availability distribution as 16.67% excellent, 0% very good, 22.22% good, 33.33% poor and 27.78% bad.

6. CONCLUSION

The following conclusions have been made from this research.

Proper carburetors, injection parts, fan belts and cylinder heads are being sold at Siwdo.

Relatively better electric fan, pumps, valve springs, piston rings, drive shaft, clutch parts, steering systems and shock absorbers are also being sold.

Connecting rod, crankshaft, camshaft, brake parts, suspension parts, train and transaxle parts have significant proportions being bad and poor in terms of availability as well as efficiency.

7. RECOMMENDATIONS

The following recommendations have been made from this research.

Short courses, seminars and other educational platforms must be organize periodically for the sellers of these parts to constantly upgrade their knowledge in automobile mechanics.

There must be formal accounting training for these sellers as well as management of financial and human resources.

There must be financially aid for these owners from government, non-governmental institutions and financial institutions.

There must be serious public information on the importance of the activities of these automobile spare parts dealers by means of posters, adverts, promotions, print and electronic media information among others.

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