



A TECHNICAL REPORT
ON
STUDENT INDUSTRIAL WORK EXPERIENCE SCHEME
(SIWES)
HELD AT
KWARA STATE MINISTRY OF WORK
ILORIN, KWARA STATE

PRESENTED BY:
ISIAKA FAWAZ ADEKUNLE
ND/23/MEC/FT/019
SUBMITTED TO:
DEPARTMENT OF MECHANICAL ENGINEERING,
INSTITUTE OF TECHNOLOGY (IOT)
KWARA STATE POLYTECHNIC, P.M.B 1375 ILORIN

IN PARTIAL FULFILLMENT FOR THE REQUIREMENT FOR THE
AWARD OF NATIONAL DIPLOMA (ND) IN MECHANICAL
ENGINEERING KWARA STATE POLYTECHNIC, ILORIN.

5TH AUGUST -5TH DECEMBER, 2024

DEDICATION

I dedicate this report to Almighty Allah, the beginning and the end of this programme, the giver of all wisdom. Knowledge and understanding. If not for Him this programme would not have been possible

Also to my humble parent, **Mrs. ISIAKA** for their financial and moral support and not forgetting my younger ones for their immense support throughout the days of my SIWES programme.

Also all my friends and well wisher I pray that Allah will bless everyone of you (amin).

ACKNOWLEDGEMENT

All praise goes to Almighty GOD for His wonderful work in completion of this SIWES report and also for giving me strength, knowledge and understanding in the course of the SIWES training.

TABLE OF CONTENTS

Title page	i
Dedication	ii
Acknowledgement	iii
Preface	iv
CHAPTER ONE	
1.0 Introduction to SIWES	1
1.1 Aims and Objectives of SIWES	1
1.2 Workshop safety	2
CHAPTER TWO	
2.0 History of the company	3
2.1 Organization chart of the company	3
2.2 Component if automobile engine	4
2.3 Maintenance of motor vehicle	6
2.4 General Service of Automobile engine	6
CHAPTER THREE	
3.0 Brake Pad	7
3.1 Function of Brake Pads	7
3.2 Replacement Brake Pads	7
3.3 Brake Shoes	8

4 Function of Brake Shoes	8
5 Spark plug	8
6 Gasket	9
7 Shock Absorber	10
CHAPTER FOUR	
4.0 Experience Gained	11
4.1 Suggestion for Improvement of the Programme	11
CHAPTER FIVE	
5.0 Recommendation	12
5.1 Conclusion	12

CHAPTER ONE

1.0 INTRODUCTION TO SIWES

The Student Industrial Work Experience Scheme (SIWES) is an accepted skills programme which forms part of the approved academic standards in the degree programme for Nigerian Universities. In 1974, the Federal Government of Nigeria introduced the national policy on Industrial training, called the Students, Industrial Work Experience Scheme (SIWES). This programme is under the umbrella of the Ministry of Education through the Industrial Training Fund (ITF), was designed to help students acquire the necessary practical education/experience in their fields of study and other related professions.

This is an effort which was created in order to bridge the existing gap between the theory taught in the classroom and practice of science, agriculture, medicine, engineering, technology and other professional programmes in the Nigerian tertiary institutions. This programme is aimed at exposing the students to the use of various machines and equipment's, professional work methods and ways of safeguarding the work areas in industries as well as other organizations.

The Students Industrial Work Experience Scheme (SIWES) programme involves the student, the Universities and the industries. This training is funded by the Federal Government of Nigeria and jointly coordinated by the Industrial Training Fund (ITF) and the National Universities Commission (NUC).

1.1 AIMS AND OBJECTIVES OF SIWES

The following are the major aims and objectives of SIWES program to the student

- ❖ To prepare students in skills development by participating in field works, particularly in report writing in their field of works.
- ❖ Provision of avenue for students to acquire industrial skills and experience during their course of study.

- ❖ To expose students to work methods and techniques in handling equipment and machineries that they may not be available in the universities
- ❖ To make the transition from the university to the world of work easier and thus enhance students contacts for later job placement.
- ❖ Exposure of the student to working methods and techniques in handling equipment and machineries that may not be available in their institutions.

1.2 WORKSHOP SAFETY

Safety is generally the preventive measure that are taken against hazards, accident or harm in day to day activities in the workshop, industry and there environment. Safety is an essential ingredient for existence. Workshop safety is particularly focusing on ways of preventing dangers, harm particularly accident, injury a times death to personnel, or others and things around the operator while doing work. The following are the basic workshop safeties that must be comply with. These include:

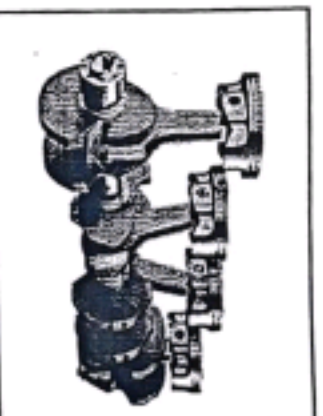
1. Always use the right tools for the right job and damaged tools should be repair or do away with.
2. Movement within the workshop should be normal and not hurry with proper watch out for projected materials, machine part, or materials in transit or slippery floor.
3. Appropriate workshop clothing should be worn with all loose part properly secured
4. Never walk under a load carried by crane or mechanical hoist
5. Keep your work area tidy
6. Clean up any spills immediately
7. Wash hands after using equipment and materials

2.2 COMPONENTS OF AUTOMOBILE ENGINE

⇒ Camshaft: is a type of rotating device used in piston engines propelling and operating the poppet valves. It works with the help of gears, chain and belt.



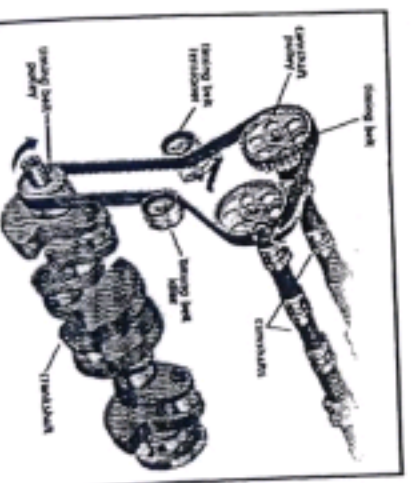
⇒ Crankshaft: is a device which converts the up and down movement of the piston into rotary motion. It is present at the bottom of an engine.



⇒ Connecting rod: they are made of metals which are used for joining a rotating wheel to a reciprocating shaft it is also known as the con rod i.e it is used for joining the piston and the crankshaft.



⇒ Engine/Timing belts: they are bands made of flexible material used for connecting or joining two rotating shafts or pulleys together.



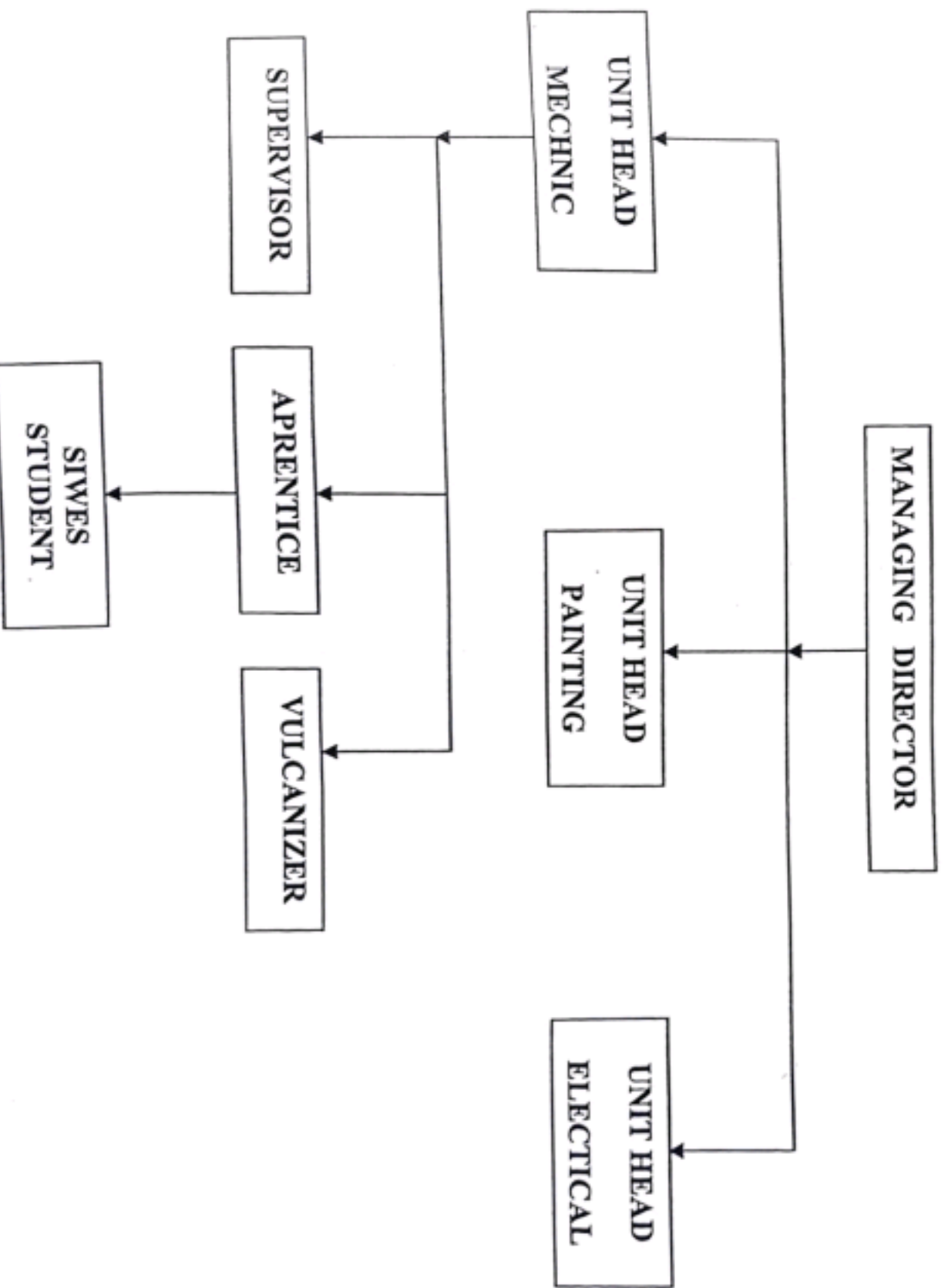
CHAPTER TWO

2.0 HISTORICAL BACKGROUND OF THE ORGANIZATION ATTACHMENT

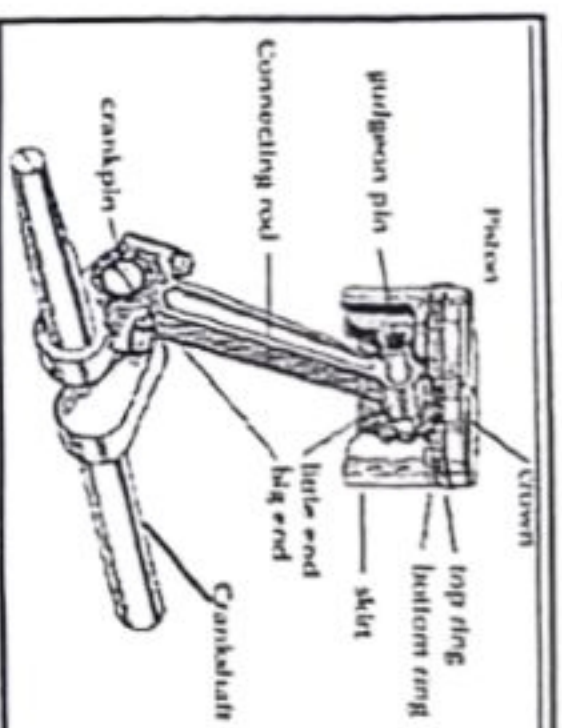
Kwara State Ministry of Works and Transport is located along Tanke Road P.M.B 1384, Ilorin, Kwara state. It own and manage by the Kwara State government. It is one of the Kwara State ministries that is majorly concerned about the welfare, construction and maintenance of roads, bridges and automobiles (like motor vehicle, motorcycle, tricycle) of the state.

2.1 ORGANIZATION CHART OF THE COMPANY

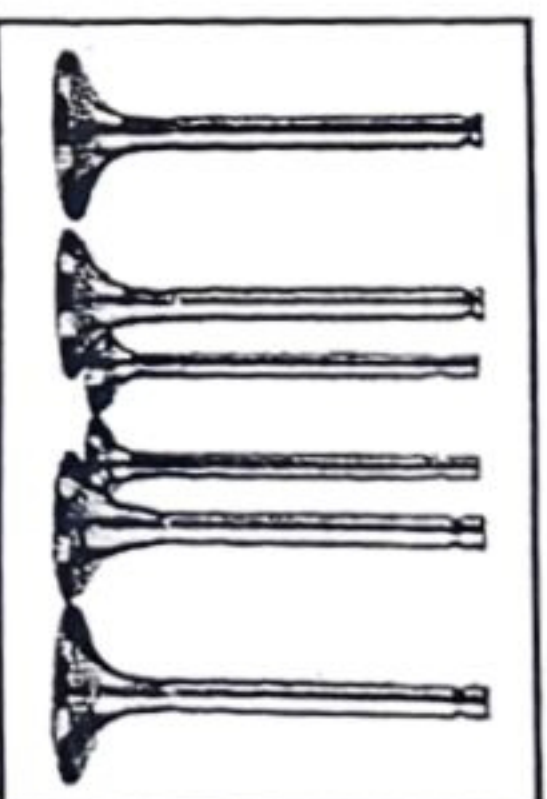
The Kwara State Ministry of Works and Transport is so much organized like every other establishment, from the management level to the least in the organization. Below is the structural chart of the organization of the organization



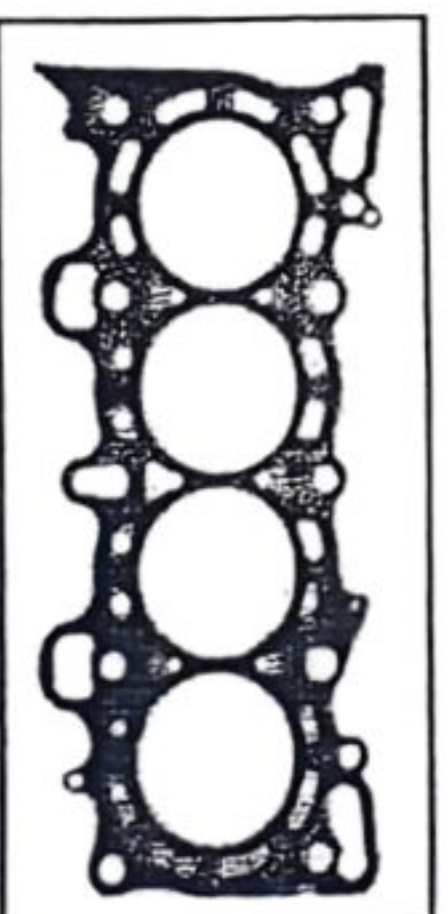
⇒ Piston: is a cylindrical plug which is used for moving up and down the cylinder according to the position of the crankshaft in its rotation.



⇒ Engine valve: are devices that regulate the flow of fuel mixture into the cylinder and assist in expelling exhaust gases.

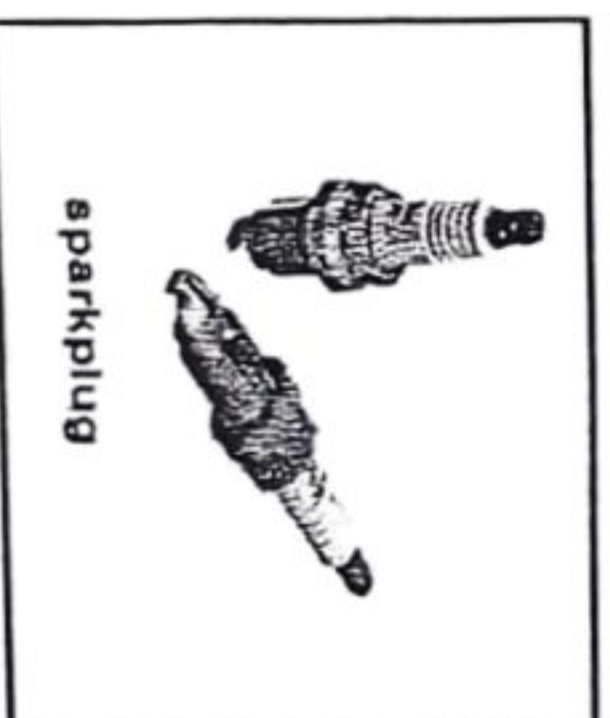


⇒ Gasket: it is a paper-like sheet which is placed between the engine block and the engine head.



⇒ Fuel pump: is a device that supplies the petrol to the carburetor sucking from the fuel tank

⇒ Spark plug: this device is used in petrol engine only and ignites the charge of fuel for combustion



⇒ Fuel injector: this device is used in diesel engine only and delivers fuel in fine spray under pressure.

2.3 MAINTENANCE OF MOTOR VEHICLE

To extend the life span of a vehicle some certain procedures need to be considered

1. Checking of oil level (both engine oil and gear oil)
2. Ensure that the four wheel tyres are of equal size.
3. Always check the water level inside the radiator
4. worn out brake pads and brake lamina should be replaced for adequate braking system
5. replace/rebuild the burnt clutch disk with another for absolute gear efficiency.
6. Replace engine oil with the oil filter when certain kilometers are covered or merely every three (3) months interval.

2.4 GENERAL SERVICE OF AUTOMOBILE ENGINE

1. Changing of oil and its filter
2. Cleaning of air filter and fuel filter
3. Servicing of nozzle valve on injector
4. Changing of spark plug and replace it with new one.

- Clean the caliper thoroughly remove any rust and check the grooves or cracks.
- Check the brake disc for damage or cracks.
- Install the pad springs.
- Push the piston so that caliper will fit over the pads. Make sure that the piston boot is in position to prevent damaging it when pivoting the caliper down
- Pivot the caliper down into position, then install caliper bolt and tighten it.
- Depress the brake pedal several times to make sure the brakes, then the road test.
- After installation check for leaks at hose and line.

3.3 BRAKE SHOES

Brake shoe is the part of a braking system which carries the brake lining in the drum brakes used on automobiles or the brake block in train brakes and bicycle brakes

3.4 FUNCTION OF BRAKE SHOES

The brake shoe carries the brake lining which is riveted or glued to the shoe, when the brake is applied, the shoe moves and presses the lining against the inside of the drum. The friction between lining and drum provides the braking effort. Energy is dissipated as heat.

3.5 SPARK PLUG

It's a device for delivering electric current from an ignition system to the combustion chamber of a spark-ignition engine to ignite the compressed fuel/air mixture by an electric spark, while containing combustion pressure within the engine.

PARTS OF THE SPARK PLUG

- ✓ Terminal
- ✓ Insulator
- ✓ Ribs
- ✓ Seal

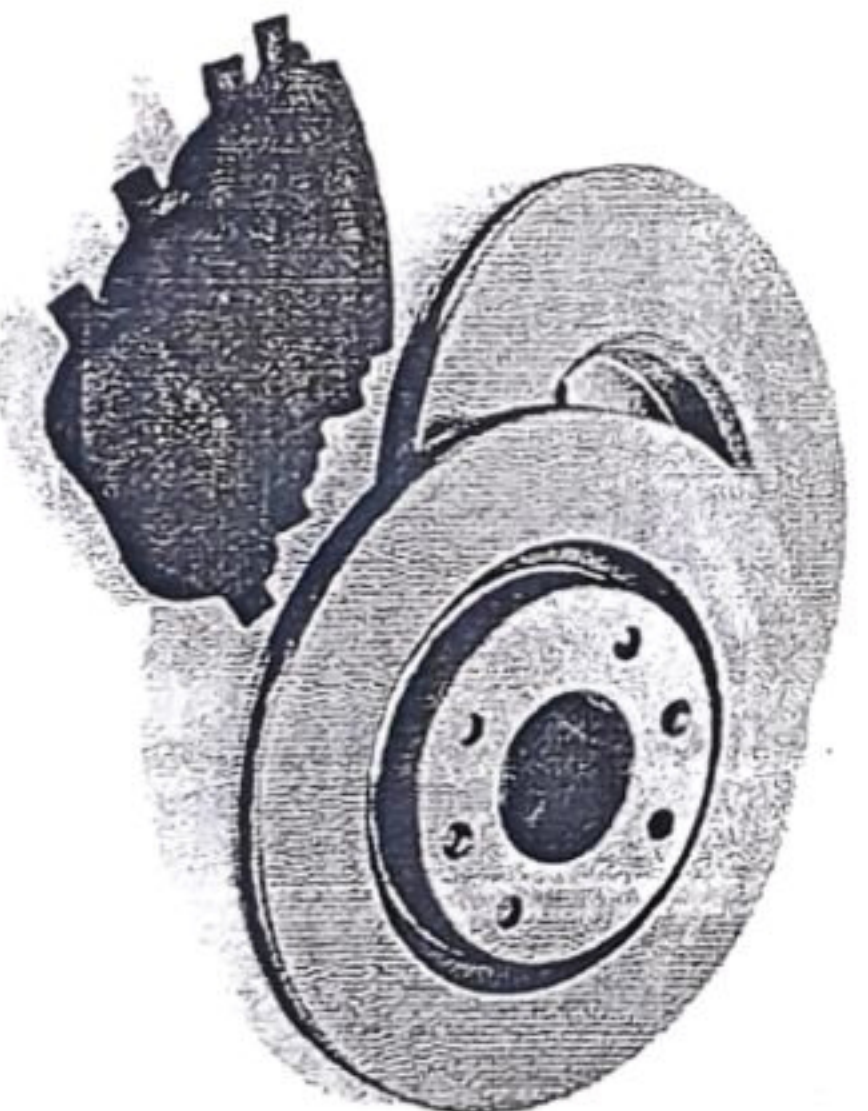
CHAPTER THREE

3.0 BRAKE PAD

BRAKE PAD: are a component of disc brakes used in automobile and other application. Brake Pads are steel backing plates with friction material, bound to the surface that face the disc brake rotor.

3.1 FUNCTION OF BRAKE PADS

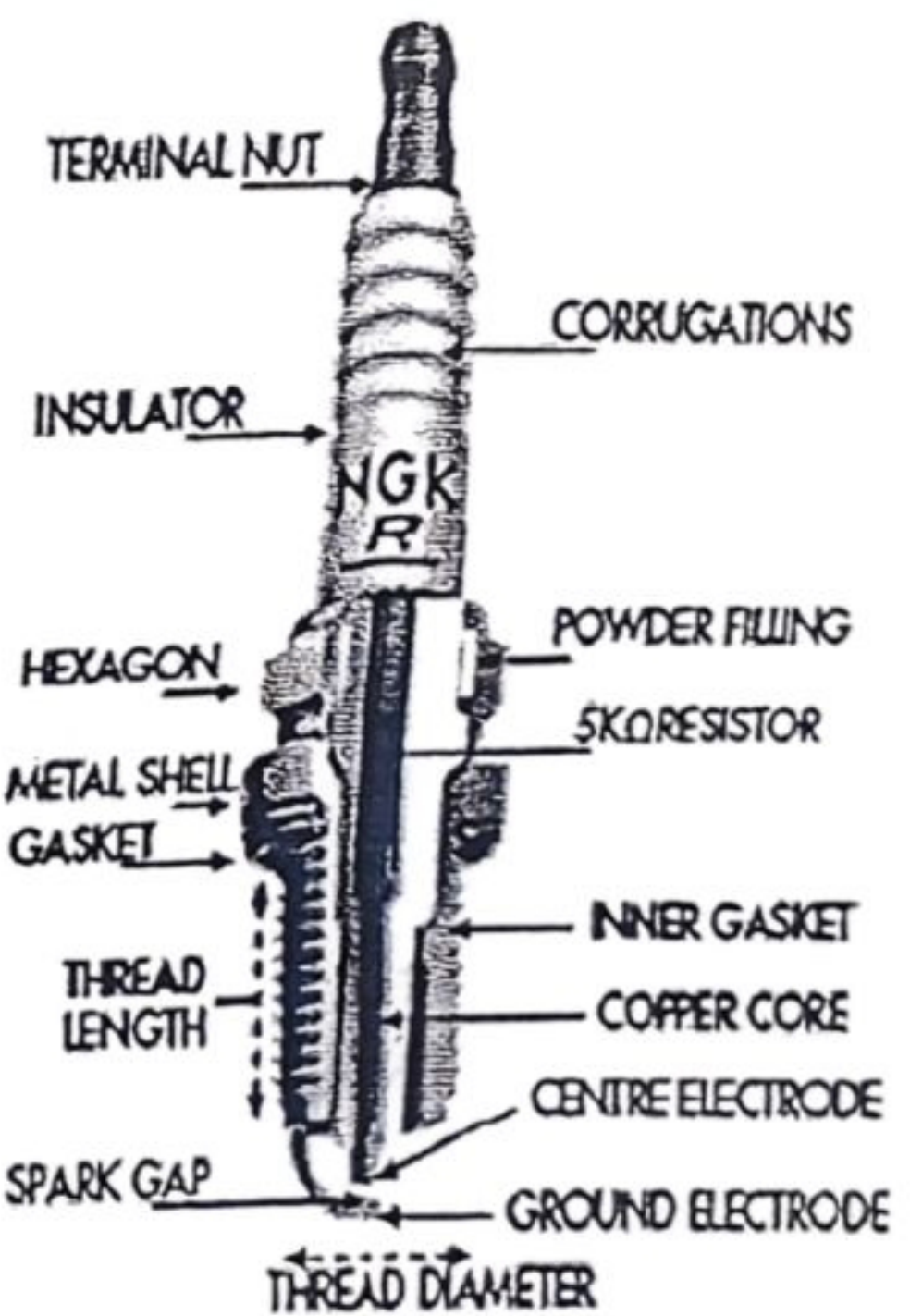
Brake Pads convert the kinetic energy of the car to thermal energy by friction the brake pads are contained in the brake caliper with their friction surfaces facing the rotor. When the brakes are hydraulically applied, the caliper clamps or squeezes the two pads together into the spinning rotor to slow or stop the vehicle when a brake pad is heated by contact with a rotor, it transfers small amounts of friction material to the disc, turning it dull gray. The brake pad and disc (both now with friction material) then stick to each other, providing the friction that stops the vehicle.



3.2 REPLACEMENT BRAKE PAD

- Loosen the front wheel nuts, slightly then raise the car and support on safety stand and remove the tire
- Remove the caliper bolt and pivot the caliper up out of the way.
- Remove the pad shims, pad springs and pads.

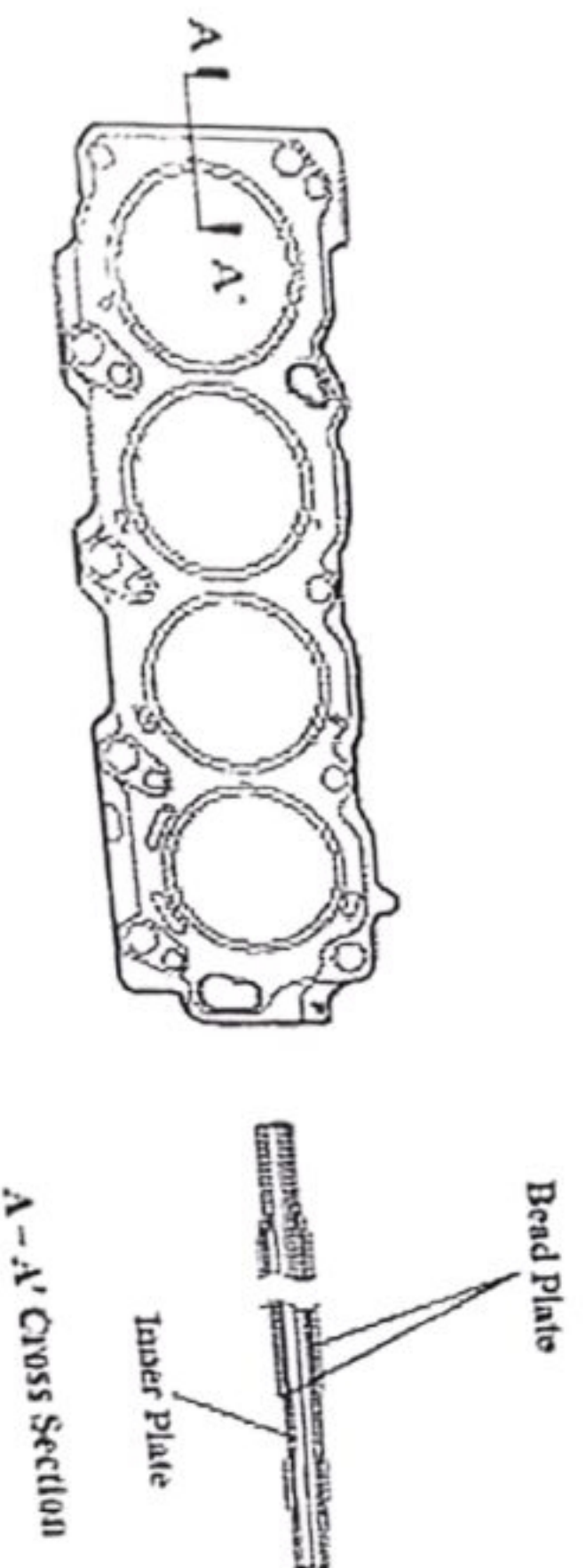
- ✓ Metal case/shell
- ✓ Central electrode
- ✓ Side electrode.



3.6 GASKET

The gasket is a mechanical seal which fills the space between two or more mating surfaces, which is then used to prevent leakage from or into the joined objects while under compression. Gaskets are typically made from asbestos graphite.

We have different kinds of gaskets



CHAPTER FOUR

4.0 EXPERIENCE GAINED

During the four months programme I gained a lot especially in repairing a faulty engine block and the crankshaft, changing of an automobile suspension system like the shock absorber, control arm, and the tie rod.

4.1 INTERPERSONAL RELATIONSHIP WITHIN THE ORGANIZATION

My four months SIWES program has equipped me the knowledge of mechanical engineering especially in the automobile section by repairing and maintenance of engine block and crankshaft.

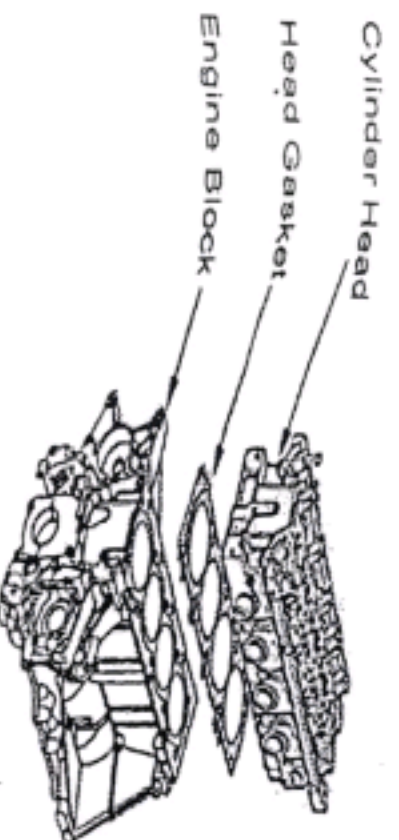
4.2 SUGGESTION FOR IMPROVEMENT OF THE PROGRAMME

I suggested that the polytechnic should make adequate supervision for the student during their programme, they should appeal to the federal government that every organization must accommodate at least some number of SIWES student.

I would encourage that the training should continue so as to give the student enough practical experience. The industrial training fund should have up and hold committee on inspecting the student in their various organizations that they are attached to as this will improve the level of seriousness of the student to the program.

Head gasket

Head gasket is a gasket that sits between the engine block and cylinder head in an internal combustion engine. The purpose of the head gasket is to seal the cylinder to ensure maximum compression and avoid leakage of cooler or engine oil into the cylinders. It is the most critical sealing application in any engine.



3.7 SHOCK ABSORBER

Shock absorber: is to keep the car's tyres in permanent contact with the road, helping to provide optimum grip, when cornering and braking.



CHAPTER FIVE

5.0 RECOMMENDATION

The experience I gained during my SIWES program cannot be over emphasized. I was practically oriented, I humbly recommend that the SIWES programme should be made compulsory for students of engineering fields in order to gain more experience in their course of study.

5.1 CONCLUSION

This SIWES programme has turn out to be more interesting, educative due to the nature of the program itself. I found it interesting and I fully participated in it which in turn yields a successful result, indeed it prepares me for future challenge in my chosen field.