MOTOR VEHICLE MECHANICS 2015 - NECTA FORM FOUR

Solutions from: Maktaba by TETEA

By Yohana Lazaro

1.

i	ii	iii	iv	v	vi	vii	viii	ix	x
E	A	B	B	A	E	B	D	C	A

2.Reasons to bleed the hydraulic brake system:-

-to remove air bubbles from the brake system line.

-to replace the brake fluid with the new one.

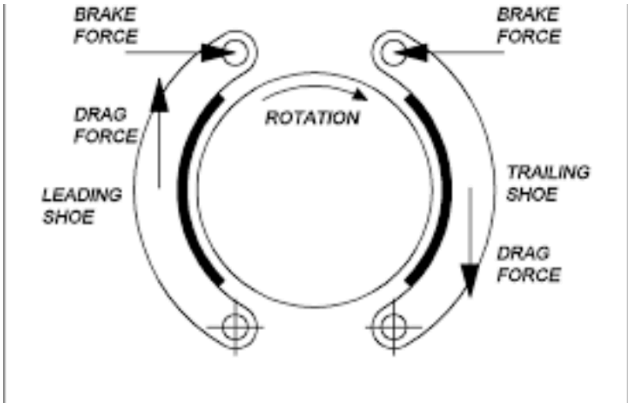
3.Phases of combustion in CI engine are;-

-ignition delay period

-Flame spread

-direct burning.

4.Leading shoe is the shoe that works mostly in braking when the vehicle is moving forward,WHILE Trailing shoe is the shoe that works less in braking especially when the vehicle is moving backwards.



5.Units to form steering system are

-Hand operated steering wheel

-steering column.

6.a-compression ring

b-compression ring

c-scrapping ring

d-piston

e-connecting rod

f-washer.

7(a)tachometer is usually connected to the shafts in order to measure the revolution speed of the shaft.

(b)The oscilloscope tests and displays the voltage signals as waveforms,visual representation of the variation of voltage per time.

8.causes of spring sagging is overloading the vehicle on oneside repeatedly

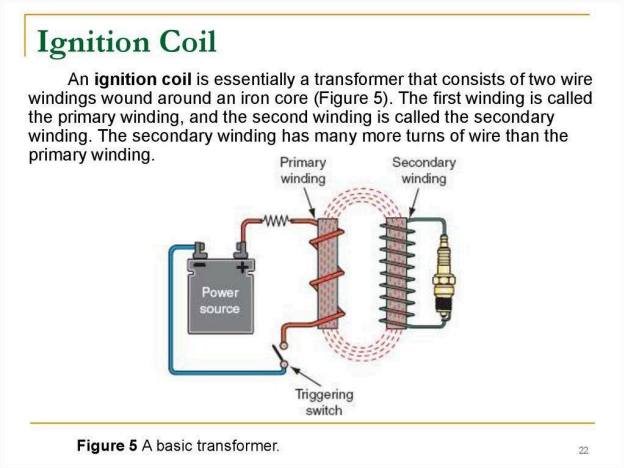
9.(a)Safety stands are

-jack stands

-lifts.

(b)They are able to raise the load effectively.

10.Primary coil is connected to the source to draw power from it, and the secondary coil deliver power to the loads,spark plugs.

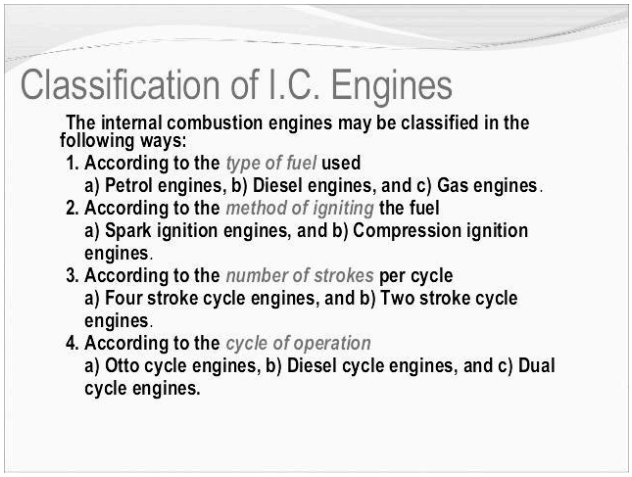


11.

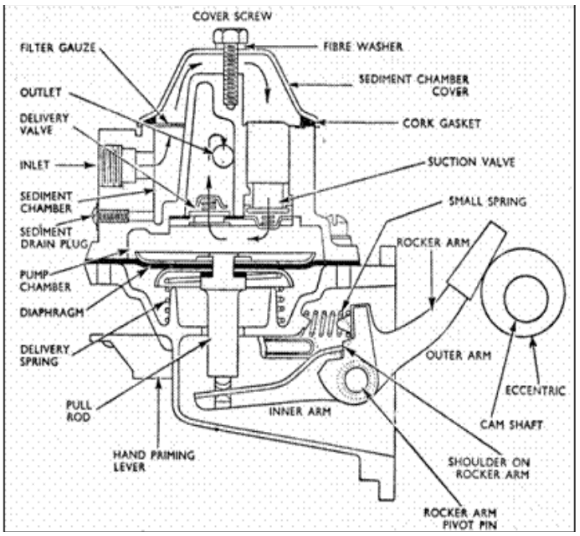
SI engine Vs CI engine

Description	SI	CI
Basic Cycle	Otto cycle or constant volume heat addition cycle	Diesel cycle or constant pressure heat addition
Fuel	Gasoline, a highly volatile fuel, high self ignition temperature	Diesel, a non volatile fuel, low self ignition temperature
Introduction of Fuel	A mixture of fuel and air is introduced during suction stroke(Induction Stroke)	Fuel is injected just at the end of compression stroke
Load control	Quantity governed	Quality governed
Fuel Ignition	Requires Spark plug	Self ignition

12.Classifications of the internal combustion engine.



13(a) Mechanical fuel pump.



(b)Mechanism of the mechanical fuel pump.

A mechanical fuel pump is driven by the camshaft , or by a special shaft driven by the crankshaft . As the shaft turns, a cam passes under a pivoted lever and forces it up at one end.

The other end of the lever, which is linked loosely to a rubber diaphragm forming the floor of a chamber in the pump, goes down and pulls the diaphragm with it.

When the lever pulls the diaphragm down, it creates suction that draws fuel along the fuel pipe into the pump through a one-way valve .

As the revolving cam turns further, so that it no longer presses on the lever, the lever is moved back by a return spring , relaxing its pull on the diaphragm.

The loosely linked lever does not push the diaphragm up, but there is a return spring that pushes against it.

The diaphragm can move up only by expelling petrol from the chamber. The petrol cannot go back through the first one-way valve, so it goes out through another one leading to the carburettor.

The carburettor admits petrol only as it needs it, through the needle valve in its float chamber ;

14.-Fuel tank -to store fuel

-pipeline to channel the fuel from one point tank to another

-fuel filter to remove impurities from fuel

-fuel pump to provide pressure to push the fuel

-carburrator to break down fuel into smallest particles

-inlet manifold to distribute fuel into different cylinders.

-air cleaner to remove impurities from the air.

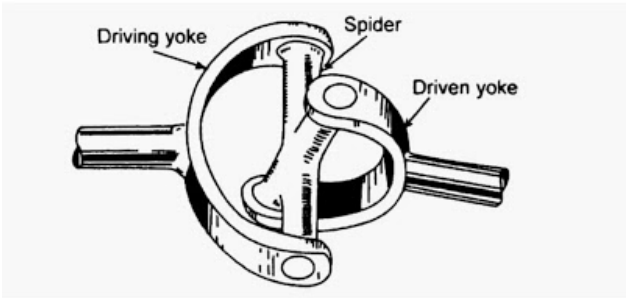
(b)

Constant Velocity Joint

- Constant-velocity joints (aka homo kinetic or CV joints) allow a drive shaft to transmit power through a variable angle, at constant rotational speed, without an appreciable increase in friction or play.
- They are mainly used in front wheel drive and many modern Rear wheel drive cars with independent rear suspension typically use CV joints at the ends of the rear axle half shafts, and increasingly use them on the prop shafts.
- Constant-velocity joints are protected by a rubber boot, a CV gaiter. Cracks and splits in the boot will allow contaminants in, which would cause the joint to wear quickly.

UNIVERSAL JOINT

- A **universal joint**, (**universal coupling**, **U-joint** or Hooke**'s joint**) is a joint or coupling in a rigid rod that allows the rod to 'bend' in any direction, and is commonly used in shafts that transmit rotary motion.
- To give drive at varying angles (up to 20 degree)



15.(a)most cause of air bubbles in coolant is the blown head gasket in which the air pressure inside the cylinder head is transferred to the cooling system.

(b)

Types of Carburettor

Depending on the method of varying the mixture strength or **choke area** carburettors are classified as:

1.Open Choke or **Constant Choke carburettor**

The mixture strength is determined by the varying depression of a fixed tube or venturi

Eg: solex and zenith

2.Variable Choke or **Constant Depression** or **Constant Vaccum carburettor**

Depression in the choke tube is reasonably constant and the size of the jet is varied to provide the correct mixture for all engine operating conditions.

Eg: S.U. carburettor

(c)(i) air cleaner helps to remove impurities from the air, hence avoid the occurrance contaminated fuel.

(ii)Running a vehicle without air cleaner can leads to contamination of fuel leading to improper burning of fuel.

16.(a)

Extraction is a three-step process.

- Drill into the broken stud to the specified depth using the drill bit that corresponds to the extractor size you'll be using. When drilling, let the drill bit do the work and don't force the bit. Also, use the appropriate speed on your drill for the bit selected. Using a lubricant/cutting fluid can help speed the drilling process and keep your bit and the work cool.
- Insert the extractor into the hole you just drilled by turning it counterclockwise. Continue turning the extractor counterclockwise with a wrench or ratchet and socket until the stud is removed. Straight and square flute extractors must be hammered into the hole drilled in the stud to remove the stud.

(b) friction locking devices are:-

-nuts.

Position locking devices are:-

-split beam nut,

-castellated but

-cap screw.

(c)a-leaf spring or laminated spring

b- U bolt.