# JOB ROLE – AUTOMOTIVE SERVICE TECHNICIAN

Sector: Automotive
(Qualification Pack Code : **ASC/Q01402)**

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# UNIT 10 : Regular Maintenance of Brakes

## Session 1: Brake and its Maintenance

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# Session Objectives

The student will be able to explain importance of brakes

Able to list general steps during servicing of brakes

# Introduction

ake is a mechanical device which inhibits motion. Its opposite ponent is clutch. Most commonly, brakes use friction to ert kinetic energy into heat, though other methods of energy ersion may be employed. Brakes are generally applied to ing axles or wheels, but may also take other forms such as surface of a moving fluid (flaps deployed into water or air). e vehicles use a combination of braking mechanisms, such rag racing cars with both wheel brakes and a parachute or anes with both wheel brakes and drag flaps raised into the uring landing.

# Principle of Braking

brake is a friction creating device which causes speed uction of the vehicle at a faster rate than the speed reduction ained by changing the gears and closing down the elerator.

## ctions of a good braking system

- The brakes should stop the vehicle in shortest possible ance and without skidding the vehicle.
- The brakes should work equally well on fair or bad roads.
- Pedal effort applied by the driver should not be more, so as, to strain the driver.
- Brakes should work equally well in all weathers.
- t should have very few wearing parts.
- t should require little maintenance.

# Different types of brakes

Mechanical brakes

Hydraulic brakes

Vacuum Servo brakes

Pneumatic brakes

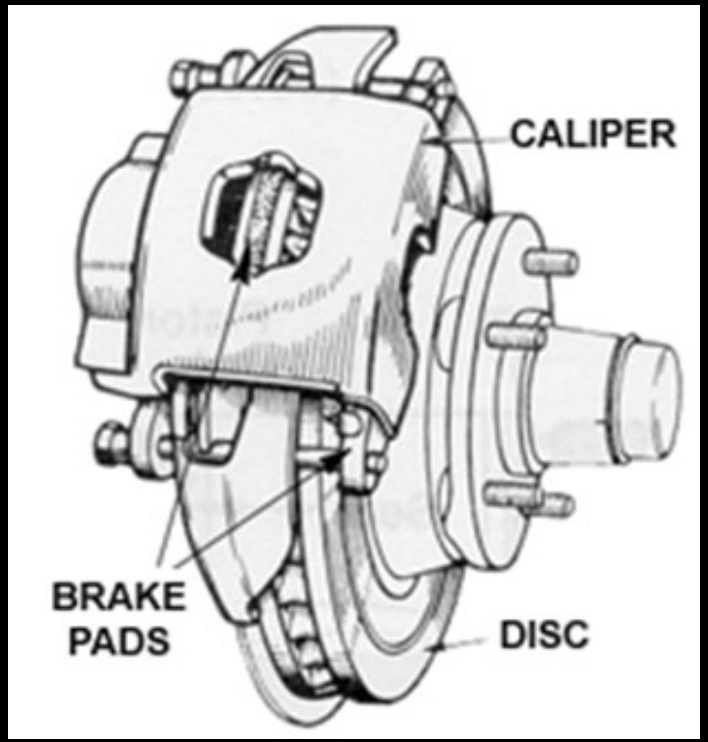
Disc brakes

chanical brakes: Brakes which operates mechanically by
ng cam, rod and linkage with drum brake.

draulic brakes: Brakes which are operated by the pressure on
raulic fluid are called hydraulic brakes. This braking system
sists of master cylinder, fluid line, wheel cylinder and drum
ke.

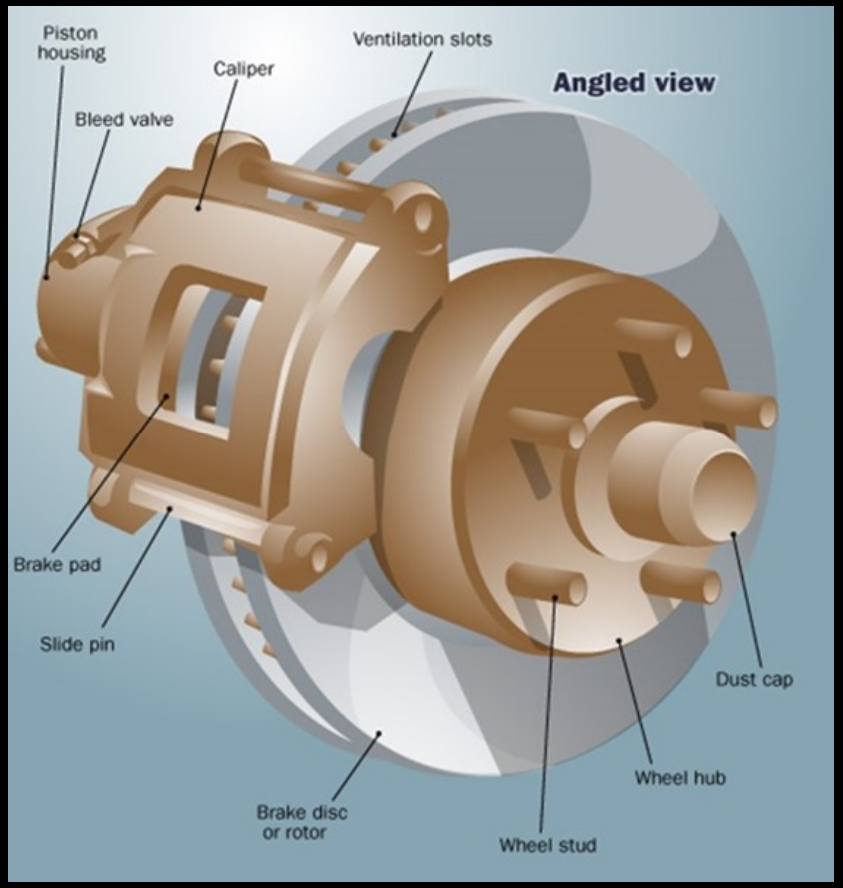
uum servo brakes: Application of brake is assisted by engine
uum for suction and is called vacuum servo brake. This
tem consists of vacuum reservoir, master cylinder, vehicle
trol unit and server with diaphragm.

matic brakes: Brakes which are assisted to work on
ressed air are called pneumatic brakes. Braking system
sts of following components; air compressor, air tank,
valve, brake valve, brake chamber, diaphragm/ chamber
rum brake.



# Disc brakes

is mounted on the wheel, instead rake drum, which rotates between er assembly. Caliper pads/friction s are operated hydraulically by ns of piston which comes in act with rotating disk. Due to on it reduces the speed of the disc vell as wheel. System consists of ter cylinder, caliper assembly, er pad/friction pad and disc.



# Steps for repairing mechanical brakes

Remove/unthread the wheel nuts with spanner and separate the wheel from brake drum.

Straighten and pull out the spilt pin, fitted in castle nut, using combination plier.

Lock the axle shaft by putting the vehicle and open the castle nut using socket and handle.

Hammer the axle shaft lightly by using brass drift, this may contract the brake drum loose and remove the brake drum.

Remove brake shoe lock, mount on anchor pin, with the help of nose plier.

Serrate the brake shoes from brake lever cam and the steady post.

# Steps for repairing mechanical brakes

Clean the brake shoes and the brakes drum with the help of emery paper.

Fit both the shoes on the cam and anchor pin and lock them.

Fit the brake drum over the axle shaft and tighten the castle nut with the help of socket and handle.

Tighten the brake shoe adjusting nut with the help of spanner, this makes the shoes to expand and grip the drum firmly.

Loosen the adjusting nut by a little amount and turn the wheel, it must roll free. Do the shoe adjustment this way.

Tighten the main nut locked it properly.

Fit the wheel over brake drum and tighten wheel nuts.

Take a road test of the vehicle.

# Hydraulic Brakes

## erhauling of wheel cylinder

Place an obstacle to rear wheels and serrated from wheels hub plate using ring spanner.

Rest the vehicle's front on iron horses by lifting with the help of jack and placing them below front axle. • Straighten lock washer of "check nut" of stub axle.

Serrated the brake drum from stub axle. The drum comes out with bearing.

Serrate the brake hose pipe from the brake pipe line.

Took out the shoe's lock with the help of combination plier and serrated the spring and locks from shoes.

Took out the shoe return springs, this will make the shoes serrated from wheel cylinder and steady post.

Continue

Take off the dust caps of wheel cylinder and dismantle them. There will be the piston, bore, spring and rubber seals. Check them for being “OK”.

Wash the assembly (metal parts) using petrol and fit the assembly (housing) on another plate and reassemble it.

Fit the anchor plate over the stub axle and tighten it properly.

Fit the shoes along with the return spring and lock It.

Join the brake hose connections and tighten the brake line.

Place the wheel and brake drum over axle.

Adjust  the wheel bearing’s free play.

Take out the iron horses by lifting the vehicle, a little up and en rest it down. •  This completes your job of overhauling the eel cylinder assembly.

# Overhauling of Master Cylinder

Drain out the master cylinder from the reservoir
Disconnect the brake pedal connection from the master cylinder .
Using nose pier, remove the locking clip and then takeout piston, primary and secondary cups, check valve with spring.
Wash all the components of master cylinder thoroughly with the help of clean brake fluid.
Check the components for service limit
Clean the bypass and intake ports and outlet passage of master cylinder.
Assemble all the components with new master cylinder kit
Fit back master cylinder on the vehicle

## eeding

cess of removing trapped air from the fluid line is called ‘
eding ‘ otherwise, it may cause spongy brakes.

## portant note

Bleeding operation is to be carried out on the wheel cylinder
hich is farthest from the master cylinder.
f the master cylinder is provided with bleeder valve and
bleeding to be carried out first on the master cylinder.
Bleeding operation can also be carried out with the help of
pressure bleeder machine.

## rking brakes

king brakes are a special type of brakes, designed to assist normal braking system, when it is necessary to hold the icle or to hold heavy load descending or inclining. It is also d for parking of vehicle.

## rvicing of the parking brake

- Pull up the parking break lever
- Count the number of notches the lever has travelled. If it is more than 3 to 4 notches, then, adjust brake shoe clearance or adjust the brake cable.
- Regularly check the free operation of the brake.

# Summary

this session you have learnt about , The brake is a friction ating device which causes speed reduction of the vehicle at a ter rate than the speed reduction obtained by changing the rs and closing down the accelerator.

erent types of brakes

- Mechanical brakes
- Hydraulic brakes
- Vacuum Servo brakes
- Pneumatic brakes
- Disc brakes

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