ESOL PATHFINDER PROJECT

Introduction to Vehicle Care

Materials produced by
Blackburn College

Liverpool COMMUNITY COLLEGE

BLACKBURN COLLEGE

WirralMet

ESOL PATHFINDER PROJECT

Introduction to Vehicle Care

Produced and collated by Dave Threlfall

Introduction to Vehicle Care

Content

1. **Mapping Document**
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3. **Course Materials**

Pathfinder

Learner Profile

Name: _____

Course: _____

Tutor: _____

Description of Course

Introduction to Vehicle Care

This course will help the learner develop the skills needed to carry out simple maintenance of cars.

Course Skills

The tutors at Blackburn College will help you to improve your reading, writing, listening, speaking and maths skills.

This means that we will:

- Plan, with you, a programme of work to meet your needs.
- Regularly review the programme with you,
- Help you to keep records of your work and achievements.
- Give you the chance to gain qualifications.

Any discussion you have will be confidential

In return, we ask you to:

- Work on your agreed programme.
- Give respect to all students, members of staff and visitors.
- Come at the correct time for classes.

Reading Skills	**Task**	**I can do**	**To Develop Tutor to sign and date**
Rt/E3.1/E3.3/E3.5 E3.6/E3.8/E3.8	Change a road wheel/check tyre		
Rs/E3.1a/E3.1b Rs/3.2a	Change a windscreen wiper		
Rw/E3.1/E.2/E3.3	Change a windscreen wiper		

Learner Signature _____ Date _____

Tutor Signature _____ Date _____

Speaking Skills	**Task**	**I can do**	**To Develop Tutor to sign and date**
Lr/E3.1/E3.2/E3.5 E3.6	Check engine oil level		
Sc/E3.1/E3.3	Check engine oil level		

Learner Signature _____ Date _____

Tutor Signature _____ Date _____

Writing Skills	**Task**	**I can do**	**To Develop Tutor to sign and date**
Wt/E3.2/E3.3 E3.4	Check engine oil		
Ws/E3.1/E3.2 E3.3	Check engine oil		
Ww/E3.1/E3.2	Check engine oil		

Learner Signature _____ Date _____

Tutor Signature _____ Date _____

WHAT HAVE I LEARNT?

Learner Signature _____ Date _____

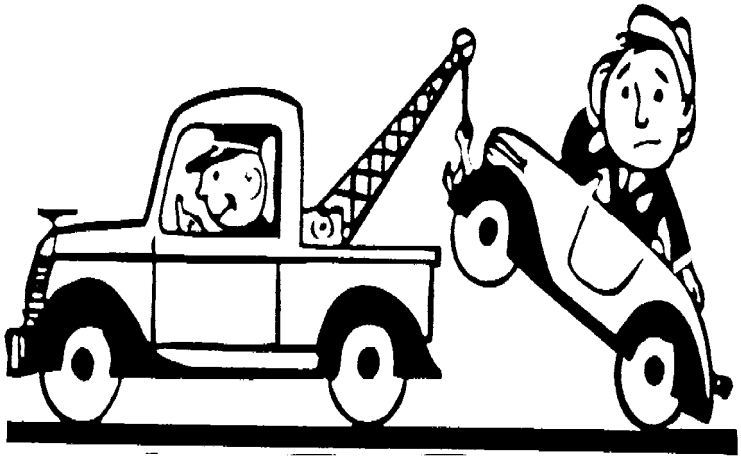
Tutor Signature _____ Date _____

Action Plan

What next?

Learner Signature _____ Date _____
Tutor Signature _____ Date _____

An Introduction to Motor Vehicle Care and Maintenance



Learner's Name ……

Group ……

Tutor ……

Customer …… Address …… Post Code …… Telephone ……	Car …… Registration…… Mileage ……	Job Card Number …… Date …… Time ……
Job Instructions …… …… …… …… …… ……	Test Results …… …… …… …… …… ……	Work done By…… …… Checked by …… Pass/Refer
Mechanic's Report …… …… …… …… …… …… …… …… …… …… …… …… …… ……	Parts used …… …… …… …… …… …… …… …… …… …… …… …… …… ……	Price …… …… …… …… …… …… …… …… …… …… …… …… …… Total ……

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Health and Safety (1)

To lesson the chance of injury in the workshop it is important to work safely, but why?

Please fill in the blank spaces below saying why you think these things should be done.

What is the right clothing to wear?	
Caring for other people's safety	
Working safely	
Work safely	
Following instructions	

Health and Safety (2)

Sometimes mistakes are made which can cause injury to other people.

Say what injuries could result from the mistakes listed below.

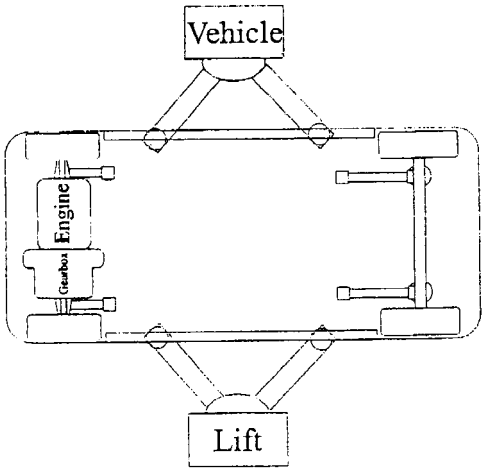
A poor spanner fit on a nut	
Using too much force on a small spanner	
Using a file without a handle	
Using a blunt screwdriver	

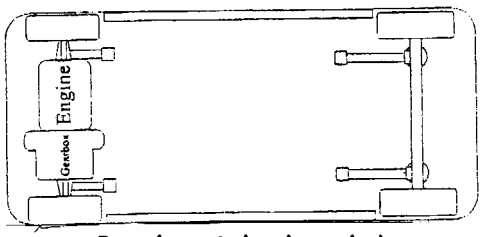
Working Situations

Below are some situations that could possibly be dangerous.

Can you say what the danger is in each case?

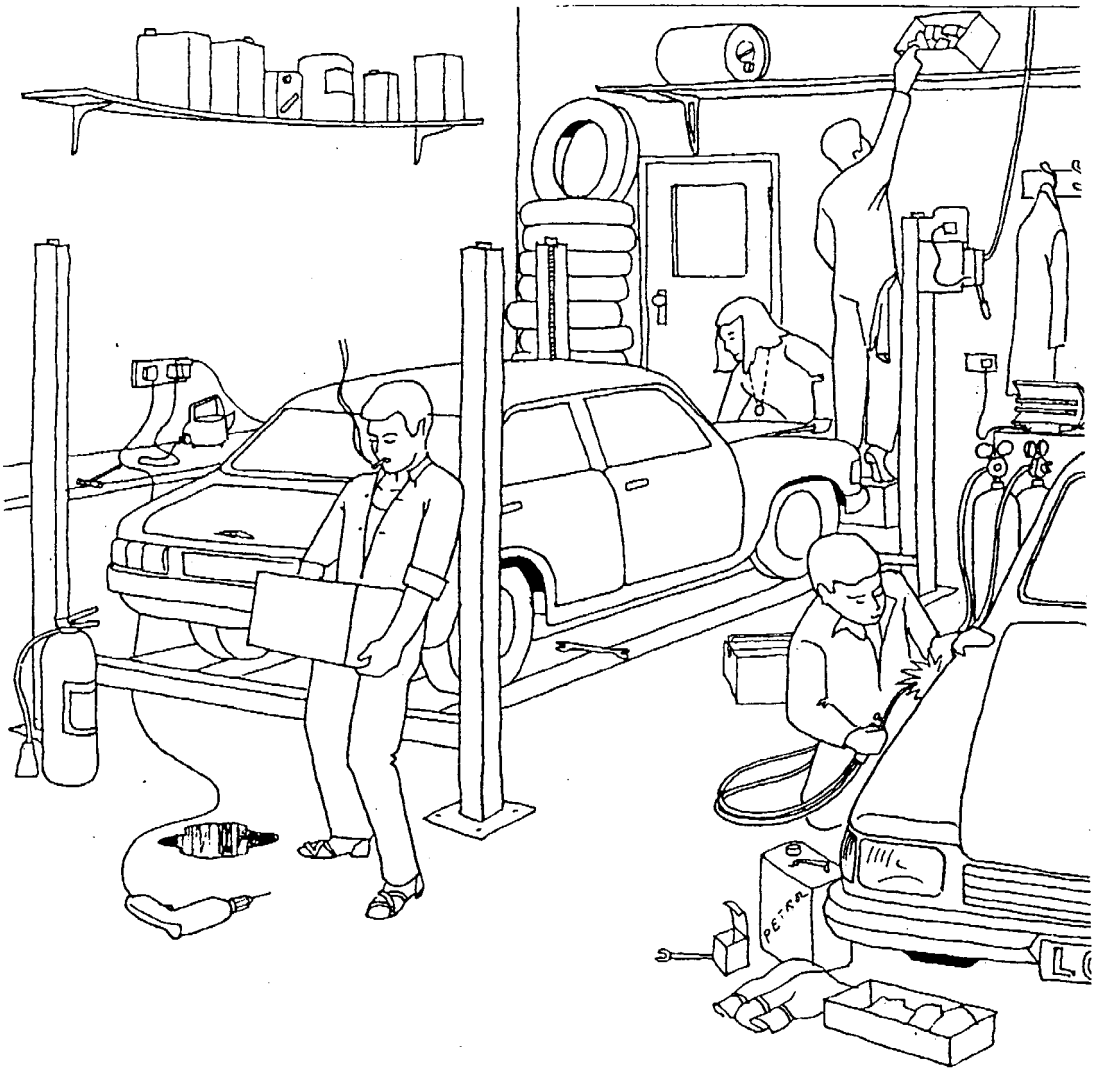
Inflating tyres	
Moving vehicles	
A build up of waste, oily rags, etc.	
Working underneath a car	
Filling he car with petrol or diesel	





On the right hand diagram, show four other safe jacking points

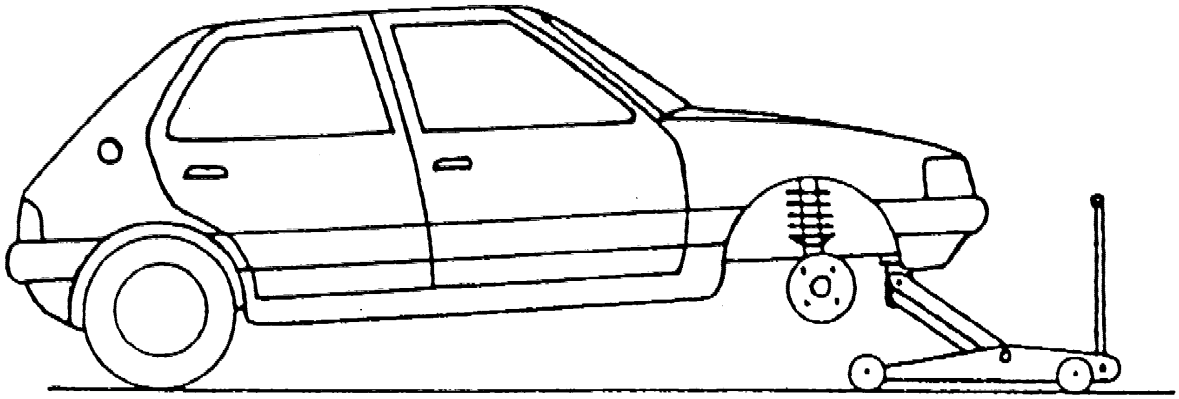
Look at the drawing carefully and list all the hazards you can find in the garage workshop.



Equipment

Many accidents in garages are caused either by not taking the correct action to avoid them or by faulty equipment.

If you were asked to work on the vehicles shown below, what **two** actions or precautions would you **insist** on before starting?



1 _____

2 _____

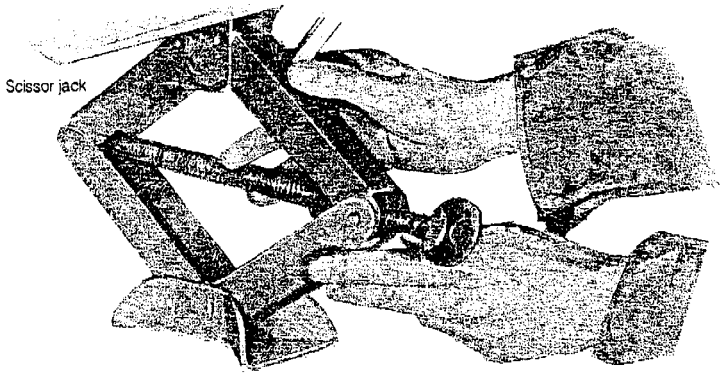
What two other precautions should you take?

1 _____

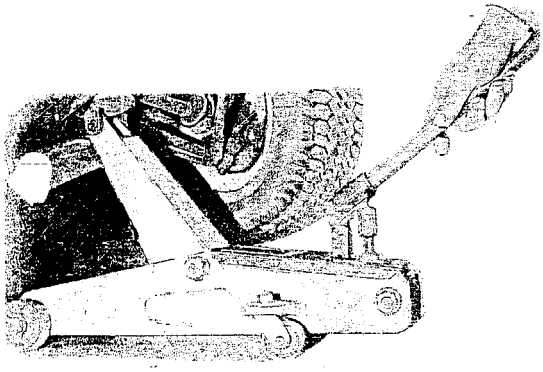
2 _____

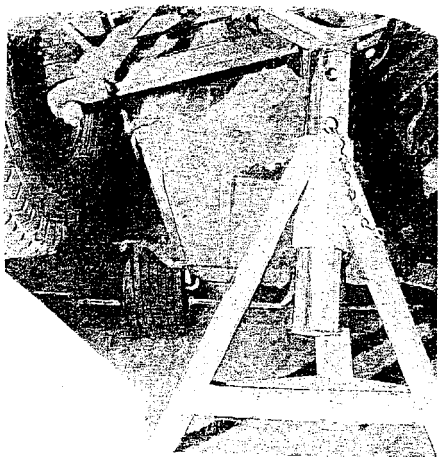
Equipment for raising the car
(Jacking up the car)

A jack is supplied with the car. It can be used to lift the wheel so that it can be changed. Never get under a car that is supported only by a jack. It is not safe.



In the workshop we use hydraulic jacks and support the car on an axle stand.





Where is the safest place to put the axle stand?

Answer _____

Where is it not safe to put the axle stand?

Answer _____

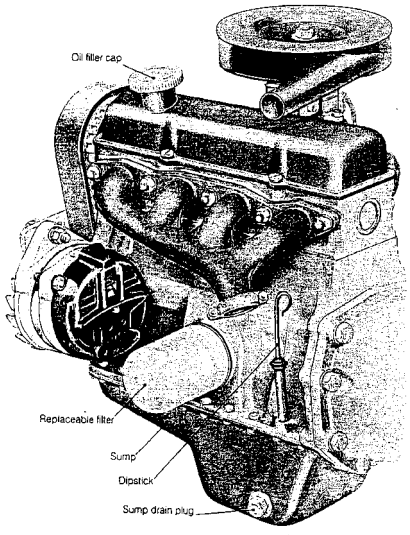
Checking the Engine Oil

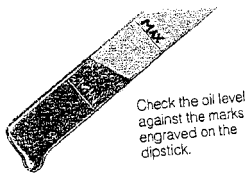
You need to check the engine oil level once a week.

1. The car should be on level ground.
2. The dipstick is usually yellow and on the side of the engine.
3. Take out the dipstick and wipe it clean.
4. Put it fully back into the engine.
5. Take out the dipstick and look at the bottom.
6. You will see the oil level, check it is between the MIN and MAX marks.
7. If it is below MIN add oil until the level is up to MAX.
8. The difference between MIN and MAX is usually 0.75 litres.

TO ADD OIL

1. Remove the oil filler cap from the top of the engine.
2. Pour in some of the right grade of engine oil.
3. After about a minute (to allow the oil to run down in the sump) check the oil level is at the MAX mark.
4. Put the oil filler cap and the dipstick back on the engine.





Tyres and Wheels

Tyre Inspection

1. Inspect the wheels and tyres for damage as shown in the diagram below.

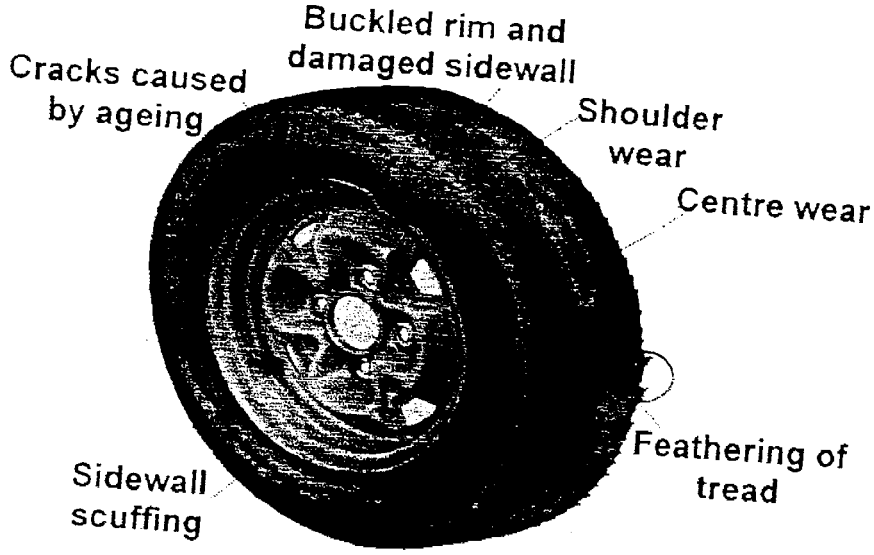
2. Check the tread depth of the tyre

3. Check the tyre pressures (make sure that you make a note of what the pressure is measured in Bar or PSI (pounds per square inch) etc.).

4. Note down the tyre size.

5. Enter your finding into the boxes below.

Wheel no.	Wheel size	Sidewall faults	Tread faults	Wheel faults
1				
2				
3				
4				



Check the tread for abnormal wear patterns, cuts or embedded nails or stones. Check the sidewall for cuts, cracks, abrasions or bulges.

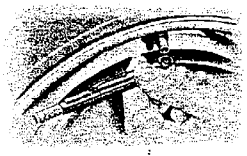
Now change a wheel. Ask you tutor for help.

Checking Tyres

When we are driving the tyres need to have good contact with the road.

Here are a few rules for safe and legal tyres.

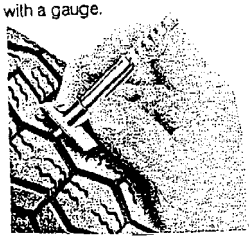
1. Check the tyres every week.
2. Check the tyre pressure.
3. Look at the tyre for wear, cuts and bulges in the side wall.



Checking tyre pressure.

The tyre tread will need careful checking. You can use a tread depth gauge like the one shown here to make sure that the tread is 1.6mm deep. You can also look at the special tread blocks on the tyre to see if the tread is deep enough to get rid of the water when it rains.

Check the tread depth with a gauge.



How would you find out the pressure setting for a car tyre?

……

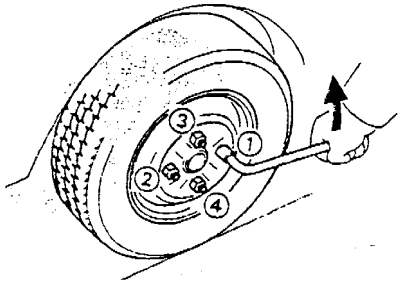
What do the numbers and letter mean on this tyre (165SR13)?

……

Show the bulge on this picture of a tyre.

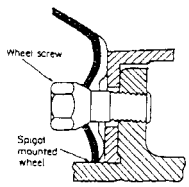
Changing a Road Wheel

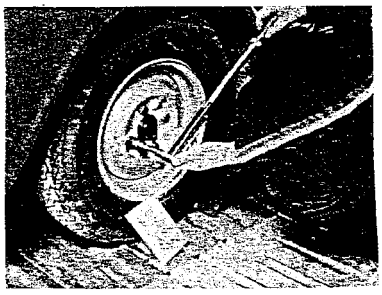
1. Make sure the car is on level ground.
2. Pull on the handbrake.
3. Put a piece of wood in front and a piece behind the wheel that is staying on the ground. This will stop the car moving when it is jacked up.
4. Using the wheel nut wrench, loosen the wheel nuts $\frac{1}{2}$ turn in a criss-cross sequence, before jacking up.
5. Jack up and put an axle stand under the car.
6. Now take off the wheel nuts using the wheel nut wrench.
7. Take off the wheel.



To put the wheel back on the car.

1. Put the wheel back on the car
2. Put the wheel nuts back by hand. Once the nuts are turning you can use the wheel nut wrench to tighten them up.
3. Take out the support and use the jack to lower the car on to the ground. Take out the jack.
4. Tighten the wheel nuts using a torque wrench set to the correct torque for the wheel.





Using a torque wrench for the final tightening

What is the torque setting for most car wheels? ……

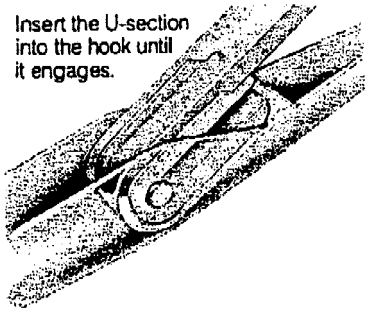
Why must the wheel nuts be fitted with the rounded end to the wheel?……

Checking and replacing windscreen wipers

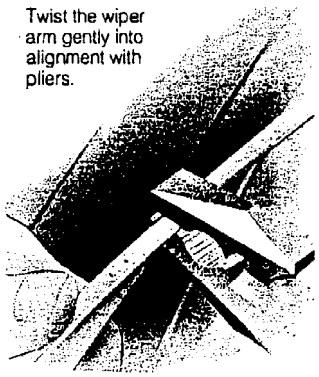
Inspection
Look carefully at the rubber wiping edge of the windscreen wiper. Look for splits at the edge of the rubber. If there are splits then you will need to fit a new blade.

Removing
The blade is pushed on the end of the wiper arm.
Squeeze the ends of the U shaped plastic clip together. Move the blade down the arm to the open end of the hook. Disconnect the U shaped plastic from the hook.

Replacing
To fit a new blade, thread the hooked arm through the blade. Push the plastic U shape into the hook and pull the blade back into place.



Faults
If the wipers judder across the windscreen the arm may need twisting with pliers.



How do you know which size of wiper blade to fit to the car?

……

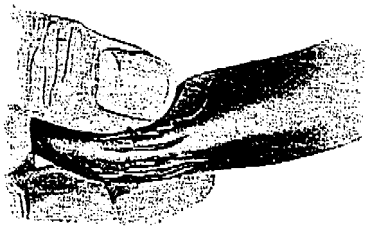
Engine Cooling

Safety: The engine must be cool before you start to do any work on the cooling system.

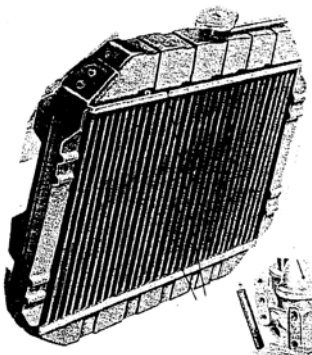
Checking for water leaks.

1. Check where the hoses fasten to the engine and to the radiator.

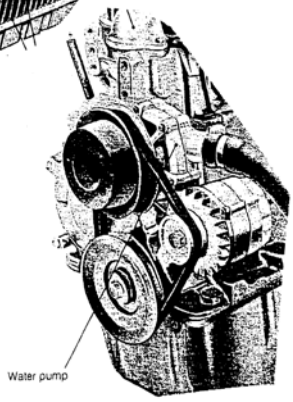
2. Squeeze the hoses and look for cracks.



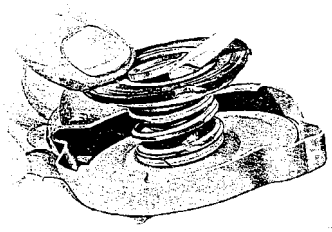
3. Check the radiator.



4. Check the water pump.



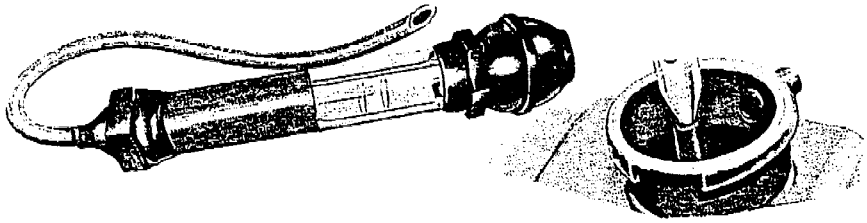
Check the radiator cap and the seal inside.



Checking Antifreeze

Testing with a hydrometer.

1. Suck in water (coolant) from the tank.
2. Take a reading where the float breaks the liquid surface.
3. Use the conversion chart to convert the reading into antifreeze strength.
4. Add the additional antifreeze needed to bring the coolant up to strength.



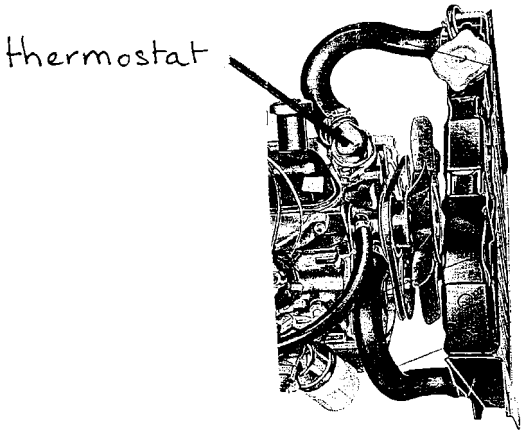
Taking precautions.

Antifreeze damages paintwork. If it does splash onto the paintwork, wash it off with soap and water.

Know the parts of the cooling system.

Select names from the list and use them to name the parts of the cooling system in the drawing. One has been done for you as an example.

Radiator, thermostat, top radiator hose, bottom radiator hose, heater hose, water pump, pressure cap, cooling fan, drive belt.



Glossary

Anti-freeze	An additive mixed with engine coolant to lower its freezing point.
Axle	A shaft that transfers drive from the differential to the road wheels.
Ball joint	A flexible joint used in steering linkage and suspension systems.
Catalytic converter	An exhaust component which looks like a muffler that reduces the toxic gases before they are released into the atmosphere.
Chassis	The backbone or frame of a vehicle on which all other components are mounted.
Clutch	A device used to connect or disconnect two rotating parts.
Coil	An ignition component used to increase battery voltage needed at a spark plug.
Coolant	Liquid used in a cooling system.
Cooling System	A system which generally uses air or water, that removes excess heat from a running engine.
Corrosion	A chemical action that eats away the surface of an object.

Dipstick	Indicates the level of oil in the sump of an engine.
Exhaust system	A system that transfers the burnt gases from the engine to the atmosphere at the rear of the vehicle and includes pipes, manifold, muffler and catalytic converter.
Filter	This removes foreign articles from air, oil, water or petrol.
Firing order	The sequence of firing (spark at the plug) each cylinder of a multi-cylinder engine.
Fuse	A device that melts when the current flow in an electrical circuit exceeds a safe value. It protects the other electrical parts in the circuit from higher than normal current flow.
Gasket	A special substance placed between two mating surfaces to form a seal.
Hand brake	Wheel brake assemblies on one axle or driveline operated by the driver through a mechanical linkage. It prevents a parked vehicle from moving. Sometimes called a park brake.
Headlight	The converts electrical energy into light that is strong enough to allow the vehicle to be driven at night.
High tension	Refers to the very high voltage produced in an ignition coil and delivered to the spark plugs.

Hydraulic brakes	Brakes operated by hydraulic pressure. The master cylinder provides operating pressure which is transmitted through steel pipes to wheel cylinders or pistons and applies the brakes shoes or disc pads.
Ignition system	Designed to produce a spark within the cylinders of an engine to ignite the mixture of petrol and air.
Lubrication	Reducing friction between two surfaces by coating them with grease or oil.
Oil sump	A casing bolted to the base of the engine which holds the oil used for engine lubrication.

Learner's Name				
Task	Help all the time	Help at times	Rarely needs help	Independently
Engine oil level				
Condition of tyres				
Change a wheel				
Windscreen wipers				
Condition of coolant				