

- Make sure packages are securely stored, preferably in the boot of the vehicle, where they should be strapped down or wedged in to stop them moving around.

If you do need to carry packages inside the car, make sure that they won't move if you have to brake or turn suddenly. In particular

- strap down any large or heavy object with the seat belt
- don't put anything where it would obstruct your vision
- don't carry any items in the driver's footwell. If you put something elsewhere on the floor, make sure that it can't roll around the vehicle.

Carrying a heavy load may have an effect on the handling of your car, so

- allow a greater stopping distance
- adjust your headlights and increase your tyre pressure to take account of the load
- distribute the weight evenly, as any change to the vehicle's centre of gravity will affect the braking and steering.

Consider fitting

- a specially designed roof box to carry bulky items. This is streamlined to save fuel and will also hold the load more securely
- special cycle racks on top of or behind the car to carry cycles more securely. If they're fitted behind the car, make sure that the number plates and lights aren't obscured.



## Section three

# → The controls

### This section covers

- Your vehicle handbook
- Driving position
- The hand controls
- The foot controls
- Switches
- Other controls

# → Your vehicle handbook

In-car controls and technologies – when used correctly – help you drive and manage your vehicle. New technologies appear all the time and they vary between different models of vehicle. Make sure you're familiar with the particular vehicle you're in charge of and follow the manufacturer's guidelines.

## → Driving position

You must adopt a suitable driving position before you can use the controls on the car safely.

You must be able to

- reach and use each control easily and comfortably; for example, you should be able to operate the clutch pedal without stretching your left leg
- control the vehicle by keeping a suitable grip on the steering wheel; your arms should be relaxed and not restricted at the elbows
- see the road ahead clearly.

### Driving seat adjustment

You should make sure that the seat is adjusted to suit you. Most driving seats can be adjusted for

- 'rake' – the angle of the seat back
- position – the seat will move forwards or backwards.

Sometimes, the driving seat will also adjust for height.



The driver and front passenger should avoid sitting too close to the steering wheel or dashboard.

If someone else has been driving the vehicle, make any necessary adjustments before you start to drive.

Never adjust your seat while the vehicle is moving.

Remember, after adjusting your seat, make sure it's firmly locked in position. Listen for, or feel for, the locking mechanism engaging. An insecure driving seat is dangerous.

As soon as you're seated, check that the parking brake is applied.

### Steering column adjustment

On some vehicles, you can adjust the steering column to suit you. You can move it towards or away from you, and adjust the angle of tilt.

When making an adjustment, take care not to allow the steering wheel to interfere with your view of the instrument panel. Also, make sure you secure the locking mechanism after any adjustment.

Never attempt to adjust your steering column while the vehicle is moving.

### Head restraint adjustment

Head restraints are provided to protect against neck and spine injuries, commonly called whiplash.

See why it's important to adjust the head restraint correctly, and how to do it, in this video.

[youtube.com/watch?v=wIYIPuRvwtM](https://youtube.com/watch?v=wIYIPuRvwtM)



For maximum protection, the head restraint should be correctly adjusted – but it's easy to overlook.

The head restraints should be adjusted so that the rigid part of the head restraint is

- at least as high as the eyes or top of the ears
- as close to the back of the head as is comfortable.

An incorrectly adjusted head restraint offers little or no protection against whiplash injuries.

Don't remove the head restraints; they're fitted for your safety and can save you from more serious injuries in the event of an incident.

Remember, it's a head restraint, not a head rest.



## Seat belt adjustment

Adjust the seat belt properly. Place the lap belt as low as possible over the hips. Ensure the shoulder belt lies on the chest and over the shoulder.

Many cars are now fitted with height adjusters for the diagonal strap. The diagonal strap should be adjusted to lie centrally over the shoulder and away from the neck. Adjust the strap so that it lies in contact with your shoulder and slopes up and back to the anchorage point.

## → The hand controls

The positions of some of the controls, such as indicators, light switches and windscreen wipers, vary from model to model.

Before you drive an unfamiliar vehicle, you should get to know the positions of all the controls. You should never have to fumble or look down for them when you're driving.

Keep your eyes on the road.

## The steering wheel

The steering wheel should normally be controlled with both hands.

### Function

The steering wheel controls the direction in which you want the vehicle to travel.

It controls the steering mechanism, which turns

- the front wheels in most vehicles
- all four wheels in vehicles with four-wheel steering – limited to a small number of models.

### How to use the steering wheel

For best control

- keep both hands on the wheel, unless you're changing gear or working another control with one hand. Return that hand to the wheel immediately after you've finished the task
- avoid resting your arm on the door, which can restrict your movement
- grip the wheel firmly, but not too tightly; when the vehicle is moving you need very little effort to turn the wheel.



**REMEMBER,** never take both hands off the wheel when the vehicle is moving.



### Steering lock\*

This is the angle through which the front wheels turn when you turn the steering wheel; it can be either 'right lock' or 'left lock'.

Turning the steering wheel as far as it will go is called 'full lock'. The amount of lock varies from vehicle to vehicle.

Small cars will generally turn in a smaller circle than larger vehicles. Taxi cabs are an obvious exception as they have a very small turning circle.

\* Not to be confused with the steering-column locking mechanism, which engages when the ignition key is removed on most modern vehicles as an anti-theft device.

## Steering

You should

- place your hands on the steering wheel in a position that's comfortable and which gives you full control
- keep your movements steady and smooth
- turn the steering wheel to manoeuvre round a corner at the correct time.



### Oversteer and understeer

Vehicles vary in how they behave when turning at various road speeds.

Some respond more than you would expect in relation to the amount of turn you give the wheel (oversteer). Some respond less (understeer).

You must get to know the characteristics of your vehicle before you drive in traffic, and drive extra carefully until you're familiar with its behaviour.

### Power-assisted steering

Power-assisted steering (PAS) is generally standard in today's vehicles.

PAS makes steering easier by reducing driver steering effort and gives a lighter feel to the steering.

On some vehicles the amount of power assistance reduces with increased speed.

PAS is most useful at low speeds, such as when manoeuvring in a tight corner or parking.

With PAS the steering feels light and you can easily turn the wheel too much, especially if you're used to driving a vehicle not fitted with it.

Not all vehicles have PAS. For example, it's often not fitted in older vehicles. The steering can feel heavy if it's not fitted. Consult the vehicle handbook before driving a car you've not driven before.



### 'Dry' steering

When you're manoeuvring, try to avoid turning the steering wheel when the vehicle is stationary. This is known as 'dry' steering and may cause

- damage to the tyres
- wear in the steering mechanism.

This applies whether you have PAS or not.



Power-assisted steering helps to manoeuvre the car more easily, especially when turning a tight corner or parking.

## The gear lever

The gear lever is normally to the left of the driving seat, either on the floor or on a raised console.

Some cars have the gear lever protruding from the instrument panel; others have a gear lever on the steering column.

### Function

The gear lever enables you to change from one gear to another.

## The gearbox

The gearbox contains the gears, which control the relationship between engine speed and road speed.

First gear provides the greatest force at the driving wheels and is normally the one you use to get the vehicle moving.

As you speed up, you change up to the higher gears, each one giving you less gear force but more road speed. Top gear provides the least force, but usually has the widest range of speeds. Using as high a gear as possible for speed and road traffic conditions saves fuel.

Most modern cars have five or six forward gears, while heavier vehicles often have many more.

As well as the five or six forward gears, there's a reverse gear.

In neutral, no gear is engaged.

The clutch links the engine to the road wheels through the gearbox and allows the gradual connection of the engine to the wheels.

Four-wheel-drive vehicles may have a double gearbox with high- and low-ratio ranges, which effectively double the number of available gears. The lower range is normally used off-road.



## Gear positions

Most cars have five-speed or six-speed gearboxes. On a five-speed gear lever, the first four gears normally form an 'H', while reverse and fifth form an additional 'I'. Many cars are designed so that you can't move straight from fifth to reverse gear, and the gear lever automatically springs back into neutral when no gear is engaged. This tendency of the gear lever to line up with particular gears is known as bias. Third and fourth gears are often lined up.

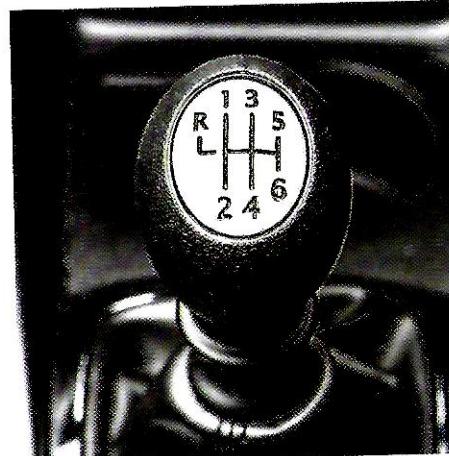
Some older cars have four-speed gearboxes. These have the gears in an 'H', with reverse extended on the left or right.

### Avoid looking down at the gear lever

You should have a mental picture of the gear layout. This will enable you to change gear without looking at the diagram on the top of the gear lever. Your eyes should be on the road.

With practice, changing gear becomes second-nature.

For automatic transmission systems, see section 22.



## The parking brake

Sometimes the parking brake is referred to as the handbrake.

### Position

The parking brake lever is normally mounted on the floor, just behind the gear lever. In some vehicles it's just under the instrument panel, while on other models the parking brake is applied by operating an additional pedal.

### Function

The parking brake holds the vehicle still when it has stopped.

In most cars the parking brake operates on the rear wheels only. If it's applied while the vehicle is moving, there's a real danger of locking the braked wheels and skidding.

The parking brake shouldn't be used to stop a moving vehicle, except in an emergency such as footbrake failure – very unlikely with dual-circuit braking systems.

**REMEMBER,** when you park your vehicle, always leave it in gear and make sure that the parking brake is fully on.



### Applying

Apply the handbrake firmly according to your manufacturer's guidelines. Refer to your vehicle handbook to check the correct procedure for your vehicle.

### Releasing

Pull the lever up slightly and press the button in to release the ratchet. Then, keeping the button in, move the lever to the 'off' position.

On some vehicles, instead of pressing a button, the parking brake is released by twisting the hand grip.

### Electronic parking brake

Some modern vehicles are fitted with an electronic parking brake which is operated with a switch or button and releases automatically when you drive off.



## ④ The foot controls

### The accelerator/gas pedal

This is operated by the right foot and is positioned on the extreme right of the group of three pedals.

#### Function

The accelerator controls the ratio of fuel and air that's supplied to the engine. The name 'gas pedal' is derived from 'gasoline', the American word for petrol.

#### Petrol engines

All modern cars have an electronic fuel-injection system, designed to give optimum engine performance.

Older cars had a carburettor that mixed the fuel with air as it was drawn into the engine.

#### Diesel engines

A high-pressure fuel injector delivers the fuel into the cylinders. This is known as a compression-ignition engine.

#### In both engine types

The more you press the accelerator, the more fuel goes to the engine, the more power is generated and the higher the engine speed.

Knowing the right amount of pressure to put on the accelerator takes practice. Accelerating firmly wastes fuel and creates noise.

When moving off, you need just the right amount. Too little, and the engine stalls. Too much, and the vehicle can surge forward.



### The footbrake

The right foot operates the footbrake as well as the accelerator. You shouldn't need to use both controls at the same time.

The footbrake is the middle of the group of three pedals, so the right foot can travel smoothly and quickly from one to the other.

#### Function

The footbrake is used to slow down or stop the vehicle.

#### Using the footbrake

The more pressure you put on the footbrake, the more the vehicle will slow down.

Slowing down under control isn't just a matter of slamming the footbrake on as hard as you can. As with the other foot controls, using the footbrake needs practice.



Press the footbrake with the ball of your foot. Use enough pressure to slow the wheels without allowing them to lock.

### **Progressive braking**

In normal circumstances, always press lightly on the brake pedal to begin with and gradually press harder as the brakes begin to act. This is known as progressive braking, and will give maximum control as well as smoother stopping.

### **Dual-circuit braking**

Modern cars are equipped with dual-circuit braking systems. These systems ensure that, in the rare event of a braking system failure, there remains some braking available when the brake pedal is pressed. Under these conditions it may be necessary to push the brake pedal harder than normal.

### **Anti-lock braking system**

Many cars either have an anti-lock braking system (ABS) fitted or have it available as an option.

If ABS is fitted it activates automatically. It prevents the wheels from locking, so that you can continue to steer the vehicle while braking. You should refer to the vehicle handbook for details of the manufacturer's recommended method of use.

ABS is only a driver aid; it doesn't help the vehicle to stop more quickly. Nor does it remove the need for good driving practices such as anticipating events and assessing road conditions. You still need to plan well ahead and brake smoothly and progressively.

## **The clutch**

The clutch pedal is operated by the left foot and is on the left of the group of three pedals.

### **Function**

The clutch is the connection between the engine and the gearbox. It's a connection over which the driver has control, but which requires practice in its use.



### **How it works**

In its simplest form, the clutch is made up of two plates. One is connected to the engine and rotates all the time the engine is running. The other is linked to the gearbox and rotates only when it's held against the first plate by springs.

When you press the clutch pedal, you force the plates apart, breaking the drive connection.

In neutral, even though both plates are touching, the wheels don't turn because no gear is engaged.

### **The 'biting point'**

The point of engagement, when the two plates begin to make contact and the load on the engine increases, is known as the 'biting point'.

You'll learn with practice to judge the biting point exactly. You'll feel it, and hear it because the engine speed will drop slightly.

The feel of the clutch will vary with different vehicles. Also, as the clutch plates begin to wear, the biting point may change.

### **Clutch control**

Being able to sense the biting point is a crucial part of clutch control.

The other important part is allowing the clutch plates to engage fully and smoothly. If the plates come together too suddenly, the engine can stall or the vehicle may lurch sharply.

Good clutch control comes only with practice, and is essential when moving off or changing gear.

## → **Switches**

### **Sidelights and headlights**

#### **Position**

In many vehicles, the lighting controls are on a stalk at the side of the steering column.

This stalk normally has three positions

1. off
2. sidelights (or dim-dip), rear and number-plate lights
3. headlights (main or dipped beam) and the dip control. On some vehicles the dip control is a separate switch.

Some vehicles have 'dim-dip' headlights, which come on as the sidelights are switched on. It's impossible to drive these vehicles with only the sidelights switched on.

The sidelights normally work without the ignition being switched on.

#### Use

This is covered in section 13.

## Fog lights

Fog lights should work only when the sidelights or headlights are on. Modern vehicles must be fitted with at least one rear fog light. Front fog lights are often fitted as an option.

#### Position

Since they're only used in bad weather, the fog light switches are usually on the instrument panel rather than on the steering column.

#### Use

You must only use fog lights when visibility is seriously reduced, ie 100 metres (328 feet) or less. You mustn't use fog lights in any other circumstances, because they can dazzle and distract other drivers.



When using front fog lights, a warning light will show so that you know they're on.



A warning light will show when the rear fog lights are on.

## Automatic and adaptive headlights

#### Automatic headlights

These work through sensors which detect the level of light outside the vehicle. When the sensors detect a certain level of darkness, the headlights switch on.

Drivers shouldn't rely on such technology and should continue to turn on their headlights manually if needed.

#### Adaptive headlights

These are designed to improve visibility at night around corners and over hills. The headlights adjust according to the driver's input and the driving conditions to illuminate the road without dazzling other drivers.

## Direction indicator

#### Position

The direction indicator switch is usually on a stalk, which may be on either side of the steering column.

#### Function

The direction indicators enable you to show other road users which direction you intend to take. Correct use of the direction indicators is vital to safe driving.

Self-cancelling indicator switches might not cancel after a slight change of direction.



Always check that the signal has been cancelled. You can do this by checking the

- repeater warning light
- audible warning, usually a ticking noise when the indicators are flashing.

Most modern vehicles are fitted with lane change indicators. Flicking the indicator stalk in either direction gives you three flashes and removes the need to cancel the indicator. This functionality is especially useful for overtaking when driving on motorways and dual carriageways.

#### **Use**

You should be able to operate the direction indicators without taking your hand off the steering wheel.

## Hazard warning lights

#### **Position**

The position of this switch varies. Some vehicles have it on the steering column, others on the instrument panel. It's usually

- within easy reach of the driver's hands
- clearly marked to prevent accidental use.



#### **Use**

Hazard warning lights should be used to warn other road users when you're temporarily obstructing traffic; for example, when

- you've broken down
- you have to slow down quickly on a motorway or unrestricted dual carriageway, because of a hazard ahead. Use them only long enough to ensure that your warning has been seen.

Don't use them to excuse stopping in a restricted area, such as on double yellow lines, regardless of how brief your stop.

Because the lights flash at the same rate as normal indicators, if another driver is unable to see both sides of your vehicle, the hazard warning lights could be mistaken for a turning or moving-out signal.



## Windscreen washers and wipers

#### **Position**

The windscreen washer and wiper controls are usually on stalks mounted on the steering column. You should be able to find the controls without taking your eyes off the road.

On most vehicles, the same stalk controls both the washers and wipers. Both are essential in bad weather.

Where they're provided, rear washers and wipers have separate controls. Some vehicles may be fitted with miniature washers and wipers to keep the headlights clear.

Increasingly, vehicles are fitted with rain sensors which automatically adjust the speed of your wipers according to the amount of rain. This means you don't have to regularly adjust the speed of your wipers, or switch them on and off.

#### **Function**

The windscreen washers and wipers keep the windscreen clear of rain, spray, snow or fog.

#### **Use washers before wipers**

Use your washers first to wet the surface before you switch on your windscreen wipers. Wiping a dry windscreen can cause scratches to the screen as well as shortening the life of the wiper blades.

Avoiding excessive dirt build-up can also help to stop scratches on your windscreen. Tiny bits of grit can scratch the surface and make driving at night very difficult.

Wash your windscreen regularly with a sponge and plenty of water. Wash the wiper blades as well.

#### Regular checks

Check the windscreen washer bottle and keep it topped up.

You can use additives to prevent smearing, assist cleaning and, especially in the winter, to prevent icing up.

#### Wiper blades

Wiper blades wear and become ineffective, causing smears and streaks across the windscreens. You **MUST** replace them if this happens.



## Horn

#### Position

On most vehicles, the horn switch is either

- on the steering wheel
- on the outer end of the stalk which controls the direction indicators.

#### Function

The horn is used to warn other road users of your presence.

#### Use

Use it to tell other road users you're there, if this is necessary.

Aggressive sounding of the horn is dangerous. It can distract and alarm other road users.

You mustn't sound your horn (unless there's a danger from another vehicle) when your vehicle is stationary or when driving in a built-up area between 11.30 pm and 7.00 am.



## Heated windscreens and rear window

Most cars have heated rear windows, and some have heated front windscreens as well.

#### Function

The front and rear windscreen heaters keep the windscreens and rear window clear of:

- internal condensation
- frost and ice on the outside.

#### Use

They should be used as necessary to keep your windscreens and rear window clear, especially in wet and cold conditions.



#### Demister

Once the engine has warmed up, you can set the controls to direct warm air to the windscreens and, on some vehicles, the front side windows.

The fan control can be set to boost the warm air flow.

## Ignition switch and starter

#### Position

The ignition switch is usually positioned on the steering column.

#### Before operating the starter

Make sure that

- the parking brake is on
- the clutch is disengaged (pressed in) if required to start the car
- the gear lever is in neutral.

On most vehicles, the ignition and starter are incorporated in the same switch and operated by the ignition key. Some vehicles have a separate starter button.

On most vehicles, an anti-theft device is incorporated into the ignition switch and operated by the ignition key. The mechanism locks the steering column,

so a slight movement may need to be applied to the steering wheel while turning the ignition key to release it.

#### **The first position**

This operates some of the electrical equipment, such as the radio.



#### **The second position**

This switches on the ignition, instrument panel and gauges. A red ignition warning light will usually show when the key reaches this position.

#### **The third position**

This operates the starter.

The direction indicators, and on some vehicles the headlights, will only operate when the ignition is switched on.

#### **Use**

The starter is usually operated by turning the ignition key to its maximum. As soon as the engine starts, release the key. Don't operate the starter when the engine is running. This can damage the starter motor and the engagement mechanism.

#### **Being towed**

When the vehicle is being towed, the anti-theft device locking the steering column must be released by inserting the ignition key and ensuring that the steering wheel is free to move (unless a suspended tow is being used).

**REMEMBER,** without the ignition switched on, the steering will be heavy and the brakes won't work properly.



## Other controls

### Instrument panel

For detailed information and guidance on this, see your vehicle handbook.

The main visual aids on the instrument panel are

- speedometer, to tell you how quickly the vehicle is travelling in miles and kilometres per hour. It's usually a dial, with a needle showing the speed, but it may be a digital display
- direction indicator repeater light(s)
- fuel gauge
- high-beam indicator light (usually blue)
- rev counter (on some vehicles), to tell you the engine speed in revolutions per minute (rpm)
- warming-up coil indicator light (on diesel engines)
- temperature gauge (may be a warning light).



The visual aids are grouped on the instrument panel in plain view of the driver.

### Cruise control

This is a device, usually electronic, which enables the driver to select and maintain a fixed speed on the open road.

Use cruise control on your vehicle if it's fitted. The sophisticated electronics in the engine management system precisely measure the amount of fuel the engine needs to work most efficiently for a given speed. If you use this where you can, it may reduce your vehicle's fuel consumption.

Cruise control relieves the driver of the physical effort involved in keeping an even pressure on the accelerator pedal for long periods. It's only suitable where changes of speed are unlikely to be required.

Normal control can be resumed immediately should the need arise. In most cases this happens as soon as the driver uses the accelerator, clutch or footbrake.

### Adaptive cruise control

This technology uses radar to detect other vehicles ahead. Unlike normal cruise control, this system can automatically adjust your vehicle's speed in order to maintain a safe following distance from the vehicle in front. This technology shouldn't be relied upon, and a driver should use their judgement in maintaining a safe separation distance.

## Speed limiter

This technology operates in a similar way to cruise control and allows the driver to set a maximum speed for the vehicle.

Like cruise control, it's normally operated using simple switches mounted on the steering wheel. Whereas cruise control maintains a constant speed, a speed limiter prevents you from accelerating beyond the selected speed. You can slow down by taking your foot off the accelerator, as normal.

On some vehicles (particularly commercial vehicles), the maximum speed is fixed and the speed limiter can't be adjusted by the driver.

## Warning lights

### Function

These lights help you to

- drive safely
- monitor the performance of the engine
- protect your engine and other equipment against damage
- see the functions selected.

### Types of light

Many different types of light may be fitted, including

- oil pressure light (often red) – this shows if the oil level is dangerously low or the oil isn't circulating as it should be. It should light up as you turn the ignition on, but go out as the engine starts

- ignition warning light (usually red) – if this comes on when the engine is running, it shows you have a problem with the electrical charging system
- ABS warning light – this should light up as you turn the ignition on and may not go out until the car is travelling at 5–10 mph
- brake condition warning light
- water temperature light (or gauge) – this tells you if the engine is overheating
- 'doors open' and/or 'boot lid unlocked' light
- 'parking brake applied' light
- four-way hazard warning lights
- rear fog light warning light
- rear window heater indicator light
- seat belt warning lights
- fog lights/headlights/sidelights indicator lights
- tyre pressure warning light – this tells you if the tyre pressure is below the recommended setting.



Oil pressure



Parking brake  
warning and  
brake condition



Doors open



Seat belt

## Choke

All vehicles with petrol engines have some form of choke. This reduces the amount of air in the air/fuel mixture, and helps to start the engine from cold. Most cars have an automatic choke but some older cars may have a manual choke. The further you pull the control out, the richer the mixture. You must push in the control as soon as the engine warms up.

A pre-heating device is incorporated in some vehicles with diesel engines. The starter should only be operated when the indicator light goes out (where fitted).