Approved Driving Instructors Programme

Stage 2
Car driving skills
Acknowledgements

This module was developed referencing previously documented work. We would particularly like to acknowledge the following publications:

2. The DSA Official Guide to Driving: The essential skills
3. Practical Teaching Skills for Driving Instructors, A training manual for the ADI Examination and the Check Test by John Miller, Tony Scriven and Margaret Stacey
4. The RSA national website www.rsa.ie
5. The RSA Driving Fault Marking Guidelines

We would also like to acknowledge the enormous contribution made by a number of key people from within the RSA in the design and development of this programme material. In particular we would like to acknowledge the contribution of Michael Dolan, ADI Chief Examiner, as without his contribution and support this programme could not have been developed.

Whilst every attempt has been made to acknowledge the sources of our reference material, and the origin of the information that we have retrieved from the public domain, errors and/or omissions may have occurred. If there are errors or omissions in the acknowledgements of our references please contact the originator who will ensure such errors and/or omissions are corrected.
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Objectives

On completion of this module you will be able to highlight the importance of the following activities to your learner drivers, and be able to correctly identify faults if occurring with your learner drivers in each of the areas:

- Complete all relevant technical and safety checks on a vehicle as outlined in the *Rules of the Road*
- Complete the cockpit drill before starting the engine
- Carry out all driving tasks in a safe way
- Apply the MSMPSL (mirror-signal-manoeuvre-position-speed-look) technique to driving
- Use mirrors appropriately
- Communicate effectively with other road users through signals and indicating
- Demonstrate a courteous driving manner
- Anticipate hazards
- Successfully complete driving manoeuvres such as
  - Moving off and stopping
  - Parallel parking
  - Turning corners
  - Negotiate junctions and roundabouts
  - Join and exit dual carriage ways and motorways
  - Complete a turnabout and u-turn
  - Carry out an emergency stop
  - Park the vehicle in a controlled manner
  - Demonstrate the correct way to couple and uncouple a trailer
  - Overtake vehicles and change lanes safely and smoothly
- Have a working tool to assist you in bringing these standards to new learner drivers to the Irish roads
Agreed group ground rules

1. ________________________________________________________________
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Introduction to car driving skills

Over the duration of this module you will complete an in-depth programme both theory and practical on the standards for driving skills from a road sharing perspective.

The programme includes a PowerPoint presentation that will be presented throughout the module which will highlight the standards required in all aspects of driving.

The aim of the module is that you will be of the standard that the Road Safety Authority wants all of their instructors to reach, and this will be certified with the ADI assessment process.

We hope that you will leave this programme better equipped to offer a high level training service to future learner drivers and skills to develop learner drivers into safe, competent drivers who use the roads with a road share ethos.

The goal is that eventually the training that all learner drivers receive across the country will be of the same quality and content, creating an almost universal driver in Ireland with everyone reading from the same page as it were.

In developing this manual we are hoping to offer you a working tool that you can take away with you and use to train your own students.

The manual will cover:

- All the critical aspects of safe driving and skills required
- Working templates you can use for training your students
- Helpful hints on what to look for when you have a learner driver in your vehicle
- A copy of the scoring sheet
- A test run scoring sheet tailored for the content of this programme.

All that is left is to say good luck and we hope you enjoy the experience and leave feeling that you can offer the best service possible to your future students.
Competencies required by all drivers

In this module we will be taking you through what the standard is in relation to all key aspects of driving. It is in all of these areas that any driving instructor needs to be expert and also be able to recognise when your learner driver does not complete the action in line with the desired standard. With a number of your colleagues, make a list of the areas that any driver needs to be competent in. When developing the list you are only required to list the main headings of areas that a driver needs to be competent in; you do not need to list all the things within the area. For instance you should list road position as a main area, but there is no need to list all aspects of this, such as when driving normally, when overtaking, when on bends, etc. All we require you to do is to list the main areas. You should also think of the best order of dealing with these competencies when you are training a learner driver.

Areas drivers need to be competent in:
List of areas that a driver needs to be competent in

The following is a list of the key areas that all drivers need to be competent in. This list will be a useful backdrop for all instructors when designing the course of sessions you are going to undertake with a learner. All areas will be covered. What will differ, depending on the previous experience of the learner, will be how long you will need to spend on each one. For a new driver the instructor will need to spend quite a bit of time on each element, but if training a more experienced driver, the instructor may spend very little time at all on some of the elements. The areas are:

**Legal responsibilities**
Correct tax, insurance, NCT displayed
Knows and obeys rules of the road

**Defensive driving**
Understanding what defensive driving is and how to utilise it in everyday driving
Adopting a road sharing attitude
Contributing to safer roads in Ireland

**Environmental issues**
Drives in the most environmentally way possible, e.g. takes a higher gear
Considers other drivers safety and health
Keeps all vehicle fluids topped up to avoid unnecessary fumes

**Safety checks**
Go through the weekly safety checks of the vehicle, i.e. petrol, oil, electrics, water, rubber, fluids, tyres
Clean mirrors and windows

**Towing a Trailer**
All necessary safety checks completed
Trailer attached safely and securely
Trailer weight within vehicle gross weight restrictions
Load distributed evenly

**Cockpit checks**
Adjust seat, mirrors and steering wheel to ensure best visibility of the road

**Vehicle controls**
Display good control of all pedals and the handbrake as well as a knowledge of the secondary controls, e.g. demister, wipers, indicators etc. and their location within their vehicle
Pedestrian crossings
Observing road signs and warnings
Speed on approach to crossings
Times and places of high risk (school runs)
Different behaviours of pedestrians according to weather conditions, e.g. running across the street without looking during heavy rain

Anticipation and planning
Monitor road ahead and pre-empt possible hazards
Observe warning signs
Defensive driving
Control vehicle depending on weather conditions

Use of speed
Know the speed limits
Observe area specific speed limit signs
Adjust speed in line with the flow of traffic
Be aware of pedestrian activity, which may impact on the speed
Know the stopping distances
The two-second rule

Mirrors
Use the MSMP5L technique
When to use them and how often
Why they should use them
Identify the vehicle blind spots

Signals
Indicate in due time
Use hand signals if needed

Safe positioning
Position themselves correctly on the road
Use the MSMP5L technique on the road even if there are no markings

Moving away and stopping
Balance and control between the clutch and accelerator
Control of the steering and know when to use the handbrake
When and what to look for on the road around them
When to signal
Locate a suitable stopping place and pull in correctly
**Turning the vehicle**
Uses the MSMP$SL$ technique
Indicating in due time
Correct road position
Controllable speed when taking the corner
Good balance of clutch and accelerator

**Emergency stop**
Good clutch and brake control
Good control of steering
Uses defensive driving
Good skid control
Observes the road for possible hazards

**Parking**
Uses the MSMP$SL$ technique
Accurate judgement of parking space chosen
Good control of steering
Balance between the clutch and accelerator
The parking is safe, legal and convenient

**Junctions**
Uses the MSMP$SL$ technique
Observes road signs indicating upcoming junctions
Speed when turning
Who has right of way

**Roundabouts**
Uses the MSMP$SL$ technique
Maintains the correct road position
Who has right of way
Speed on approach and while on the roundabout

**Reversing**
Uses the MSMP$SL$ technique
Good balance of clutch and accelerator
Good control of steering wheel
Judges the correct time to turn and straighten the vehicle
Controllable speed during manoeuvre
Continuous observation during manoeuvre
Dual carriageways
Uses the MSMPSL technique
Correct lane usage
Observes road signs and markings
Speed according to signed limits
Anticipating and watching for possible hazards

Darkness
Uses correct vehicle lights
Observes the road for possible hazards caused by poor visibility
Uses defensive driving
Speed is at a pace where the vehicle can stop within the area visible in front
Pays close attention to road signs

Weather conditions
Speed adjusted to suit conditions
Two-second rule – four-second rule in poor weather conditions
Observes road to avoid aqua-planing and skidding
Uses the correct vehicle lights
Pays attention to warning signs

Security
Security systems in working order
Parks safely and legally
Minimises opportunity for theft of or from vehicle
Road sharing – What is it?

All road users share the road with others. They may be pedestrians, cyclists, car drivers, van drivers, truck drivers, bus drivers or animals.

When we are learning to drive (whatever type of vehicle), one of the most difficult issues to come to terms with is the whole area of road sharing. To be a good road user we need to understand not only our own problems and difficulties but those difficulties being experienced by other road users.

A driver of an articulated truck experiences very different problems from those problems experienced by a cyclist or pedestrian (even at the same location).

A good road user does not take right of way because s/he has the right of way, but rather takes his/her right of way because it is safe to do so. It would be unwise to pull out in front of a speeding 40 tonne truck simply because it was your turn to go!

Responsible road sharing involves a road user taking stock of the situation, analysing all the various things that can be seen, or may reasonably be expected to happen, and then planning a course of action that is both safe and forgiving of others’ mistakes.

As you work through this course and even as you deliver training/coaching to your students, the idea of responsible road sharing needs to be to the forefront of everything you do. At specific points throughout this manual you will see the term ‘road sharing’. Wherever it crops up, you are asked to consider what it means in that particular situation. In a training situation, ask your student to reflect on the other road users’ difficulties; in doing this you will be actively encouraging your students to be considerate, which will in turn make Irish roads safer.
Legal Responsibilities

Before taking any vehicle on to the road the student must be able to answer yes to the following questions:

– Is the motor vehicle taxed?
– Is the tax disc on the windscreen/front of vehicle?
– Is the insurance cover up to date and valid?
– Is the insurance disc on the windscreen/front of vehicle?
– Is the vehicle roadworthy and does it have an up-to-date National Car Test (NCT) Certificate?
– If using a coach, bus, ambulance, goods vehicle or goods trailer over a year old, does it have a Certificate of Roadworthiness?
– Does the vehicle clearly display proper “L” plates at the front and back?
Respecting other Road Users

No vehicle has greater right-of-way than any other road user, so, for safety reasons, everyone should drive defensively. This means expecting the unexpected and making way for other road users when necessary.

Road Share - Be responsible – consider other people’s needs as well as your own

No one has a greater right of way over another road user.
Pedestrians

The instructor must ensure the student is aware of the following,
In relation to pedestrians, bearing the principles of Road Sharing in mind

– The student must give way to pedestrians:
  – on or at a zebra crossing
  – on or at a pelican crossing, when the amber light is flashing,
  – crossing the road, if you are moving off from a stationary position
  – at a junction, if they have started crossing the road.

– The student must watch for Pedestrians who may attempt to cross the street between parked cars

Pedestrians

– The student must take care when they are:
  – driving beside footpaths where there are young children,
  – coming out from side entrances or driveways,
  – driving in car parks,
  – reversing, in particular where there are young children

– When a warden or junior warden raises the ‘Stop’ sign they must stop and remain stopped until:
  – the school children have crossed the road,
  – the sign is lowered, and
  – the school warden has safely returned to the footpath

– They must never park in a place that blocks a warden’s view.

– The student should take care near school buses, especially if overtaking a bus that children are boarding or leaving.
Cyclists and Motorcycles

- The student must never put a cyclist or motorcyclist at risk.

- They must watch for cyclists and motorcyclists:
  - at junctions,
  - where cycle tracks merge with roads,
  - when you change lanes,
  - when opening your door to get out of a vehicle,
  - when stopping and turning, especially when making a left turn,
  - when reversing.

- They must use their mirrors and recheck blind spots for upcoming cyclists and motorcyclists.

- They must never park or drive on cycle tracks.

Overtaking

- The student must never cut in front of cyclists or motorcyclists when overtaking them.

- They must give them plenty of space, especially:
  - in wet or windy weather,
  - when road conditions are icy,
  - when they are starting off.
  - when the road surface is poor. Cyclists and motorcyclists may need to avoid potholes so be prepared for swerving.
Cyclists and Motorcycles

**Turning**
- They must watch for cyclists coming up on the left
- They must give way to the cyclist if they intend to turn left as the cyclist may be continuing straight ahead
- They must watch out for cyclists coming up between lanes on the right or on the left
- They must give way to oncoming cyclists if they intend to turn right
Animal on the Road

- The student should watch out for warning signs of animals crossing ahead
- If they see these signs they should slow down and prepare to stop if necessary
- If overtaking an animal in the road they should slow down and give good clearance in case the animal bucks
- They should not use a horn as this would startle the animal
Common errors

List below the common errors people can make in regard to sharing the road with other road users
Respect for other road users

Common errors

Below is a list of common errors/faults that drivers can make in relation to other road users:

- Poor observation of road warning signs resulting in the need to brake quickly
- Not observing the road ahead
- Not obeying the two-second rule resulting in a possible collision if the driver in front brakes suddenly to avoid a pedestrian or animal
- Not checking mirrors regularly for the position of motorcycles and cyclists on road
- Not checking mirrors before turning corners or completing manoeuvres
- Uncertainty in their ability to drive resulting in selfish driving and not allowing people to pass or cars to pull out in front of them
Respect for other road users
What do you know?

What actions should you take when waiting at a pedestrian crossing when you are the lead vehicle?
List the four main types of pedestrian crossings

1. 
2. 
3. 
4. 

What steps must you complete on approach to a pedestrian crossing?
Respect for other road users

Actions you should take when waiting at a pedestrian crossing when you are the lead vehicle

1. Have the vehicle in first gear and the handbrake on

2. Have the ‘biting point’ ready

3. Have the balance between the accelerator and clutch

4. Watch the traffic lights for the signal to go

5. Observe the pavement for pedestrians on approach to the crossing who may decide to run across the street just as the lights turn green for you to move off

6. Keep a check on the road ahead for pedestrians who may be crossing just up from the crossing because they see the traffic has stopped

7. Do not take off the handbrake to proceed until you are sure the road is clear and it is safe to do so
Four main types of Pedestrian crossings

1. Pedestrian refuge/island – a small section of pavement in the road where pedestrians can stop before completing their crossing

2. Pelican crossing – traffic light operated crossing

3. Zebra crossing – black and white stripe markings on the road accompanied by flashing amber beacons

4. Signal controlled junction – traffic light controlled junction

Steps to complete on approach to a pedestrian crossing

1. Check your mirrors

2. Look ahead on the road for pedestrians approaching the crossing

3. Slow down your speed

4. If the lights are red come to a stop

5. If the lights are green and there are no pedestrians attempting to cross the street, continue through the crossing and continue at a controlled speed
Defensive Driving

The instructor needs to explain the following to the Student

Defensive Driving is based on

- good anticipation,
- observation
- control.
- Underpinned by a road sharing attitude

It involves

- Awareness
- Planning
- Anticipating
- Staying in control
- Responsibility
- Care
- Consideration
- Courtesy

To be an effective defensive driver, the student should consider the following:

- They must question the actions of other road users and always be prepared for the unexpected
- They must put safety first at all times
- They should drive with patience and not act too hastily
- They should never drive in the spirit of competition
- They should make allowances, if someone cuts them off they should hold back and increase the distance between them
- They should be aware of the other road users, speed, and behaviour
- They should scan the road ahead and be prepared to stop in case of emergency

In general promote a road sharing attitude by being considerate
Defensive Driving

A useful tool to explain to the student for Defensive Driving is to get them to ask themselves a series of questions as they drive along or approach obstacles like:

- Can I see the full Picture?
- Am I in the correct position?
- Am I driving at a controllable speed?
- Am I driving within the speed limit?
- What might I meet on this road?
- Could I stop quickly if I had too?
- What is the attitude/action of the driver ahead and behind?
- What are the road and weather conditions
## Eco driving

### Ecologically Environmentally Friendly Driving

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<td>Allow adequate time to respond to hazards. Brake and accelerate smoothly.</td>
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<td>Speed limits</td>
<td>Speed always appropriate for the road and traffic conditions</td>
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<td>Starting / moving off</td>
<td>Start with minimal use of gas. Move off slowly</td>
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<td>Use of accelerator</td>
<td>Use in a smooth manner/ Do not over rev in between gear changes</td>
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### Eco driving

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<th>Topic</th>
<th>Satisfactory Driving</th>
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<td>Gear selection</td>
<td>Use sensibly, efficiently and select highest suitable gear as soon as possible without making the engine labour</td>
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<td>Engine braking</td>
<td>Take advantage of the effects of engine braking when appropriate i.e. downhill</td>
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<tr>
<td>Engine power</td>
<td>Avoid over revving the engine as this consumes fuel unnecessarily</td>
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<tr>
<td>Cruise control</td>
<td>Use when appropriate</td>
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**Vehicle maintenance**

**What do you know?**

List the five *daily checks* that must be carried out on your vehicle

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List the eight *weekly* checks that must be carried out on your vehicle to ensure it is in working order

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<th>Weekly checks:</th>
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Basic Maintenance

The Instructor needs to ensure that the student knows that the following checks should be completed on any vehicle being used:

**Daily checks**
- Windows and mirrors clean
- Dangling mascots, L plates, badges not impairing view of the road
- Lights and brake lights in working order
- Visual check of tyres for flints in sidewalls and to ensure fully inflated
- Horn, indicator, screen washers and wipers in working order

**Weekly checks**
- **Engine oil level** – oil should be checked when the engine is cold. Oil levels should be between the maximum and minimum levels on the dipstick.
- **Oil leaks** – check for any leaks by checking over the engine for fluid and by looking under the car for damp spots on the ground.
- **Cooling system** – coolant should be checked when the engine is cold. Top up coolant with a mixture of water and antifreeze as per manufacturers specifications.
- **Brake and clutch fluid** – top up fluids as per instructions in manufacturers manual.
Basic Maintenance

- **Windscreen washers and fluid** – top up the container with water and washer solvent
- **Windscreen wipers** – clean the wiper blade rubbers. Renew blades if not working correctly
- **Battery** – check the electrolyte level. Top up if necessary
- **Seat belt** – check the tension in the seatbelts looking for cuts and fraying
- **Get periodic services done on the vehicle**

**Seasonal checks**
- In winter get strength of antifreeze checked
- In spring hose the underneath of the car to remove any grit and salt accumulated
Safety Checks

- **P**  Petrol
- **O**  Oil
- **W**  Water
- **E**  Electrics
- **R**  Rubber

Instructor needs to ensure that the student is aware of the following checks

- **Tread depth**: Tyres should not be worn down too much and should have the minimum tread depth of 1.6 mm over the main treads.

- **Pressure**: Must be to the recommended pressure levels.

- **Checking for damage**: Tyres examined for cuts, cracks and bulges, which could cause unexpected 'blow-outs'.

- **Replacing tyres**: Replacement tyres bought only from reputable dealers and no mixed radial and cross-ply tyres on any one axle.

- Temporary use (space saver) spare tyres: Used only to complete a journey or make a journey to a tyre dealer.
Safety checks

Instructor needs to ensure the student is aware of the checks related to lights:

– At the front:
  – Two headlights (white or yellow)
  – Two white sidelights
  – Direction indicator lights (amber only)

– At the back
  – Two red lights (commonly known as tail lights)
  – Two red brake lights
  – Two red reflectors
  – Number plate lighting
  – Direction indicator lights (amber only)

Other safety checks that students need to be aware of:

– Type of windscreen: Laminated glass must be used for the windscreens of motor vehicles registered since January 1986.
– Windscreen wipers: Windscreen wipers and wiper blades in good working condition
– Clear vision: Windscreen and windows clean and free of clutter
– Brakes: Working correctly
– Steering: Where power steering fluid topped up
– Coolant: Must be used during cold weather to prevent the water in the engine freezing
– Fuel: Be cautious to not let the fuel go to empty
Safety checks

Instructor needs to ensure that the student is aware of the following

– They must wear a safety belt except in the following circumstances:
  – People who wear a disabled person's belt,
  – People whose doctors have certified that, on medical grounds, they should not wear a safety belt,
  – Driving instructors or driver testers during a lesson or a test,
  – Garda or members of the defence forces in the course of their duty.

Safety checks

Instructor needs to ensure that the student is aware of the following where applicable

Child Seats

– They must use the correct restraint for each child.

– They must use the child seat for every journey, no matter how short.

– They must ensure they fit the child seat correctly, according to the manufacturer's instructions.
Safety checks

Child Seats
– They should fit the seat in the back seat of their car.

– For young children, they should use a seat that:

  – Bears an E mark (meaning that it meets united nations standard ECE regulation 44 03),

  – Suits the child's weight and height,

  – Is suitable for the type of car.

Instructor needs to ensure that the student is aware of the following where applicable

Roof Racks
– If they use a roof rack or roof box, they must:
  – Securely fit it to the vehicle,
  – Make sure that the load does not block their view of the road in any direction,
  – Never overload it,
  – Never place the load in a way that might cause it to fall off,
  – Never load the rack or box in a way that would de-stabilise the vehicle
Safety checks

Vehicle Registration Plates

– The vehicle registration plates look like.

![Vehicle Registration Plates]

– Vehicle registration plates should be clean and legible.
– All numbers and letters are in plain black text on a plain white reflective background.
– There should be no italics or shadows.

Car Safety Regulations

Ensure the student is aware of the following regulations:

– Children in motor vehicles
  – They must not leave infants or young children on their own in a motor vehicle

– Animals in motor vehicles
  – They should never leave animals alone in vehicles.

– Using a mobile phone
  – They must not drive a vehicle or ride a motorbike while using a hand-held mobile phone.

– Personal entertainment systems
  – As a road user, they should avoid using personal entertainment systems through earphones. If they do use a personal or in-car system, they should play it at a volume that does not distract or prevent them from hearing emergency sirens or car horns.
Towing a trailer

The instructor must ensure the student is aware of the following:

Combination
- The student must know and obey the manufacturers maximum permissible trailer mass which their vehicle is allowed
- They must know the legal limit for their vehicle for towing an unbraked trailer
- The student must be aware of the legal speed limits for their combination

Mirrors
- Exterior towing mirrors must be fitted at both sides of the trailer

Towing a trailer

Stabiliser
- A stabiliser must be fitted to the tow bar to assist in stabilising the combination in crosswinds etc. (note: this does not cure instability of a poor towing vehicle or combination)

Weight distribution
- The weight of the trailer should be evenly distributed to ensure correct stability of the combination
- Heavy items to be placed over the axles wherever possible
- Lighter items distributed to give suitable “nose weight” at the towing coupling
- The load should be properly secured so that it does not fall from the vehicle
Towing a trailer

Safety checks

The student must carry out the following safety checks before moving off with a trailer

- Load correctly distributed with the right “nose weight”
- Load hitched up securely
- Breakaway cable/secondary coupling properly connected
- Lights and indicators connected and working correctly
- Braking system in working order
- Tyre pressure correct to manufacturers specifications

The instructor should outline the following techniques for the student with regard to driving with a trailer

Driving techniques

- Always be aware of the increased weight length and width of the combination
- Allow more time to brake when slowing/stopping
- Allow three times the normal distance when overtaking another vehicle
- Remember the increased length of the combination if turning a corner or negotiating a junction/roundabout
Towing a trailer

**Snaking**
- To correct swerving “snaking” of the combination
- Ease of the accelerator
- Allow for a twitch in the steering
- Reduce speed until snaking stops
Common errors

List below the common errors people can make in regard to towing a trailer

Common errors:
Towing a trailer

Common errors

Below is a list of common errors/faults that drivers can make in relation to towing a trailer:

- Not connecting the trailer correctly and securely
- Not distributing the weight of the load correctly
- Not securing breakaway cable/secondary coupling
- Not checking the tyre pressure for both trailer and vehicle
- Slamming on the breaks to prevent ‘snaking’
- Underestimating the additional length of the combination when turning corners
**Cockpit Drill**

Instructor needs to ensure that the student completes the following checks on entering the vehicle and understands why they need to conduct these checks each time they intend to use the vehicle:

**Doors**
- All the doors are firmly shut including passenger doors

**Seat and head restraint**
- Seat adjusted so that foot pedals can be easily operated without stretching or being restricted in movement.
- Seat in upright position to ensure student can see the road surrounding the car clearly
- If necessary steering wheel adjusted

**The Cockpit Drill**

**Mirrors**
- Mirrors adjusted so that student has a clear view of the road behind and to the side of the vehicle.
- Use both hands to adjust the rear view mirror ensuring that the back window can be fully seen when sitting in the driving position.

**Handbrake/gears**
- Checks the handbrake is on and the gear lever is in neutral before student starts the engine

**Seatbelts**
- Seatbelt fastened
Common errors

List below the common errors that people can make in relation to the cockpit drill

Common errors:
Cockpit drill

Common errors

Below is a list of common errors/faults that drivers can make in relation to the cockpit drill:

- Failure to adjust mirrors correctly for driving position, i.e. the position you will be sitting in once you move off, resulting in poor visibility in one or more of your mirrors, or the driver needing to re-adjust the mirrors once moving

- Not adjusting the driver seat, and then not being in the correct position for driving they take off

- Not putting on the seat belt before starting to drive and trying to do it instead while driving, resulting in serious risk of a collision

- Not putting the gears correctly into first resulting in a tearing/grating noise resulting in a jerky move off
Vehicle Controls - Gears

The Instructor needs to cover the following in relation to Gears:

- Student should not look at the gear lever when changing gears
- The student must know how to use Gears correctly and smoothly. The Instructor should make the following points related to gears:
  - 1st Gear
    - Used for moving off,
    - Maneuvering
    - Creeping slowly in traffic
    - At junctions.
  - 2nd Gear
    - Used for moving off down very steep hills,
    - Building up speed after moving away
    - Driving at low speeds.

Vehicle Controls - Steering

The Instructor needs to emphasise the following in relation to steering:

1. Both hands must be on the wheel in the “10 to 2” position, or ¼ to 3 position (unless using other vehicle controls e.g. gears)
2. The pull-push method of steering should be used with no crossing of hands
3. The student must be clear that there should be no slipping of the wheel back through their hands after turning.
Vehicle Controls - Gears

- 3rd Gear
  - Used to build up speed
  - When more power is needed for climbing hills.
  - Increases control when going down steep hills and dealing with some bends.

- 4th Gear
  - Used for driving at speeds higher than 30 kilometres, where there are no hazards to confront.

- 5th Gear
  - Used for high speeds such as long straight open roads, motorways or dual carriageways, etc.

Vehicle Control - Accelerator

The Instructor needs to ensure the student knows the following about the accelerator:

- Moving off – Enough Acceleration to be used to keep the balance with the clutch and no unnecessary revving of the engine

- Driving - They should avoid jerking or unnecessary bursts of acceleration while moving

- Slowing/Stopping - They need to decelerate in good time reducing the need for braking and fuel usage.
Vehicle Controls

The Instructor must ensure the student understands the key aspects of using the clutch:

- They need excellent clutch control for all situations, particularly when:
  - Moving off
  - Driving uphill
  - When manoeuvring in a confined space
  - Getting “biting point” before moving off
- Never coast while driving
- They must not ‘cover’ the clutch while driving.

Vehicle Controls- Brakes

The Instructor must check the student understands the following about brakes:

Foot Brake

1. They should make no sudden and harsh braking unless an emergency occurs.
2. Accurate and smooth braking when stopping.
3. They should not over use the footbrake
4. Release accelerator in good time to achieve the required rate of slowing.
Vehicle Controls

Hand Brake

The student should know to apply the Handbrake when:

1. Vehicle stopped and before selecting neutral
2. Waiting at a STOP sign
3. Waiting at Traffic lights
4. If stopped in traffic
5. Stationary on an uphill gradient (however slight)
6. Parked at the roadside.

Secondary Controls

The Instructor should go through the following Secondary Controls with the student:

Student must be able to locate and operate the following:

– Windscreen wipers and washers
– Demisters
– Rear window heater
– Lights and air-conditioning
– Fans,
– Rear fog-lights,
– Air vents and temperature control.
Vehicle Controls

The Instructor should go through the following with the student so they can demonstrate a working knowledge of them:

- Air pressure and the condition of tyres,
- Oil,
- Lights,
- Indicators,
- Horn.
Vehicle Dual Controls

The following outline the effective use of Dual controls:

- The Instructor should never completely trust the student to follow instructions or to do the correct thing.

- The Instructor must sometimes be firm and take whatever action necessary to protect the pupil, the car and other road users.

- The Instructor must Look, think and plan well ahead.

- The Instructor needs to get to know individual pupils and watch them. The Instructor will soon learn to predict how they are likely to respond in given situations.

- The Instructor should anticipate changes in the traffic situation and give instructions early enough for pupils to react.

Vehicle Dual Controls

There are four main reasons that a Driving Instructor should intervene with the students driving

- To prevent risk of injury or damage to persons or property

- To prevent an offence against the law

- To prevent excessive stress to the learner

- To prevent mechanical damage to the vehicle.
Vehicle Dual Controls

If the student does not react to verbal instruction, the Instructor will need to act to complete the following:

- Sound the horn
- Turn the wheel
- Switch off the engine
- Select a missed gear
- Release a partially engaged handbrake
- Use the brake/clutch pedal to stop the vehicle.

Vehicle Dual Controls

Best practice in using the dual footbrake

- Keep your foot near the brake to allow immediate reaction if needed
- If you see a potential need for using the brake, have your foot ready over the pedal.
- Avoid fidgeting with the brake — this is likely to unnerve the pupil.
- If your pupil becomes frozen on the accelerator, do not use the dual clutch as well as the brake. This could result in a ‘blown’ engine.

Always explain to your student why you have used the dual control
Vehicle Dual Controls

Dual Clutch

- Assisting pupils by using the dual clutch should be done sparingly.
- It should, only be used where there is a potential danger or risk of damage,
- Avoid over-use of the dual clutch, this will lead pupils to think that they have better control of the vehicle than they actually do
- Always explain to your student why you used the dual control

Vehicle Dual Controls

Dual eye mirrors

- The extra rear view mirror will help you to keep in constant touch with the all-round traffic situation,
- Mirrors should be placed on the windscreen in a position that does not affect the students view of the road
- They should be correctly adjusted to give maximum vision with minimum movement.
Common errors

List below the common errors people can make in all aspects of the vehicle controls namely the accelerator, gears, clutch etc.

Common errors:
Notes
Vehicle controls

Common errors

Below is a list of common errors/faults that drivers can make in relation to the vehicle controls:

Accelerator:
- Not balancing correctly with the clutch and pushing down too hard on the accelerator, causing the engine to rev loudly when waiting to move off
- Giving too much acceleration when turning corners, increasing the need to slam on the brake to prevent a collision with oncoming traffic and/or parked vehicles

Gears:
- Not choosing the correct gear to negotiate the next hazard or to make effective progress
- Not knowing when to change gears when approaching roundabouts, junctions, STOP signs, etc.

Clutch:
- Keeping the left foot on (covering) the clutch, leading occasionally to interference with the biting point
- Not carefully finding the biting point when moving off or manoeuvring
- Lifting their foot off the clutch too quickly resulting in the vehicle shutting off
- Coasting, especially around corners (coasting is keeping the clutch down when driving)
Foot Brake:

- Over use (unnecessary) of the brake because they are not used to judging when to slow down the vehicle if approaching road obstacles

Handbrake:

- Placing the left hand on the handbrake before stopping, leading to single hand steering and reducing the driver’s ability to react to a hazard correctly

Steering:

- Wheel slipping and crossing hands needlessly
- Over steering causing the vehicle to swerve on the road
- Over steering turning corners causing the vehicle to take the corner too wide, resulting in the vehicle crossing over the centre white line into the opposite lane

Secondary controls:

- Not being able to locate and/or use the secondary controls in the vehicle

Technical Checks

- Not knowing how or where to top up required liquids/fluids in the vehicle
Traffic Controls

The instructor should monitor the students knowledge of the traffic controls and road markings while driving

- All drivers must know the road signs and what they mean before commencing their driving career
- The road signs are now covered in depth in the Theory test
- There are 3 main types of road sign
  - Regulatory
  - Warning
  - Information

Regulatory signs

- These indicate what the driver must do under road traffic law
- There are two types of regulatory signs
  - a white background with a red border and black letters, symbols or numbers,
  - a blue background with white symbols or letters
Traffic Controls

Warning signs

– Are diamond or rectangular shaped,
– Have a yellow background with a black border
– Use a black symbol to show the hazard ahead.

Roadwork’s signs

– Rectangular or diamond shaped,
– Orange with a black border and black symbols or words

Stop and Go traffic control at roadwork’s

– Stop when there is a stop sign
– Only proceed through or past the road works when the go (teigh) sign is displayed.
– It is an offence not to obey these signs
Traffic Controls

Information signs

- Blue signs with white letters on motorways
- Green signs with white letters on national roads
- White signs with black letters on local and regional roads

Traffic Calming signs

- Some towns and villages use road signs and markings for traffic calming to slow down the pace of traffic and manage its flow at junctions.
- The signs used for traffic calming are regulatory, warning and information.
- Some of the methods for traffic calming are:
  - traffic islands,
  - gateways,
  - mini-roundabouts,
  - build-outs,
  - chicanes,
  - pinch points.
Traffic Controls

Bridges
– On approach to a bridge, there will be warning signs, showing the highest vehicle that will be able to pass under the bridge.
– Bridge signs can be in either of the 3 forms
  – Warning
  – Information
  – Regulatory

Traffic Controls

Trams and railway signs
– Road users must be familiar with signs for tram tracks for on-street trams (such as the Luas in Dublin city and suburbs)
– As with bridge signs tram/railway signs come in all 3 forms
  – Warning
  – Information
  – Regulatory
Traffic Controls

Bus lanes

There are two types of bus lane:
- **With-flow** – Runs in the same direction as the traffic beside it. It can be used by bicycles and taxis as well during the periods shown on information signs at the start of the lane.

- **Contra-flow** - Runs in the opposite direction to the traffic beside it. It is reserved only for buses.

Traffic Controls

- If a 'yield' sign appears at the end of the bus lane, the bus must give way to other vehicles as it merges back into normal traffic.

Bus-only streets

- As their name suggests, these streets are intended only for buses. Other traffic may use them only to get access to a building or side road.
Traffic Controls

The student needs to know the following about Road tunnel signs:

- Lane control signs will be found above each traffic lane at, or on, the approach to the entrance to a road tunnel and at regular intervals inside a road tunnel.
  - A green arrow pointing down means the lane is open
  - A red X means the lane is closed.
  - A green arrow pointing to the left means you must move into the left-hand lane.
  - A green arrow pointing to the right means you must move into the right-hand lane.

Traffic control signs can be displayed indicating a limit on certain types of vehicle allowed into the tunnel.

- Speed limit signs in tunnels can be either of the following:
Traffic Lights Signals

- Red – STOP
- Green – GO only if the way is clear
- Amber – STOP unless it is unsafe to do so
- Flashing Amber – You may proceed but you must Yield to traffic already coming through the road
- Green arrow – Proceed in direction of arrow if the way is clear

Hand Signals

A driver must know and recognise hand signals given by other road users as well as be able to use them themselves

For following traffic
- I am turning Right
- I going to stop/slow down
- I am turning Left

For oncoming traffic and points man
- I am turning right
- I am turning Left
- I want to go ahead
### Road Markings

<table>
<thead>
<tr>
<th>Road marking</th>
<th>What they mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous white line with a broken line behind it</td>
<td>Regulatory road markings to indicate 'No Entry' and you must not enter past</td>
</tr>
<tr>
<td></td>
<td>those markings.</td>
</tr>
<tr>
<td>Single or double continuous white lines along the centre of the road</td>
<td>All traffic must keep to the left of the line (except in an emergency or for</td>
</tr>
<tr>
<td></td>
<td>access).</td>
</tr>
<tr>
<td>A broken white line along the centre of the road</td>
<td>You must not cross them unless it is safe to do so.</td>
</tr>
</tbody>
</table>

### Road Markings

<table>
<thead>
<tr>
<th>Road marking</th>
<th>What they mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double broken white lines along the centre of the road</td>
<td>There is a continuous white line ahead. You must not cross them unless it is</td>
</tr>
<tr>
<td></td>
<td>safe to do so.</td>
</tr>
<tr>
<td>A broken white line with a single white line along the centre of the road</td>
<td>The driver must obey the line that is nearest to them. In this picture, the</td>
</tr>
<tr>
<td></td>
<td>driver in the car must remain to the left of the continuous white line.</td>
</tr>
</tbody>
</table>
### Road Markings

<table>
<thead>
<tr>
<th>Road marking</th>
<th>What they mean</th>
</tr>
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<tbody>
<tr>
<td>A single broken yellow line along the side of the road</td>
<td>This is the hard shoulder of the road. The hard shoulder is only for pedestrians and cyclists unless a vehicle is broken down</td>
</tr>
<tr>
<td>A broken white line and triangular symbol crossing the left-hand lane.</td>
<td>The driver must give right-of-way to any traffic on a major road ahead. The yield line usually appears with an upright Yield sign.</td>
</tr>
</tbody>
</table>

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### Road Markings

<table>
<thead>
<tr>
<th>Road marking</th>
<th>What they mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>A continuous white line and the word STOP crossing the left hand lane.</td>
<td>The driver must come to a complete stop before entering a major road</td>
</tr>
<tr>
<td>An advanced stop line for cyclists, which is in front of the stop line for other traffic</td>
<td>Cyclists may position themselves in front of the other traffic. The driver must wait behind the first white line they reach and not cross into the shaded area.</td>
</tr>
</tbody>
</table>
### Road Markings

<table>
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<tr>
<th>Road Markings</th>
<th>What they mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>A turning box showing a white arrow in a white edged box, found at junctions</td>
<td>This shows where to position a vehicle if you want to take a right turn.</td>
</tr>
<tr>
<td>found at junctions controlled by traffic lights</td>
<td></td>
</tr>
<tr>
<td>Marked off white box with the words bus lane</td>
<td>Bus lane</td>
</tr>
<tr>
<td>Marked off white box with the words bus lane and a white arrow pointing the</td>
<td>Contra flow bus lane</td>
</tr>
<tr>
<td>direction</td>
<td></td>
</tr>
</tbody>
</table>

### Road Markings

<table>
<thead>
<tr>
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<th>What they mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>White triangle between 2 lanes followed by a divided white line pointing in</td>
<td>Merging of traffic lanes ahead (hatched markings)</td>
</tr>
<tr>
<td>the direction you are heading</td>
<td></td>
</tr>
<tr>
<td>Divided white line followed by a white triangle and central median island</td>
<td>Diverging of traffic lane ahead,</td>
</tr>
</tbody>
</table>
## Road Markings

<table>
<thead>
<tr>
<th>Road Markings</th>
<th>What they mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>White marked strip running down the centre of the road</td>
<td>Safety barrier separating the lanes on a 2 plus 1 road. Motorists may not cross these markings. If you need to turn about you may exit onto a minor road and perform a safe U turn.</td>
</tr>
<tr>
<td>White box marked in front of railway gates</td>
<td>You must STOP until the gate raises and your way is clear.</td>
</tr>
</tbody>
</table>
Common errors

List below the common errors people can make with regard to traffic controls

Common errors:
Traffic controls

Common errors

Below is a list of common errors/faults that drivers can make in relation to understanding and dealing with traffic controls:

- Inability to understand the signage for traffic controls
- Failure to look ahead at traffic signs, resulting in missed exits
- Failure to look at road markings, resulting in illegal manoeuvres
- Confusion regarding direction due to an inability to look out for traffic signs and directional road markings
- Disregard for box junctions
- Failure to stop for school wardens
Hazards

The Instructor should go through the following points with the student in relation to hazard perception

1. They must react promptly to hazards

2. Anticipation is the word to describe how to avoid having to react suddenly to a hazard.

3. Whereas observation involves seeing what is actually happening, anticipation means predicting or thinking ahead to what may happen.

4. The best way to improve anticipation is by getting as much driving experience as possible in all road, weather and traffic conditions.

5. “Expect the unexpected”. For example if at a junction you intend to turn right and a car coming from the right of the main road is indicating left onto the side road you are on, WAIT until the driver turns. NEVER ASSUME that the indication is correct. The driver may be intending to pull in after the turn and has simply indicated too soon.

6. They should keep in mind that situations can change quickly from what you can observe to what might develop.

7. If they have right of way, they should never take for granted that they are going to get it.
8. They should always do plenty of looking and be prepared to stop

9. They should beware if the car in front is crawling slowly. The driver may be looking for a parking space or could be lost and looking for directions. So they may suddenly stop or turn right or left without indication. They should stay well back until they work out what the driver is doing.

10. If a car stops beyond a vacant space, the driver may be about to reverse in. If too close the student may have to reverse themselves.

11. They should not just look at the road or car directly ahead!

12. They should display good road sharing techniques, this may lesson their need to react in the first place

13. In traffic they should keep an eye on traffic in front of them.

14. When the brake lights of cars up ahead come on, they should begin to decelerate and prepare to brake

15. Going through a built-up area, they should pay attention to what is happening on footpaths and cycle lanes

16. They should watch for pedestrians and cyclists who are close that a sudden movement on their behalf would affect them.

17. Children and the elderly deserve special attention, Children can lack road- sense while the elderly might be hard of hearing or slow on their feet.
18. Remember that the person in front might be a learner or inexperienced driver.

19. When moving in slow-moving traffic, never go so close that the rear tyres of the car in front cannot be seen.

20. At a junction on a slope, never stop too close to the car in front, as it may roll back.

21. Watch out during a shower of rain! Pedestrians may run with their heads down or have umbrellas or hoods obscuring their view.

21. Watches out for cyclists and other vulnerable road users (road sharing)
Common errors

List below the common errors people can make with regard to hazard perception

Common errors:
Hazard perception

Common errors

Below is a list of common errors/faults that drivers can make with regard to hazard perception:

- Failure to look far enough ahead at the road and traffic so unable to react quickly enough to a hazard if it arises
- Not keeping a good enough distance between themselves and the vehicle in front, resulting in a collision if forced to make an emergency stop
- Not anticipating a hazard and not being prepared for possible dangers
- Not observing road signs and markings which indicate hazards ahead
- Approaching animals and not showing anticipation
Commentary driving

- Commentary driving is a wonderful tool for student’s who cannot multi-task or become confused when they are in a complex situation

- Encourage your students to say what they are doing and observing on the road as they move through the steps of learning to drive

- Commentary driving also gives you the Instructor an opportunity to evaluate how the student is progressing in the most important aspect of driving “Observation”

- Allows the instructor to coach the development of a positive road sharing attitude, and how this will effect the driver
  - Did they see those warning signs? Etc.

The technique has three steps

- Demonstrate driving in the specific situation and give a commentary out loud

- While your learner completes the same situation, describe aloud what you’d do. Keep practising until your driver completes each step safely and smoothly

- Get your learner to drive and talk at the same time
Mirrors

Highlight with the student how they should use their mirrors when:

- moving off,
- changing lanes,
- overtaking,
- slowing down,
- stopping,
- before turning,
- opening doors.
- checking mirrors regularly when driving.

- Highlight the need for drivers to check their mirror regularly and to ensure they are clean, in good condition and correctly positioned to make sure they are effective.
Common errors

List below the common errors people can make with the use of mirrors

Common errors:
Mirrors

Common errors

Below is a list of common errors/faults that drivers can make in relation to the use of mirrors:

- Not adjusting mirrors correctly before they start off on their journey, resulting in poor vision of the road around them
- Not checking mirrors often enough
- Not checking mirrors before performing a manoeuvre
- Not checking mirrors during a manoeuvre
- Only checking the rear mirror and forgetting about the side mirrors
Signalling

The instructor must explain the following to the student

- Signalling tools
  - Indicators
  - Horn
  - Lights
  - Hand signals
- Students must signal to other road users in good time so that they can react or adjust their course accordingly
- They should only use their horn as a warning if necessary
- Flashing their lights should only be used to alert drivers they are there if the horn is not working otherwise it is not appropriate to use flashing lights
- The appropriate hand signals should be used if the indicators are not working correctly

Pulling out
- The student must indicate to other traffic their intent to pull out by using the appropriate indicator

Turning a corner
- The student must use the appropriate indicator in good time to tell other drivers the direction they intend to take

Overtaking
- The student must indicate right to tell the driver in the following car of their intention to overtake and move back into the left lane ensuring not to cut in too close to the vehicle behind them (if on a dual carriageway/motorway you must signal left before attempting to move into the lane)

Changing lanes
- The student must use the appropriate indicator to inform traffic of their intent to move into another lane
Common errors

List below the common errors people can make in relation to signalling

Common errors:
Signalling

Common errors

Below is a list of common errors/faults that drivers can make in relation to signalling:

- Not indicating when intending to change course/lane
- Not indicating in due time to warn other traffic of their intent to change/manoeuvre
- Signalling too soon before manoeuvre or too late after manoeuvre
- Not having a good knowledge of hand signals and when to use them
- Not paying attention to the signals of other drivers and failing to see their change in direction/manoeuvre
### Speed

#### The student must be aware of the following

<table>
<thead>
<tr>
<th>Type of Road</th>
<th>Speed Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motorway,</td>
<td>120km/h</td>
</tr>
<tr>
<td>National roads</td>
<td>100km/h</td>
</tr>
<tr>
<td>Non-national roads</td>
<td>80km/h</td>
</tr>
<tr>
<td>Roads in built-up areas</td>
<td>50km/h</td>
</tr>
</tbody>
</table>

Local authorities can apply specific speed limits to roads as required.

### Speed limits for vehicles

<table>
<thead>
<tr>
<th>Speed Limit</th>
<th>Vehicle Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>80 kilometres an hour (80km/h)</td>
<td>Any vehicle towing a trailer, caravan, horsebox or other attachment</td>
</tr>
</tbody>
</table>
The 2 second rule

The Instructor should explain in detail the principal of the 2 second rule

On a dry road
– Choose a point like a lamp post or road sign.
– When the vehicle in front passes that point, say out loud ‘only a fool breaks the two-second rule.’
– If the student’s vehicle has passed the point before they finish saying the phrase, they are too close to the vehicle in front and need to pull back.

In wet weather
– Double the distance between their vehicle and the one in front
– Say the 2 second rule twice
Speed
What do you know?

List below the main reasons why a vehicle may be forced into a skid on the road

**Causes of skids:**

List below the steps that can be taken to avoid skidding

**Avoidance of skidding:**
List the causes and solutions of the following

**Four wheel skid**

<table>
<thead>
<tr>
<th>Causes:</th>
<th>Solutions:</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

**Rear wheel skid/slide to either side**

<table>
<thead>
<tr>
<th>Causes:</th>
<th>Solutions:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>

**Front wheel skid**

<table>
<thead>
<tr>
<th>Causes:</th>
<th>Solutions:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
What is the anti-locking braking system (ABS)?

Describe the benefits of ABS

What are the disadvantages of ABS?
List below 10 situations where driving at the speed limit could or would be dangerous

**Dangers of driving at speed limit:**
Skidding

The main reasons why a vehicle may be forced into a skid on the road:

**Causes of skids:**

1. The main cause of skidding is the driver due to:
   - Excessive speed
   - Excessive acceleration, braking and cornering
2. Road conditions
3. Weather conditions
4. Other drivers can also cause skidding.

The steps that can be taken to avoid skidding:

**Avoidance of skidding:**

1. Driving at the correct speed
2. Good control of the accelerator
3. No unnecessary braking
4. Taking corners at a controlled speed
5. Driving at a speed that is appropriate to the weather, i.e. an icy road surface requires a slower speed
6. Driving at a controlled speed on uneven surfaces
7. Observing the road ahead and other road users
8. Defensive driving – this will put you in a position to anticipate the need to slow down, reducing the need for emergency stops
Causes and solutions:

Four wheel skid

Causes:
1. Excessive speed for the road/traffic conditions
2. Uncontrolled over-braking

Solutions:
1. Quickly reapplying the brake in a rapid on/off action

Rear wheel skid/slide to either side

Causes:
1. Excessive speed
2. Cornering forces
3. Harsh acceleration
4. Excessive braking

Solutions:
1. Release the accelerator and compensate with steering
2. Be careful not to over-steer as this will simply cause the vehicle to skid the other way

Front wheel skid

Causes:
1. Turning sharply into a corner/bend at excessive speed
2. Hard acceleration and braking

Solutions:
1. Straighten the wheel
2. Reduce the pressure on the accelerator or brake
**Anti Locking Braking System (ABS)**

An anti-locking braking system (ABS) is a system on motor vehicles which prevents the wheels from locking while braking.

**The benefits of ABS**

1. Allows the driver to maintain steering control under heavy braking by preventing a skid
2. Allows the wheel to continue to forward roll and create lateral control
3. It can also shorten braking distances
4. It helps with traction control, brake assist, and electronic stability control

**The disadvantages of ABS**

1. Increased braking distances under rare circumstances
2. It creates a "false sense of security" among drivers who do not understand the operation and limitations of ABS
10 situations where driving at the speed limit could or would be dangerous:

**Potential Dangers of driving at speed limit in some situations**

1. The stopping distance for the vehicle while travelling at the speed limit is too long to successfully stop within the distance that can be seen to be clear

2. In a built up area where there are children playing and the speed limit is 40-50kph

3. If another driver refuses right of way and cuts in front

4. Coming up to a corner/bend, roundabout or junction

5. During let out times on school roads

6. When there are speed bumps or traffic calming methods on the roads

7. On a poor or uneven road surface

8. During bad weather i.e. frost, storms

9. Through busy shopping and commercial areas

10. On narrow country roads
Common errors

List below the common errors people can make with regard to speed

Common errors:
Common errors in relation to speed

Common errors

Below is a list of common errors/faults that drivers can make in relation to speed:

- Not observing the speed limits of the road
- Staying at a low speed for fear of going too fast
- Driving too quickly for their ability to control the vehicle and react fast enough to hazards
- Not practising the two-second rule and driving too close to the vehicles in front of them
- Not checking their speedometer on a regular basis
- Not looking ahead of them and adjusting their speed in due course with the flow of traffic
Golden Rule

M  MIRROR
S  SIGNAL
M  MANOEUVRE  P  POSITION
S  SPEED
L  LOOK

Moving Off

The Instructor needs to ensure the student knows the following about moving off:

– Rear view mirrors must be clean and properly adjusted before attempting to move off

– The Seat and head restraint must be properly adjusted so the road ahead and around the vehicle can be clearly seen and the pedals can be reached at ease without unnecessary stretching.

– When ready to move off rear view mirror and both side mirrors need to be checked for traffic, pedestrians and cyclists
Moving Off

- They need to indicate that they intended to pull out
- They must check all mirrors and look over their right shoulder to check the vehicle blind-spots for traffic
- Ensure they get the ‘biting point’ and balanced acceleration for take-off speed

Continued on the next slide

Moving Off

- If moving off from the kerb the student should give way to other traffic and pedestrians crossing in front of the vehicle
- The student must check all three mirrors again and look over their right shoulder
- The student must be aware they can only move off when a suitable gap in traffic appears and they must check their rear view mirror for following traffic as they drive off
- The student must adjust their speed so they are travelling at the same speed as the other traffic (provided it is within the legal speed limit) as quickly as possible
Common errors

List below the common errors people can make when moving off

Common errors:
Moving off

Common errors

Below is a list of common errors/faults that drivers can make when moving off:

- Forgetting to do a shoulder check
- Not double checking their mirrors before starting to pull out
- Moving off causing another road user to slow down or change direction to avoid them
- Rolling back slightly through poor clutch control
- Not using the correct gear and stalling or swerving excessively
- Releasing the clutch too quickly, resulting in the vehicle stalling
- Not positioning correctly on the road when they have moved out, i.e. being too close to the centre white line
On the Straight

The Instructor needs to make the following clear in relation to driving on the straight:

- The student needs to position the vehicle far enough to the left to allow traffic to safely pass or overtake on the right but not so far to the left that they are driving on a cycle lane or blocking or endangering cyclists or pedestrians.

- They need to maintain the correct speed as per the speed limit.

- They should practise good clutch, accelerator and gear control to prevent an uneven/jolting progress as they drive.

- They must remain aware of other vehicles that are attempting to overtake them and allow them to do so safely.

On the Straight

- Where practical they need to be looking at least four cars ahead, watching for possible hazards.

- They need to be observing the road signs and markings for the correct lane and direction they are travelling.

- In built up areas the student should keep a minimum of a car door width between their car and any parked vehicles.

- The student should be aware of children/pedestrians that may suddenly walk out in front of them without looking.
Common errors

List below the common errors people can make when driving on the straight

Common errors:
On the straight

Common errors

Below is a list of common errors/faults that drivers can make when driving on the straight:

- Driving too close to, or over, the white line in the centre of the road
- Poor observation and not checking mirrors regularly
- Coasting (leaving foot on clutch as you drive)
- Driving too close to parked vehicles – not leaving a door’s width between you and the vehicle
- Not knowing when to move up and down the gears as needed
Turning

The Instructor needs to ensure the student understands the following

1. When Turning right the student needs to be aware they need to:
   - Check their rear view and right mirrors for position of cars behind them
   - Indicate their intent to turn right in good time to warn traffic
   - Position the vehicle to be parallel with the white line to the centre of the side road
   - Begin to reduce speed and move down the gears
   - Check their mirrors and adjusts the position of their vehicle to the centre of the road alongside the white line

Turning

- Look into the road they intend to turn down
- Check their mirrors again and looks ahead at the oncoming traffic
- When the way is clear they turn into the side road smoothly and aim for the correct position on the left
- If on a one way street they follow the road markings to direct them to a safe right turn
- If there are no road markings they follow the procedure as if there were and move over to the right hand side of the road before making a turn
Turning

2. When Turning left the student should:
   - Check their rear view and left mirror for the position of following traffic
   - Look out for cyclists and pedestrians coming up on the left
   - Signal their intent to turn left in due time to warn traffic
   - Reduce speed and move down the gears
   - Check their rear view and left mirrors and when the way is clear they take the left turn leaving adequate space for pedestrians and cyclists
   - When the turn is complete they should check their mirrors and adjust their position on the road
Common errors

List below the common errors that people can make in relation to turning

Common errors:
Turning

Common errors

Below is a list of common errors/faults that drivers can make in relation to turning:

- Not checking mirrors for the position of following traffic
- Not checking road signs and markings, especially for right turns, to see where they should position the vehicle to take the turn safely, i.e. if there is a continuous white line on the road when there is a right turn permitted, the white line will break where the turn should be taken
- **When turning left**
  - Not leaving enough of a gap between the vehicle and the kerb, obstructing cyclists and pedestrians
  - Taking a corner too fast, resulting in the vehicle crossing over to the other lane
  - Taking a corner too slow causing the vehicle to crawl round the corner, slowing down following traffic
  - Not using a filter lane where one is provided
- **When turning right**
  - Not being able to judge a suitable gap in traffic to take the turn
  - Not rechecking mirrors before taking the turn
  - Not looking down the road they are turning into for the position of traffic and possible pedestrians
  - Taking the turn too close to the right lane in the new road
  - Hitting or mounting a kerb unnecessarily
  - Trying to make a square right turn at a T junction
- Not repositioning the vehicle correctly when the turn has been completed
Overtaking

The Instructor must emphasise to the student that the manoeuvre can only be performed if it is safe, legal and convenient to other road users.

The Instructor needs to ensure the student understands the fundamentals of overtaking, including the following points:

1. The student must observe the road markings and signs to make sure they are permitted to overtake on this road.

2. The student must make sure the road in front of them is clear and that they have enough room to move back into the lane after they have overtaken the vehicle.

3. The student must check oncoming traffic to ensure that they have sufficient space between lanes to perform the manoeuvre.

4. The student must check their mirrors and make sure the traffic behind them is not attempting to overtake.

5. The student must indicate to the traffic that they intend to overtake.

6. The student must check their mirrors and observe the position of the following traffic.
Overtaking

7. When the way is clear they move out, increasing speed and overtaking the vehicle in front

8. When they are well clear they check their mirrors, and move back into the lane ensuring not to cut in too close to the vehicle behind them (they must indicate left before attempting to move back into the lane if on a dual carriageway/motorway)

9. The student must perform the manoeuvre with no hesitation in movement and as smoothly as possible

10. If overtaking on the left they do so only:

   – If the driver in front has indicated they are turning right and they are travelling straight on

   – They have signalled that they intend to turn left.

   – Traffic in both lanes is moving slowly and traffic in the left-hand lane is moving more quickly than the traffic in the right-hand lane
Overtaking

11. The student does not overtake if:
   - They are at or near a
     - pelican crossing,
     - zebra crossing
     - pedestrian crossing
   - A traffic sign or road marking prohibits it.
   - They are approaching a
     - junction
     - corner,
     - bend,
     - dip in the road,
     - hump-back bridge,
     - Hill
   - They are on a narrow road.
   - They are in the left-hand lane of a dual carriageway or motorway
     and traffic in both lanes are moving at normal speed

12. May overtake in left hand lane if in slow moving traffic
Overtaking
What do you know?

List below the steps a driver must complete before overtaking a stationary vehicle:

Stationary vehicle
List below the steps a driver must complete before overtaking a moving vehicle:

**Moving vehicle**
Overtaking
Steps to be completed

Steps a driver must complete before overtaking a stationary vehicle:

Stationary vehicle

1. Make sure the road ahead is clear
2. Check your mirrors for the position of the following traffic
3. Indicate, if necessary, your intent to move out
4. Position your vehicle so as to leave a door’s width between you and the stationary vehicle
5. When you have cleared the vehicle check your mirrors to ensure you have sufficient space to move back in
6. Signal your intent to move back in and reposition your vehicle to the correct road position
7. Do not break the speed limit when overtaking
Steps a driver must complete before overtaking a moving vehicle:

**Moving vehicle**

1. Make sure the road ahead is clear
2. Never directly follow another overtaking vehicle
3. Give way to faster traffic overtaking you from behind
4. Check your mirrors and blind spots for the position of the following traffic
5. Signal in good time, move out when it is safe to do so, accelerate and overtake
6. When you are safely past, check your mirrors, signal and gradually move in again making sure not to cut across the vehicle you have passed
7. Take extra care when overtaking a long vehicle as you will need extra road length to pass it and safely return to the left-hand side of the road
8. You must not break the speed limit, even when overtaking
Common errors

List below the common errors people can make when overtaking

Common errors:
Overtaking

Common errors

Below is a list of common errors/faults that drivers can make when overtaking:

- Poor observation and failure to check mirrors before manoeuvring
- Not observing road signs and markings correctly which indicate if overtaking is not permissible on the road
- Not being able to judge when exactly to move out and perform the overtake
- Not indicating when moving out to overtake especially if it is a parked vehicle they are overtaking
- Not giving enough clearance between them and the vehicle they intend to overtake
- Moving back into the lane prematurely
- Overtaking on the approach to a bend, or a hill, or on a narrow road
Changing Lanes

The Instructor must emphasise to the student that the manoeuvre can only be performed if it is safe, legal and convenient to other road users

The instructor must make the student aware of the following:

- They should not move from one traffic lane to another without good reason.
- They must give way to traffic already in the lane they are moving into.

The Instructor needs to ensure the student pays attention to the following

1. The student must check the rear view and relevant wing mirrors to ensure the way is clear and that the vehicle behind is not preparing to change lanes or overtake them

2. They should signal to traffic in good time of their intent to change lanes

3. They should take a quick sideways glance to check the position of the vehicle behind them has not changed and move into the lane
Changing Lanes

4. They should NOT hesitate when changing lanes and do not change back and forth between lanes unnecessarily.

5. When the manoeuvre is complete they should check rear and side mirrors for position of other vehicles on the road.

6. They should retake the standard road position for driving on the straight.

7. They should observe the road markings in the new lane and proceed with their journey.

8. They regularly check mirrors and observe the road ahead as per standards.
Common errors

List below the common errors people can make in relation to changing lanes

Common errors:
Changing lanes

Common errors

Below is a list of common errors/faults that drivers can make when changing lanes:

- Poor observation and not checking mirrors
- Not signalling to following traffic in time
- Not observing road signs and markings resulting in an illegal lane change
- Not repositioning correctly in the new lane, i.e. being too close to the centre white line
- An inability to judge a sufficient gap in the traffic in which to complete the manoeuvre
**Braking Distance**

**The student must be aware of the following**

The total stopping distance of a vehicle depends on four things:

- **Perception time** = how long it takes for you to see the hazard
- **Reaction time** = how long it takes for you to move your foot from the accelerator to the brake
  (combined these two are your total thinking distance)
- **Vehicle reaction time**, 
- **Vehicle braking capability**

---

**Braking Distance**

<table>
<thead>
<tr>
<th>Speed (km/h)</th>
<th>Distance (feet)</th>
<th>Distance (metres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>40</td>
<td>12</td>
</tr>
<tr>
<td>50</td>
<td>75</td>
<td>23</td>
</tr>
<tr>
<td>60</td>
<td>120</td>
<td>36</td>
</tr>
<tr>
<td>85</td>
<td>175</td>
<td>53</td>
</tr>
<tr>
<td>100</td>
<td>240</td>
<td>73</td>
</tr>
<tr>
<td>120</td>
<td>320</td>
<td>96</td>
</tr>
</tbody>
</table>

*These are the bare minimum distances, road, weather and vehicle braking performance will influence the stopping distance*
Slowing/Stopping

The Instructor needs to pay attention to the Following

1. When stopping and pulling in off the road the student needs to:
   - Check rear and side mirrors for the position of the cars behind
   - Signal their intent to pull over
   - If indicators are not working they should use the appropriate hand signals
   - Reduce speed gradually while checking the rear view and side mirrors for the position of the other vehicle at all times
   - Watch mirrors for vehicles that may have decided to overtake them and allow them to pass safely
   - Check their left wing mirror for cyclists and/or pedestrians

2. When stopping in traffic the student should:
   - In slow moving traffic stop the car within a distance that they can clearly see the back wheels of the car in front
   - Must not stop on the black and white stripes of a zebra crossing or on a yellow box junction when going straight ahead

3. When stopping at a junction the student:
   - Must not stop too far out onto the road so as to cause an obstruction (I.e. behind the line or sign as appropriate)
Common errors

List the common errors people can make when stopping/slowing a vehicle

Common errors:
Stopping/slowing

Common errors

Below is a list of common errors/faults that drivers can make in relation to slowing/stopping:

- Poor observation and not checking mirrors for the position of following traffic
- Not indicating their intent to pull over in time
- When pulling into the kerb, either being too far out or the wheels brushing off the kerb
- When stopping in traffic
  - Not obeying the two-second rule while driving, resulting in the vehicle stopping too closely, and possibly abruptly, to the vehicle in front
  - Coasting and/or covering the brake
  - Not changing to first gear to start off again
  - Releasing the clutch too quickly when traffic begins to move again causing the vehicle to stall
- When stopping at a stop sign
  - Not stopping fully and coasting
Emergency stop

The Instructor needs to ensure the student is aware of the following in relation to making an emergency stop

- The student should apply firm pressure judging pedal movement so that the brakes are on the point of locking.
- They should hold the pedal still then, as the car slows to a standstill, gradually release the pressure.
- During braking, they should keep two hands on the steering wheel and hold the car in a straight position.

They should remain alert for the first signs of the wheels locking up. (if the vehicle does not have ABS)

- If a skid starts, they should ease the pedal without releasing it completely, and then re-apply the pressure.
- They do not depress the clutch until just before they stop giving the car extra braking from the engine.
- With the car safely at a standstill, and the clutch and brake pedals still depressed, they should apply the handbrake and move the gear lever into neutral.
Emergency stop

Anti-Lock Braking Systems (ABS)

- These are designed to maintain driver control and stability of the car during emergency braking.

- ABS allows maximum braking to be applied while retaining the ability to ‘steer out of trouble’.

- The operation of ABS can slightly reduce stopping distance in some cases like on wet road surfaces, but it can increase the stopping distance in others, as may be the case in deep snow or gravel.
Common errors

List below the common errors that people can make when performing an emergency stop

Common errors:
Emergency stop

Common errors

Below is a list of common errors/faults that drivers can make with regard to the emergency stop:

- Pressing the clutch too early, resulting in a longer braking distance
- Poor brake and clutch control
- Wheels locking and vehicle skidding out of control
- Not holding the steering wheel straight, resulting in the vehicle swerving unnecessarily
Emergency stop
What do you know?

List four reasons why it is important to keep a safe gap between your vehicle and the vehicle in front of you

**Reasons for a safe gap:**
Emergency stop

Four reasons why it is important to keep a safe gap between your vehicle and the vehicle in front of you

Reasons for a safe gap:

1. If you have to brake suddenly you will be able to do so causing minimal/if any damage

2. You will have a clear view of the vehicle ahead of you so you will be able to better anticipate the driver’s movements

3. You will be at a safe distance in case the driver in front rolls back slightly

4. In poor weather conditions it gives you a better ability to bring the vehicle to a controlled stop
Punctures/blowouts

1. Pull up slowly at the side of the road
2. Hold the steering wheel firmly to keep control of the car
3. If it is a front wheel blow out
   – Let the vehicle roll to a stop
   – Grip the steering wheel firmly
4. Turn on hazard warning lights
5. Place a red triangle a distance away as appropriate to warn other road users of the hazard
6. Put on a fluorescent vest
7. Change the tyre (if it is safe to do so)
General Parking Rules

The instructor must ensure the student understands the following:

– They need to park as close as possible to the kerb or edge of the road.

– They should use parking disc’s in built up areas containing regulatory signs indicating the need for disc usage.

– They should not park where they would block the entrance to a property unless they have the owner's permission.

– They should not park opposite another vehicle on a narrow road.

– They do not double park.

– They do not park at road works.

– They do not park at the entrance or exit of a fire station, Garda station, ambulance station or hospital.
<table>
<thead>
<tr>
<th>General Parking Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>– They do not park where parking is forbidden by traffic signs or road markings</td>
</tr>
<tr>
<td>– They do not park where there are white zig-zag lines on either side of pedestrian lights or of pelican or zebra crossings;</td>
</tr>
<tr>
<td>– They do not park within 15 metres before and 5 metres after a pedestrian crossing</td>
</tr>
<tr>
<td>– They do not park near a school entrance where there are yellow zig-zag lines along the edge of the roadway enclosing the words 'SCHOOL KEEP CLEAR';</td>
</tr>
<tr>
<td>– They do not park within an area marked as a bus stop or taxi rank</td>
</tr>
<tr>
<td>– They do not park wholly or partly on a footpath, a grass margin, a cycle lane or a median strip</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>General Parking Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>– They do not park within 5 metres of a road junction unless parking spaces are clearly marked</td>
</tr>
<tr>
<td>– They do not park on a part of a road reserved for casual trading during trading hours</td>
</tr>
<tr>
<td>– They do not park in a loading bay</td>
</tr>
<tr>
<td>– They do not park in a tram lane during the period the tram lane is in force</td>
</tr>
<tr>
<td>– They do not park in a disabled space unless they are displaying a disability sticker</td>
</tr>
<tr>
<td>– They do not park on the approach to a level crossing</td>
</tr>
</tbody>
</table>
General Parking Rules

– They do not park where the kerb has been lowered to help wheelchair users

– They do not park at a corner, bend, brow of a hill or on a hump-back bridge,

– They do not park where there is a sharp dip in the road,

– They do not park anywhere that blocks the view of a school warden

– They do not park where it will be inconvenient for other road users and pedestrians.

Failure to follow the parking rules may be considered as dangerous parking and may result in the vehicle being clamped or possibly towed and the driver receiving penalty points.
Parking

The Instructor needs to ensure that the student is clear on the following in relation to parking

When parking the student:

1. Should check for road signs and markings to ensure parking is allowed before they pull off the road
2. Should check all mirrors for the position of the traffic
3. Should indicate to traffic on a roadway that they intend to pull in
4. Should check mirrors and blind spots again

5. When there is a suitable gap (if applicable) and the way is clear they should pull into the kerb/parking block
6. They should park close to and parallel with the kerb or edge of the road
7. Where a parking bay is marked out on a road they should park the vehicle fully within the parking space.
8. They should get out of the vehicle only when it is safe and they are not blocking other road users.
9. Ensure vehicle is secured and locked before leaving it unattended
Common errors

List below the common errors people can make when parking

Common errors:
Parking

Common errors

Below is a list of common errors/faults that drivers can make in relation to parking:

- Poor observation and not seeing road signs and markings

- Parking at the roadside
  - Not checking mirrors for the position of following traffic
  - Not indicating their intent to park in time
  - Parking too close to the kerb or possibly on the kerb causing obstruction to pedestrians

- Parking in a parking bay
  - Not checking mirrors for traffic – people forget that there is still traffic in a parking bay
  - Not parking within the two white lines, preventing another vehicle from using a space

- Not checking mirrors before exiting vehicle or pulling out of the space
Parallel parking

The Instructor must emphasise to the student that the manoeuvre can only be performed if it is safe, legal and convenient to other road users.

The Instructor needs to ensure the student is familiar with the following:

1. The student must use the left turn signal to indicate that they are entering the space.
2. They must ensure that the parking space is at least 2 metres (6 feet) longer than their vehicle.

3. They must be cautious when parking - for instance - near a lamppost in order to avoid hitting it with the rear bumper.
4. Make sure the front bumper has cleared the rear bumper of the front vehicle.
5. Continue to keep an eye on the vehicle behind.
6. They should end with the car parallel to the curb.
7. They should centre the vehicle in the middle of the parking space, ensuring both the front and the rear vehicles have sufficient space for exiting the parking.
Common errors

List below the common errors people can make when parallel parking

Common errors:
Parallel parking

Common errors

Below is a list of common errors/faults that drivers can make when parallel parking:

• Poor observation and not seeing road signs and markings
  o Not checking mirrors and indicating their intent to park in time
  o Not judging the space correctly causing difficulty in parking, which in turn causes an obstruction to the flow of traffic on the road
  o Poor control of the clutch and accelerator, resulting in too fast a movement and increasing the need for fast braking
  o Not turning the steering wheel fully, making the moves for the manoeuvre a longer and more difficult process

• Not checking mirrors before exiting vehicle or pulling out of the space
Junctions

The Instructor must ensure the student is aware that:

- If they see a ‘Stop’ sign they must stop at the sign or at the white line on the road, even if there is no traffic.

- If they see a “Yield” sign they must slow down and make sure the road is clear before proceeding.

The Instructor needs to pay attention to the following:

Right of way

1. If at a junction between a major and minor road the student needs to give way to the traffic on the major road from both directions.

2. If at a junction where the roads are of equal importance, the student must give way to the traffic on the right.

3. If approaching a T junction, the student must give way to the traffic already on the road they are joining.
Junctions

4. If turning right at a cross junction, the student must give way to the traffic coming straight through the junction from the opposite direction.

5. If turning right at a junction and a vehicle from the opposite direction wants to turn into the same road, they should give way to the vehicle that is turning left.

6. They should proceed with caution while showing regard for other road users.

7. The student must understand they must yield to Pedestrians already crossing at the junction.

8. The student must watch for cyclists and motorcycles coming out from junctions who might be difficult to see because of their small size.
Yellow box junction

The Box Junction Rule

Generally there is NO Entry to a yellow box junction unless they can clear it without stopping.

The Instructor needs to ensure the student is clear on the following:

- The Student may only stop and wait at a yellow box junction:
  - when they are turning right.
  - waiting for a gap in traffic coming from the opposite direction.

- The student should cause as little traffic disruption as possible.

- The student should not enter the box and block other traffic that has the right of way.

- The student must be extra alert and observant when waiting to turn right at a box junction.
Common errors

List the common errors people can make when driving through junctions

Common errors:
Junctions

Common errors

Below is a list of common errors/faults that drivers can make in relation to junctions:

- Poor observation and not checking mirrors
- Failure to see road signs and markings, resulting in an abrupt stop due to insufficient time to slow down the vehicle
- Forgetting to change to first gear to start off again when at a STOP sign at a junction
- Stopping too far behind a STOP line making it too difficult to see traffic coming from the left and right
- Stopping too far over a STOP line causing an obstruction to traffic coming from the left and right
- When the first vehicle at the junction stops, a lot of learners panic because they do not want to hold up traffic causing them to release the clutch too quickly resulting in the vehicle stalling
- Inability to access a suitable gap in which to take off
- Poor clutch and acceleration control, resulting in the vehicle rolling back when the handbrake is released to start off again
Junctions
What do you know?

You are approaching a closed uphill T junction. Cars are parked on each side of the road and there is only room for one vehicle to pass through the middle. School children are on the pavements and are attempting to cross the road between parked cars.

How should you approach this junction? List five factors that determine your speed:
Junctions

You are approaching a closed uphill T junction. On each side of the road cars are parked and there is only room for one vehicle to pass through the middle. School children are on the pavements and are attempting to cross the road between parked cars.

Five factors that determine your speed when approaching this junction:

1. The school children may run out in front of you without looking
2. There may be vehicles coming towards you through the narrow space between the parked cars
3. A door may open suddenly from one of the parked cars
4. One of the parked cars may pull out without checking
5. The vehicle in front of you may stop to let people pass and may roll back slightly when moving off again
Roundabouts

The instructor must ensure that the student is aware of the three Rules to be obeyed on roundabouts:

1. Vehicles that are on the roundabout have right of way over those approaching

2. Those entering the roundabout must give way to vehicles coming from the right

3. If the roundabout is clear and free of traffic, the driver should enter without stopping

Roundabouts

The Instructor needs to ensure the student is aware of the following in relation to roundabouts:

1. The student must take notice of the road signs indicating an upcoming roundabout

2. The student should begin to slow their speed and gradually move down the gears

3. The student should know that they need to change lanes (if needed) for the exit they wish to take and indicate this to the following drivers in good time
Roundabouts

4. When at the roundabout:
   – They must check their mirrors for the position of the following traffic
   – They must look out to the right watching for a suitable gap
   – When a gap appears they should move off smoothly

5. When making a LEFT turn the student should
   – Stay in the left-hand lane,
   – Indicate “left” as they approach the roundabout and continue to indicate until they have passed through

6. When travelling STRAIGHT ahead the student should:
   – Stay in the left-hand lane
   – Indicate “left” when they have PASSED the first exit and move off straight through

7. When making a RIGHT turn the student should:
   – Indicate right on their approach
   – Stay in the right-hand lane,
   – Maintain the signal until they have passed the exit before the one they intend to take.
   – Then change to the “left” turn indicator and exit roundabout
Common errors

List below the common errors people can make when dealing with roundabouts

Common errors:
Roundabouts

Common errors
Below is a list of common errors/faults that drivers can make in relation to roundabouts:

- Not moving down gears quickly enough on approach to the roundabout
- Not positioning yourself in the correct lane on approach to the roundabout
- Poor observation, not checking mirrors and not looking to the right at traffic already on the roundabout
- Inability to judge when to move off and what is a suitable gap in traffic
- Not indicating to other drivers on the roundabout in enough time when you intend to exit the roundabout
- Increasing speed when on the roundabout believing that they must complete the task quickly, resulting in loss of control and unnecessary anxiety
- Not positioning the vehicle correctly on the road after exiting the roundabout
Roundabouts on dual carriageways
What do you know?

You are approaching a large roundabout on a dual carriageway. The road is dry and there is very little traffic. The zone of vision on approach is very clear, allowing observation in all directions for some 50m before the give away lines. What should you do?

Describe your likely actions on approach and through the junction:
Roundabouts

You are approaching a large roundabout on a dual carriageway. The road is dry and there is very little traffic. The zone of vision on approach is very clear allowing observation in all directions for some 50m before the give away lines. What should you do?

**Actions on approach and through the junction:**

You would follow the same procedure as for any roundabout busy or otherwise -

1. Check mirrors, indicate and move into the correct lane on your approach
2. Slow the vehicle and stop at the line/entrance to the roundabout
3. Look to your right for traffic
4. When you see a suitable gap proceed onto the roundabout at a controlled speed
5. Indicate left just before you approach the exit you wish to take
6. If you exit from the dual carriageway, reduce your speed to that of the road you have joined
7. If you remain on the dual carriageway, maintain the correct speed
Reversing

The Instructor must emphasise to the student that the manoeuvre can only be performed if it is safe, legal and convenient to other road users.

The Instructor must ensure the student is aware of the following when reversing:

1. The student must pull in just after the corner/space they are going to reverse into.
2. They should apply the handbrake and put the car into the reverse gear.
3. They need to check the rearview and side mirrors to ensure there is no traffic pulling out from or blocking the position they wish to reverse into.
4. They must look over both shoulders and out of the rear window checking blind spots.

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Reversing

5. They should give way to pedestrians and other traffic.
6. If their view is restricted, they should ask for help when reversing.
7. When the way is clear they should reverse in a controlled manner and at a controllable speed.
8. The student should know they cannot reverse from a minor road onto a major road.

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Common errors

List below the common errors that people can make when reversing

Common errors:
Reversing

Common errors

Below is a list of common errors/faults that drivers can make when reversing:

- Not checking mirrors to see if the road behind them is clear
- Not putting the gears into reverse correctly
- Not controlling the accelerator and clutch correctly, resulting in reversing at an unsafe speed
- Not continuously checking their mirrors while performing the manoeuvre
- **Reversing round a corner**
  - Not checking the road they are reversing into is clear
  - Not checking side mirrors to make sure there are no pedestrians coming up behind the vehicle
  - Not looking over their shoulder to check blind spots
  - Not locking the wheel correctly, causing the vehicle to go up onto the kerb
  - Not controlling the speed correctly and taking the corner too quickly sometimes loosing control of the vehicle
  - Reversing too far away from the kerb
  - Obliging another road user to slow or stop
- Not straightening up the vehicle in time causing the back wheels to tear the kerb
Hill start

The Instructor needs to ensure the student is aware of the following related to hill-starts:

1. They must check the mirrors and blind spots for traffic
2. They must get the ‘Biting Point’ and balance the vehicle so that it feels as though the car is being pulled forward.
3. They should check mirrors for the position of following traffic
4. They should release the handbrake and apply enough acceleration to take off without rolling backwards
Common errors

List below the common errors people can make when performing a hill start

Common errors:
Hill start

Common errors

Below is a list of common errors/faults that drivers can make when performing a hill start:

- Not getting the bite before starting
- Not checking mirrors for the position of any vehicle behind them (this is key in this manoeuvre due to roll back)
- Not balancing the vehicle on clutch and accelerator until they feel the pulling sensation in the vehicle before releasing the handbrake, causing the vehicle to roll backwards
- Releasing the clutch too quickly when they have the vehicle balancing on the hill causing the vehicle to stall
- Giving too much acceleration causing the engine to roar and the vehicle to take off too quickly when the handbrake is released
**Turnabout**

The Instructor must emphasise to the student that the manoeuvre can only be performed if it is safe, legal and convenient to other road users.

The Instructor needs to ensure the student understands the following about turnabouts:

- The student must check all mirrors for traffic and pedestrians attempting to pass.
- They must be aware they need to give way to any traffic and pedestrians.
- The student must check all mirrors in every step of the manoeuvre and make all round observations.
- If there is a slight rise in the road the student must use a small amount of controlled acceleration to complete the manoeuvre.
Common errors

List below the common errors people can make when performing a turnabout

Common errors:
Turnabout

Common errors

Below is a list of common errors/faults that drivers can make when performing a turnabout:

• Not checking mirrors to see if road is clear
• Not locking the wheel fully on each turn, resulting in the need for more manoeuvring
• Not controlling the clutch and accelerator correctly, resulting in the vehicle moving too quickly across the road causing the driver to react with abrupt braking
• Not judging the distance correctly, resulting in the vehicle mounting the kerb
• Not checking mirrors between and during each step of the manoeuvre
• Obliging another road user to slow or stop while carrying out the manoeuvre
• Releasing the clutch too soon causing the vehicle to stall when taking off from the manoeuvre
**U - Turn**

The Instructor must emphasise to the student that the manoeuvre can only be performed if it is safe, legal and convenient to other road users.

The Instructor needs to ensure the student is clear on the following:

- The student should check there are no road signs or markings prohibiting a U-turn,
- They should look for a safe place, where they can see clearly in all directions.
- The student should give way to all other road users.
- The student must check carefully for cyclists and motorcyclists.
- They should not delay or prevent pedestrians from crossing safely.
- They should make sure there is sufficient room to complete the maneuver competently.
- When the way is clear they should check all mirrors and perform the manoeuvre quickly and smoothly.

[Image of no U-turn sign]
Common errors

List below the common errors that people can make when performing a U-turn

Common errors:
U-turn

Common errors

Below is a list of common errors/faults that drivers can make when performing a U-turn:

- Not checking mirrors for the position of following and oncoming traffic
- Not locking the steering wheel fully, resulting in an incomplete manoeuvre that means the driver has to reverse to get back onto the straight and causes an increased obstruction on the road
- Not checking mirrors and looking to the road in front of them before moving off after the manoeuvre
Dual Carriageways

The Instructor needs to ensure the student is aware of the following regarding Dual Carriageways:

- The student should drive in the left-hand lane of a dual carriageway as with all national roads.
- They should only use the outer lane of a two-lane or three-lane dual carriageway:
  - for overtaking
  - when intending to turn right

When turning left onto a dual carriageway the student should know they must:

- Keep to the left of the road they are currently on
- Carry out the MSMPSL routine
- Check their mirrors and watch for traffic.
- Take the turn when it was safe to do so.
- Take up the standard road position and adjust their speed within the limits to that of the dual carriageway so as not to inhibit the flow of traffic.
Dual Carriageway

When crossing a dual carriageway or joining it by turning right the student should know they must:

- Check their mirrors and observe the traffic already on the carriageway
- Move into the median strip when a gap appears and wait there until it is safe to proceed
- Turn into the second half of the dual carriageway entering the left hand lane
- Adjust to the correct speed and road position

Dual Carriageway

- If crossing the junction they must move off from the median strip when a suitable gap appears and finish the crossing
- If another vehicle is already blocking the median space, the student must wait on the minor road until there is enough space for them to complete the maneuver by entering the left hand lane
- If the median is too narrow for the vehicle, the student should wait on the minor road until they can complete the maneuver in one smooth movement
Dual Carriageway

The Instructor needs to ensure the student understands following

When driving a vehicle which is too large to wait in the middle of the minor road, they should:

– Not treat each half of the dual carriageway as a separate road.

– Remain on the minor road until they can cross both sides of the dual carriageway without stopping.

– Take care turning as they need extra room to finish a turn.
Rules On the Motorway

The instructor should discuss the following with the student and ensure they are prepared for the Motorway when they get a full licence

1. Turning or reversing is not permitted.

2. They must progress at a speed that is in line with the flow of traffic and within the legal limit.

3. They must not drive on any part of the motorway that is not a carriageway; for example a hard shoulder, except in case of emergency.

4. They must not stop or park on any part of the motorway unless their vehicle breaks down or they are signalled by a Garda to do so.

5. They must not drive a vehicle that is restricted to a maximum of 80km/h or less in the traffic lane nearest the centre median of the motorway (lane 3). An exception to this where the speed limit is 80km/h or less.

6. They must not pick up or set down anybody on a motorway.
Joining the motorway

The instructor should discuss the following with the student and ensure they are prepared for the Motorway when they get a full licence:

- The student must obey road signs and road markings.
- The student cannot drive on hatch markings before merging with the traffic.
- They must yield to all traffic on the motorway when attempting to join the motorway.
- They should use the acceleration lane to build up speed before merging into traffic on the motorway.

They should check their mirrors and signal early to other motorists that they intend to merge.

As they prepare to merge with the traffic they should check their mirrors and blind spots for a safe gap in the traffic on the main motorway and complete the merge quickly and smoothly.

They should adjust to a safe speed not exceeding the legal speed limit.

They should treat each lane change as a separate maneuver.

They should remain in one lane for a while until they are fully comfortable with the high speed.
Driving on the Motorway

The instructor should discuss the following with the student and ensure they are prepared for the Motorway when they get a full licence

- The student uses the “2 second rule” when driving on motorways
- When in a queue they should leave enough room in front to allow them to stop safely.
- They should check mirrors and blind spots regularly.
- They should not position themselves in another driver’s blind spot
- They should keep a view of several cars ahead
- They should maintain a steady speed and allow traffic that wishes to overtake to do so safely

Using lanes properly on the Motorway

The instructor must ensure that the student is aware of the correct usage of lanes on the motorway

Lane 1
- The normal 'keep left' rule applies.
- Stay in this lane unless overtaking.

Lane 2
On a two-lane motorway,
- Use lane 2 for overtaking only and move back into lane 1 when finished.
- Use lane 2 to accommodate traffic merging from the left.
Using lanes properly on the Motorway

Lane 3
If you are travelling on a three-lane motorway,
- Use lane 3 only if traffic in lane 1 and 2 is moving slowly
- If overtaking or accommodating merging traffic.
- Move back to the left once finished overtaking,
- Use of the lane nearest the central median is prohibited if driving:
  - a goods vehicle with gross weight of more than 3,500 kilograms,
  - a passenger vehicle with seating for more than 8 passengers
  - a vehicle towing a trailer, horsebox or caravan.
- Lane 3 can be used in exceptional circumstances i.e. when you cannot proceed in the inner lane because of a blockage ahead.
- Lane 3 may also be used if the speed limit of 80km/h or less applies.

Overtaking on the Motorway

The instructor should discuss the following with the student and ensure they are prepared for the Motorway when they get a full licence

- The student should overtake only on the right, unless traffic is travelling in slow moving queues
- If moving from a slower lane to a faster lane, they should adjust their speed first.
- They should check all mirrors and ensure that the way is clear behind and ahead
Overtaking on the Motorway

- They should signal well in advance that they intend to overtake
- When a suitable gap appears they should move out, increase speed and overtake the vehicle
- They should only move back into the lane when they have passed the vehicle enough that they can see it in their internal rear view mirror
- They should make sure their vehicle is well past the vehicle being overtaken. They must be aware that they do not cut in too soon
- They should signal their intent to move back into the left lane

Stopping and Parking on a Motorway

The instructor must ensure that the student is aware that you may only stop or park on the motorway when:

- Your car breaks down
- A Garda signals you to do so,
- There is an emergency (such as a crash),
- There are road works (and it is necessary)
- You are at a toll plaza.
Breakdowns on a Motorway

The instructor must ensure that the student knows if they breakdown on a motorway they must:

- Switch on the hazard warning lights.
- Move the vehicle on to the hard shoulder.
- Get out of the vehicle from the safest side depending on the position of the vehicle.

Place warning triangle a sufficient distance back as an early warning for other traffic (this is not a legal requirement in some countries such as the UK)

- Get help quickly and do not leave the vehicle unattended for longer than necessary.
- Wait for help on the embankment side of the motorway.
- Use the roadside telephone or a mobile phone to tell the Gardai.
Leaving the Motorway

The instructor should discuss leaving a motorway with the student and ensure they are prepared for the Motorway when they get a full licence

– On approaching the exit they wish to take off the Motorway the student should check all mirrors and blind spots and signal in good time their intent to leave the motorway

– They should move into the deceleration lane and begin to slow down

– At the exit they are taking, they should check their mirrors and move off into the slip road

– They should adjust their speed to the appropriate level for the new road

– If they miss the exit, they should drive on to the next exit.
Common errors

List below the common errors people can make in relation to driving on a dual carriageway or motorway

Common errors:
Dual carriageway and motorway

Common errors

Below is a list of common errors/faults that drivers can make in relation to driving on dual carriageways and motorways:

- Not checking mirrors for following traffic when entering and exiting a dual carriageway/motorway
- Inability to recognise a suitable gap to enter/exit the dual carriageway/motorway
- Too slow to adjust speed to that of the road they are joining
- Possibility of going too fast due to not checking speed vehicle is travelling at
- Not positioning themselves correctly on the road making it difficult for other drivers to overtake them
- Not checking road signs and markings
- Focusing too intently on the road ahead and forgetting about the road and traffic surrounding them
- Inability to smoothly and quickly move down the gears when approaching a junction or exit
Tunnels

The instructor must ensure the student is aware of the following regarding driving in a tunnel

1. The student should check they have enough fuel before entering the tunnel.

2. They should remove sunglasses,

3. They should switch on the dipped headlights,

4. If available they should tune into the designated FM radio station to hear safety instructions during the journey.

5. They should know that the station frequency is displayed on an information sign at the entrance to the tunnel,

6. They should keep a safe distance from the vehicle in front.

7. They should watch out for regulatory signs stating restrictions on large and heavy goods vehicles

8. They should keep in their lane and not overtake.

9. They should not drive in the right-hand lane if the vehicle is prohibited from using this lane.

10. They should not turn or reverse.

11. They should not stop, except in case of emergency.

12. They should obey the speed limits.

Leaving a Tunnel

- The student should follow the road signs and keep a safe speed and position on the roadway.
**Stopping in a Tunnel**

The instructor must ensure the student is aware of the following if required to stop while in a tunnel:

- Switch on the hazard warning lights,
- Keep a safe distance between their vehicle and the vehicle in front,
- Switch off the engine,
- Check the radio for instructions from the tunnel operator,
- Check all electronic signs in the tunnel for information,
- If necessary, leave the tunnel using the nearest available pedestrian exit

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**Breakdown/Crash in a Tunnel**

The instructor must ensure the student is aware of the following while in a tunnel:

If there is a breakdown or a crash in the tunnel, the student should:

- Switch on the hazard warning lights,
- Switch off the engine,
- Go to an emergency station and use the emergency phone to tell the tunnel operator,
- Check the radio for instructions if it is another vehicle that has broken down
- Check all electronic signs in the tunnel for information
Vehicle Fires in a Tunnel

The Instructor must ensure the student is aware of the following while in a tunnel

– If there is a fire in the vehicle the student should:
  – Switch off the engine
  – Leave the vehicle immediately
  – Go to an emergency station and use the emergency phone to tell the tunnel operator
  – Leave the tunnel from the nearest available exit.

Vehicle Fires in a Tunnel

The Instructor must ensure the student is aware of the following while in a tunnel

– If there is a fire in another vehicle the student should:
  – if the fire is behind them, drive out of the tunnel
  – if the fire is ahead of them
    – Turn off the engine
    – Leave the vehicle immediately
    – Leave the tunnel by the nearest emergency exit.
Driving at night

The Instructor needs to ensure that the student is aware of the following regarding driving at night:

– The student should drive at a speed that allows them to stop within the distance covered by their lights

– They should keep the headlights properly aligned to avoid dazzling other drivers and pedestrians

– When on an unlit road they should use dipped/high beam lights as necessary
Headlights

The Instructor needs to ensure the student pays attention to the following in relation to use of headlights:

The student should use their dipped headlights:
- At dusk and dawn
- When they need them to see clearly,
- When stopped in traffic,
- When meeting other traffic,
- In built-up areas where there is good street lighting,
- On continuously lit roads outside built-up areas,
- When following traffic,
- In dense fog, falling snow or heavy rain,
- When daylight is fading,
- To avoid inconveniencing other traffic.

- Use the MAIN BEAM HEADLIGHTS in situations, places and times outside of those listed above

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Headlights

- Use FOG LIGHTS only during dense fog and falling snow
- If the dazzle is from an oncoming vehicle they
  - Slow down and look towards the side of the road until the vehicle has passed and prepare to stop if necessary
- If the dazzle is from a vehicle behind and reflected in the mirror they
  - operate the night-driving mode on the mirror.
Breakdown

The instructor should go through the following points with the student

1. Steer the vehicle to the side of the road/hard shoulder

2. Put on handbrake, put car in neutral and turn engine off,

3. Turn on hazard warning lights

4. Put on a fluorescent vest

5. Place a red triangle a distance away as appropriate to warn other road users of the hazard

6. Contact road side services (there may be a road phone that you can use if you do not have a mobile)

7. Do not wait inside the vehicle as if a driver fails to see you parked there may be a collision

8. If the vehicle gets fixed start the engine and begin the moving off procedure and rejoin the traffic on the road safely
Accidents

The Instructor should go through the following points with the student

If involved in an accident on the road it is important to follow the correct procedure

1. No-one was injured but vehicles are causing obstruction:
   - Mark the position of the vehicles and move them off the road
   - If necessary contact Gardai
   - Exchange particulars (insurance details) with the other driver
   - Notify your insurance company of the incident as soon as possible
   - If the person is uninsured report the incident to the Motor Insurers Bureau also

2. Accident with hazardous material
   - Keep well clear
   - Contact Gardai immediately and inform them that the materials are hazardous
   - Follow any instructions given to you

3. Damage to property
   - Notify the owner of the property immediately

4. Person injured
   - Call the ambulance and Gardai immediately
   - Do not move the victim unless there is a risk of fire or further injury
   - Do not give the victim anything to drink
   - Loosen any tight clothing around the neck
   - Keep the person as warm as possible
   - If there is heavy bleeding try to stop the flow of blood by applying pressure to the wound
Summary

We are now at the end of this part of the ADI instructors’ programme. As you can see from the slide show quiz games and practical sessions, we have put a lot of detail into the programme to assist you in your training and to ensure that this programme produces expert drivers.

Throughout the programme you will probably have noticed that the one point kept coming up throughout - OBSERVATION. This is the most crucial part to becoming a great driver. All manoeuvres, collisions, hazards, progress on the road, are linked to observation.

Good observation
- Prevents collisions as you have given yourself enough time to react
- Prevents road hazards from becoming catastrophes because you have seen the hazard warning signs in time to react and adjust your course if necessary
- Prevents manoeuvres from becoming obstacles to flowing traffic as you have ensured that you have enough time and space to perform the manoeuvre safely

Another point that was repeated throughout the module was INDICATING. Again, indicating is very important for safe driving because you need to let your fellow road user know what you intend to do in adequate time for them to adjust their course.

Throughout the manual we have listed common errors to help you to identify what you need to look out for in your own students.

You probably noticed that in this section the same two points were repeated throughout but in the reverse effect.

Learner drivers have very poor OBSERVATION and are very hesitant when it comes to INDICATING.

The main reason for this is of course that they are trying to deal with the mechanics of the vehicle, i.e. gears, clutch, accelerator, and they forget there is a world outside the vehicle.
The key point here is that OBSERVATION and CLEAR INDICATING are things that come with experience which the learner driver does not have. However these points are crucial to safe driving and you should remind your student of this at every session.

Use the **commentary driving** technique to encourage the student to observe the road around them and to get them accustomed to looking at the road outside the vehicle, not just their new world inside.
Vehicle mechanics

Below is a recap on the vehicle mechanics section covered in Stage One of the programme.

(The following section on vehicle mechanics is adapted from information taken from the How Stuff Works website: www.howstuffworks.com)

Drivers of any vehicle expect to be able to complete their journey in safety and with minimal complications. Although vehicles seem very complicated, the modern vehicle, no matter what size or make, runs on the same basic mechanical principles. To give you a better understanding of what exactly is going on in your vehicle, this section will give you a brief breakdown and description of the working parts of any vehicle. You will by no means be a qualified mechanic at the end of this section but you will be a more effective instructor if you understand your primary working tool - your vehicle.

The engine

The internal combustion engine

If you put a tiny amount of high-energy fuel into a small, enclosed space and ignite it, an incredible amount of energy is released in the form of expanding gas. In the case of a combustion engine, a cycle is created that allows you to set off explosions like this hundreds of times per minute. This energy harnessed is the core of the basic combustion engine.
Most vehicles work on a *four stroke combustion* cycle to convert petrol into motion. The four strokes are:

**Intake stroke** – The piston moves down to let the engine take in air and petrol

**Compression stroke** – The piston moves back up to compress the air and petrol mixture to make the explosion more powerful

**Combustion stroke** – The spark plug ignites the petrol and the charge in the cylinder explodes driving the piston down

**Exhaust stroke** – Once the piston hits the bottom of its stroke the exhaust valve opens and the exhaust leaves through the tailpipe

**The diesel engine**

The diesel engine is typically the choice for large vehicles, such as trucks and buses. However, as people are improving the diesel engine to make it cleaner and less noisy, the everyday commuter vehicles are being fitted with diesel engines. The diesel engine and the petrol engine operate in a similar way. They both covert fuel into energy through a series of small explosions or combustions. The major difference between diesel and petrol is the way these explosions happen. In a diesel engine, the air is compressed first, and then the fuel is injected. Because air heats up when it's compressed, the fuel ignites. Unlike the petrol engine, the diesel engine does not have a spark plug. It is the heat in the compressed air that lights the fuel in a diesel engine.

**Fuel injection**

Diesel engines use direct fuel injection – the diesel fuel is injected directly into the cylinder.

The injector on a diesel engine is its most complex component and in any particular engine it may be located in a variety of places. Some diesel engines employ special induction valves, pre-combustion chambers, or other devices to swirl the air in the combustion chamber or otherwise improve the ignition and combustion process.
Some diesel engines contain a **glow plug**. When a diesel engine is cold, the compression process may not raise the air to a high enough temperature to ignite the fuel. The glow plug is an electrically heated wire that heats the combustion chambers and raises the air temperature when the engine is cold so that the engine can start.

**Engine parts**

The core of the engine is a cylinder with a piston moving up and down inside the cylinder. Most vehicles have between four and eight cylinders. These cylinders are arranged in one of three ways:

- **Inline** – The cylinders are arranged in a line in a single bank
- **V** – The cylinders are arranged in two banks set at an angle to one another
- **Flat** – The cylinders are arranged in two banks at opposite sides of the engine

![Engine Diagram](image)

**Spark plug**

This supplies the spark that ignites the air/fuel mixture so that combustion can occur

**Valves**

The intake and exhaust valves open at the proper time to let in air and fuel and to let out exhaust (Note that both valves are closed during the compression and combustion phase)

**Piston**

This is a cylindrical piece of metal that moves up and down inside the cylinder

**Piston rings**

These provide a sliding seal between the outer edge of the piston and the inner edge of the cylinder. The rings serve two purposes:

- They prevent the fuel/air mixture and exhaust in the combustion chamber from leaking into the sump
- They keep oil in the sump from leaking into the combustion area
**Connecting rod**
This connects the piston to the crankshaft

**Crankshaft**
This turns the piston's up-and-down motion into circular motion

**Sump**
This surrounds the crankshaft. It contains some amount of oil, which collects in the bottom of the sump.

The valve train consists of the valves and a mechanism that opens and closes them. The opening and closing system is called a camshaft. The camshaft has lobes on it that move the valves up and down.

Most modern engines have what are called overhead cams, i.e. the camshaft is located above the valves. These activate the valves directly or through a very short linkage.

N.B. Older engines used a camshaft located in the sump near the crankshaft, linked by rods to valve lifters above the valves.

A timing belt links the crankshaft to the camshaft so that the valves are in sync with the pistons. Many high-performance engines have four valves per cylinder (two for intake, two for exhaust), and this arrangement requires two camshafts per bank of cylinders, hence the phrase ‘dual overhead cams’.

The ignition system produces a high-voltage electrical charge that transmits to the spark plugs via ignition wires. The charge flows to a distributor which has one wire going in to the centre and four, six, or eight wires (depending on the number of cylinders) coming out of it.

The ignition wires send the charge to each spark plug.

**Engine cooling, air-intake and starting systems**

The cooling system in most vehicles consists of a radiator and water pump. Water circulates through passages around the cylinders and then travels through the radiator to cool it off. In some vehicles, as well as most motorcycles, the engine is air-cooled instead (you can tell an air-cooled engine by the fins adorning the outside of each cylinder to help dissipate heat).
Air circulation

Most vehicles are **normally aspirated**, i.e. air flows through an air filter directly into the cylinders. High-performance engines are either **turbocharged** or **supercharged**, which means that air coming into the engine is first pressurised to increase performance. The amount of pressurisation is called **boost**. A turbocharger uses a small turbine attached to the exhaust pipe to spin a compressing turbine in the incoming air stream. A supercharger is attached directly to the engine to spin the compressor.

The **starting system** consists of an electric starter motor and a **starter solenoid**. When you turn the ignition key, the starter motor spins the engine a few revolutions so that the combustion process can start. Because so much energy is needed and because most vehicles use a 12-volt electrical system, hundreds of amps of electricity must flow into the starter motor. The starter solenoid is essentially a large electronic switch that can handle that much current. When you turn the ignition key, it activates the solenoid to power the motor.

**Engine lubrication, fuel, exhaust and electrical systems**

The engine’s **fuel system** pumps petrol from the petrol tank and mixes it with air so that the proper air/fuel mixture can flow into the cylinders. Fuel is delivered in three common ways: carburetion, port fuel injection and direct fuel injection.

- In carburetion, a device called a **carburettor** mixes petrol with air as the air flows into the engine.
- In a **fuel-injected** engine, the right amount of fuel is injected individually into each cylinder either right above the intake valve or directly into the cylinder.

**Oil** is also very important to your engine’s health. The oil is circulated throughout the engine via the **lubrication** system.

The two main parts of your engine that require oil are the pistons and any bearings that allow things like the crankshaft and camshafts to rotate freely.

The **exhaust system** includes the exhaust pipe and the muffler. The muffler dampens the sound of the thousands of small explosions coming out your tailpipe. The exhaust system also includes a catalytic converter, which converts
the harmful pollutants into less harmful emissions before they ever leave the vehicle’s exhaust system.

The electrical system consists of a battery and an alternator. The alternator is connected to the engine by a belt and generates electricity to recharge the battery. The battery makes 12-volt power available to everything in the vehicle needing electricity.

**The transmission system**

The transmission system serves to send power from the engine to the wheels to get the vehicle in motion. The transmission system consists of:

**The clutch** – In a clutch, a flywheel connects to the engine, and a clutch plate connects to the transmission. When the driver pushes the clutch pedal down (engages), the release bearing is pushed against the diaphragm spring which flexes, allowing the pressure plate and friction plates to spin freely releasing the drive.
The gearbox
The gears are arranged in two shafts within a gearbox. Power is transmitted from the engine through the input shaft which then turns the gear wheels. There is a second set of gear wheels on the output shaft which work in unison with the input shaft. When the clutch is engaged these two sets of gear wheels rotate at all times. When a gear is selected, power is transmitted from the engine to the vehicle wheels via the driveshaft.

Front-wheel drive – Rotational power from the engine is sent to the front wheels via the final drive unit. The front wheel drive is connected to the driveshaft with universal joints. Most modern vehicles will have a front-wheel drive system.

Rear-wheel drive – This is found mainly in older vehicles. The engine power is sent to the rear wheels via a propeller shaft. The rear wheel drive is connected to the driveshaft the same way as the front wheel drive.

Four-wheel drive – All four wheels of the vehicle are driven directly by the engine and the transmission system has extra drive shafts.

Automatic transmission
Automatic transmission differs from manual transmission with the elimination of the clutch for the torque converter, which is an impeller attached to the flywheel drive.

The braking system

Leverage and hydraulics
The basic idea behind any hydraulic system is that force applied at one point is transmitted to another point using an incompressible fluid.

Two pistons are fit into two glass cylinders filled with oil and connected to one another with an oil-filled pipe. If you apply a downward force to one piston, then the force is transmitted to the second piston through the oil in the pipe. The pipe connecting the two cylinders can be any length and shape. The pipe can also fork, so that one master cylinder can drive more than one slave cylinder if desired.

There are two main types of foot brake in vehicles:

The disc brake
The disc brake consists of:
- Brake pads
- The calliper, which contains a piston
- The rotor, which is mounted to the hub

In a disc brake, the brake pads squeeze the rotor instead of the wheel, and the force is transmitted hydraulically instead of through a cable.
The drum brake
Like the disc brake, the drum brake has two brake shoes and a piston. But the drum brake also has an adjuster mechanism, an emergency brake mechanism and lots of springs.

When you hit the brake pedal, the piston pushes the brake shoes against the drum. Many drum brakes are self-actuating; as the brake shoes contact the drum, there is a kind of wedging action, which has the effect of pressing the shoes into the drum with more force.

The extra braking force provided by the wedging action allows drum brakes to use a smaller piston than disc brakes. The springs are there because the wedging action means that the shoes must be pulled away from the drum when the brakes are released.
The master cylinder
When you press the brake pedal, it pushes on the primary piston through a linkage. Pressure builds in the cylinder and lines as the brake pedal is depressed further. The pressure between the primary and secondary piston forces the secondary piston to compress the fluid in its circuit. If the brakes are operating properly, the pressure will be the same in both circuits.

The combination valve
You will find a combination valve on most vehicles with front disc brakes and rear drum brakes.

The valve does the job of three separate devices:

- The metering valve
- The pressure differential switch
- The proportioning valve

Metering valve
The metering valve section of the combination valve is required in vehicles that have disc brakes on the front wheels and drum brakes on the rear wheels. As we
have already seen, the disc brake pad is normally in contact with the disc, while the drum brake shoes are normally pulled away from the drum. Because of this, the disc brakes are in a position to engage before the drum brakes when you push the brake pedal down.

The metering valve compensates for this, making the drum brakes engage just before the disc brakes. Having the rear brakes engage before the front brakes provides a lot more stability during braking.
Pressure differential switch

The pressure differential valve is the device that alerts you if you have a leak in one of your brake circuits. The valve contains a specially shaped piston in the middle of a cylinder. Each side of the piston is exposed to the pressure in one of the two brake circuits. If one side develops a leak, the pressure will drop in that circuit, forcing the piston off-centre. This closes a switch, which turns on a light in the instrument panel of the vehicle.

Proportioning valve

The proportioning valve reduces the pressure to the rear brakes. Regardless of what type of brakes a vehicle has, the rear brakes require less force than the front brakes.

If equal braking force were applied at all four wheels during a stop, the rear wheels would lock up before the front wheels. The proportioning valve only lets a certain portion of the pressure through to the rear wheels so that the front wheels apply more braking force.

Suspension

The suspension of a vehicle is part of the chassis, which comprises all of the systems located beneath the vehicle's body. These systems include:

- The frame – structural, load-carrying component that supports the vehicle’s engine and body
- The suspension system – supports weight, absorbs and dampens shock and helps maintain tire contact
- The steering system – enables the driver to guide and direct the vehicle
The tyres and wheels – makes vehicle motion possible by way of grip and/or friction with the road

The three components of any suspension are: springs, dampers and anti-sway bars

Springs
Coil springs – These are the most common type of spring and are heavy-duty torsion bars coiled around an axis. Coil springs compress and expand to absorb the motion of the wheels.

Leaf springs – These consist of several layers of metal (called leaves) bound together to act as a single unit. They are used on most trucks and heavy-duty vehicles.

Torsion bars – Torsion bars use the twisting properties of a steel bar to provide coil-spring-like performance. One end of a bar is anchored to the vehicle frame, the other is attached to a wishbone, which acts like a lever that moves perpendicular to the torsion bar. When the wheel hits a bump, the torsion bar then twists along its axis to provide the spring force.

Air springs – Air springs consist of a cylindrical chamber of air positioned between the wheel and the vehicle's body. They use the compressive qualities of air to absorb wheel vibrations.

Because springs are great at absorbing energy but not so good at dissipating it, other structures, known as dampers, are required to do this.
Dampers: shock absorbers

Unless a **dampening structure** is present, a vehicle spring will extend and release the energy it absorbs from a bump at an uncontrolled rate. The **shock absorber**, or ‘snubber’, is a device that controls unwanted spring motion through a process known as **dampening**. Shock absorbers slow down and reduce the magnitude of vibratory motions by turning the kinetic energy of suspension movement into heat energy that can be dissipated through hydraulic fluid.

Shock absorbers work in two cycles – the **compression cycle** and the **extension cycle**. The compression cycle occurs as the piston moves downward, compressing the hydraulic fluid in the chamber below the piston. The extension cycle occurs as the piston moves toward the top of the pressure tube, compressing the fluid in the chamber above the piston. The compression cycle controls the motion of the vehicle’s unsprung weight, while extension controls the heavier, sprung weight.

All modern shock absorbers are **velocity-sensitive** – the faster the suspension moves, the more resistance the shock absorber provides.
Dampers: struts and anti-sway bars
Another common dampening structure is the strut – basically a shock absorber mounted inside a coil spring. Struts perform two jobs:

- A dampening function like shock absorbers
- They provide structural support for the vehicle suspension.

Because shocks and struts have so much to do with the handling of a vehicle, they can be considered critical safety features. Worn shocks and struts can allow excessive vehicle-weight transfer from side to side and front to back. This reduces the tyre’s ability to grip the road, as well as handling and braking performance.

Anti-sway bars
Also known as anti-roll bars these are used along with shock absorbers or struts to give a moving automobile additional stability. An anti-sway bar is a metal rod that spans the entire axle and effectively joins each side of the suspension together.

When the suspension at one wheel moves up and down, the anti-sway bar transfers movement to the other wheel. This creates a more level ride and reduces vehicle sway.
Vehicle instruments

Battery malfunction symbol

High beam headlights are switched on

Low oil level

Indicator lights
Reflection on workshop learning

Take a few moments to reflect on the following questions and discuss your answers with at least one other colleague from the programme

<table>
<thead>
<tr>
<th>What have I gained/learned from the workshop:</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ For myself</td>
</tr>
<tr>
<td>➢ In my work</td>
</tr>
<tr>
<td>➢ In relation to my colleagues and friends</td>
</tr>
</tbody>
</table>

| What personal changes will I undertake/implement myself and with colleagues? |

| Where do I go from here? |

| What specific actions am I going to take? |
**What I want to leave here:**
(Anything that I used to do before I came to the training session that I am now going to discontinue thinking, saying or doing)

<table>
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</table>

**What I want to take with me:**
(Anything that I did not do, say or think before I came to the training session that I am now going to start doing, saying or thinking)

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