



**WP7. Harmonisation of Ecodriving in driving school curriculum and driver test**

# **Harmonised Ecodriving Curriculum for Driving School Education and Driver License Testing**



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# Imprint

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# 1. Preamble

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Bionics, as dedicated to nature's inventions, strongly influences technical research and development nowadays. Birds' design and energy management, energy-efficient flying and the construction of feathers aiming to minimize turbulences are as good examples in this context as the shapes of fishes providing information on optimum streamlining. There is a lot to learn from nature enabling innovations like aircraft wings copying birds' wings to save fuel.



Drivers can benefit from the ideas of nature, as well, particularly as the effects may be experienced in everyday driving. The broader perspective of a mixed mobility of car driving, cycling and walking would provide even more opportunities for optimization.



No cyclist would accelerate heavily while approaching a stop, brake sharply before getting there and immediately accelerate again afterwards. He/ she would quickly run out of breath and power. On the contrary, smart cyclists aim to maintain a steady speed by clever manoeuvring through traffic in order to avoid stopping. However, some overdo it when ignoring red lights for the sake of the momentum built-up.



Car drivers often behave in a different way as driving-off doesn't perceptibly cost energy. Also braking after accelerating is easy to do. At first glance, energy-efficiency seems to play no role in car driving, unlike in cycling.



Cyclists do know, that a steady way of riding requires the smallest amount of power and makes them reach their destination relaxed, energy-efficient and yet on time. That is why cyclists are role models for riding in an environmentally friendly way and additionally are less accident prone by avoiding heavy acceleration with the effect of driving too close behind.



This way of cycling, becoming natural in time, illustrates what steady, safe and energy-efficient mobility looks like. This driving style is ideal for car driving too, as Ecodriving saves fuel and makes people reach their destinations swiftly, in a relaxed mood and a safe manner. Burning fuel causes harmful emissions and costs money. In particular, driving at too high revs, unnecessary accelerating and braking and a careless use of in-car electrics increase fuel consumption dramatically.

## 2. Advanced Car Driving

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Up-to-date techniques and tactics of safe and environmentally friendly driving should be part of learner drivers' tuition from the very beginning in order to adapt driving know-how to today's challenges and form driving culture accordingly. Any novice driver is initially confronted with the special emotionality of traffic. Young people in particular must learn and be taught rational, clever and socially responsible behaviour first. Participation in traffic means taking responsibility for the own actions and their effect on other road users, passengers or the environment. This is in particular influenced by current diverse and increasing mobility.

On one hand, novice drivers, mostly young people, must have the necessary driving skills when starting their career as traffic participants. On the other hand, they must realise their responsibility as drivers and be able to meet it. Therefore, in the framework of driver education, existing competences must be cemented and solid basics conveyed. If theoretical lessons are mandatory, the respective teaching should start at this point already.

Driving a car is generally considered fairly easy to learn. In actual fact, it is quite challenging as drivers simultaneously have to control the car, know and follow the many traffic rules and be fully concentrated all the time. Additionally, drivers must closely observe a complex and ever changing traffic which requires immediate but appropriate decisions in a partnership mind-set, responsible and environmentally conscious. Driving instructors know that driving a car is not a simple activity. All novice drivers, especially the majority of young people, must be able to cope with these requirements from the very start as mistakes in real-world traffic may have incalculable consequences.

Considering a partly different access because of cultural reasons, already existing learner drivers curricula as well as the GDE-matrix, the following outline plan may serve as a foundation for environmentally friendly and safe driving.

### 3. Ecodriving in Driving School Education and Testing

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#### Sustainability

It is in the interests of all, from an environmental point of view and out of a sustainable perspective, that we waste less fossil fuel. The driving school has an important duty to train the learner drivers to meet these demands. The training should be used from the beginning and replace the old fashioned way of training. The key question often raised during discussions with instructors but also examiners is:

#### Do learner drivers have sufficient competence/ skills?

The answer to this is relatively easy, because a learner has the skills acquired that he/she has been trained during driver training in driving schools. Yet this requires a different mindset within didactics of learner driver education. If you build up education based on the GDE-Matrix or the Stage-Model (level of proficiency based education model), learning targets have to be evolved step-by-step and put in meaningful sequence and have not to be treated in parallel. Thinking about the right contents of education it becomes clear that not only learners but also instructors have to deal with a very complex situation which in light of increasing speed of technological development gets even more complex on an ongoing basis. It seems appropriate to change the education from an “one-size fits all” approach towards an individual education in which the personal skills and preferences of a learner have to be taken into account. Of course this requires additional didactical methods in order to enable driving instructors to collect the information needed and this way getting easier access to the learners.

#### Coaching

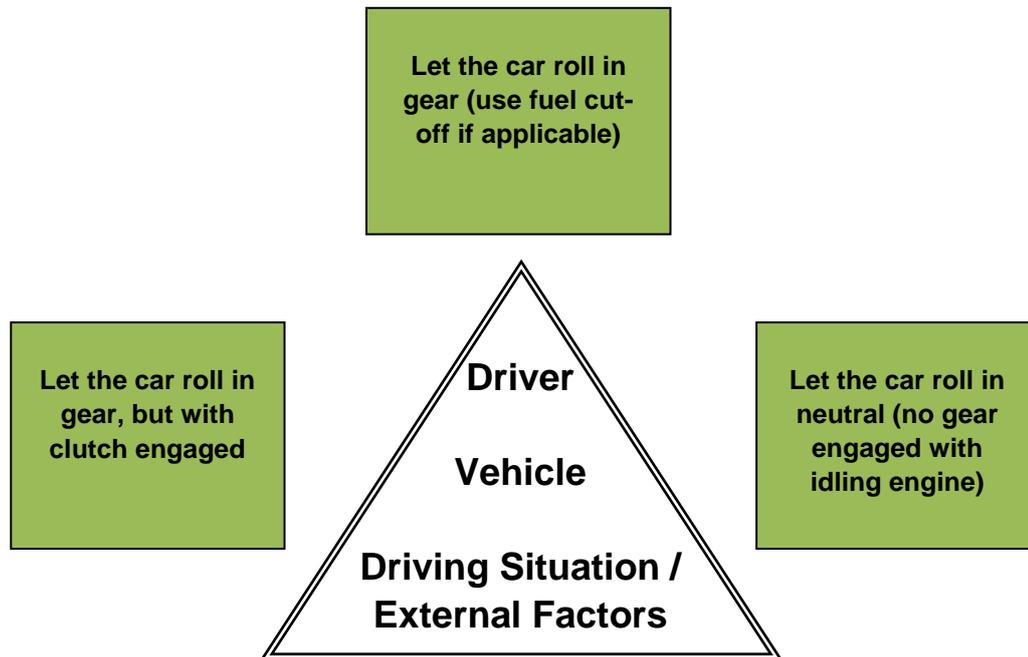
Coaching is **one** additional tool for driving instructors to broaden their portfolio of teaching methods and prepare learners based on their individual capabilities but also on continuously changing circumstances and technological development. Ecodriving recommendations strongly depend on the situation but also on the specifications of the car. This is fully in line and completely confirms the findings and recommendations resulting from the **ECOWILL** project which will be demonstrated in the following example:

**ECOWILL project:**  
[www.ecdrive.org](http://www.ecdrive.org)

**Anticipate traffic flow to make maximum use of vehicles' momentum/ to use built-up kinetic energy of the car most efficiently**

- **Let the car roll in gear**
- **Let the car roll in neutral (no gear engaged with idling engine)**
- **Let the car roll in gear, but with clutch engaged**
- **Make use of the engine's fuel cut-off whenever useful**

According to the ECOWILL project the appropriate driving technique to be used is a situational decision depending on the following factors:



It has to be taken into account that respective techniques to utilize momentum also in the sense of the Coaching method have to be adapted to the individual skills and preferences of the learner driver. **Therefore it has to be assured that an adequate rolling in neutral (even with gears disengaged or clutch pressed) is recognized and appreciated as a special Ecodriving technique by the examiners.** From the perspective of minimum standards and requirements it seems sufficient if at least one of the above mentioned techniques is shown in a satisfactory manner during the practical test.

## 4. Driver Education and the GDE-Matrix

### GDE-Matrix

The so called "GDE-Matrix" (Goals for Driver Education) deals with all relevant factors and targets that a harmonised European driving school education must comprise according to the GADGET-experts<sup>1</sup> from eight different countries, describing what is characterising a good driver.

1. Vehicle control
2. Traffic situations
3. Goals and context of driving
4. Goals for life, skills for living

The first 4 levels show, that driving consists of technical and social and psychological dimensions with the latter having the bigger impact on driving behaviour. Participating in traffic is not primarily determined by rules or learned behaviour, but underlies psychological and social factors that severely and spontaneously influence and modify driving behaviour. Conveying and reinforcing behavioural patterns accepted as useful help to avoid those external factors can cause such rapid changes.

### 5. Cultural and work related influences

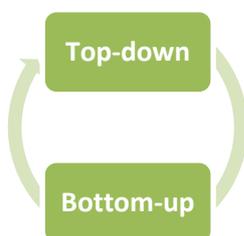
In 2010, an additional 5<sup>th</sup> level comprising cultural and work-related influences was introduced. This 5<sup>th</sup> level is considered as an additional influencing variable to the already existing 4 levels.

The GDE-Matrix as a model helps to understand which aspects of driver license training are important, or - to make it clearer- which competences need to be established during learner driver education. The different levels within the GDE-Matrix demonstrate that the learning process should be organised in a consistent system.

This means that at the beginning of education on the level „Goals for Life, Skills for Living“ it must be clear why the learner driver wants to obtain a driver license and what is his attitude towards traffic, social norms and values. A learner driver frustrated by society will have a different view of traffic compared to a learner feeling acknowledged and supported.

On the other side there needs to be sufficient competence on the level of "Vehicle Control" in order to appropriately assess traffic and traffic situations as well as to learn safe behavior in traffic. If there is a lack of competence in vehicle control the learner driver concentrates more on the vehicle instead of focusing on traffic. The learning process is overloaded or disturbed.

This learning model is not to be seen as a hierarchical model, but as a combination of "Top Down" and "Bottom Up" strategies approaching learning targets from both sides.



<sup>1</sup> See EU-Project GADGET, Final report ([http://www.kfv.at/fileadmin/webcontent/Publikationen\\_englisch/GADGET-FinalReport.pdf](http://www.kfv.at/fileadmin/webcontent/Publikationen_englisch/GADGET-FinalReport.pdf)).

## GDE-Matrix

(Hatakka, Keskinen, Glad, Gregersen, Hernetkoski, 2002) (see EU-Project HERMES, 2010, Scenarios Handbook English [www.alles-fuehrerschein.at/HERMES](http://www.alles-fuehrerschein.at/HERMES))

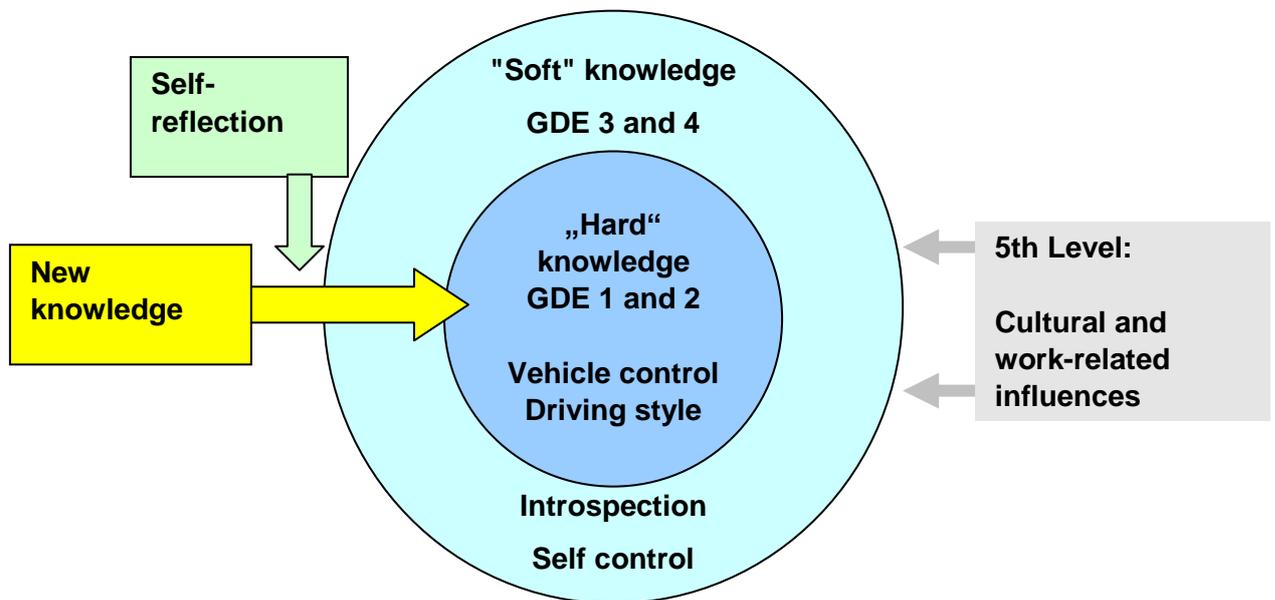
	<b>Knowledge and skills</b>	<b>Risk-increasing factors</b>	<b>Self assessment, introspection</b>	
<b>Goals for life, skills for living</b>	Lifestyle, age, social position, values	Sensation seeking, peer pressure, risk acceptance	Risky tendencies, impulse control	<b>5th Level:</b>  <b>Cultural and work-related influences</b>
<b>Goals and context of driving</b>	Role of motives, route planning, choice of time	Alcohol, fatigue, purpose of driving	Own motives, self critical thinking	
<b>Traffic situations</b>	Traffic rules, observation, driving path, automatisisation	Disobeying rules, information overload	Awareness of personal strengths and weaknesses	
<b>Vehicle control</b>	Control of direction, position, physical laws	Unsuitable speed, difficult conditions	Calibration and awareness of car control skill	

Moreover, the GDE-matrix shows the limitations and difficulties for learning processes aiming to train and change behavioural patterns. Ignoring these aspects, attempts may fail to establish application of contents or change in behaviour.

The GDE-Matrix also stresses the possibility to influence and control the learning process. Thoughts, resistances and attitudes as part of “Soft” knowledge (GDE-level 3, 4 and 5) may cause complete rejection of driving techniques or behavior as part of “Hard” knowledge (GDE-level 1 and 2). The learning process is disturbed and important content is being blocked/ rejected.

This means for instance that learner drivers being raised with the thought that speed limits are only established to allow the local authorities to raise money from drivers, will not fully accept the rules and show poor handling of speed limits. The driving instructor is in charge to question and get to know the attitude of his learner driver. With this knowledge he might be able to open an important door towards the attitudes of his student putting him into a position to inspire or excite him for new knowledge and content. This can also be described as a capability of learner drivers to reflect on themselves and their behavior.

## GDE-Matrix as support



Conveying driving techniques like early shifting, letting the car roll and enlarging the safety distance are mainly "hard knowledge" how to handle the car and specific driving situations on levels 1 and 2. If those driving techniques are to be accepted by the learner drivers, the corresponding willingness of levels 3 and 4 ("soft knowledge") has to be given. For example, it is hard to teach learners a modern driving style, if e.g. their parents constantly drive with medium or even high engine speed / high revolutions (rpm), contradicting and conflicting with the taught driving techniques.

Taking into account the cultural and work-related influences of level 5, to ignore this dimension may result in complete confusion when communicating with learner drivers. It is crucial to understand why somebody wants to obtain the drivers licence or to drive a car. Knowing the individual wishes, expectations and hopes can influence the learning process.

In experiencing novice drivers' driving style significantly distinguish between technical and social components. The technical components are the most important foundation for learner education containing basic-knowledge on how to operate a vehicle. The technical components have to be learned and internalised up to a level of automatic reaction.

Social aspects have to be included at a later stage of the education. They serve to smartly master the challenges in daily traffic, and help to actively organise driving in traffic. Overloading the learning process e.g. including social components at a too early stage may prevent significant positive impacts on educational targets.

For this reason, education needs to be organised in different well-matched and connected stages building on each other. It is advised to subdivide the education into the following five stages: Basic Stage, Structural Stage, Performance Stage, Special Trips and Final Stage (approaching the driver test). The basic and structural stages contain and train technical dimensions, while the performance stage the special trips and the final stage focus on social dimensions.

## 5. Coaching as an additional Method in the Field of Driver Education

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### Term “coach”

Coaching is the professional counselling and support of a person (the coachee) by a coach, while the person is exercising complex actions. Aim is to enable the coachee to achieve his personal optimum result.

The term "coach" means a horse-drawn carriage getting people from one point to another. In this respect, on the meta-level, coaching can be seen as a "development tool". The target is defined by the coachee who is accompanied by the coach on a specific journey, for example carefully approaching a road crossing.

The term "coach" in this meaning was initially used in sports, where the coach is not only a trainer of skills but also partner and motivator. In the first place, a coach is the trainer of the mental strength of sportsmen. As neutral partner in communication and interaction, the coach shall enable, accompany and facilitate the coachee's individual development process.

### Application

Increasingly, coaching is practiced in management and marketing, but also in personal contexts. Triggered by expert suggestions, specific actions are assessed under real-world conditions and better alternatives jointly revealed. Coaching is the most effective way to lead the coachee to his personal optimum, maybe even a top performance.

Regarding road traffic and especially car-driving, coaching requires the consideration of the full context of driving from the coachee's real-life point of view. Driving a car is not isolated, but strongly correlated to contextual conditions (see GDE-matrix). Here, the task of the coach is to support the learner driver in achieving an excellent performance in safe, economical and environmentally friendly driving. Especially the targeted use of open questions puts the learner driver into a position where he/ she has to be active. Mere answering with "Yes" or "No" and thus avoiding being involved is not sufficient any more. The learner drivers need to reflect on the traffic system and all factors involved. Using open questions the driving instructor gets a lot of important information which allows him to influence and control the whole learning process of his pupils.

Coaching is characterised either by intensive evaluation of experiences made using specific key questions or slowly acquainting the coachee to new behaviour by asking for ideas or first impressions/experiences. In this sense, especially in further education of drivers, situations can be customised, activating the participant, allowing important first impressions and triggering further-leading interactive involvement.

The role of the coach is not to represent a "knowledge pool" but to incorporate an interested companion, allowing the coachee to find his own way by the help of sophisticated questioning. The key principle of coaching is partnership.

Coaching urgently requires that learner and "teacher" are introduced in the subject of learning. The targets need to be defined beforehand so the learner knows in which direction the common work is aimed.

Driving is more than just moving from point A to point B. It is quite a complex task in a social context. Driving and the related risks are strongly determined by driving motives and purposes as well as by lifestyle and attitudes towards road traffic. Very few drivers ever reflect this link so keeping these connections unconscious. The earlier and more intense drivers learn to confront themselves with these factors and learn to question them, the bigger their competence will be in assessing certain driving situations, avoiding or dealing with them in a risk decreasing way.

As stated earlier, it is important to get to know the related wishes, expectations and hopes of the learner in the context of driving school education (see chapter GDE-Matrix). Therefore it is useful to skilfully ask the learner about his motives and expectations right from his first lesson. The following key questions could be used to start a conversation:

### Open questions



- Could you please describe briefly why you want to obtain a drivers licence?
- Why do you want to obtain a drivers licence?
- What expectations do you have regarding the driver license?
- What wishes and expectations do you associate with the driver license?
- What are the first things coming to your mind thinking of the drivers licence?
- What do you want to do when you have obtained the drivers licence?

### Personalised education plan

Getting to know the details behind those questions a personalised education plan can be established, helping to get the optimum access to the learner.

## 6. Coaching as an additional Method in the Field of Driver Testing

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The Coaching method is also useful for the driver testing, especially for the case that the pupil made mistakes, which are not clear to understand. Here the examiner can use the open questions to get more information from the pupil and his / her understanding of the traffic:

- Why did you react in this way?
- What are your thoughts in this situation?
- What did you expect from your behaviour?
- Why have you done this in this way?
- What do you think will happen if you do it the other way?

## 7. The Golden Rules of Ecodriving



Fuel consumption at 50 kph:



### 1. Anticipate traffic flow

- Read the road as far ahead as possible and anticipate the flow of traffic
- Act instead of react – increase your scope of action with an appropriate distance to use momentum. An increased safety distance equivalent of about 3 seconds to the car in front optimises the options to balance speed fluctuations in traffic flow – enabling steady driving with constant speed (see also additional explanation #1).
- Make maximum use of the vehicle's momentum. Three different techniques are applicable (within 2 categories: (i) in gear; (ii) in neutral) – consider details of the car's manual (see also additional explanation #2)

### 2. Maintain a steady speed at low RPM

- Drive smoothly at low RPM using the highest possible gear (See also additional explanation #3.1)
- Remember driving at high speeds or with high RPM significantly increases fuel consumption (See also additional explanation #3.2)

### 3. Shift up early

- Shift to higher gear at approximately 2.000 RPM
- Consider the traffic situation, safety needs and vehicle specifics (See also additional explanation #4)

### 4. Check tyre pressures frequently at least once a month and before driving at high speed

- Keep tyres properly inflated as low tyre pressure is a safety risk and wastes fuel (For correct tyre pressure (acc. to loading, highest pressure and speed driven), check with car's manual.)

### 5. Consider any extra energy required costs fuel and money

- Use air conditioning and electrical equipment wisely and switch it off if not needed  
Electrical energy is converted from extra fuel burned in a combustion engine, so electrical equipment doesn't work "for free" – it always costs extra energy and money.
- Avoid dead weight and aerodynamic drag

## Additional Explanation to the Golden Rules:

### Additional Explanation #1:



Systematically increasing vehicle-to-vehicle distance within traffic flow significantly improves overall road safety. Increased safety distance equivalent of around 3 seconds to a vehicle driving ahead optimises options to act instead of only react and reduces risky situations.

Key action: Step off the accelerator if traffic flow is slowing down to keep safety distance. With this simple action speed fluctuations in traffic can often be equalised and gently managed. As a result (strong) braking – while wasting built-up kinetic energy – can be often avoided as well as the need to accelerate after too hard deceleration.

### Additional Explanation #2:

#### Using vehicle's momentum:

##### 1. In gear

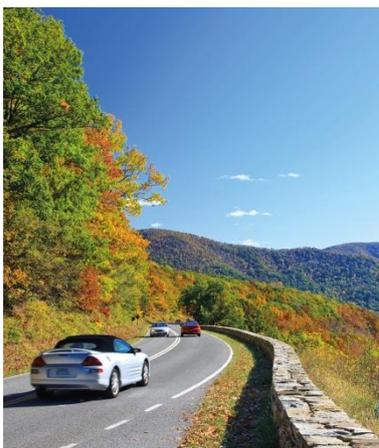
##### 2. In neutral:

- no gear engaged with idling engine
- in gear with clutch engaged

Making use of vehicles' momentum means to use built-up kinetic energy of the car most efficiently. The overall goal is letting the car roll and driving at a steady speed whenever possible instead of braking and subsequently accelerate.

Using vehicles momentum three different techniques are applicable – classified in two categories. It is important to consider specific advice of the individual car's manual as well as strictly follow national legal requirements.

Using momentum can be realised within two different categories of driving techniques: (i) in gear, (ii) in neutral – resulting in three specific techniques.



#### Category #1 "using momentum in gear"

##### Driving advice technique #1: Let the car roll in gear

The speed of the vehicle will reduce due to the engine's braking effect via mechanical friction (as gear engaged). Using the right gear unintended acceleration (e.g. while driving downhill) can be avoided. This technique is beneficial to saving fuel if the respective engine has a fuel cut-off mode and also while driving at higher speeds (consider advice for engine's fuel cut-off).



**Note: All three techniques are to be applied strictly following the guideline "Safety First".**

## Category #2 "using momentum in neutral"

### Driving technique #2: Let the car roll in neutral (no gear engaged with idling engine)

The technique rolling in neutral with no gear engaged (with idling engine) makes better use of a vehicle's kinetic energy because there is no engine braking effect. This is beneficial for situations like approaching an obstacle or an identified stop (red traffic lights; Stop-sign). Thus, a relative long distance can be driven at quite constant speed without additional acceleration. While rolling in neutral the fuel consumption is defined by the idling engine alone. Especially for cars without engine fuel cut-off mode this is a good technique to use vehicle's kinetic energy. But also for cars with fuel cut-off the option to let the car roll without gear engaged can save fuel at typical low speed driving in cities (esp. when "stop-and-go" or only a little faster). Engine's fuel cut-off does not work at low RPM (check with the car's manual for details), and is activated beyond a specific engine speed for the individual car. For safety reasons while driving downhill it is important to always stay in the right gear to avoid unintended acceleration.

### Driving technique #3: Letting the car roll in gear, but with clutch engaged

This technique is advisable in situations when it can be assumed that the ride can be continued soon in the same gear, and the use of the engine's fuel cut-off and engine braking effect is not useful for good fuel efficiency.

### Consider: Make use of the engines fuel cut-off whenever useful

It is important to know that inner mechanical friction (of engine/ transmission) wastes more kinetic energy than letting the car roll without traction (no gear engaged or clutch engaged). Engine fuel cut-off (if available for a specific car) operates only at certain speed range and revs area which differs from car to car. It is useful to know the car's specifics as from the owner's manual. At low RPM and low speeds (below 50 kph) – as typical for driving in cities – the use of the engine's fuel cut-off is not always possible and useful. Especially for city driving it can be extremely difficult and distracting – safety risk! – to identify the right gear for making best use of the engine's fuel cut-off. Relevant for safe driving is the fact that some modern cars accelerate automatically if the car falls below a specifically defined (engine) speed. This effect – if unintended – should be avoided because it raises fuel consumption and may lead to driver's irritation (road safety issue). Older cars mostly have no engine fuel cut-off mode.

### Additional Explanation #3:

#### 3.1. Smooth driving with steady speed saves a lot of fuel compared to the same average speed, but with sequences of acceleration and braking.

Unnecessary speed peaks and abrupt braking do not only waste fuel, but also raise the stress level while driving and cause additional safety risks. Ecodriving strives for a smooth driving style allowing undisturbed, easy floating within traffic.

Using a cruise control can be advisable to support a smooth ride, especially for extra-urban driving (rural roads or highways), but also some traffic situations in city driving.

#### 3.2. High speed driving leads to a drastically increased fuel consumption

Especially for city driving there is nearly no chance to increase average speed or gain time advantage with strong acceleration and speed peaks. The time you need for a ride is dominated by external factors (like traffic density, traffic lights, etc.). Even on highways the time saving potential is quite low and has to be paid with drastically increased fuel consumption. Even getting a little bit faster means higher RPM plus aerodynamic drag, even within speed limits (e.g. 110 to 120 kph), and more fuel has to be burned and money wasted (see on-board vehicle computer).

### Additional Explanations #4:

#### **Rough guidance for shifting and steady speed driving (on the flat, not uphill):**

1 <sup>st</sup> Gear:	Driving-off only (one vehicle length)
2 <sup>nd</sup> Gear:	20 kph
3 <sup>rd</sup> Gear:	30 kph
4 <sup>th</sup> Gear:	40 kph
5 <sup>th</sup> Gear:	50 kph
6 <sup>th</sup> Gear:	60+ kph

1. Driving with high or even medium engine RPM always consumes more fuel than driving at low RPM at whatever speed. Therefore, early shifting is highly recommended. However, vehicle specifics and also the prevailing traffic situation has to be taken into account.

Based on the rough guidance for steady speed driving (on the flat, not uphill) the optimum gear shifting for each car has to be identified individually.

Full throttle acceleration should be avoided if the acceleration can be chosen individually. When driving uphill choose a gear which does not require fully pushing down the accelerator to keep an acceleration reserve (safety issue). As appropriate accelerator pedal position 2/3 or 3/4 should be chosen.



**Note: "Safety First"** guideline also applies for acceleration! For strong acceleration required (e.g. overtaking, lane changing, driving onto a highway) use intentionally full throttle acceleration "pedal to the metal" to quickly achieve the speed envisaged and safely manage the specific situation.



When accelerating stronger skipping gears can help to save fuel. Skipping gears is meaningful and fuel-efficient to reach faster a targeted final (steady) speed and keeping it for a longer time.

Engine torque curves of diesel and petrol cars differ strongly, also when comparing older and advanced engines in general (irrespective of fuel sort). Cars with diesel powered engines or advanced direct injection gasoline engines can be shifted up at even lower RPM than (older) petrol powered cars.



#### Specific advises for automatic transmission:

To drive fuel-efficient avoid kick-down to accelerate excepted when it is required for safety reasons (see above).

To intentionally shift up and ride with lower RPM with automatic transmission simply step-off the accelerator shortly.

Shifting and driving at low RPM is harmless to any engine or car! Overloaded/blocked particulate filter of diesel cars do not result from driving with low RPM, but relate to low engine temperature at too many short trips (also to be avoided due to high fuel consumption). If necessary a 10 minute lasting highway ride can prevent blocking the particulate filter. Please also see details and practical instructions in the car's manual or from car manufacturer directly. In general it is advised to select and buy a car that fits to the use pattern and trip structure.

## 8. Executive summary

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### Ecodriving from the first lesson

The most important step including Ecodriving in learner driver education from the first lesson on is to include all relevant techniques from the first lesson on without running into the risk to overstrain the learners. Therefore the right teaching method and the above presented step-by-step approach based on the GDE-Matrix and the level of proficiency based education is very important. Within this chapter the most important techniques are summarized again to give an overview on the general goals for education.

### Environmentally friendly driving

Environmentally friendly driving should be based on the following.

To start and to accelerate consumes extra energy. Many stops and accelerations can be avoided by anticipatory driving and adapting of the speed.

High speed and high roll resistance consumes extra energy. The difference in fuel consumption at varying speeds should be clarified. Other causes can be loading on the car roof, unnecessary load in the trunk, low tyre pressure etc.

A quick acceleration in low revs is favourable for the fuel consumption. The modern engine technique optimizes the fuel consumption during the acceleration. The highest possible gear should be engaged quickly and a steady speed with a minimum of gas given should be the aim.

Low revs – high gear is ideal for improved fuel consumption. In all situations the highest possible gear should be used for example when turning a street corner. A tight turn might require low revs and 2nd gear or a long corner could be as high as 4th with low revs.

High revs while accelerating and when driving are impact negatively on fuel consumption and causes more polluted exhausts. Change to a higher gear by 2500-3000 rpm at the latest and the catalytic converter will take care of the exhaust.

It is not necessary to always go through each gear during the acceleration. Every change of gear increases the fuel consumption, so it is possible to skip gears where appropriate.

Engine braking occurs when the accelerator is released; during engine braking the fuel consumption is zero. Avoid pressing the clutch until the number of revs is near 1000 and do not touch the gas pedal at all during the engine braking.

### **The goal is reached when the learner driver**

- Adapts the speed and the distance to vehicles ahead so unnecessary stops, braking and acceleration are avoided.
- Uses the highest possible gear in every situation.
- Shows competence in choosing the right method of deceleration in complex traffic situation. Core competence: Anticipation
- Accelerates in an environmentally friendly way, decisively and with low revs.
- Turns off the engine during (longer) stops.
- Shows knowledge of the influence/effect driving has on the environment and how damage can be reduced.

### **Appropriate use of engine braking in a car with fuel cut off**

When releasing the accelerator completely from revs exceeding 1300 rpm (1200 – 1400 rpm depending on the car) the fuel consumption will be shut off to zero until the revs are below 1000 rpm (1100 – 900 rpm depending on the car) where the engine starts to consume fuel again. Especially in higher gears long distances can be covered with zero fuel consumption when approaching crossings and bends. This method has a great impact on the overall fuel consumption.

Frequent wrong behavior is:

1. Not completely releasing the accelerator
2. Pressing the accelerator at any time during the engine braking
3. Changing to a lower gear before the revs are at 1000 rpm.

#### **Procedure notes:**

From revs exceeding 1300 rpm in different gears the learner driver should release the accelerator and let the engine brake until 1000 rpm be reached where he/she can

1. Change to a lower gear and continue the engine braking
2. Accelerate again
3. Press the clutch fully down and roll until stop

It is important to press the brake to show brake lights to warn following traffic where necessary

Repeated training should give the learner driver a feeling for how the distance covered differs in different gears and from different initial velocities.

In normal traffic sometimes the engine braking needs to be completed with braking but the clutch should always be in the upper position until the revs are at 1000 rpm.

An onboard computer which shows the current fuel consumption is beneficial during training.

### **The goal is reached**

When the learner driver routinely uses the momentum in the car during engine braking

## **Acceleration**

Modern cars with a manual transmission have at least 5 gears and 6 gears have become more common in recent years. A reason, among others, is that it is possible to drive at low revs at most speeds. During acceleration it is not necessary to use every gear. It could be more fuel efficient to skip gears. 1-2-4-6, 1-2-3-5 are examples but it could be used in different ways also 3-6 is possible in certain situations. In a powerful acceleration you often need higher revs when skipping gears and in most petrol cars 2500 rpm is a guideline.

### **Frequent wrong behavior is**

1. Slow acceleration e.g. a long distance in low gears. This is not fuel efficient.
2. Not choosing the highest possible gear when the desired speed is reached. For example when acceleration in 2nd gear results in a speed near 40-45 km/h the next gear ought to be 5 and not 4.

### **Procedure notes**

The learner driver should train to skip gears in various situations and in different order. He/she should also get experience in when the method does not work well e.g. on uphill slopes and when a powerful acceleration is needed for safety reasons.

### **The goal is reached**

When the learner driver uses the best method for a safe and environmentally friendly acceleration.

## 9. ECOWILL Blueprint

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The ECOWILL Blueprint describes the different steps to build up the modern style of driving in an effective way based on the GDE-Matrix and the “stage-model of learning”.

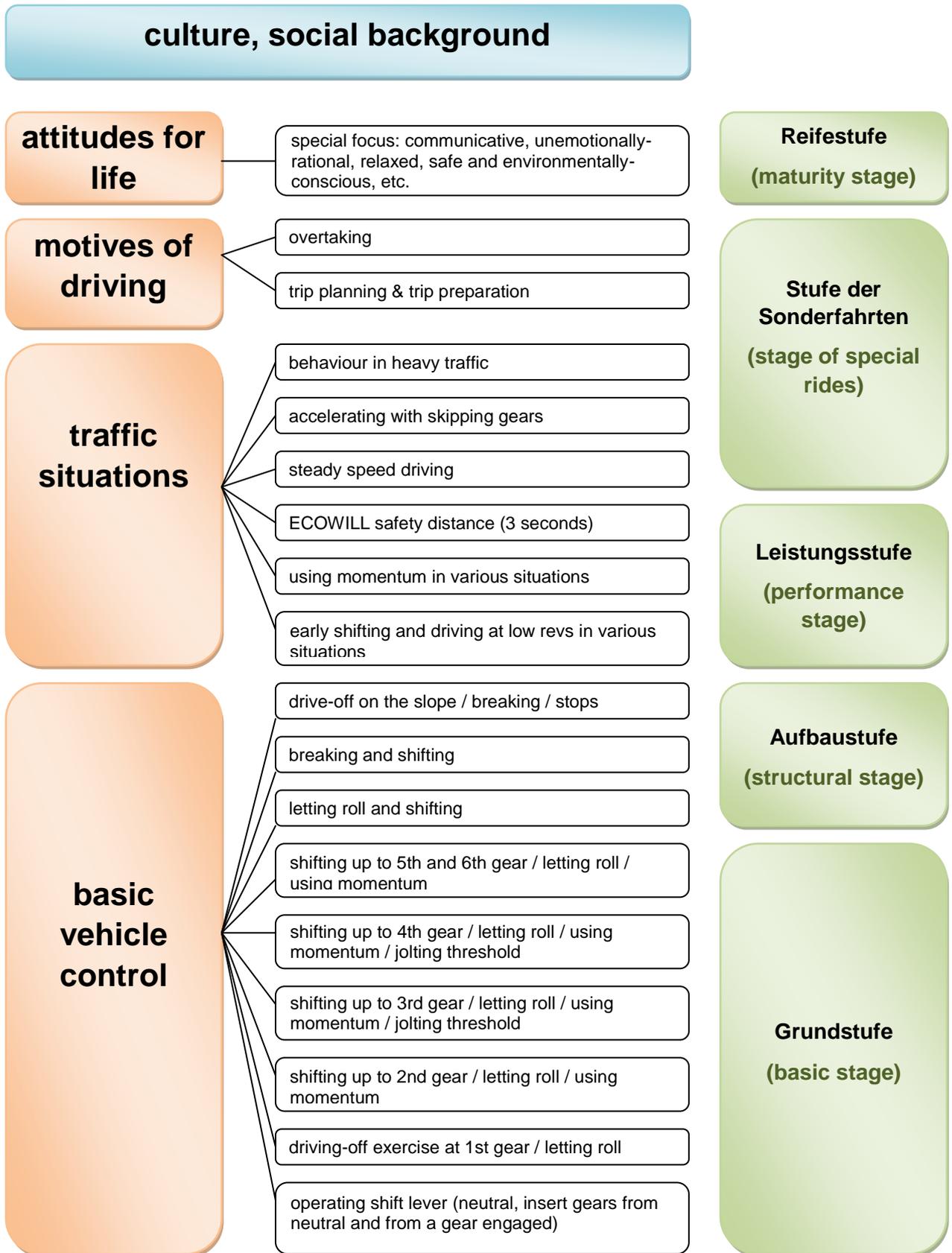
“Objectives”, “Place of learning”, “Procedure notes” and “Examples of guiding questions” for different contents support driving teachers to educate Ecodriving from the very beginning of learning to drive a car.

“Examination notes” describe what can / must be shown in the examination.

The examination guidelines (see Chapters 14, and 15) help examiners to use the examination as a support of an effective learning process.

# ECOWILL Blueprint

## Structure based on GDE-Matrix



## 10. ECOWILL Blueprint – 1. Basic Vehicle Control

### ECOWILL Blueprint 1. Basic Vehicle Control

#### Golden rules:

- Shift up early
- Anticipate traffic flow



### 1. Operating the gear lever

#### Objectives:

- ▪ The learner driver shall know the gear changing positions and how to move the hand the correctly while changing gears.
- ▪ The learner driver shall be able to engage neutral without problems.
- ▪ The learner driver shall be able to change gears exactly - even with a reverse gear lock.
- ▪ The learner driver shall be able to change into any gear from the idle position.

#### Place of learning:

Since these are exercises when the car is stationary they can be carried out in the parked position.

#### Procedure Notes:

The instructor explains the gear positions for the specific vehicle, where appropriate, preparing a simple sketch. Here, he/ she explains that precise and selective gear changing shifting is a basic condition for safe, economical and environmentally friendly driving.

Then the learner driver successively changes through all gears with the clutch fully pressed down, beginning with first gear. Here, he/ she shall learn to change the gears upwards and downwards while looking out the front window.

In the next step, the learner driver engages a specific gear identified by the instructor directly from the idle position: from neutral to 1<sup>st</sup> gear, from neutral to 2<sup>nd</sup> gear, from neutral to 3<sup>rd</sup> gear, and so on. The same exercise is also trained vice versa, i.e. from 6<sup>th</sup> gear to neutral, from 3<sup>rd</sup> to neutral, from 2<sup>nd</sup> to neutral, and so on. In these exercises, it is important to ensure that the learner driver is looking out the front window

Then, the learner driver is taught how to get into reverse gear. Here, the instructor must ensure that the learner turns to look through the rear window.

During the gear changing, the instructor asks the learner to identify which gears he/ she is engaging. The exercise only ends, when the learner is constantly correctly identifying the gears he/ she is engaging.



Examples of guiding questions:

- ▪ Is it necessary to shift the gears in the sequence of 1, 2, 3, 4, 5, or is it possible to skip gears?
- ▪ Is it recommended to change down gears before stopping?
- ▪ Where should one look, when moving the gear lever?

**ECOWILL Blueprint**  
**1. Basic Vehicle Control**

**Golden rules:**

- Shift up early
- Anticipate traffic flow



**2. Exercises when moving off in 1<sup>st</sup> gear/ Letting the car roll**

Objectives:

The learner driver shall get to know, try out, practise and perform the following driving techniques:

- ▪ Find and hold the slipping point of the clutch
- ▪ Starting 1<sup>st</sup> gear without the gas pedal
- ▪ Drive without the gas pedal, experiencing the idle speed
- ▪ Start in 1<sup>st</sup> gear with light pressure on the gas
- ▪ Start in 1<sup>st</sup> gear with up to 2,000 rpm maximum (or below, depending on the vehicle)
- ▪ Use momentum (neutral or idle) to a stop. Learn how far a vehicle rolls

Place of learning:

These exercises are to be performed in a quiet area, so that the learner can concentrate exclusively on these driving techniques.

Procedure Notes:

It is recommended, that at the beginning the learner driver just tries to find and hold the slipping point of the clutch on his own. As soon as the vehicle rolls, the clutch should be smoothly pressed fully down in order to interrupt power. Subsequently, the slipping point is to be identified again. This exercise is to be repeated several times.

In the next step, the learner driver shall start the vehicle with the clutch only (without the accelerator) and roll idling for a few meters before pressing the clutch fully down re-entering the clutch.

After that, the learner driver shall start in 1<sup>st</sup> gear with slight acceleration without exceeding 2,000 rpm. Once 2,000 rpm are reached, the learner shall utilise the car's momentum by pressing the clutch fully down or engaging neutral until the vehicle comes to a stop.<sup>2</sup>

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<sup>2</sup> Only if there are no objections from the national perspective



Examples of guiding questions:

- ▪ What do you know about starting up a car?
- ▪ What do you need the clutch for when starting?
- ▪ What do you think will happen, if you do not accelerate and let the vehicle roll with the gear engaged?
- ▪ How far do you estimate the vehicle will roll in neutral?



## Examination Notes:

### Behaviour when moving off

With category B vehicles with manual transmission on level ground first gear is only to be used for moving off and just for a few meters (approximately length of the vehicle). Independent of transmission system the engine should be kept at low number of revolutions when moving off.

ECOWILL Blueprint  
1. Basic Vehicle Control

Golden rules:

- Shift up early
- Anticipate traffic flow



### 3. Changing into 2<sup>nd</sup> gear/ Letting the car roll/ Using momentum

Objectives:

- ▪ The learner driver shall move less than a car's length, accelerate, and independently change from 1<sup>st</sup> to 2<sup>nd</sup> gear when reaching a speed of about 2,000 rpm (or below, depending on the vehicle). Thereby, the learner driver shall test and learn, at what speed the gear change is possible without the engine labouring.
- ▪ After engaging 2<sup>nd</sup> gear and accelerating briefly, the learner driver is to make use of the momentum of the vehicle (in-gear, neutral or idle).<sup>3</sup>
- ▪ The learner driver is to accelerate and change into 2<sup>nd</sup> gear. After that, he/ she shall release the accelerator and brake until the shuddering threshold is reached. Thereafter, he/ she is to accelerate again without pressing the clutch fully down.
- ▪ Just before the engine would cut out, the learner driver is to press the clutch pedal fully down.
- ▪ Use momentum (neutral or idle) to a stop. Learn how far a vehicle rolls.<sup>4</sup>

Place of learning:

Practical lessons

Procedure Notes:

After accelerating in 1<sup>st</sup> gear, the learner driver is to engage the 2<sup>nd</sup> gear at 2,000 rpm. When fallen back to 2,000 rpm, the momentum shall be used by pressing the clutch fully down engaging neutral<sup>5</sup> until the car comes to a halt. The instructor has to look after the coordination between the hand on the steering wheel and the hand operating the gear lever. The steering hand must be absolutely independent from the hand on the gear lever.

<sup>3</sup> Only if there are no objections from the national perspective

<sup>4</sup> Only if there are no objections from the national perspective

<sup>5</sup> Only if there are no objections from the national perspective



Examples of guiding questions:

- ▪ How far would you estimate the vehicle would roll on a level road in neutral or with the clutch pressed fully down?
- ▪ How far will the car roll without giving gas but in gear?



## Examination Notes:

### Behaviour when moving off

With category B vehicles with manual transmission on level ground first gear is only to be used for moving off and just for a few meters (approximately length of the vehicle). Independent of transmission system the engine should be kept at low number of revolutions when moving off.

ECOWILL Blueprint  
1. Basic Vehicle Control

Golden rules:

- Shift up early
- Anticipate traffic flow



## 4. Changing into 3<sup>rd</sup> gear/ Letting the car roll/ Using momentum/ Shuddering Threshold

Objectives:

- ▪ The learner driver shall start driving, accelerate and independently change from 2<sup>nd</sup> into 3<sup>rd</sup> gear at about 2,000 rpm (or below, depending on the vehicle). Here, he/ she shall test and learn at what revs the gear change is possible without the engine labouring.
- ▪ After changing into 3<sup>rd</sup> gear and brief acceleration, the learner driver is to make use of the vehicle's momentum (in-gear, neutral or idle).<sup>6</sup>
- ▪ The learner driver shall accelerate and change into 3<sup>rd</sup> gear. After that, he/ she is to release the accelerator and to brake until the shuddering threshold is reached. Then, he/ she shall accelerate again without operating the clutch.
- ▪ The learner shall accelerate and change into 3<sup>rd</sup> gear, then release the accelerator and brake until the shuddering threshold is reached. Only shortly before the engine would cut out, he / she is to push the clutch pedal fully down.
- ▪ Use momentum (neutral or idle) to a stop. Learn how far a vehicle rolls.

Place of learning:

Practical lessons

Procedure Notes:

After accelerating in 2<sup>nd</sup> gear, the learner driver shall select 3<sup>rd</sup> gear at approximately 2,000 rpm and accelerate again. When 2,000 rpm are reached, make use of momentum by pressing the clutch fully down or selecting neutral, until the car comes to a halt.<sup>7</sup> The instructor has to ensure proper coordination between the hand on the steering wheel and the hand operating the gear lever. The steering hand must be absolutely independent from the hand on the gear lever.

<sup>6</sup> Only if there are no objections from the national perspective

<sup>7</sup> Only if there are no objections from the national perspective



Examples of guiding questions:

- ▪ How far would you estimate the vehicle would roll on level ground in neutral or with the clutch pressed fully down?<sup>8</sup>
- ▪ How far will the car roll without giving gas but in gear?



## Examination Notes:

### Behaviour when moving off

With category B vehicles with manual transmission on level ground first gear is only to be used for moving off and just for a few meters (approximately length of the vehicle). Independent of transmission system the engine should be kept at low number of revolutions when moving off.

### Changing and selection of gear

The candidate is to engage the next higher gear as soon as possible (on reaching 2.000 rpm (or less depending on vehicle)).

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<sup>8</sup> Only if there are no objections from the national perspective

**Golden rules:**

- Shift up early
- Anticipate traffic flow

## 5. Changing into 4<sup>th</sup> gear/ Letting the car roll/ Using momentum/ Shuddering Threshold

Objectives:

- ▪ The learner driver shall drive, accelerate and independently shift from 3<sup>rd</sup> into 4<sup>th</sup> gear at about 2,000 rpm (or below, depending on the vehicle). Here, he/ she shall test and learn at what revs the gear change is possible without labouring the engine.
- ▪ After changing into 4<sup>th</sup> gear and brief acceleration, the learner driver is to make use of the vehicle's momentum (in-gear, neutral or idle)<sup>9</sup>
- ▪ The learner driver shall accelerate and change into 4<sup>th</sup> gear. After that, he/ she is release the accelerator and to brake until jolting threshold is reached. Successively, he/ she shall accelerate again without operating the clutch.
- ▪ The learner shall accelerate and change into 4<sup>th</sup> gear, then release the accelerator and brake until the shuddering threshold is reached. Only shortly before the engine would cut out, he / she is to push the clutch pedal fully down.
- ▪ Use momentum (neutral or idle) to a stop. Learn how far a vehicle rolls.<sup>10</sup>

Place of learning:

Practical lessons

Procedure Notes:

After accelerating in 3<sup>rd</sup> gear, the learner driver shall change into 4<sup>th</sup> gear at approximately 2,000 rpm and accelerate again. When 2,000 rpm are reached, make use of momentum by pressing the clutch fully down or engaging neutral<sup>11</sup>, until the car comes to a halt. The instructor has to ensure a proper coordination between the hand on the steering wheel and the hand operating the gear lever. The steering hand must be absolutely independent from the hand on the gear lever.

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<sup>9</sup> Only if there are no objections from the national perspective

<sup>10</sup> Only if there are no objections from the national perspective

<sup>11</sup> Only if there are no objections from the national perspective



Examples of guiding questions:

- ▪ How far would you estimate the vehicle rolling on the level in neutral or with gear disengaged?
- ▪ How far will the car roll without acceleration but with a gear engaged?



## Examination Notes

### Behaviour when moving off

With category B vehicles with manual transmission on level ground first gear is only to be used for moving off and just for a few meters (approximately length of the vehicle). Independent of transmission system the engine should be kept at low number of revolutions when moving off.

### Changing and selection of gear

Attention is to be given to timely gear changing and selection. The candidate is to engage the next higher gear as soon as possible (on reaching 2.000 rpm (or less depending on vehicle)) and with vehicles in category B, depending on the vehicle type, as a rule to use at least the first four gears up to 50km/h; other gears are also to be used as soon as possible.

Vehicles with automatic transmission: The accelerator has to be pressed slowly. The „Kick down“ has to be avoided.

**ECOWILL Blueprint**  
**1. Basic Vehicle Control**

**Golden rules:**

- Shift up early
- Anticipate traffic flow



**6. Changing into 5<sup>th</sup> and 6<sup>th</sup> gear/ Letting the car roll/ Using momentum/ Shuddering Threshold**

Objectives:

The learner driver shall get to know, try out, practise and perform the following driving techniques:

- ▪ The learner driver shall start driving, accelerate and independently change from 4<sup>th</sup> into 5<sup>th</sup> and 6<sup>th</sup> gear, each at about 2,000 rpm (or below, depending on the vehicle). Here, he/ she shall test and learn at what revs the gear changes are possible without labouring the engine.
- ▪ After changing into 6<sup>th</sup> gear and brief acceleration, the learner driver is to make use of the vehicle's momentum (in-gear, neutral or idle)<sup>12</sup>
- ▪ The learner driver shall accelerate and change into 6<sup>th</sup> gear. After that, he/ she is to release the accelerator and to brake until shuddering threshold is reached. Then, he/ she shall accelerate again without operating the clutch.
- ▪ The learner shall accelerate and change into 6<sup>th</sup> gear, then remove gas and brake until shuddering threshold is reached. Only shortly before the engine would cut out, he / she is to push the clutch pedal fully down.
- ▪ Use momentum (neutral or idle) to a stop. Learn how far a vehicle rolls.<sup>13</sup>

Place of learning:

These exercises are to be performed in quiet areas, so that the learner can concentrate exclusively on these driving techniques.

Procedure Notes:

After accelerating in 5<sup>th</sup> gear, the learner driver shall select 6<sup>th</sup> gear at approximately 2,000 rpm and accelerate again. When 2,000 rpm are reached, momentum shall be used by pushing the clutch fully down or engaging neutral<sup>14</sup>, until the car comes to a halt. The instructor has to ensure proper coordination between the hand on the steering wheel and the hand operating the gear lever. The steering hand must be absolutely independent from the hand on the gear lever.

<sup>12</sup> Only if there are no objections from the national perspective

<sup>13</sup> Only if there are no objections from the national perspective

<sup>14</sup> Only if there are no objections from the national perspective



Examples of guiding questions:

- ▪ How far would you estimate the vehicle rolling on level ground in neutral or with gear disengaged?
- ▪ How far will the car roll without giving gas but with a gear engaged?



## Examination Notes

### Behaviour when moving off

With category B vehicles with manual transmission on level ground first gear is only to be used for moving off and just for a few meters (approximately length of the vehicle). Independent of transmission system the engine should be kept at low number of revolutions when moving off.

### Changing and selection of gear

Attention is to be given to timely gear changing and selection. The candidate is to engage the next higher gear as soon as possible (on reaching 2.000 rpm (or less depending on vehicle)) and with vehicles in category B, depending on the vehicle type, as a rule to use at least the first four gears up to 50km/h; other gears are also to be used as soon as possible.

Vehicles with automatic transmission: The accelerator has to be pressed slowly. The „Kick down“ has to be avoided.

**Golden rules:**

- Shift up early
- Anticipate traffic flow

## 7. Letting the vehicle roll/ Changing gears

Objectives:

The learner driver shall get to know, try out, practise and perform the following driving techniques:

- ▪ Letting the vehicle roll until the shuddering threshold is reached
- ▪ Change down when approaching the shuddering threshold
- ▪ Letting the car roll with gears disengaged

Place of learning:

These exercises are to be performed in quiet areas, so that the learner can concentrate exclusively on these driving techniques.

Procedure Notes:

The learner driver starts up in the 1<sup>st</sup> gear and has the vehicle rolling on level ground with the gear engaged. Initially, he/ she will probably assume that the vehicle will stop on its own. After a sufficient distance, the learner is told to softly brake without going into neutral. The brake is pressed until the vehicle slightly vibrates and the motor starts shuddering. At this point, the learner shall release the brake to avoid the shuddering threshold and keep the vehicle rolling on.

This exercise is performed in all gears. The instructor must ensure that the required minimum speed for each gear is reached first, before the shuddering threshold is experienced by means of gentle braking.

In comparison to rolling in-gear, the learner driver shall also do roll exercises with the clutch disengaged<sup>15</sup>.

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<sup>15</sup> Only if there are no objections from the national perspective



### Examples of guiding questions:

- ▪ How far will a vehicle roll with clutch engaged but without pressing the accelerator?
- ▪ At what revs will the shuddering threshold be reached?
- ▪ What is the normal engine speed for this car?
  - low revs
  - 'sub-low' revs (close to shuddering jolting threshold)
- ▪ How far will the vehicle roll with clutch disengaged?



## Examination Notes

### **Behaviour when moving off**

With category B vehicles with manual transmission on level ground first gear is only to be used for moving off and just for a few meters (approximately length of the vehicle). Independent of transmission system the engine should be kept at low number of revolutions when moving off.

### **Changing and selection of gear**

Attention is to be given to timely gear changing and selection. The candidate is to engage the next higher gear as soon as possible (on reaching 2.000 rpm (or less depending on vehicle)) and with vehicles in category B, depending on the vehicle type, as a rule to use at least the first four gears up to 50km/h; other gears are also to be used as soon as possible.

Vehicles with automatic transmission: The accelerator has to be pressed slowly. The „Kick down“ has to be avoided.

### **Anticipatory driving**

Before coming to a foreseeable stop, e.g. at a junction or at a red traffic light, without using the gas and without changing to a lower gear, make early use of the vehicle's momentum and allow the vehicle to coast (with gear).

**Golden rules:**

- Shift up early
- Anticipate traffic flow

## 8. Braking/ Changing gears

Objectives:

The learner driver shall get to know, try out, practise and perform the following driving techniques:

- ▪ Changing down gear by gear
- ▪ Changing down with gear skips

Place of learning:

These exercises are to be performed in a quiet area, so that the learner can concentrate exclusively on these driving techniques.

Procedure notes:

While pressing the clutch full down in order to shift down, the learner driver shall realize that the car rolls on with almost undiminished speed. Therefore, he/ she presses the clutch fully down at approximately 30 km/h in 3<sup>rd</sup> gear and checks his speedometer for the rolling speed of the vehicle. Depending on the degree of deceleration before changing down, he/ she shall learn which gear is the most appropriate to choose.

The learner driver shall decelerate from around 30 km/h to around 10 km/h and select 2<sup>nd</sup> gear. After engaging the gear, he/ she controls revs and speed. Rpm should be under 2,000. Speedometer shouldn't indicate much over 10 km/h.

With 4<sup>th</sup> gear engaged, the learner driver shall decelerate from around 40 km/h to around 10 km/h and select 2<sup>nd</sup> gear. After engaging the gear, he/ she controls revs and speed. Rpm should be under 2,000. Speedometer shouldn't indicate much over 10 km/h.

If the aim of braking is to bring the car to a halt (red traffic light), you don't shift down but select neutral after stopping.



Examples of guiding questions:

- ▪ What is the function of the transmission?
- ▪ Which factors determine the choice of the gear?
- ▪ In which situations skipping gears is appropriate?
- ▪ Why is there a lock on reverse gear?



## Examination Notes:

### Behaviour when moving off

With category B vehicles with manual transmission on level ground first gear is only to be used for moving off and just for a few meters (approximately length of the vehicle). Independent of transmission system the engine should be kept at low number of revolutions when moving off.

### Changing and selection of gear

Attention is to be given to timely gear changing and selection. The candidate is to engage the next higher gear as soon as possible (on reaching 2.000 rpm (or less depending on vehicle))

**Golden rules:**

- Shift up early
- Anticipate traffic flow

## 9. Starting up on a hill/ Braking/ Stopping

Objectives:

The learner driver shall get to know, try out, practise and perform the following driving techniques:

- ▪ Starting up in 2<sup>nd</sup> gear without pushing the gas pedal (for vehicles with automatic transmission: determining a gear stage below top stage)
- ▪ Letting the vehicle roll with motor brake
- ▪ Watching the speedometer
- ▪ Stopping on hills
- ▪ Shifting into 3<sup>rd</sup> gear and then into 2<sup>nd</sup> gear

Place of learning:

These exercises are to be performed in a quiet area, so that the learner can concentrate exclusively on these driving techniques.

Procedure notes:

The learner driver shall realize that on the hill the vehicle starts rolling when releasing the brake. With 2<sup>nd</sup> gear selected, he/ she shall engage swiftly without pushing the accelerator, lift the foot off the clutch and stop again after approx. 30 meters. This exercise is to be repeated several times.

Depending on the gradient, the learner driver shall shift from 2<sup>nd</sup> into 3<sup>rd</sup> gear at about 1,500 rpm. He/ she shall realize that the vehicle is picking up speed during the shifting process because of the hill. After engaging and at about 30 km/h, the learner shall harshly brake almost too walking pace before changing back into 2<sup>nd</sup> gear. The gear changing process on the hill must be conducted so swiftly, that the rpm after engaging the 2<sup>nd</sup> gear stay significantly under 2,000. This exercise should be repeated several times.

With 3<sup>rd</sup> gear engaged, the learner shall stop the car and start up again after having shifted to 2<sup>nd</sup> gear. Here, he/ she shall realize, that the braking distance on the hill depends on the gradient and is significantly longer than on level ground.



Examples of guiding questions:

- ▪ What is the difference between moving the car off on a hill and on level ground?
- ▪ What is the difference between stopping the vehicle on a hill and on level ground?
- ▪ What is the difference between changing down on a hill and on level ground?
- ▪ What is the difference between changing up on a hill and on level ground?



## Examination Notes

### Changing and selection of gear

Attention is to be given to timely gear changing and selection. The candidate is to engage the next higher gear as soon as possible (on reaching 2.000 rpm (or less depending on vehicle)) and with vehicles in category B, depending on the vehicle type, as a rule to use at least the first four gears up to 50km/h; other gears are also to be used as soon as possible.

Vehicles with automatic transmission: The accelerator has to be pressed slowly. The „Kick down“ has to be avoided.

### Anticipatory driving

Appropriate speed and sensible gear selection when driving uphill and downhill.

## 11. ECOWILL Blueprint – 2. Traffic Situations

### ECOWILL Blueprint 2. Traffic situations

#### Golden rules:

- Shift up early
- Anticipate traffic flow
- Maintain a steady speed at low RPM



### 1. Changing gears/ Driving at low revs in various situations

#### Objectives:

Now, the learner shall apply and practice the techniques of changing gear and driving at low engine speed, which he/she learned and practised in quiet traffic situations, in more complex situations.

#### Place of learning:

Practical lessons

#### Procedure notes:

In the framework of further driver education, the learner driver shall integrate the learned techniques in changing gears and driving at low engine speed into his / her everyday driving.

For example in the following situations:

- ▪ Lane usage on quiet streets and on roads with heavier traffic
- ▪ Driving in marked and unmarked lanes
- ▪ Driving in areas with intersections and junctions
- ▪ Crossing intersections with traffic lights
- ▪ Changing lanes
- ▪ Right or left turns in simple and complex situations
- ▪ On roundabouts
- ▪ At level crossings
- ▪ Passing construction sites

Newly-learned driving techniques and information may sometimes impede the consistent application of the current driving knowledge. In this case, it is the instructor's responsibility to remind the learner driver with brief reminders not to exceed 2,000 rpm approx. (depending on the vehicle). This ensures that the application of the new driving techniques becomes routine after a while.



## Examination Notes

### Behaviour when moving off

With category B vehicles with manual transmission on level ground first gear is only to be used for moving off and just for a few meters (approximately length of the vehicle). Independent of transmission system the engine should be kept at low number of revolutions when moving off.

### Changing and selection of gear

Attention is to be given to timely gear changing and selection. The candidate is to engage the next higher gear as soon as possible (on reaching 2.000 rpm (or less depending on vehicle)) and with vehicles in category B, depending on the vehicle type, as a rule to use at least the first four gears up to 50km/h; other gears are also to be used as soon as possible. Acceleration should be done with gear skips when practical and safe.

Vehicles with automatic transmission: The accelerator has to be pressed slowly. The „Kick down“ has to be avoided.

### Driving speed

Driving speed should be adjusted to conditions and other road users. Unnecessarily high rpms are to be avoided when accelerating.

### Anticipatory driving

Changing gear and driving in low revs

Steady and smooth driving in the highest possible gear

Before coming to a foreseeable stop, e.g. at a junction or at a red traffic light, without using the gas and without changing to a lower gear, make early use of the vehicle's momentum and allow the vehicle to coast (disengaged, without gear, with gear<sup>16</sup>)

In the case of delays / speed variations in the flow of traffic, e.g. traffic ahead slowing down or traffic restrictions, make early use of the vehicle's momentum and allow the vehicle to coast without accelerating and without changing to a lower gear

Avoid unnecessary braking and acceleration

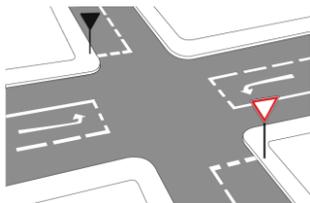
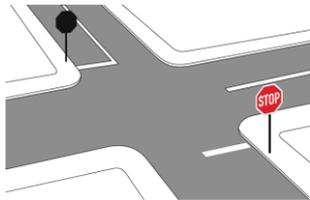
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<sup>16</sup> determined by Member State

## ECOWILL Blueprint 2. Traffic situations

### Golden rules:

- Shift up early
- Anticipate traffic flow
- Maintain a steady speed at low RPM



## 2. Making use of momentum in various situations

### Objectives:

Now, the learner shall apply and practice the techniques to make use of the vehicle's momentum, which he/ she learned and practised in quiet traffic situations, in more complex situations.

### Place of learning:

Practical lessons

### Procedure notes:

In the framework of further driver education, the learner driver shall integrate the learned techniques on using the car's momentum into his/ her everyday driving.

For example in the following situations:

- ▪ Driving in areas of intersections and junctions
- ▪ When the cross traffic has right of way
- ▪ Crossing intersections with traffic lights
- ▪ Right or left turns in simple and complex situations
- ▪ On roundabouts
- ▪ At level crossings
- ▪ Passing construction sites

Newly-learned driving techniques and information may sometimes impede the consistent application of the current driving knowledge. In this case, it is the instructor's responsibility to remind the learner driver with brief reminders. This ensures that the application of the new driving techniques becomes routine after a while.



## Examination Notes

### Behaviour when moving off

With category B vehicles with manual transmission on level ground first gear is only to be used for moving off and just for a few meters (approximately length of the vehicle). Independent of transmission system the engine should be kept at low number of revolutions when moving off.

### Changing and selection of gear

Attention is to be given to timely gear changing and selection. The candidate is to engage the next higher gear as soon as possible (on reaching 2.000 rpm (or less depending on vehicle)) and with vehicles in category B, depending on the vehicle type, as a rule to use at least the first four gears up to 50km/h; other gears are also to be used as soon as possible. Acceleration should be done with gear skips when practical and safe.

Vehicles with automatic transmission: The accelerator has to be pressed slowly. The „Kick down“ has to be avoided.

### Driving speed

Driving speed should be adjusted to conditions and other road users. Unnecessarily high rpms are to be avoided when accelerating.

### Anticipatory driving

Changing gear and driving in low revs.

Steady and smooth driving in the highest possible gear.

Before coming to a foreseeable stop, e.g. at a junction or at a red traffic light, without using the gas and without changing to a lower gear, make early use of the vehicle's momentum and allow the vehicle to coast (disengaged, without gear, with gear<sup>17</sup>).

In the case of delays / speed variations in the flow of traffic, e.g. traffic ahead slowing down or traffic restrictions, make early use of the vehicle's momentum and allow the vehicle to coast without accelerating and without changing to a lower gear.

Avoid unnecessary braking and acceleration.

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<sup>17</sup> determined by Member State

## ECOWILL Blueprint 2. Traffic situations

### Golden rules:

- Shift up early
- Anticipate traffic flow
- Maintain a steady speed at low RPM



## 3. ECOWILL distance ("3-Second-Rule")

### Objectives:

- ▪ The learner driver shall recognise that a 2-seconds' safety distance is not enough to maintain steady driving.
- ▪ The learner driver shall find out by himself, what is the minimum distance necessary in order not to be forced to react to every temporary delay ( late braking) by the driver in front with own braking manoeuvres.
- ▪ The learner driver shall explain how to assess his safety distance while driving.
- ▪ The learner driver shall explore how to keep and check a safety distance of 3 to 4 seconds in live traffic conditions.
- ▪ In the course of a training sequence, the learner shall keep this safety distance from the car ahead (buffer distance) and, if possible, compensate for speed variations with a reserve in the buffer distance.

### Place of learning:

Practical lessons

### Procedure notes:

In a brief discussion, the instructor finds out the learner driver's knowledge on the topic of safety distance. Then, the instructor illustrates the benefits resulting from a deliberate choice of the safety distance like avoiding having to brake sharply. Once the learner driver finds out what is a reasonable safety distance, he/ she shall describe how to check this whenever necessary while driving (defining a fixed point, which is passed by the car ahead and then on counting the seconds "one elephant, two elephants, three elephants, and so on"). After that, the learner driver shall try out and train to keep the buffer distance and check it regularly on his own (possibly describing what he/ she does). This exercise should be performed on major roads with heavy traffic. Preferably, there are no other driving techniques trained at the same time.



### Examples of guiding questions:

- ▪ What do you know about the necessary safety distance from the car ahead?
- ▪ What are the benefits of keeping the recommended safety distance?
- ▪ What could you do to get even more leeway?
- ▪ How do you measure the safety distance?
- ▪ What benefits have you observed as a co-driver in regard to keeping the safety distance?



## Examination Notes

### **Behaviour when moving off**

With category B vehicles with manual transmission on level ground first gear is only to be used for moving off and just for a few meters (approximately length of the vehicle). Independent of transmission system the engine should be kept at low number of revolutions when moving off.

### **Changing and selection of gear**

Attention is to be given to timely gear changing and selection. The candidate is to engage the next higher gear as soon as possible (on reaching 2.000 rpm (or less depending on vehicle)) and with vehicles in category B, depending on the vehicle type, as a rule to use at least the first four gears up to 50km/h; other gears are also to be used as soon as possible. Acceleration should be done with gear skips when practical and safe.

Vehicles with automatic transmission: The accelerator has to be pressed slowly. The „Kick down“ has to be avoided.

### **Driving speed**

Driving speed should be adjusted to conditions and other road users. Unnecessarily high rpms are to be avoided when accelerating.

## **Anticipatory driving**

Changing gear and driving in low revs

Steady and smooth driving in the highest possible gear

Maintenance of an increased safety distance (use of a 3 second buffer distance)

Before coming to a foreseeable stop, e.g. at a junction or at a red traffic light, without using the gas and without changing to a lower gear, make early use of the vehicle's momentum and allow the vehicle to coast (disengaged, without gear, with gear<sup>18</sup>)

In the case of delays / speed variations in the flow of traffic, e.g. traffic ahead slowing down or traffic restrictions, make early use of the vehicle's momentum and allow the vehicle to coast without accelerating and without changing to a lower gear

Avoid unnecessary braking and acceleration

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<sup>18</sup> determined by Member State

ECOWILL Blueprint  
2. Traffic situations

**Golden rules:**

- Shift up early
- Anticipate traffic flow
- Maintain a steady speed at low RPM



## 4. Driving at a steady speed

Objectives:

- ▪ The learner driver shall drive on major roads with a speed as steady as possible.
- ▪ In particular by keeping an adequate safety distance, by letting the car roll in a clever way and by gentle braking and acceleration, the learner driver shall maintain a steady speed.
- ▪ The learner driver shall focus on monitoring the traffic situation and practice keeping a steady speed without unnecessary braking and acceleration manoeuvres.

Place of learning:

Practical lessons

Procedure notes:

In preparation for driving on ordinary roads, highways, etc., this session trains how a steady speed can be maintained. On major roads, red lights, roundabouts and cars ahead are observed specifically with a view to maintaining a steady speed by keeping the buffer safety distance, releasing the gas pedal early and letting the car roll. In this training session, other driving tasks should stay in the background.

Examples of guiding questions:

- ▪ How do you assess a steady speed?
- ▪ What could help you to drive as steadily as possible?
- ▪ What information is important for maintaining a steady speed?
- ▪ What driving techniques can help maintain a constant speed?



## Examination Notes

### Behaviour when moving off

With category B vehicles with manual transmission on level ground first gear is only to be used for moving off and just for a few meters (approximately length of the vehicle). Independent of transmission system the engine should be kept at low number of revolutions when moving off.

### Changing and selection of gear

Attention is to be given to timely gear changing and selection. The candidate is to engage the next higher gear as soon as possible (on reaching 2.000 rpm (or less depending on vehicle)) and with vehicles in category B, depending on the vehicle type, as a rule to use at least the first four gears up to 50km/h; other gears are also to be used as soon as possible. Acceleration should be done with gear skips when practical and safe.

Vehicles with automatic transmission: The accelerator has to be pressed slowly. The „Kick down“ has to be avoided.

### Driving speed

Driving speed should be adjusted to conditions and other road users. Unnecessarily high rpms are to be avoided when accelerating.

### Anticipatory driving

Changing gear and driving in low revs

Steady and smooth driving in the highest possible gear

Driving at a steady speed on main roads without exaggerated braking or acceleration

Maintenance of an increased safety distance (use of a 3 second buffer distance)

Before coming to a foreseeable stop, e.g. at a junction or at a red traffic light, without using the gas and without changing to a lower gear, make early use of the vehicle's momentum and allow the vehicle to coast (disengaged, without gear, with gear<sup>19</sup>)

In the case of delays / speed variations in the flow of traffic, e.g. traffic ahead slowing down or traffic restrictions, make early use of the vehicle's momentum and allow the vehicle to coast without accelerating and without changing to a lower gear

Avoid unnecessary braking and acceleration

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<sup>19</sup> determined by Member State

## ECOWILL Blueprint 2. Traffic situations

### Golden rules:

- Shift up early
- Anticipate traffic flow
- Maintain a steady speed at low RPM



## 5. Acceleration with gear skips

### Objectives:

- ▪ The learner driver shall reflect on traffic situations where powerful acceleration is necessary for safety reasons.
- ▪ The learner driver shall explain what he/ she considers as appropriate driving behaviour in such situations.
- ▪ In – quiet traffic conditions, the learner driver shall explore how to skip gears , e.g. from 2<sup>nd</sup> to 4<sup>th</sup> gear, 3<sup>rd</sup> to 5<sup>th</sup> gear and even 4<sup>th</sup> to 6<sup>th</sup> gear if appropriate.
- ▪ The learner driver shall perform skipping gears skips in appropriate traffic situations for example when overtaking or entering a highway or expressway.

### Place of learning:

Practical lessons

### Procedure notes:

Preparing the sections "Overtaking" and "Driving on the highway", the learner driver shall gather first experiences with upward gear skipping. He/ she shall describe in which situations gear skips are suitable. The learner driver shall be able to carry out and practice skipping gears regardless of actual traffic situations (e.g. quiet traffic areas or wide major roads).

### Examples of guiding questions:

- ▪ Can you describe traffic situations which might force to accelerate sharply with revs significantly over 2,000?
- ▪ In which situations is it absolutely necessary to do so?
- ▪ Having avoided a serious traffic situation by powerful acceleration what options regarding gear selection do you have?
- ▪ What have you observed as a passenger in situations when the driver had to accelerate sharply?
- ▪ How would you describe your driving style, when you have to carry out sharp acceleration?



## Examination Notes

### Behaviour when moving off

With category B vehicles with manual transmission on level ground first gear is only to be used for moving off and just for a few meters (approximately length of the vehicle). Independent of transmission system the engine should be kept at low number of revolutions when moving off.

### Changing and selection of gear

Attention is to be given to timely gear changing and selection. The candidate is to engage the next higher gear as soon as possible (on reaching 2.000 rpm (or less depending on vehicle)) and with vehicles in category B, depending on the vehicle type, as a rule to use at least the first four gears up to 50km/h; other gears are also to be used as soon as possible. Acceleration should be done with gear skips when practical and safe.

Vehicles with automatic transmission: The accelerator has to be pressed slowly. The „Kick down“ has to be avoided.

### Driving speed

Driving speed should be adjusted to conditions and other road users. Unnecessarily high rpms are to be avoided when accelerating.

### Anticipatory driving

Changing gear and driving in low revs

Steady and smooth driving in the highest possible gear

Driving at a steady speed on main roads without exaggerated braking or acceleration

Maintenance of an increased safety distance (use of a 3 second buffer distance)

Before coming to a foreseeable stop, e.g. at a junction or at a red traffic light, without using the gas and without changing to a lower gear, make early use of the vehicle's momentum and allow the vehicle to coast (disengaged, without gear, with gear<sup>20</sup>)

In the case of delays / speed variations in the flow of traffic, e.g. traffic ahead slowing down or traffic restrictions, make early use of the vehicle's momentum and allow the vehicle to coast without accelerating and without changing to a lower gear

Avoid unnecessary braking and acceleration

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<sup>20</sup> determined by Member State

## ECOWILL Blueprint 2. Traffic situations

### Golden rules:

- Shift up early
- Anticipate traffic flow
- Maintain a steady speed at low RPM



## 6. Behaviour in heavy traffic

### Objectives:

The learner driver shall skillfully apply and practice the driving techniques relating to "Gear Changing/ driving at low revs" and "Making use of the car's momentum" in heavy traffic with the aim of driving steadily.

### Place of learning:

Practical lessons

### Procedure notes:

In heavy traffic, the learner driver shall gear change/ drive at low revs, use the vehicle's momentum and keep a steady speed.

Especially the use of momentum under stop-and-go conditions and early gear changes must be further trained and practised. Building-up and using momentum with extremely light acceleration may be a focus of this exercise.

In case stopping is inevitable, one should leave an appropriate gap to the car ahead to be able to drive off simultaneously with the others in order to improve traffic flow (rear tires of the vehicle ahead must be visible).

## Examination Notes:

### Behaviour when moving off

With category B vehicles with manual transmission on level ground first gear is only to be used for moving off and just for a few meters (approximately length of the vehicle). Independent of transmission system the engine should be kept at low number of revolutions when moving off.

### Changing and selection of gear

Attention is to be given to timely gear changing and selection. The candidate is to engage the next higher gear as soon as possible (on reaching 2.000 rpm (or less depending on vehicle)) and with vehicles in category B, depending on the vehicle type, as a rule to use at least the first four gears up to 50km/h; other gears are also to be used as soon as possible. Acceleration should be done with gear skips when practical and safe.

Vehicles with automatic transmission: The accelerator has to be pressed slowly. The „Kick down“ has to be avoided.

## **Driving uphill and downhill**

The candidate is to show, that he/she is in complete control of the vehicle when driving uphill and downhill, especially when starting a climb (up to approx. 10%) with coordinated use of accelerator, clutch and brake.

## **Driving speed**

Driving speed should be adjusted to conditions and other road users. Unnecessarily high rpms are to be avoided when accelerating.

Behaviour at crossroads, junctions, roundabouts and railway crossings

Attention is to be paid to the following:

In the case of a foreseeable extended stop (longer than 20 seconds) the engine is to be switched off.

## **Anticipatory driving**

Appropriate speed and sensible gear selection when driving uphill and downhill

Changing gear and driving in low revs

Steady and smooth driving in the highest possible gear

Driving at a steady speed on main roads without exaggerated braking or acceleration

Maintenance of an increased safety distance (use of a 3 second buffer distance)

Before coming to a foreseeable stop, e.g. at a junction or at a red traffic light, without using the gas and without changing to a lower gear, make early use of the vehicle's momentum and allow the vehicle to coast (disengaged, without gear, with gear<sup>21</sup>)

In the case of delays / speed variations in the flow of traffic, e.g. traffic ahead slowing down or traffic restrictions, make early use of the vehicle's momentum and allow the vehicle to coast without accelerating and without changing to a lower gear

Avoid unnecessary braking and acceleration

Use vehicle's momentum in stop-start situations

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<sup>21</sup> determined by Member State

## 12. ECOWILL Blueprint – 3. Motives of Driving

### ECOWILL Blueprint 3. Motives of Driving

#### Golden rules:

- Shift up early
- Anticipate traffic flow
- Maintain a steady speed at low RPM
- Check tyre pressures frequently at least once a month and before driving at high speed



### 1. Trip planning and preparation

#### Objectives:

- ▪ The learner driver shall have a conscious look at route planning.
- ▪ He/ she shall thoroughly reflect on the planning of his/ her journeys.
- ▪ The learner driver shall create a checklist for a journey preparation.
- ▪ The learner driver shall make a realistic assessment of a journey.
- ▪ The learner driver shall differentiate necessary, reasonable and unnecessary journeys and the respective impact on driving style.

#### Place of learning:

Theoretical instruction

#### Procedure notes:

This sequence is useful to discuss journey motivation and how these can determine the driving style. Subsequently, the learner drivers shall discuss and identify the determining factors of a thorough journey preparation like tire pressure, definition of destination, realistic assessment of the travel time or. After that, they shall develop a checklist for future journeys.

#### Examples of guiding questions:

- ▪ Why did you apply for your driver's licence?
- ▪ Why do you want to drive a car?
- ▪ How can you avoid that your driving style is affected by certain driving motives?
- ▪ What do you have to check on your vehicle before making a journey?
- ▪ How do you prepare yourself for a journey?
- ▪ Which aspects are useful in this context?

## ECOWILL Blueprint

### 3. Motives of Driving

#### Golden rules:

- Shift up early
- Anticipate traffic flow
- Maintain a steady speed at low RPM



## 2. Overtaking

#### Objectives:

- ▪ The learner driver shall reflect on the motives for an overtaking manoeuvre.
- ▪ The learner driver shall realise, that overtaking is very often triggered by emotional factors.
- ▪ The learner driver shall reflect on what is important when overtaking.
- ▪ The learner driver shall realize what must be considered when overtaking.
- ▪ The learner driver must be able to identify, which potentially hazardous situations may result from an overtaking manoeuvre before he/ she puts it to practice.
- ▪ The learner driver must know, what Ecodriving means to overtaking.

#### Place of learning:

Practical lessons

#### Procedure notes:

It is essential that the learner driver knows the physics of safe overtaking. It must be clear that in some cases sharp acceleration with significantly more than 2,000 rpm is necessary for safety reasons. This doesn't contradict Ecodriving as "Safety first" is one of its basic principles. After such a sharp acceleration in order to avoid an accident, Ecodriving comes in again recommending gear skips in the given situation. Another important objective of this lesson is that overtaking manoeuvres are very often triggered by emotional factors (e.g. the wish to prove faster than others – showing off, time pressure, the allure of fast driving, the feeling of being blocked by the car ahead, feeling slowed down, an inability to drive behind other vehicles).

Here, a dialogue or a group discussion on overtaking should be held to check and evaluate reasons for overtaking manoeuvres in relation to the safety risk.



### Examples of guiding questions:

- ▪ What do you know about overtaking manoeuvres from the passenger perspective?
- ▪ Which reasons are important enough to you to make you overtake?
- ▪ What would motivate you to perform an overtaking manoeuvre, although it cannot really be judged as safe?
- ▪ How would you plan an overtaking manoeuvre?
- ▪ What must be considered before overtaking?
- ▪ What does Ecodriving mean to you in the course of an overtaking manoeuvre?
- ▪ What do you have to pay attention to before and during an overtaking manoeuvre?



## Examination Notes

### **Behaviour when moving off**

With category B vehicles with manual transmission on level ground first gear is only to be used for moving off and just for a few meters (approximately length of the vehicle). Independent of transmission system the engine should be kept at low number of revolutions when moving off.

### **Changing and selection of gear**

Attention is to be given to timely gear changing and selection. The candidate is to engage the next higher gear as soon as possible (on reaching 2.000 rpm (or less depending on vehicle)) and with vehicles in category B, depending on the vehicle type, as a rule to use at least the first four gears up to 50km/h; other gears are also to be used as soon as possible. Acceleration should be done with gear skips when practical and safe.

Vehicles with automatic transmission: The accelerator has to be pressed slowly. The „Kick down“ has to be avoided.

### **Driving uphill and downhill**

The candidate is to show, that he/she is in complete control of the vehicle when driving uphill and downhill, especially when starting a climb (up to approx. 10%) with coordinated use of accelerator, clutch and brake.

## **Driving speed**

Driving speed should be adjusted to conditions and other road users. Unnecessarily high rpms are to be avoided when accelerating.

Behaviour at crossroads, junctions, roundabouts and railway crossings

Attention is to be paid to the following:

In the case of a foreseeable extended stop (longer than 20 seconds) the engine is to be switched off.

## **Anticipatory driving**

Appropriate speed and sensible gear selection when driving uphill and downhill

Changing gear and driving in low revs

Steady and smooth driving in the highest possible gear

Driving at a steady speed on main roads without exaggerated braking or acceleration

Maintenance of an increased safety distance (use of a 3 second buffer distance)

Before coming to a foreseeable stop, e.g. at a junction or at a red traffic light, without using the gas and without changing to a lower gear, make early use of the vehicle's momentum and allow the vehicle to coast (disengaged, without gear, with gear<sup>22</sup>)

In the case of delays / speed variations in the flow of traffic, e.g. traffic ahead slowing down or traffic restrictions, make early use of the vehicle's momentum and allow the vehicle to coast without accelerating and without changing to a lower gear

Avoid unnecessary braking and acceleration

Use vehicle's momentum in stop-start situations

## **Overtaking**

Overtaking is to be tested if possible. When overtaking, attention is to be paid to the following:

- rapid acceleration

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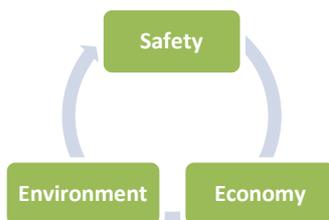
<sup>22</sup> determined by Member State

## 13. ECOWILL Blueprint – 4. Attitudes for Life

### ECOWILL Blueprint 4. Attitudes for life

#### Golden rules:

- Shift up early
- Anticipate traffic flow
- Maintain a steady speed at low RPM



### Particular emphasis: communicative, rational, relaxed, safe, environmentally conscious, etc.

#### Objectives:

- ▪ The learner drivers shall discuss in general the benefits of safe and environmentally friendly driving, also with the health aspects.
- ▪ The learner drivers shall describe what they consider as the modern way of driving.
- ▪ The learner drivers shall describe the benefits of a rational driving style and discuss what is important to them.

#### Place of learning:

Theoretical instruction

#### Procedure notes:

In this sequence, learner drivers shall talk about their attitude to driving and today's traffic. Here, the benefits of a safe and environmentally friendly driving style must be pointed out and driving motives shall be analyzed. By interviewing and follow-up questions, the relevant aspects shall be identified and focused on.

#### Examples for guiding questions:

- ▪ Why do you want a drivers licence?
- ▪ What do you want to do with the car after having passed the exam?
- ▪ How do you envisage ideal road traffic?
- ▪ What are your wishes concerning future road traffic and why?
- ▪ What does "rational driving" mean in your eyes?
- ▪ Which aspects of driving are particularly important to you and why?
- ▪ What do you know about modern, up-to-date motoring?
- ▪ What do you think the motor industry is aiming at by constantly improving fuel saving technology? How can you contribute to this development?
- ▪ Why does the European Union promote Ecodriving?
- ▪ What is the most important aspect of driving in your view and why?
- ▪ What are the health benefits from Ecodriving in your opinion?

## **14. Annex 1: Guidelines for testing applicant's competence to drive environmentally and in an energy saving way for motor vehicles with a combustion engine.**

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### **1. Introduction**

The applicant for a driving licence has to demonstrate his/her ability of environmentally friendly way of driving in a theory and practical test. (...)

A person is capable of driving motor vehicles who has adequate knowledge of an environmentally friendly and energy saving way of driving and is able to apply this in practice, (...)

### **4. Theory test**

In the theory test the candidate has to demonstrate that he/she has adequate knowledge of the legal regulations for the driving of motor vehicles and of the concept of environmentally friendly and energy saving way of driving (...)

### **5. Practical test**

In the practical test the candidate has to demonstrate that he/she has the technical knowledge necessary for the safe driving of a motor vehicle, if applicable with trailer, in traffic, and has adequate knowledge of an environmentally friendly and energy saving way of driving and is able to apply this in practice. (...)

#### **According to 5.17.2.2 Assessment of the test**

In the assessment of the driving part of the test, the following skills are to be observed:

- adequate traffic observation
- appropriate speed adaptation
- appropriate distance to the vehicle in front
- correct use of vehicle controls
- environmentally friendly and energy saving way of driving (precise and smooth use of the vehicle optimising its qualities regarding environmental impacts, fuel consumption and wear)

#### **According to 6. Driving test result**

The examiner has to make notes on the test, which in particular give information about the quality of the skills that the candidate has demonstrated.

At the end of the test the examiner has to inform him/her with a brief statement mentioning what skills shown that correspond to those, which are required, and what he/she has to develop.

## **Annex: Driving test guidelines concerning environmentally and energy saving way of driving**

### **a. Requirements of the driving part of the test**

#### **General notes**

The driving part is an essential component of the practical test. The following requirements apply with special consideration of the requirements of the test vehicle:

#### **Behaviour when moving off**

With category B vehicles with manual transmission on level ground first gear is only to be used for moving off and just for a few meters (approximately length of the vehicle). Independent of transmission system the engine should be kept at low number of revolutions when moving off.

#### **Changing and selection of gear**

Attention is to be given to timely gear changing and selection. The candidate is to engage the next higher gear as soon as possible (on reaching 2.000 rpm (or less depending on vehicle)) and with vehicles in category B, depending on the vehicle type, as a rule to use at least the first four gears up to 50km/h; other gears are also to be used as soon as possible. Acceleration should be done with gear skips when practical and safe.

Vehicles with automatic transmission: The accelerator has to be pressed slowly. The „Kick down“ has to be avoided.

Consideration is to be given to the information in the instructions for use of the specific vehicle.

#### **Driving uphill and downhill**

The candidate is to show, that he/she is in complete control of the vehicle when driving uphill and downhill, especially when starting a climb (up to approx. 10%) with coordinated use of accelerator, clutch and brake.

#### **Driving speed**

Driving speed should be adjusted to conditions and other road users. Unnecessarily high rpms are to be avoided when accelerating.

#### **Overtaking**

Overtaking is to be tested if possible. When overtaking, attention is to be paid to the following:

- rapid acceleration

## **Behaviour at crossroads, junctions, roundabouts and railway crossings**

Attention is to be paid to the following:

- in the case of a foreseeable extended stop (longer than 20 seconds) the engine is to be switched off.

## **Anticipatory driving**

- appropriate speed and sensible gear selection when driving uphill and downhill
- changing gear and driving in low revs
- steady and smooth driving in the highest possible gear
- driving at a steady speed on main roads without exaggerated braking or acceleration
- maintenance of an increased safety distance (use of a 3 second buffer distance)
- before coming to a foreseeable stop, e.g. at a junction or at a red traffic light, without using the gas and without changing to a lower gear, make early use of the vehicle's momentum and allow the vehicle to coast (disengaged, without gear, with gear<sup>23</sup>)
- in the case of delays / speed variations in the flow of traffic, e.g. traffic ahead slowing down or traffic restrictions, make early use of the vehicle's momentum and allow the vehicle to coast without accelerating and without changing to a lower gear
- avoid unnecessary braking and acceleration
- use vehicle's momentum in stop-start situations

## **b. Test Report**

If the driving test is passed, the candidate's attention should be drawn especially – if appropriate – to his/her very good environmentally friendly way of driving.

The test report must enable a brief statement of the discrepancy between the requirements and the real driving test of the candidate related to the environmentally friendly and energy saving way of driving to be reported by the examiner.

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<sup>23</sup> determined by Member State

## 15. Annex 2: Guidance for the driving test examiner<sup>24</sup>

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### a. Important general information

1. An environmentally friendly way of driving has a positive influence both on traffic safety and protection of the environment.
2. It is the aim of driving instruction to develop appropriate and responsible driving behaviour as well as creating the most stable possible foundations to prevent, after successfully passing the driving test, external influences allowing a rapid change of driving behaviour in an undesirable direction.
3. Individual behaviour in road traffic is not determined by rules and conscious behaviour, but is subject above all to psychological and social factors which can have an enormous influence on and can change driving behaviour. Therefore, driving school education must place a greater emphasis on these factors.
4. In the experience of their driving style, young people differentiate very clearly between technical and social components. The technical components relate to the use of a vehicle. They constitute an extremely important foundation. The social components, on the other hand, serve to master the demands which are posed by daily traffic and to take a proactive approach in traffic.
5. The environmentally friendly way of driving is determined by a relaxed involvement with the everyday tasks of driving and is characterised in particular by the following driving techniques: (1) rapid acceleration; (2) early change into the next higher gear approximately at about 2,000 rpm; (3) steady driving in the highest possible gear; (4) maintaining an increased safety distance; (5) early decelerating when it is clear that it is going to be necessary to stop or the traffic flow is slowing; (6) using the vehicle's momentum as soon as it is clear that the driver cannot proceed or the traffic flow is slowing and there is therefore no point in accelerating; (7) switching off the engine in familiar situations when it is clear the vehicle will be stationary for more than 20 seconds.

### b. The environmentally friendly way of driving in the driving test

1. In the driving test the examiner is to make a judgement regarding the extent to which the candidate is in a position to be involved in road traffic safely, responsibly and in accordance with the regulations. This is the context in which the examiner decides whether the candidate has passed the driving test or not.
2. In addition, it is the duty of the examiner, as an independent, neutral and competent observer, to emphasise safe driving behaviour and to itemise weaknesses which have become evident in order to have a positive influence on further development and to consolidate the candidate's driving personality.
3. It is particularly important to motivate the candidate by confirming that he/she is on the right path and should pursue this path consistently.
4. If the driving test is passed, the successful candidate's attention should be drawn especially – if appropriate – to his/her very good environmentally friendly way of driving. A statement by an independent, neutral and competent examiner will support and promote the lasting acquisition of this driving technique.

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<sup>24</sup> Guidance 'Moderne, umweltschonende Fahrweise' (Modern, Environmentally Friendly Driving Technique); Hermann, U., Sturzbecher, D. & Bönninger, J.; Dresden, 2008

## 16. References

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1. Drive cool – save fuel, Compendium, Editor DVR, 2007 [www.cool-fahren-sprit-sparen.de](http://www.cool-fahren-sprit-sparen.de) .
2. Guidance 'Moderne, umweltschonende Fahrweise' (Modern, Environmentally Friendly Driving Technique); Hermann, U., Sturzbecher, D. & Bönninger, J.; Dresden, 2008.
3. Drive safely and save gas along the way – safe, economical and environmentally friendly driving; Trainer Handbook, Editor DVR, 2001.
4. To the point 3, Studies on „Drive like a pro – safe driving, both in a professional and a private context“, Editor DVR, 2009.
5. ECOWILL project deliverable D3.1 „Compendium for ecodriving education in driving schools” (Mastertrainer Handbook for Driving Instructors, Level 1).
6. ECOWILL project deliverable D3.3 „Handbook for the set-up of 'snack' training programmes” (Mastertrainer Handbook for Trainers, Level 2).

