

Inovatívne bezpečnostné systémy



<http://projektstepahead.sk/>

STEP AHEAD: The support of Professional development of VET teachers and trainers in following of New trends in Automotive Industry

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Tento projekt je spolufinancovaný Európskou úniou v rámci programu ERASMUS+.



Cieľ aktivity: Pomocou odborného článku a video ukážky oboznámiť študentov s inovatívnymi bezpečnostnými systémami automobilov a ich používanými skratkami

KROK 1.

Stručný popis aktivity: Video ukážky bezpečnostných systémov:

<http://www.howsafeisyourcar.com.au/aeb/>

<http://www.howsafeisyourcar.com.au/Electronic-Stability-Control/>

<http://www.howsafeisyourcar.com.au/Safety-Features/Safety-Features-List/Daytime-Running-Lights/>

Inštrukcie pre študentov: Počuli ste už o inovatívnych bezpečnostných systémoch v automobiloch? Uvidíte tri krátke videá a potom si povieme, ktoré bezpečnostné prvky už poznáte. (5 minút)

Have you ever heard of innovative safety systems of the vehicles? You are going to watch three short videos and tell us, which of these safety systems are already known to you.

KROK 2.

Stručný popis aktivity: Brainstorming - cieľom je zistiť, čo už študenti vedia o inovatívnych bezpečnostných systémoch a skratkách, ktoré sa k nim viažu. Učiteľ zapisuje kľúčové pojmy z brainstormingu na tabuľu. (5 minút)

Inštrukcie pre študentov: Čo všetko vám zide na um, keď počujete výraz „inovatívne bezpečnostné systémy v automobiloch“? Hovorte všetko, čo vás napadne, neriešte, či vaše odpovede sú správne alebo nesprávne. Spoločne si zapíšeme poznámky na tabuľu.

What comes to your mind when you hear the expression vehicles' „innovative safety systems“? Tell us everything that comes to your mind in relation with these systems. We are going to write the notes down on a blackboard..

KROK 3.

Stručný popis aktivity: Učiteľ oboznámi študentov s metódou V-CH-D.

Inštrukcie pre študentov: Budete pracovať s tabuľkou. Vašou úlohou je na základe video ukážok a úvodného brainstormingu vyplniť jej prvý stĺpec "VIEM". Zapište do neho všetky skratky a názvy inovatívnych bezpečnostných systémov, ktoré v súvislosti s bezpečnosťou už z minulosti poznáte.

(po chvíli) Keď budete mať prvý stĺpec vyplnený, do druhého stĺpca zapište všetko, čo by ste sa o tejto téme a nových skratkách, ktoré ste doposiaľ nepoznali, chceli dozvedieť. (5 minút)

You are going to work with a chart. Your task is, after watching the video, to fill in the first column of this chart „I KNOW“. Please, write down all the names and abbreviations of the safety systems, which you already know from the past.

Later, please fill in the second column „I WANT TO KNOW“ with all your questions regarding this topic.

EVOKÁCIA

Inovatívne bezpečnostné systémy

Pomôcky: Tabuľka – metóda V – CH – D (Príloha 2)

Čas: 20 min.

Poznámky: Téma je rozvrhnutá na 2 vyučovacie hodiny, teda 2 x 45 min.

Učiteľ v úvode pripomenie pravidlá V-CH-D, ak je to pre študentov potrebné.

Zdroje:

<http://www.howsafeisyourcar.com.au/Safety-Features/>

<http://www.bezpecnecesty.cz/cz/bezpecnost-automobilu/aktivni-prvky-bezpecnosti/esp-esc>

<http://www.hybrid.cz/toyota-predstavila-nove-bezpecnostni-technologie-pro-auta>

Cieľ aktivity: Naučiť sa anglické skratky inovatívnych bezpečnostných systémov automobilov a ich význam pomocou metódy priraďovania.

KROK 1.

Stručný popis aktivity: Čítanie článku - Učiteľ rozdá študentom článok *Today's Cars are High Tech Devices on Four Wheels*, a upozorní, že študenti môžu používať slovník v mobilnom telefóne. Ich úlohou je v článku podčiarknuť skratky a celý názov bezpečnostných systémov, o ktorých sa dozvedeli na základe jeho prečítania. (10 minút)

Inštrukcie pre študentov: Prečítajte si článok „*Today's Cars are High Tech Devices on Four Wheels*“. Vašou úlohou je podčiarknuť skratky a plné názvy bezpečnostných systémov, o ktorých sa píše v texte. Ak niečomu nerozumiete, použite slovník v mobilnom telefóne.

Read the text „Today's Cars are High Tech Devices on Four Wheels“. Your task is to underline abbreviations and full names of the safety systems that you read about.

KROK 2.

Stručný popis aktivity: Metóda V – CH – D – pokračovanie

Do priloženej tabuľky študenti zapíšu skratky jednotlivých bezpečnostných prvkov, o ktorých sa dozvedeli z článku. Nasleduje diskusia, v ktorej študenti hodnotia svoje poznámky. (5 minút)

Inštrukcie pre študentov: Do tabuľky V-CH-D si zapíšete skratky jednotlivých bezpečnostných prvkov, o ktorých ste sa dozvedeli z článku. Potom svoje poznámky z tabuľky prečítajte spolužiakom. Kľúčové pojmy si zapíšeme spoločne na tabuľu.

Write the abbreviations of concrete safety systems into the chart. Then read loud what you wrote. We together make the notes on a blackboard.

KROK 3.

Stručný popis aktivity: Metóda priraďovania pojmov

Učiteľ vysvetlí študentom metódu priraďovania pojmov a rozdelí ich do dvojíc, prípadne do skupín. Potom rozdá študentom rozstrihané prúžky so skratkami, názvami a charakteristikami jednotlivých bezpečnostných systémov. Študenti pracujú v dvojiciach či skupinách. (10 minút)

Inštrukcie pre študentov: Rozdeľte sa do skupín. Do každej skupiny dostanete rozstrihané prúžky papiera so skratkami, názvami a charakteristikami jednotlivých bezpečnostných systémov. Vašou úlohou je v skupinách priradiť k skratkám názov a charakteristiku bezpečnostného systému, ktorý predstavujú.

Divide into groups. In each group, you'll receive abbreviations, names and descriptions of individual safety systems. Your task is to match the abbreviations, names and the descriptions with concrete safety systems.

KROK 4.

Stručný popis aktivity: Kontrola správnosti

Študenti si navzájom kontrolujú správnosť priradených skratiek, názvov a charakteristík.

Inovatívne bezpečnostné systémy

(5 minút)

Inštrukcie pre študentov: Navzájom si skontrolujte správnosť priradených skratiek, názvov a charakteristík.

Please check together, whether your matching is correct.

Pomôcky: Kópie článku Today's Cars are High Tech Devices on Four Wheels (Príloha 1)

Rozstrihané prúžky so skratkami bezpečnostných systémov, názvami bezpečnostných systémov a charakteristikami bezpečnostných systémov (Príloha 3), v počte podľa počtu skupín

Čas: 30 min.

Zdroje:

<http://www.howsafeisyourcar.com.au/Safety-Features/>

<http://www.bezpecnecesty.cz/cz/bezpecnost-automobilu/aktivni-prvky-bezpecnosti/esp-esc>

<http://www.hybrid.cz/toyota-predstavila-nove-bezpecnostni-technologie-pro-auta>

Cieľ aktivity: Aplikácia poznatkov o bezpečnostných systémoch a ich používaných skratkách v praxi.

KROK 1.

Stručný popis aktivity: Metóda ROLE PLAY - oboznámenie s metódou

Učiteľ oboznámi študentov s metódou ROLE PLAY. (5 minút)

ROLE PLAY – príprava

Študenti pracujú v dvojiciach či skupinách a majú za úlohu diskutovať spolu ako kamaráti o nových bezpečnostných prvkoch, ktoré majú vo svojich autách. Používajú pritom skratky i charakteristiky jednotlivých systémov. (10 minút)

Inštrukcie pre študentov: Pracujte vo dvojiciach. Vašou úlohou je zvoliť si konkrétny typ auta (dve rôzne autá na každú dvojicu) a diskutovať o nových bezpečnostných prvkoch, ktoré v nich máte. Používajte pritom skratky i charakteristiky jednotlivých systémov. Odôvodnite, prečo ste si vybrali práve vami zvolený typ auta.

Work in pairs. Your task is to choose concrete type of a car (two different types in one pair) and discuss the new safety systems in these cars. While working, please use abbreviations and descriptions of concrete systems. Justify, why did you choose your particular type of car.

REFLEXIA

KROK 2.

Stručný popis aktivity: ROLE PLAY – realizácia

Študenti v danom časovom úseku (2 minúty) predvedú rozhovor kamarátov o bezpečnostných systémoch v svojich autách. (15 minút)

Inštrukcie pre študentov: Svoj rozhovor o konkrétnych typoch bezpečnostných systémov odprezentujte spolužiakom.

Present your dialogue about concrete safety features.

Pomôcky: stopky

Čas: 30 min.

Poznámky: Ako doplnkovú aktivitu na hodine alebo domácu úlohu zaradíte vypracovanie interaktívnych cvičení v AJ na portáli <http://projektstepahead.sk/>. (10 – 15 min.)

Zdroje:

<http://www.howsafeisyourcar.com.au/Safety-Features/>

<http://www.bezpecneesty.cz/cz/bezpecnost-automobilu/aktivni-prvky-bezpecnosti/esp-esc>

<http://www.hybrid.cz/toyota-predstavila-nove-bezpecnostni-technologie-pro-auta>

Príloha 1 / ANNEX 1

ARTICLE

Today's Cars are High Tech Devices on Four Wheels

Today, auto technology on sale allows cars to “see” all around, gathering data on possible roadway concerns and giving drivers eyes in the back of their heads. Since more than 90 percent of crashes involve driver error, automakers created a range of safety systems that aid drivers for brief periods to help avoid accidents.

In a crash situation, different cars offer varying levels of occupant protection. Car manufacturers can include different combinations of features which impact on the safety of your car. These safety features are generally grouped into three categories:

- ❖ Crash Avoidance Features - features that help you to avoid being in a crash, like auto emergency braking (AEB), electronic stability control (ESC) and traction control
- ❖ Crash Protection Features - features that help to protect you in a crash, like seat belts, curtain airbags and car crumple zones
- ❖ Driver Features - features that add to the safety of your car by making driving easier and more comfortable, such as seat height adjustment

Auto Emergency Braking (AEB)

Among the safety features is autonomous emergency braking (AEB), which uses a laser, radar or camera to automatically stop a car if it senses there is going to be a collision. AEB has the potential to prevent a crash or reduce the impact speed of a crash.

AEB can:

- ❖ Alert the driver to an imminent crash and help them use the maximum braking capacity of the car and
- ❖ Apply the brakes independently of the driver if the situation becomes critical

Crash avoidance systems can be classified into three main categories:

- ❖ *Low Speed system* – this version targets city driving where crashes often occur at low speeds but can cause debilitating injury such as whiplash injuries. Typically, these systems look for the reflectivity of other vehicles and are not as sensitive to pedestrians or roadside objects.
- ❖ *Higher Speed system* – this version typically utilises long range radar to scan further ahead of the vehicle (up to 200 metres) at higher speeds.
- ❖ *Pedestrians* – these versions use a camera combined with radar to detect vulnerable road users through their shape and characteristics. The way in which pedestrians move relative to the path of the vehicle is calculated to determine whether they are in danger of being struck.

These three systems of AEB are not mutually exclusive and there are vehicles that may have two or more versions. It is important to note that within each type of system there will also be variation in functionality depending on the manufacturer and even car model (in terms of warnings, braking function, time-to-collision etc.,).

Video on: <http://www.howsafeisyourcar.com.au/aeb/> (0:54 min.)

Electronic Stability Control (ESC)

Electronic Stability Control (ESC) helps drivers to avoid crashes by reducing the danger of skidding, or losing control as a result of over-steering. ESC becomes active when a driver loses control of their car. It uses computer controlled technology to apply individual brakes and help bring the car safely back on track, without the danger of fish-tailing.

ESC works by using a number of intelligent sensors that detect any loss of control and automatically apply the brake to the relevant wheel, putting your car back on the intended path.

ESC is of assistance to the driver in:

- ❖ correcting impending oversteering or understeering;
- ❖ stabilising the car during sudden evasive manoeuvres;
- ❖ enhancing handling on gravel patches, such as road shoulders; and
- ❖ improving traction on slippery or icy roads.

Video on <http://www.howsafeisyourcar.com.au/Electronic-Stability-Control> (0:59)

Active Braking Systems (ABS)

Active braking systems are a new safety technology that provide drivers with braking support during emergency situations.

There are many versions of active braking systems, providing differing degrees of braking support. Preliminary systems, such as Brake Assist, measure the speed and force of brake application to determine whether the driver is attempting an emergency stop. If such an emergency is determined, the system applies additional brake pressure to allow the driver to take full advantage of the Antilock Braking System (ABS) which prevents wheel lock up.

More advanced systems such as Volvo's Collision Warning with Brake Support and Mercedes Brake Assist System Plus, use radar and or cameras to scan ahead of the car for moving and stationary hazards. If a potential collision is detected, audiovisual warnings are provided to the driver and the brakes are primed ready for maximum application.

Active braking can be of assistance to the driver by:

- ❖ preventing rear collisions by assisting with maximum brake force in emergency situations
- ❖ warning of the potential for a collision with an upcoming car or obstacle
- ❖ preventing rear collisions by partially applying the braking and assisting with maximum brake force in emergency situations

Intelligent Speed Assist (ISA)

Intelligent Speed Assist (ISA) is a safety technology that alerts drivers when they exceed the speed limit. ISA activates when a driver exceeds the posted speed limit for a section of road by a set speed (eg. 2km/hr or more). Audio and visual warnings activate to remind the driver that they are going too fast.

ISA determines the location of the car through global positioning (GPS) navigation and cross references this information to a digital road map containing speed limit information for each road. It then analyses the speed of the car and issues a visual and audio warning to notify the driver if they are travelling at a defined amount (eg. 2km/hr) or more over the speed limit.

If ISA is fitted with a speed limiting function it increases the pressure on the accelerator when you exceed the posted speed limit, making it harder to accelerate and break the speed limit.

ISA can be of assistance to the driver by:

- ❖ advising when the speed limit is being exceeded
- ❖ advising when speed limits change along a stretch of road such as those associated with traffic conditions, weather or school zones
- ❖ advising of the current posted speed limit in any location
- ❖ preventing excessive speeding

Blindspot Warning System (BLIS)

Blind Spot Information System (BLIS) is a system of protection developed by Volvo. Volvo's previous parent Ford Motor Company has since adapted the system to its Ford, Lincoln (automobile), and Mercury (automobile) brands.

The blind spot monitor is a vehicle-based sensor device that detects other vehicles located to the driver's side and rear. Some systems are camera-based, others rely on radar. Warnings can be visual, audible, vibrating or tactile.

Blind spot warning systems detect the distance and closing speed of objects in adjacent lanes and alert the driver if a collision is imminent.

On a highway, a car which is far behind can be clearly seen in the rear view mirrors. However, as the car approaches, a point is reached where the car cannot be seen in either the interior or exterior mirrors. Typically this occurs when the car is just behind and to one side of the vehicle it is overtaking. It is a common mistake for drivers to change lanes when there is a vehicle in this so-called "blind spot", a manoeuvre which causes many crashes.

Daytime Running Lights

Daytime Running Lights (DRLs) are headlights that are illuminated during the day in order to make vehicles more visible and thus reduce their involvement in crashes. It is possible to fit vehicles with a device that will automatically activate DRLs when the ignition is switched on but is overridden by full strength headlights.

DRLs have been found to increase driver's peripheral perception of vehicles. It is also easier for drivers to estimate the distance to vehicles with DRLs.

Video on: <http://www.howsafeisyourcar.com.au/Safety-Features/Safety-Features-List/Daytime-Running-Lights/>
(1:01)

Zdroje:

- <http://www.howsafeisyourcar.com.au/Safety-Features/>
- <http://www.bezpecnecesty.cz/cz/bezpecnost-automobilu/aktivni-prvky-bezpecnosti/esp-esc>
- <http://www.hybrid.cz/toyota-predstavila-nove-bezpecnostni-technologie-pro-auta>

Príloha 2 / Annex 2

VIEM / I KNOW	CHCEM VEDIETĚ / I WANT TO KNOW	DOZVEDEL SOM SA / I'VE LEARNED

Príloha 3 / Annex 3 - nutné rozstrihať

AEB	Auto Emergency Braking	a system which uses a laser, radar or camera to automatically stop a car if it senses there is going to be a collision
ESC	Electronic Stability Control	a system which helps drivers to avoid crashes by reducing the danger of skidding, or losing control as a result of over-steering
ABS	Active Braking Systems	a new safety technology that provides drivers with braking support during emergency situations
ISA	Intelligent Speed Assist	a safety technology that alerts drivers when they exceed the speed limit
BLIS	Blindspot Warning System	sensor device that detects other vehicles located to the driver's side and rest
DRLs	Daytime Running Lights	headlights that are illuminated during the day in order to make vehicles more visible and thus reduce their involvement in crashes

POZNÁMKY

Dotted lines for notes