LESSON VIII

Special Subjects of Interest to Utah Drivers

Registration, Vehicle maintenance and Emergency.

Lesson VIII
Registration & Legalization

Chapter I.

Registration & Legalization

Chapter II.

Vehicle Maintenance

Chapter III.

Driving Conditions & Vehicle Emergency.

Chapter I.
VEHICLE REGISTRATION, EMISSION AND SAFETY INSPECTION

Utah Division of motor vehicles (DMV) handles all vehicle licensing and registration

The Drivers license division (DLD) handles licensing the drivers

All automobile must be licensed, these include

- cars, trucks, watercrafts, off-highway vehicles, trailers, snowmobiles,
- campers, aircraft, motorcycles, & low speed electric vehicles (Mopeds).

Chapter I.
VEHICLE REGISTRATION, EMISSION AND SAFETY INSPECTION

All Utah residents must register their vehicles in the state.

Nonresidents using watercrafts in Utah for more than 60 days must register such watercraft in Utah.

Vehicle registrations in Utah are completed every 12 months, commercial vehicles may have longer registration periods.

Registration can be completed online, by mail, on the spot inspection stations and at the DMV office.

Emissions Inspections

- Vehicles registered in Salt Lake County with model years **less than six years old** are required to have an emission test once every two years.
- Vehicles in this category that have even-numbered model years must have an emission test in even-numbered years,
- Vehicles that have odd-numbered model years must have an emission test in odd-numbered years.
- Its illegal to drive a vehicle which is deemed unsafe by inspection station or a vehicle that doesn't have minimum equipments required by law.
- All owners have the responsibility to keep vehicle in a safe operating conditions.

Emissions Exemptions

- The following vehicles are exempt from Emissions requirements
  - New vehicles with an MSO
  - Any vehicle with a model year 1967 & older
  - Any diesel vehicle with a model year 1997 & older and with a GVWR less than 14,000 lbs.
  - All implements of husbandry
  - Off highway vehicles
  - Electric vehicles
  - Motorcycles or motor driven cycles
  - Farm vehicles
  - Vintage or custom vehicles
  - Maintenance or construction vehicles not designed or licensed to operate on a highway
  - Military tactile vehicles

Safety Inspections

Effective January 1, 2018, the State of Utah removed the safety inspection requirement for most vehicles as a prerequisite for registration. Vehicles that require a safety inspection are listed below.

- Salvage vehicles that have been rebuilt and are requesting a rebuilt title.
- First time street legal ATV registrations. This includes ownership transfers for previously registered street legal ATVs.
- Commercial vehicles are required to obtain a safety inspection for display and presenting to law enforcement, but it is not a prerequisite for registration.
- Motorhomes with three axles are considered a “Class 6” vehicle and require an annual safety inspection for display and presenting to law enforcement.

- Safety inspection program is to minimize or eliminate vehicle defects and prevents unsafe vehicles from operating on a Utah roads and highways.
- The need for an annual inspection also increases your awareness of the steps which result in a quality inspection.
- Inspection Checklist. Include
  - Brakes Tires Exhaust system Steering
  - Headlights Taillights, stop lights, and turn signals
  - Windshield and windows Windshield wipers Mirrors
  - Fuel system Muffler Safety belts

Utah Safety & Emission Recap.

Registering a vehicle

Most on- and off-road vehicles, boats, aircraft, and commercial vehicles must be registered to operate in Utah. Different requirements, fees, and taxes apply, depending on your vehicle type and other factors.

- Documents required for registration of a vehicle include
  - Recent registration
  - Current vehicle Title
  - Safety inspection certificate if applicable
  - Emission certificate
  - Vehicle Identification Number Inspection
  - Signed Application for registration & title
  - Property Tax clearance.
    - *All vehicles in Utah are subject to either an age-based fee or uniform fee of 1.5 or 1.0 percent of the fair market value of the vehicle.*

Note: New residents to Utah are allowed 60 days to transfer titles and

Registration Recap

- After providing all documents required for registration, you will be issued a ***Utah registration certificate, Utah License Plate and Decals*** for month and year of expiration.
- After a sale of a motor vehicle, the seller must remove the plates with the decals and return them to DMV or destroy them properly. (unless plates are transferred to another vehicle of the seller.
- All registered vehicles in Utah must always carry ***proof of liability insurance in the vehicle.***

Vehicle Equipments.

Equipments required on all vehicles with active Utah registration.

- ❑ *White License plate light*
- ❑ *Stop lights*
- ❑ *Red tail lights*
- ❑ *Safety belts*
- ❑ *Emergency brake*
- ❑ *Parking lights*
- ❑ *Bumpers*
- ❑ *Turn signals*
- ❑ *Headlights*
- ❑ *Horn*
- ❑ *Windshield wipers*
- ❑ *Safety glass*
- ❑ *Mirrors*
- ❑ *Brakes*

Prohibited Vehicle Equipments

The following equipments are prohibited on vehicles operated on Utah roadways

- *Any red or blue light showing toward the front*
- *Any siren, bell, or whistle*
- *A muffler cutout*
- *More than two fog lights*
- *More than two extra driving lights*
- *More than two fender lights*
- *After-market sun screening devices are not approved for use in Utah*
- *Front window must allow no less than 43% light transmittance*

Utah Vehicle Lifts

Vehicle Safety-Tires

Window Tint Video

Chapter II
Vehicle Systems & Maintenance

Before & After Engine Start Inspection.

Engine and Power Train familiarization.

Understanding and Maintaining Car System.

Suspension, Steering, Brakes & Tires.

Power Train Systems

Before Engine start Inspection

- You have probably heard the old saying that an ounce of prevention is worth a pound of cure. That maxim is especially important for drivers.
- Inspecting and caring for your care before something goes wrong can save you both money and aggravation, more importantly maintaining your care can save your life.
- You don't need to be a mechanic to inspect your car. You can check many items quickly and easily before driving.
- Make these checks at least one a month and before long road trips.
- Before you enter your care check your Under hood fluid levels, belts, hoses, and wires.

Note: Always check radiator coolant level by looking at the radiator overflow tank. If additional coolant is needed add it to the overflow tank. Not to the radiator.

After Engine Start Inspection

- Once your car engine is running, you should make several routine checks to ensure that your car is operating properly and safely.
- You should check your gauges and warning light.
- You should check your brake lights, horns, lights and turns signals for good operation.
- Your cars brake warning lights will make you aware of some but not all brake system problems. For this reason, you should always test your brakes as soon as you begin driving.

Note: When you step on the break pedal, you should feel firm resistance, and your car should to a smooth straight stop. The Brake pedal should stay well above the floor.

Engine & Power Train

Many parts works together to produce a car's power and notion. By keeping these parts operating smoothly, you help your car run safely and fuel efficiently.

Engine

Your cars engine is known as the internal combustion engine. Its called that because power it produces comes from the burning of a mixture of fuel and air inside, rather than outside the engine.

Power Train

Several part of your car work together to transmit power from the engine to the wheels, these parts make up the power train.

In most cars, the power train sends power from the engine to only two of the four wheels. The wheels that receive the power are called the drive wheels.

If the two front wheels are the drive wheels, the car has front wheel drive. If the two rear wheels receive the power, the car has rear wheel drive. A car has four-wheel drive if all four wheels receive power.

Transmission

The transmission is part of the power train. Gears in the transmission allow it to transfer power to the drive wheels.

In a car with a manual transmission, the driver uses the clutch pedal and gear shift level to shift gears and change the amount of power that goes to the drive wheels.

In a car with automatic transmission, the clutch works automatically, so the gears are shift shifted automatically too.

In a car with rear wheel drive, the transmission is connected to a driveshaft to the differential, rear axle, and rear wheels.

The differential allows the rear wheels to turn at different speeds when the car turns.

In a car with front wheel drive, the engine power is sent to a combination transmission and differential, and then directly to the front wheels.

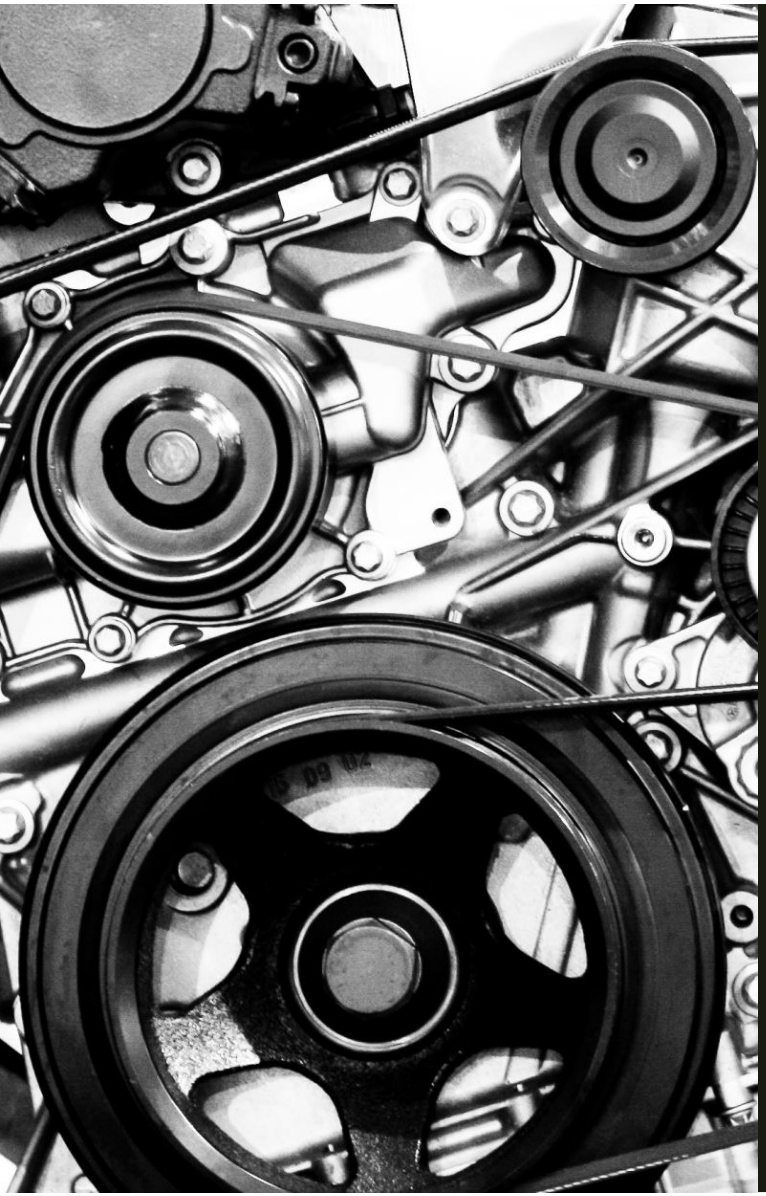
Maintaining the Engine and Power Train

- Cars that are well maintained perform better, are more fuel efficient and last longer than cars that are neglected.
- To keep your cars engine and power train in a top condition, check and change our oil regularly and have regular tune ups.
- Oil Change
  - *Check your cars oil level at least once a month. Have the oil changed at least twice a year or every 3000 miles. If you drive over 10,000 miles a year or if you pull a trailer, you may have to change the oil more often.*

Tune ups

- If you drive 10,000 to 12,000 miles a year you should take your car in for a one major and one minor tune up during that period.
- In addition to the 15-minute monthly checkups you can perform yourself, a mechanic should do some or all the following
  - *Change the oil filter*
  - *Check the carburetor adjustment or fuel injection system*
  - *Clean or replace the spark plugs*
  - *Check and when necessary, replace fuel and air filters*
  - *Check alternator, battery and voltage regulator*
  - *Check the ignition wires and timing or electronic ignition system*
  - *Check and when necessary clean the battery terminals*

Note: Its important to keep in mind, the kind of driving you do will affect how often you need to have your engine tuned. Stop and go city driving for example is much harder on a car than steady highway driving.



Understanding & Maintaining Car systems

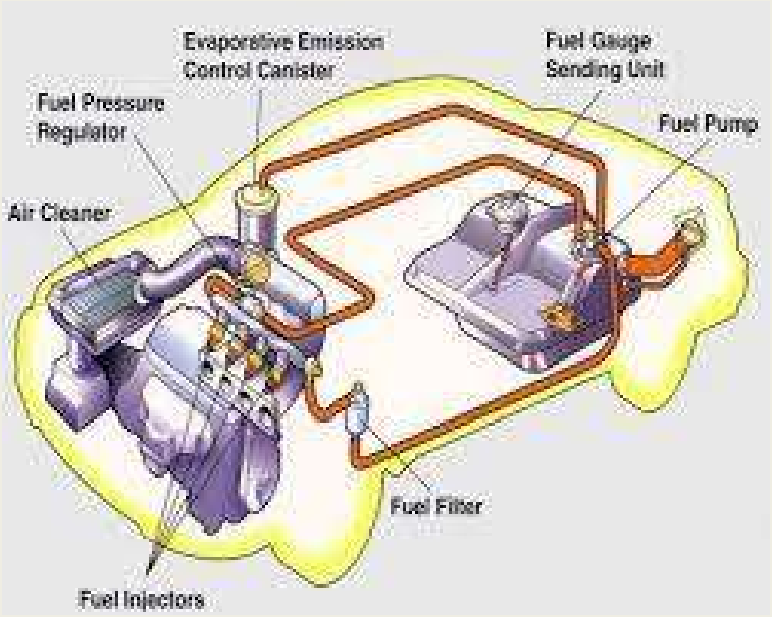
- Today its easy to take motor vehicle for granted, They are everywhere, and they have been around for a long time. But they are still among the most complicated machines ever invented.
- Every time you get behind the wheel, you take control of a network of many different systems that work together to make your car work the way it does.
- These systems include the fuel and exhaust systems, The electrical and light systems, the lubricating and the cooling systems.

Fuel & Exhaust Systems

- The fuel and exhaust systems in a car must operate properly to maximize engine efficiency and minimize pollution.
- The fuel system both stores fuel and delivers the correct air-fuel mixture to the engine, while the exhaust system carries off poisonous gases and muffles engine noise.

Fuel Systems

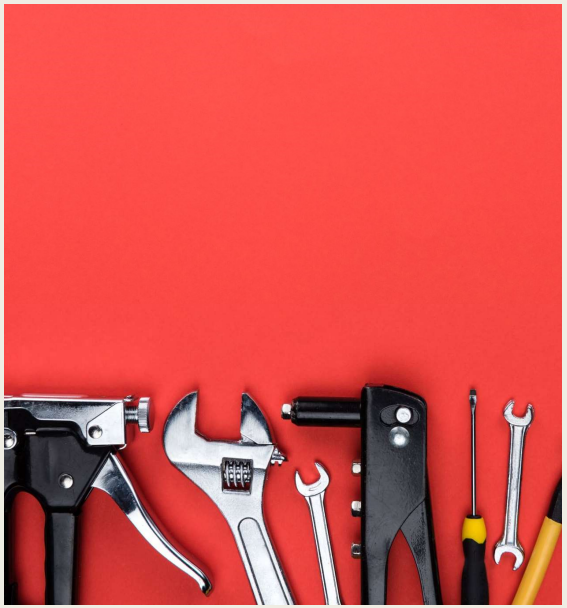
- Your cars fuel system includes the fuel tank, fuel pump, fuel filter, carburetor and air filter.
- Fuel is stores in the tank, the pump forces fuel from the tank through the filer to the carburetor.
- There the fuel is mixed with air drawn in through the air filter.
- The mixture of air and fuel becomes misty fuel vapor that then goes to the engine cylinders where its ignited.
- Some cars have fuel injection system instead of carburetor. In car with fuel injection system an electronic mechanism senses fuel demand and injections the correct fuel air mixture into the cylinders.



Exhaust System

- The exhaust system serves two main purposes. First it carriers off carbon monoxide and other harmful gas by products of combustion. Second it muffles engine noise.
- The pipes that make up the exhausts manifold collect unburned gases from the engine and carry them to the muffler.
- The muffler absorbs noise from the explosions in the cylinders.
- Exhaust gases exit through the tailpipe.
- Pollution control devices such as the catalytic converter reduce the amount of harmful gases coming from the tailpipe.

Maintaining fuel and exhaust system



- To maintain your cars fuel system, replace the air and fuel filters as needed.
- Adjust the carburetor occasionally to ensure fuel efficiency
- If your car operates on lead-free gasoline, using leaded gasoline will destroy the catalytic converter.
- How much maintenance or repair the exhaust system requires varies with the condition under which you drive. Short trips, for example are harder on the car than long highway drives.
- Be on the lookout for loose, rusting or damaged parts.
- Always have your exhaust system thoroughly inspected as part of a tune-up.

Note: Using gasoline with a high-octane rating may not increase your engine's power or fuel efficiency. Choose the lowest octane gasoline you can use without causing your engine to make a pinging sound when accelerating or driving up hill. Use your owner's manual for manufactures recommendation.

Understanding Electrical and Light system functions

- The electrical and light system help to keep your car running smoothly and safely.
- The electrical system components include the battery, the alternator, the voltage regulator, the distributor and the fuses.
- The battery provides power to start the engine, it also enables you operate equipment such as radio and lights for a short time when engine is not running.
- The alternator supplies electricity needed to keep the engine running, operate equipment and recharge battery.
- The voltage regulator control the amount of electricity generated and the rate at which the battery is recharged
- The distributor sends electric current o the individual spark plugs to ignite the fuel air mixture in the engine cylinders.
- To protect your electrical circuits from overloads, your car is equipped with fuses. These safety devices burn out incase of an electrical problem, preventing damage to the cars wiring.

The Light system

Your cars light system enables you to see and be seen.

Exterior lights include headlights, taillights, side-markers lights, brake lights, signal lights, parking lights and emergency flashers.

Interior lights include the dome light on the roof of the car and the various dashboard lights that provide you with information about the car or warn you of malfunctions.

Maintaining Electrical and Light systems

The first step in maintaining the electrical and light system is to keep your battery in top working condition.

Keep the battery terminals free of corrosion and the battery cables firmly connected.

Have your electrical system checked as part of your tune ups.

Keep an eye on the alternator gauge or warning lights for signs of trouble.

Keep headlights clean and properly aligned

Check your exterior lights at least once a week and promptly replace any burnt out bulbs.

Lubricating and Cooling Systems

As parts of your car's engine move rapidly and rub against each other, they produce friction and heat.

At the same time, the fuel-air explosions in the cylinders create more heat.

Small wonder then that the engine temperature may exceed 4000-degree Fahrenheit.

Too much heat can destroy your cars engine.

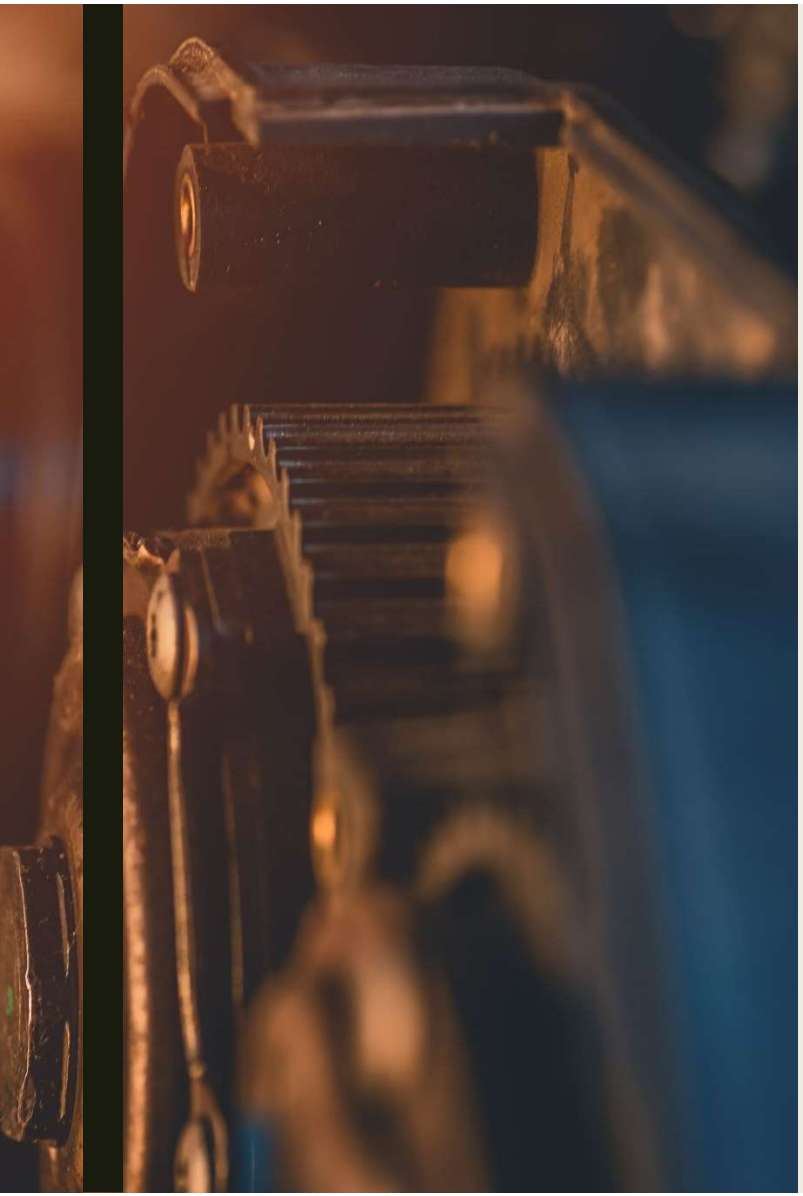
The lubricating and cooling systems are desired to keep that from happening.

Lubricating System

- *Oil* is key element in your cars lubricating system. Coating engine parts with oil reduces friction, heat and wear.
- Oil also helps *clean internal engine* surfaces and *prevent rust and corrosion*.
- An *oil pump* moves oil from the oil pan, where it is stored to all moving engine parts.
- The *oil filter* cleans the oil as it circulates.
- In addition to oil, *grease* is used to lubricate parts of the car, such as the steering system.
- Like oil, grease *reduces friction* and *helps parts move smoothly*.

Cooling System

- The purpose of the cooling system is to keep your cars engine from overheating. To do this, the cooling system circulates ***coolant***- a mixture of water and antifreeze through the engine by means of a network of pipes, channels and connecting hoses.
- Without antifreeze, the liquid in the colling system would freeze in the very cold weather could boil over in hot weather, especially in traffic jams and on long road trips. Froze or boiling coolants does not circulate, and the engine can overheat.
- Coolant is stored in ***radiator, and radiator overflow tank***.
- A ***water pump*** pumps the coolant through the radiator and the circulating network.
- A fan forces air through the radiator to cool the liquid. A ***thermostat*** in the system works to control the flow of coolant so as to maintain the best operating temperature.
- Although water-cooled engines are the most common, some cars have ***air cooled engines***. The cooling system for these engines circulates air rather than water to control engine heat build up.



Maintaining the Lubricating & Cooling System

- Checking and changing the oil and oil filter regularly is the key to maintaining your cars lubricating system. Low oil pressure allows the engine to become too hot, which may cause excessive wear of moving parts.
- Keep in mind that the oil pressure gauge or warning light doesn’t not indicate how much oil is in the engine but will signal a drop in oil pressure.
- To check the actual level of oil, use the oil dipstick, Never drive your car with insufficient oil. You could destroy the engine.

Maintaining the Lubricating & Cooling System

- Driving with an overheated engine can also damage your car. IF the temperature gauge or warning light indicates overheating, stop driving as soon as possible.
- Let the engine cool before you look for the cause of the problem.
- To maintain the cooling system, use the proper coolant, and check the fluid level whenever the car is serviced.
- Also check the fan belt and connecting hoses.
- Have the cooling system completely drained, flushed, and refilled every two years.

Practical Exercise: *Refer to your workbook for practical assignment on Lubricating and cooling system. This requires parent participation and signature.*

Suspension, Steering, Brakes and Tires

- Your comfort and safety in a car depend not only on how well you drive but also on how your car handles.
- To protect yourself and others, make sure your car suspension, steering and brake systems as well as all four tires are in good operating condition.
- Suspension, steering and brake system work together to give you control over your car and provide a comfortable ride.
- The suspension systems cushions the cars frame against bumps in the road.

Suspension System

The suspension system supports your cars weight, cushions the ride, and helps keep the car stable when you drive over bumps, or uneven roadway surfaces.

Springs and shock absorbers are the main parts of the suspension system. These parts connect the cars frame to the wheels.

The springs soften the impact of the bumps in the roadway. If your car had only springs, however it would continue bouncing after hitting a bump. This bouncing would reduce the contact between the tires and the road and make it harder for you to control the car.

The shock absorbers, shocks, as they are commonly called-work to control bouncing. By absorbing the shocks of driving, the make he ride smoother and help you maintain steering and braking control.

Steering System

- The steering system enables you to turn the front wheels.
- The steering wheel is connected to the front wheels by steering shaft and movable rods.
- The front wheels are designed to remain an upright position and move up and down over bumps, even when they are turned.

Brake System

- Brakes slow or stop a car by applying hydraulic pressure-pressure created by the force of a liquid-against the four wheels.
- Stepping on the pedal forces brake fluid from the master brake cylinder through the brake-fluid lines to the wheel cylinders.
- The are two types of brakes. Drum brakes and disc brakes.
  - *Drum Brakes*
    - In a drum brake, the fluid pressure causes the brake shoes to push against the brake lining. The lining then presses against the round hollow metal drum inside the wheel. Friction slows and stops the wheels turning motion.
  - *Disc Brakes*
    - In a disc brake, pressure squeezes the brake pads against a flat metal wheel disc, producing the friction needed to stop the wheel from turning.

Brake systems

- Many cars are equipped with disc brakes on the front wheels and drum brakes on the back wheels.
- Often brakes are power brakes, which engages with less pressure on the brake pedal than do non-power brakes.
- Power brakes do not however, shorten a car's stopping distance.
- To minimize the risk of brake failure, brake systems are designed so that front and rear brakes are controlled independently. If one pair of brakes fail, the other pair will still work to stop the car.

Antilock and Parking Brakes

- Antilock Brakes
  - *Many newer cars have antilock brakes, which are designed to keep the wheels from locking when the driver presses too hard on the brake pedal in an emergency.*
- Parking Brakes
  - *A parking brake is a mechanically operated brake that's separate from the hydraulic brake system.*
  - *Attached by cable to the rear wheels, it is used to prevent a parked car from rolling with gravity.*

The tires

A drivers control of a vehicle depends largely on the condition of the tires. Nevertheless, over 40% of nearly 250,000 cars inspected between 1982 and 1993 had defect tires.

Tire Inflation-Tires must be inflated properly to provide maximum traction and control. Too little tire pressure (underinflation) or too much tire inflation (over inflation) reduces traction, makes the car harder to handle and lowers fuel efficiency.

Its important for fuel efficiency and traction that a car's tires to be properly inflated.

The tire manufactures recommended maximum pressure is stamped on the sidewall of each tire. Refer to your manufacture recommendation for proper tire inflation.

The tires

- Tire tread- The grooved outer surface of a tire is its tread. On wet or slippery surface, the amount of tread on your tires determines how much traction your car will have.
- Compared with tires that have good tread, overly worn tires have double the risk of skidding and area also more likely to go flat or blow out.
- Tires should be replaced when the depth of the tread is 1/16 inch.
- To help judge the tread depth, you can buy a tread depth gauge at an automotive supply shop.

See the picture to the right for demonstration of a good tire vs. a bad tire with the penny test.

The Tires

- Tire rotation- Front tires generally wear faster than the rear tires.
- To equalize tire wear, have your car's tires rotated about every 5000 to 6000 miles.
- Rotating tires means witching their position from front to rear and sometimes from one side to the other side.
- Check your owner's manual for recommended tire rotation pattern.
- When tires are rotated, they often should be balanced. This helps to ensure that weight is evenly distributed as the wheels turn.
- Balanced tires provide better steering control, a smoother ride and longer tire life.

Common warning signs of car problems

- Sometimes car problems appear unexpectedly. More often, though advance warnings signal that a part or a system needs attention.
- Suspension and Steering problems
  - *There is too much play- free movement of the wheel. There should be little to no free movement in power steering, while you should no more than 2 inches of play in manual system.*
  - *The steering wheel vibrates or is difficult to turn*
  - *The front end of the car wobbles or shimmies.*
  - *The car bumps as your turn the wheel while driving on a smooth road.*
  - *The car pulls to one side as you drive.*
  - *The car bounces too much after hitting a bump*
  - *Tread wear on the front tire is uneven*

Vehicle Maintenance

Chapter III
Driving Conditions & Vehicle Emergency.

NIGHTTIME DRIVING

WEATHER OTHER CHALLENGING DRIVING

VEHICLE EMERGENCIES

Different Driving Conditions

Light and weather driving

- Good drivers are prepared for any kind of light or weather conditions
- Its important for you to understand how to manage visibility, time and space in order to minimize the risk caused by poor light or inclement weather.
- Statistics show 50% of teen motor vehicle fatalities occur between 9pm and 6am. Therefore, as a new inexperienced driver its important to be as prepared as possible to face the roadway challenges when driving in low light or weather affected roadway conditions.

Safe driving in low light & at night

- Visibility on the roadway is decreased at night and just before sunrise or after sunset. As visibility decreases, your risk of being in a collision increases. To lessen risk, you must understand how to reduced light limits visibility and how to managing driving tasks in low light conditions.
- Driving at night is harder and more dangerous than driving in daylight. The distance you can see is limited.
- For proper visibility, turn on your head-lights no later than half an hour after sunset and keep them on until half an hour before sunrise.
- If your vehicle's high beam lights are on and a car is coming toward you, dim your lights before you get within 500 feet of the oncoming car. Dim your high beams for oncoming traffic.
- If an oncoming vehicle does not dim, look at the right side of the road. This helps avoid being blinded by the headlights and dim your lights anyway.
- If you are following a car, dim your lights when you are within 300 feet of the vehicle ahead of you.

Safe driving in low light & at night

- Use your lights any time conditions keep you from seeing 1,000 feet ahead. These conditions include fog, stormy weather or dust.
- In fog, rain or snow, use your low beams to avoid glare. Some vehicles have fog lights. Avoid looking directly into head-lights. Keep your eyes searching the road in front of your vehicle.
- Search well ahead of your headlight beams. Look for dark shapes on the roadway. Glance to the right and left to check for the edge of the pavement and hazards on the sides.
- Do not wear sunglasses or colored lenses at night or on cloudy days. Tinted or colored lenses reduce the light you need for good vision.
- Increase your following distance by at least a second at night. Add at least two seconds for night driving on strange roads. It is wise to slow down a little at night.

Remember: The law requires that you drive at a reasonable and prudent speed. That means, especially at night, if you drive the posted speed limit, it may be too fast. .

Visibility, bright light and glare

- Think of a bright summer morning. The sky is cloudless, and everything is bathed in sunlight. That's a perfect picture for a day at the beach. But its not always pretty when you are behind the wheel of a car. The glow of that sunlight can turn to dangerous glare.
- Glare decreases visibility and causes you to become more easily fatigued.
- Sunshine increases visibility, but the glare causes when the sun hits your windshield can act in the opposite way. It can diminish visibility.
- The sun glare is most dangerous at certain times. In the morning or late afternoon, when the sun is low on the horizon, glare can make it hard to see the road ahead. Glare can reduce your ability to see the brake light of other vehicles.

Safe driving in sun glare

Help

- As in all driving situations, advance planning can help you minimize the risk of glare.

Part

- As part of your pre-trip preparation make sure your windshield is clean.

Part

- As part of your overall car maintenance, you should replace if its badly scratched/cracked or broken. Glare is worse through a dirty or scratched/cracked windshield.

Safe driving in sun glare

Use

- Use sunglasses when appropriate, reduce your speed and increase your following distance. Adjust your sun visor to block out the sun, However be careful that the visor does not hinder your view in anyway.

Remember

- Remember when the sun is directly behind you, in may shine on your review mirror and make seeing. Be aware the that this is happening to other drivers in front of you as well and increase your following distance.

Weather driving

- It might be pleasant if you could just stay in doors when its raining or snowing outside. However, most of the time you can't. If you must drive somewhere in rainy or snowy weather, you must understand and manage the risk that driving in such weather presents.
- Rain and snow decreases your ability to see not only ahead of you but all around you as well.
- Decreased visibility in turn makes it difficult for you to judge distance and to manage time and space well.
- Bad weather conditions also make it much harder for other drivers and pedestrians to see your car.

Rain & snow

- Heavy rain or snow can limit your view so much that you can't see very far ahead or even the edges of the roadway
- Snow and sleet collecting on your windshield can produce blind areas that your windshield wipers can't reach
- Snowy or rainy weather can also make the roadway slick, reducing the ability of your tires to grip the road and increase your risk of collision

Remember the following tips to minimize your risk.

Tips to remember during rain or snow driving

- Prepare in advance
- Allow for extra margin of safety
- Drive in the tracks of the vehicle ahead of you
- Give other drivers plenty of advance notice
- Be alert
- Keep your low beam headlights
- Ease your way into turns and curves

Anticipate and preventing Skids

- Anticipate situations in which skids are likely and take steps to maintain control of your car.
- For example, when driving on a wet road when the temperature is near freezing, allow yourself extra time and space to brake and steer.
- If you are approaching as sharp curve or steep hill, slow down well in advance and keep a firm grip on the steering wheel.
- When you have to turn the wheel, do so slowly and only as much as necessary.
- When you know that you will have to stop for a stop sign or red signal light on an ice-or snow packed roadway, shift to neutral and press the brake pedal down gently. Shifting to natural helps you to brake and to prevent skidding by eliminating the thrust effect of wheels.

Anticipate and preventing hydroplaning

- During the first 10 to 15 minutes of a rainfall, the roads are at their slickest. This occurs because the rains moisture mixes with surface dirt and oil to form a slippery film.
- This film greatly reduces the ability of your tires to grip the road.
- At speeds as low as 35 mph, the tires of a vehicle will begin to skim along the wet surface of the road, much like a water-skier zipping across the surface of a lake.
- The car may completely lose contact with the road and be moving on a thin film of water. This is called hydroplaning.
- Hydroplaning is very dangerous because it severely limits your ability to control your car. To reduce the chance of hydroplaning, reduce speed by one-third when driving on wet roadways.

Reminders on Winter driving

- Winter is the most difficult driving season. Not only do you have snow and ice to deal with, but there are fewer hours of daylight as well.
- Before winter weather arrives, make sure your vehicle is in good condition. Make sure your vehicle has good snow tires. Put them on the vehicle before the first snowfall. Front-wheel drive vehicles, it is best to put snow tires or “all-season” tires on all four wheels, not just the front.
  - *Snow tires with metal studs may be used October 15 through March 31 of each year.*

Reminders on Winter driving

- During ice or snowstorms, especially when a weather advisory is issued, do not drive unless it is necessary. If you must drive, first clear the ice and snow from your vehicle, including the headlights and taillights, the windshield wipers and all of the windows.
  - *Be sure to use a freeze-resistant cleaning solution for the wipers and that the reservoir is filled adequately.*
- Drive slowly. Even if your vehicle has good traction in ice and snow, other drivers will be traveling with caution. Do not disrupt the flow of traffic by driving faster than every-one else drives.
- When sleet, freezing rain or snow starts to fall, remember that bridges, ramps, and overpasses are likely to freeze first.
  - *Be aware that slippery spots may remain after road crews have cleared the roadways.*

Other hazardous weather conditions fog and smog

- Fog rolling in off the water, industrial smog, or a sudden dust or sandstorm can diminish the light of a bright clear day. Strong gusts of wind can blow your car off the road.
- Dense fog poses unique hazards. Scattered patches of thick fog may occur so suddenly that your field of vision is cut without warning.
- If humidity is high enough moisture can accumulate both inside and outside your windshield, further reducing your already limited visibility.

Remember: Use your low beams in fog or smog condition, don't be tempted to use your high beams. Use your windshield wipers, as necessary. IF all else fails, its always safe to turn on our hazard flashers and pull off to the right shoulder off the road until the condition improves. DO NOT STOP on the road.

Other hazardous weather conditions sand and dust

- In some parts of the country sand and dust storms cause serious visibility problems. Sand and Dust storms can make it all but impossible to see. This severe decrease in visibility greatly increases the risk of a collision.
- If possible, avoid driving in sand and dust storms. If you are caught in such a storm, remember to signal and pull off the roadway. Turn on your flashers and wait for the storm to pass.
- If you must continue driving in these conditions use your low beam headlights and proceed slowly and cautiously.

Other hazardous weather conditions lighting

- Only a hard-topped vehicle will protect you in a lightning storm.
- Make sure all doors are closed and windows are up.
- Do not touch any metal surfaces.
- Do not use radios connected to an external antenna mounted on the vehicle.

Note: the safest place to be during a thunderstorm is inside a well-constructed building with plumbing and electric wiring.

Other hazardous weather conditions TORNADOS

- Vehicles are notorious as death traps in tornadoes because they are easily tossed and destroyed.
- If you spot a tornado either leave the vehicle for sturdy shelter or drive out of the tornado's path.
- Avoid seeking shelter under bridges or overpasses.
- If a tornado moves through, winds will be stronger beneath the overpass due to a wind tunnel effect.
- Bridges and overpasses provide little protection from flying objects.

Other hazardous weather conditions flooding

- Flooding can occur when streams and rivers flow over their banks, when dams or levees break, when there is run-off from deep snow or anytime there is heavy rainfall.
- Floodwaters can be found on roads, bridges, and low are-as. Flash floods can come rapidly and unexpectedly.
- They can occur within a few minutes or hours of excessive rainfall.

Note:

- Do not drive through flooded areas. If you see a flooded roadway ahead, turn around and find another route to get to your destination.
- Be cautious, especially at night, when visibility is limited.
- Remember, six inches of water will reach the bottom of most passenger cars, causing loss of control or possible stalling. Two feet of moving water can carry away most vehicles including sport utility vehicles and pick-up trucks.
- Even if the water appears shallow enough to cross, do not attempt to cross a flooded road-way. Water can hide dips, or worse, floodwaters can dam-age roadways by washing away the underlying road sur-face.
- If there is no other route, proceed to higher ground and wait for the waters to subside.

Other hazardous weather conditions windstorm

- Depending on the size and weight of car you are driving, high winds can be a music or downright dangerous.
- Wind can buffet cars travelling on highway like boats tossed in story seas.
- A strong enough gust of wind can push a lightweight car right out of its lane.
- Remember, under windy conditions reduce speed and grip the steering wheel firmly to maintain control of your car. Increase your following distance.

Note: Nature is not the only source of wind. When a bus, truck or tractor trailer speeds by your car in directions you will feel a powerful blast as it passes.

Always allow as much distance as possible to the sides between your car and a passing large vehicles. This way you can minimize the force of the results wind gust.

Other hazardous weather conditions DRIVING IN HOT WEATHER

When driving in very hot weather pay special attention to these items:

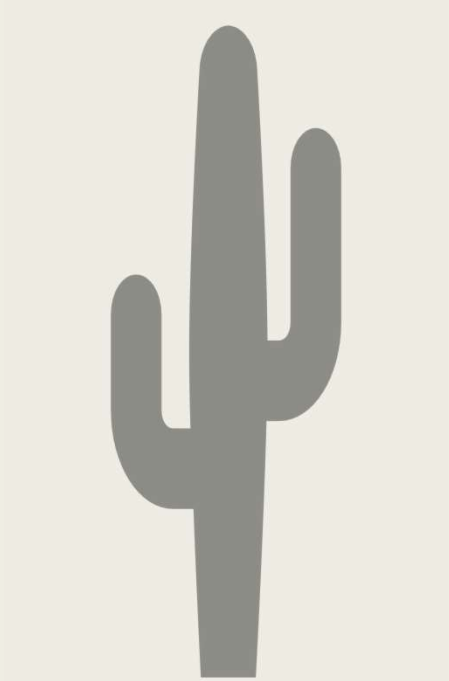
- **Tires—**check the tire mounting and air pressure. Inspect the tires every two hours or every 100 miles. Air pressure increases with the temperature. Do not let air out or the pressure will be too low when the tires cool off.
- **Engine oil**—the engine oil helps keep the engine cool. Make sure there is enough oil. If you have an oil temperature gauge, make sure the temperature is within the proper range while you are driving.
- **Engine coolant**—before driving, make sure the engine cooling system has enough water and antifreeze. When driving check the water temperature or coolant temperature gauge from time to time. Make sure that it remains in the normal range. If the gauge goes above the highest safe temperature, there may be something wrong that could lead to engine failure and possibly fire. Stop driving as soon as safely possible to find out what is wrong.
- **Watch for bleeding tar**—tar in the road pavement frequently rises to the surface in very hot weather. Spots where tar bleeds to the surface can be very slippery so use caution when you see it.
- **Go slow enough to prevent overheating**—high speeds create more heat for tires and the engine. In desert conditions, the heat may build up to the point where it is dangerous. The heat will increase chances of tire failure, or even fire and engine failure.

Other hazardous driving conditions desert driving

- Desert driving is normally done on reasonably good roads with gas, food, water and accommodations available at convenient intervals.
- Unless you are really going off-road, most roads will be paved or gravel condition. Except during the summer months deserts get hot, with daily temperatures in the 100 degrees Fahrenheit range and with low to zero humidity. Some tips to use when driving in the desert:
  - If you are not used to high temperatures, do not drive through the desert in the summer. If you must drive through the desert in the summer, stay on the freeways and use a vehicle with air conditioning.
  - Always carry enough water for you and your passengers to survive in the desert if your vehicle breaks down.
  - Carry water for your vehicle's radiator. The vehicle's cooling system can be affected, so watch the radiator temperature and coolant levels.

Other hazardous driving conditions desert driving

- **Remember**: If your vehicle breaks down in the desert, stay with it. Do not wander away from the vehicle unless it is to get help from a clearly-visible call box on the road or an inhabited building within a few minutes' walk.
- When you are off the freeways or major highways, make sure you have enough gas and water. You can never have enough water and gas in the vehicle while driving in the desert.
- Do not take side roads off the freeway or high-way unless you know for sure where they go.



Other hazardous driving conditions mountain driving

- Mountain driving can be very different from normal driving conditions. Some hazards you should be aware of are steep hills, wildlife, rocks in the roadway, and changing weather conditions
- Gravity plays a major role in mountain driving because it slows your vehicle down on an upgrade.
  - To drive up hills and mountains that are steep, you need to use lower gears.
  - When coming down steep hills or mountains gravity causes the speed of your vehicle to increase, therefore, you must select a safe speed, use proper braking techniques and use a low gear.
- You should try to plan and obtain information about any long steep grades along your planned route of travel. If possible, speak to other drivers who are familiar with the grades to find out what speeds are safe.

Tip for hill or mountain driving

Here are some more tips to use when driving up hills or mountains:

- If your vehicle experiences difficulty traveling up steep roadways, pull off the road at a safe place or stay in the right lane to allow other vehicles to pass.
- Pay special attention to speed limit signs and warning signs, such as those warning of curves, steep hills or other hazards.
- If a speed limit is posted or there is a sign indicating maximum safe speed, never exceed the speed shown.
- You must yield to vehicles going uphill if you are traveling downhill on a narrow road.
- Do not coast downhill by shifting into neutral or disengaging the clutch.
- Stay close to the right edge of the road to stay away from oncoming traffic.
- Sound the horn when approaching any sharp curve on a narrow road where the view is obstructed.

Vehicle emergency

- An emergency on the road can happen at any time. Be prepared with a survival kit that should always remain in the vehicle and replenished after each use.
- If you become stranded while traveling in cold weather, stay with your vehicle. Do not leave your vehicle unless you know exactly where you are and how far it is to help. Most deaths under these circumstances occur when people get out of their vehicles, become lost and suffer pro-longed exposure to the cold. Stay calm, wait for help to arrive and use the following tips:
  - *Turn on your hazard warning lights.*
  - *To attract attention, light two flares and place one at each end of the vehicle a safe distance away. Hang a brightly colored cloth from your driver side window, mirror or door handle.*
  - *Keep the exhaust pipe clear of snow and de-bris. Fumes from the exhaust can leak into the vehicle and can cause you to black out or even cause death.*

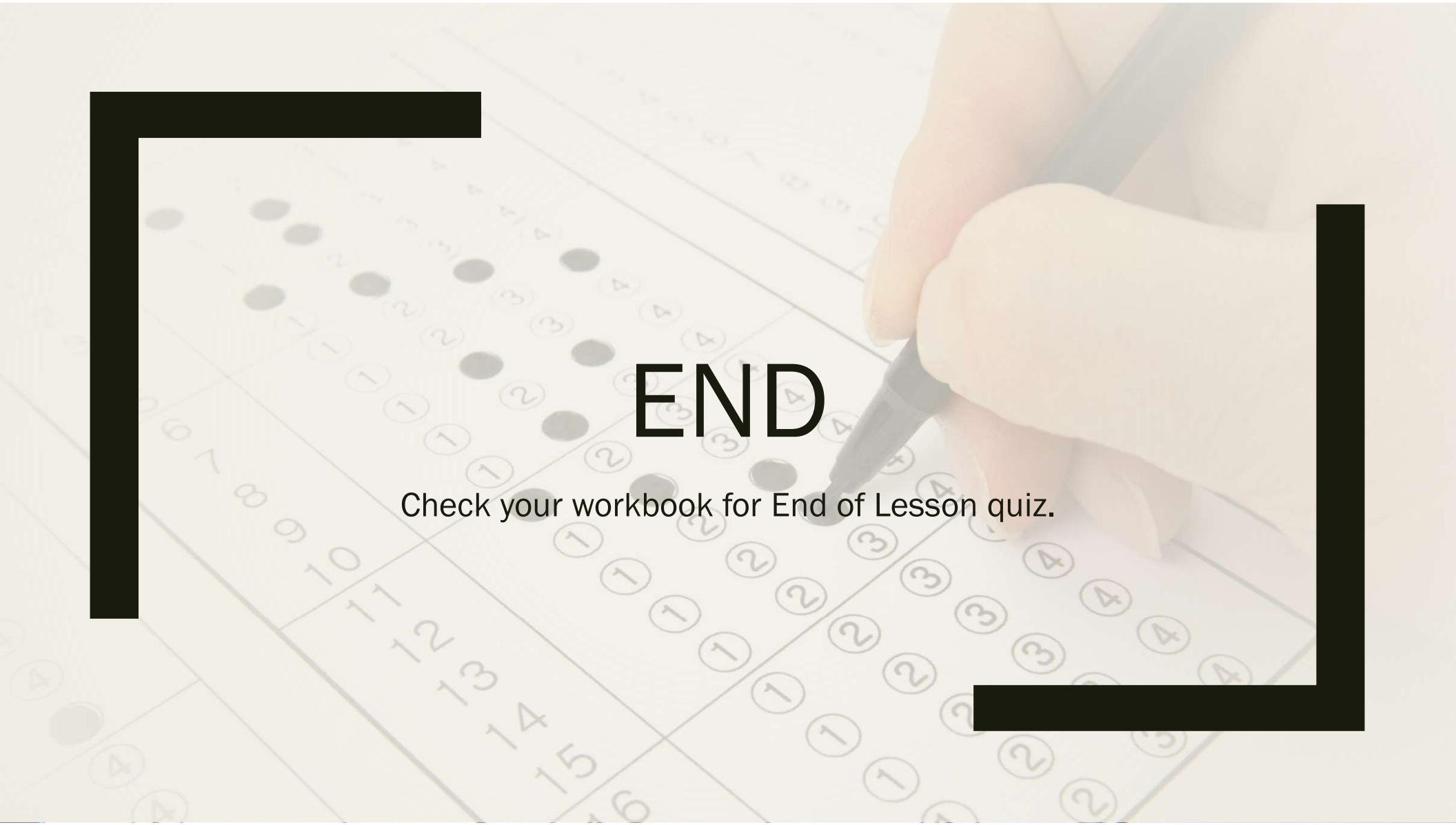
Tips to follow during vehicle emergencies

- Run the engine and heater until the vehicle is reasonably warm and then turn it off. Repeat this process as long as fuel is available. Running the engine for approximately 10 minutes each hour, in order to charge the battery and warm the interior, is recommended.
- Even in extremely cold temperatures, leave at least one window partially open to let fresh air in. Occupants of an idling vehicle can suffer carbon monoxide poisoning if ventilation is not adequate and heavy snow and ice can seal a vehicle shut.
- At least one person in the vehicle should always remain awake.
- To protect yourself from frostbite and hypothermia use woolen items and blankets to keep warm.

Vehicle emergency survival kit includes

- *A properly inflated spare tire*
- *A shovel*
- *Jumper cables*
- *Tow and tire chains*
- *A bag of salt or sand and a tool kit.*
- *Working flashlight and extra batteries*
- *Reflective triangles and brightly colored cloth & compass,*
- *First aid kit,*
- *Exterior windshield cleaner, ice scraper, snow brush,*
- *Matches in a waterproof container,*
- *Blankets, woolen gloves, socks, hat,*
- *Water*
- *Non-perishable foods that give you energy such as unsalted canned nuts, dried fruits and hard candy.*

Adverse Conditions



END

Check your workbook for End of Lesson quiz.