

Chapter 5

Natural Laws and Car Control

Key Terms

- Inertia
- Momentum
- Energy of motion
- Gravity
- Friction
- Traction
- Tread
- Blowout
- Force of impact
- Active restraint device
- Passive restraint device
- Vehicle balance
- Center of gravity
- Pitch
- Total stopping distance
- Perception time
- Perception distance
- Reaction time
- Reaction distance
- Braking distance

Energy of Motion

Inertia/Momentum

- An object at rest stays at rest and an object in motion tends to stay in motion unless...?
- Imagine you are the passenger in a vehicle, what would happen to your body if the driver suddenly slammed on the brakes?
Accelerates? Goes around a curve?
- Momentum is the tendency of an object to stay in motion... The amount of momentum an object has depends on what??
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Energy of motion/gravity

- Speed and weight determine a vehicle's energy of motion. Look at figure 2 on page 165...discuss...
- Gravity is the force that pulls all things to earth. What goes up must come down!
- How does this effect your vehicle?

Tires and Traction

- The force that keeps a tire from sliding on the road is _____
- _____ makes it possible for your vehicle to grip the road so you can control speed and direction.
- The grooved surface of a tire is called _____
 - _____ provides the traction for starting, stopping, and gripping the road.
 - Grip will depend on the type of weather condition as well as the condition of your tires.

Inflation and Traction

Discussion Points

- Under inflation
- Over inflation
- Temperature
- Refer to figure 4 on page 167
- Ensuring good traction(page 168)
 - Vehicle condition
 - Road condition
 - Driver action

Did you know??

“TIRE PRESSURE- you cant tell just by looking if your tires are properly inflated. A tire that is underinflated by 40% can look just like a properly inflated tire.”

Balance and Control

Discussion Points 😊

1. Vehicle balance
2. Center of gravity (figure 5, page 170)
3. Stability
 1. Male vs. female(center of gravity is different)
 2. Shorter person vs. larger person
 3. Small vehicle vs. big vehicle
4. Pitch, roll and YAW! Figure 6 on page 171

Curves play a huge role while driving

- Sharpness of curve
- Speed
- Load
- Shape of road
- Figure 7 for quick discussion
- Remember: Your car is always wanting to stay in a straight line because of inertia, so don't forget to turn!!!

Stopping Distance

Must know vocab!

- Perception time
- Perception distance
- Reaction time
- Reaction distance
- Braking distance
- P.D.+ R.D.+B.D.= TOTAL STOPPING DISTANCE

Discussion Points

- Vocabulary
- Figure 8 on page 173
- Figure 9 on page 174
- Factors that affect braking distance
 - Driver ability, speed, vehicle condition, roadway surface, hills and weight

Controlling force of impact

Factors for force of impact

1. Speed
2. Weight
 - The heavier a vehicle, the damage it will cause
3. Time between impact and stopping

Safety belts

- Active restraint device
- Passive restraint device
- Click it or ticket!

Air bags

An air bag is a balloon type device that automatically inflates to protect you.

- Types of air bags
 - Frontal air bags
 - Side air bags
- Air bags are meant to be used with safety belts
- Keeping your hands at 8 & 4 or 9 & 3, will offer a balanced hand position for good steering control and will help prevent injury if the air bag deploys
- Child safety (figure 12 on page 177)

Other Protective Devices

- Crush zones
- Energy-absorbing bumpers
- Side-impact panels
- Penetration- resistant windshields
- Head restraints