

Course Title – Automotive Technology

Implement start year – 2017-2018

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Unit #5 - Suspension, Steering, and Brake systems

Transfer Goal –

Students will be able to independently integrate and apply essential technical skills to identify, diagnose, maintain and repair suspension, steering, and brake systems.

Stage 1 – Desired Results

Established Goals

2009 NJCCC Standard(s), Strand(s)/CPI #
(<http://www.nj.gov/education/cccs/2009/final.htm>)

Common Core Curriculum Standards for Math and English
(<http://www.corestandards.org/>)

21st Century Themes

(www.21stcenturyskills.org)

- ___ Global Awareness
- ___ Financial, Economic, Business and
- ___ Entrepreneurial Literacy
- ___ Civic Literacy
- ___ Health Literacy
- ___ Environmental Literacy

8.2 Technology Education, Engineering, and Design

All students will develop an understanding of the nature and impact of technology, engineering, technological design, and the designed world, as they relate to the individual, global society, and the environment.

G. The Designed World: The designed world is the product of a design process that provides the means to convert resources into products and systems.

- 8.2.12.G.1 Analyze the interactions among various technologies and collaborate to create a product or system demonstrating their interactivity.

CCSS.ELA-LITERACY.RST.9-10.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.

CCSS.ELA-LITERACY.WHST.9-10.2.F Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic).

9.1 21st-Century Life & Career Skills All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.

9.1.12.A.1

Apply critical thinking and problem-solving strategies during structured learning experiences.

21st Century Skills

Learning and Innovation Skills:

- Creativity and Innovation
- Critical Thinking and Problem Solving
- Communication and Collaboration

Information, Media and Technology Skills:

- Information Literacy
- Media Literacy
- ICT (Information, Communications and Technology) Literacy

Life and Career Skills:

- Flexibility and Adaptability
- Initiative and Self-Direction
- Social and Cross-Cultural Skills
- Productivity and Accountability
- Leadership and Responsibility

Enduring Understandings:

Students will understand that . . .

EU 1

suspension and steering are linked components which control the direction of the vehicle.

EU 2

the brake system must be capable of bringing thousands of pound of steel and plastic to a quick and controlled halt.

Essential Questions:

EU 1

- How do weather and location affect a vehicle's suspension and steering system?
- What does racing history reveal about today's suspension?
- What situations would benefit from a manual steering system and why?

EU 2

- How does a 100 pound driver stop a 3000 pound vehicle?
- How have adverse driving conditions such as ice, rain, and snow created the modern braking system?
- How have federal government guidelines improved the working conditions for brake technicians?

Knowledge:

Students will know . . .

EU 1

- The parts of the tire and wheel.
- how suspension and steering operate and how they are interrelated.
- the components and operating principles of suspension.
- the components and operating principles of steering.
- the affect of wheels and tires on steering and suspension.

EU 2

- how a brake system operates.
- the components of the brake system.
- the multiple types of brake systems and how they operate.
- the forces involved in stopping or holding a vehicle.
- the brake system is the most important system on a vehicle from a safety standpoint.
- the purpose and operation of traction control and stability control systems.

Skills:

Students will be able to . . .

EU 1

- diagnose common tire problems.
- perform tire inflation and rotation procedures.
- perform service procedures for wheel bearings.
- use safe practices while servicing tires and wheels.
- diagnose common suspension problems.
- service suspension and steering components.
- use safe practices while servicing suspension and steering systems.

EU 2

- service the hydraulic and mechanical principles of the brake system.
- diagnose common brake system problems.
- inspect and maintain brake systems.
- perform the procedures for manual and pressure bleeding of a brake system.
- use safe practices while service brake systems.

Stage 2 – Assessment Evidence

Other Recommended Evidence:

- Quiz/Test
- Worksheets
- Workbooks
- Discussions
- Videos
- Software
- Brake Trainers

Stage 3 – Learning Plan

Suggested Learning Activities to Include Differentiated Instruction and Interdisciplinary Connections: *Each learning activity listed must be accompanied by a learning goal of A= Acquiring basic knowledge and skills, M= Making meaning and/or a T= Transfer.*

- Teacher led discussions on suspension systems. (A)
- Teacher led discussions steering systems. (A)
- Teacher led discussions on brake systems. (A)
- Teacher demonstration of multiple manufactured brake systems (A)
- Student demonstration on how to disassemble and reassemble brake systems from various manufacturers. (M,T)
- Use ProDemand software. (M,T)
- Workbook on suspension, steering, and brake systems unit such as chapters 65, 66, 67, 68, 69, 70, 71, 72, 73, and 74 in Modern Automotive Technology Book. (A)
- Videos on suspension, steering, and brake systems which can be found on youtube.com. (A)
- Teacher/ Student demonstration of diagnosis and replacement of suspension components. (A,M,T)
- Teacher/ Student demonstration of diagnosis and replacement of steering components. (A,M,T)
- Teacher/ Student demonstration of diagnosis and replacement of brake components. (A,M,T)
- Explain static and dynamic wheel balance (A,M)
- Teacher/ Student demonstration of wheel and tire balancing (A,M,T)