

SSS2 Steering and Suspension Components and Operation



This is an integrated instructional module designed specifically to operate within an "Instructional Pod" environment. It provides a 15-assignment study program that has been designed for use within the AutoLAB program for core learning. The module package includes hardware, software, and curriculum materials sufficient to complete the learning activities.

The curriculum incorporates continuous assessment through questions. When used in conjunction with a ClassAct networked management system, this provides instant feedback of student performance.

Each assignment is split into at least two tasks and they start with a series of questions designed to track inventory, and ensure that any missing pieces can be located. The tasks are designed to teach students about steering and suspension components, with the research activities based upon on screen material published textbooks, and CD-ROMs.

Assessment questions are incorporated into each task and a series of job sheets that are printed out by the student are used to guide them through the related shop activities on real vehicle systems.

This module provides a hardware trainer that is based on the real automotive components found in a typical front-end steering and suspension system. This includes front wheel assemblies, MacPherson strut and coil spring assemblies, road wheels and power steering rack.

The unit is mounted on a steel frame fitted with solid rubber castors and a single-phase electric motor is used to power the power steering pump that is connected to the power rack using the correct hydraulic hoses.

A complete steering wheel and column assembly is also fitted to the unit to allow the student to perform a full range of tests on the system. To aid in this the unit is fitted with a manually operated suspension loading system that enables the student to simulate the typical loaded conditions of a front-end suspension system.

The module has been designed to allow the student to practically investigate all the principles and operations of a front-wheel drive, steering and suspension system.

Typical topic areas include:

- Steering system fundamentals.
- Suspension system fundamentals.
- Steering column assemblies.
- Rack and pinion steering gear operation.
- Tie rod ends.
- Power steering fluid.
- Power steering pumps and related hardware.
- Coil springs.
- Upper and lower control arms.
- Strut rods.
- Steering knuckle assemblies.
- Shock absorbers.

The module guides the student through task-oriented instruction. The tasks include hands-on practical activities. Each task has a theoretical summary that explains the concepts and automotive applications involved.

The computer presented training material is compatible with the ClassAct classroom management system that can track student progress during these tasks and will report back immediately to instructional staff if a student falls below a predetermined standard or takes too long to perform a task.

Each assignment is designed around a list of performance objectives. These lists include academic, technical, and occupational objectives. The assignments are written in such a way as to enable a student to attain the performance objectives, with the assessment questions linked to these in order to provide a measure of true competency.

The performance objectives are used by the ClassAct management system to generate a comprehensive portfolio of student competency reports. The module includes a default competence report addressing the latest NATEF standards.

Typical activities include:

- Introduction to the steering and suspension trainer.
- Inspect steering shaft universal-joint, flexible coupling, collapsible column, lock cylinder mechanism and steering wheel.
- Disassemble, inspect, perform necessary action, and reassemble rack and pinion steering gear.
- Remove and replace manual or power rack and pinion steering gear.
- Inspect and replace manual or power rack and pinion steering gear inner tie rod ends and bellow boots.
- Inspect power steering fluid levels and condition.
- Diagnose power steering fluid leakage.
- Remove, inspect, and replace power steering pump, mounts, seals, pump belt, pump pulley, and pump belt.
- Remove, inspect, and install coil springs and spring insulators.
- Inspect, replace, and adjust tie rod ends, tie rod sleeves, and clamps.
- Remove, inspect, and install upper and lower control arms, bushings, shafts, and rebound bumpers.
- Remove, inspect and install steering knuckle assemblies.
- Inspect, remove and replace shock absorbers.

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The items supplied with this instructional module include:

- SSS2 Instructor's Guide
- SSS2 On-Screen Multimedia Manual CD-ROM
- SSS2 Video Materials CD-ROM
- SSS2 Voice-Overs CD-ROM
- NATEF Instructor's Resources CD-ROM
- Health and Safety Sheet
- Steering and Suspension Trainer
- SSS2 Consumables Pack

Additional items required:

- Computer
- Access to Printer
- Ball Joint Splitter
- Belt Tension Gauge
- Breaker Bar
- Circlip Pliers
- Clamp Band Pliers
- Coil Spring Clamps
- Drain Pan
- Hoist
- Hydraulic Press
- Jack and Axle Stands
- Personal protective equipment (PPE)
- Spring Clamps
- Steel Rule
- Torque Wrench
- Vehicle Service Manual
- Pipe Clamp
- Pipe Bung
- Power steering fluid (Consumable Item)
- Various Hand Tools

NATEF task list areas addressed:

- IV-A2 P-1
- IV-B6 P-2
- IV-B8 P-1
- IV-B9 P-1
- IV-B10 P-1
- IV-B11 P-2
- IV-B12 P-2
- IV-B13 P-1
- IV-B14 P-3
- IV-B15 P-3
- IV-B16 P-2
- IV-B18 P-1
- IV-C1-3 P-3
- IV-C1-4 P-2
- IV-C1-6 P-2
- IV-C2-1 P-2
- IV-C3-1 P-1

Module Facts

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	No.	Average time
Assignments	15	90 minutes
Extension Activities	11	60 minutes
Total		34 hours



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