

PERFORM PERIODIC MAINTENANCE OF SUSPENSION SYSTEM

After completing this module, you are expected to be capable of:

- Determine the purpose of struts and shock absorbers and explain their fundamental structure.
- Determine the elements that make up a MacPherson strut system and explain how it works.
- Determine the purpose of stabilizers and bushings. Conduct a general examination of the front suspension.
- List the three fundamental kinds of rear suspensions and understand how they affect tire wear and traction.
- Determine the different kinds of springs and their purposes where in the rear-axle chassis they are located.
- Explain the benefits and how the three work. fundamental suspension systems with electronic control: active, adaptive, and level control.
- Describe how electronic suspension parts work including sensors, air compressors, control modules, electronic shock absorbers, air shocks, and electrical struts.
- Determine which parts make up a car's suspension system.
- Describe the procedures for carrying out routine suspension system maintenance.
- Use appropriate inspection methods to guarantee the best possible suspension performance.

Similar to other automobile and light truck systems, the suspension system has become more advanced over time. These developments have been made to offer safer, better, and smoother handling and a smoother ride. Today, the front and back suspensions can be fairly complex and consist of numerous elements.

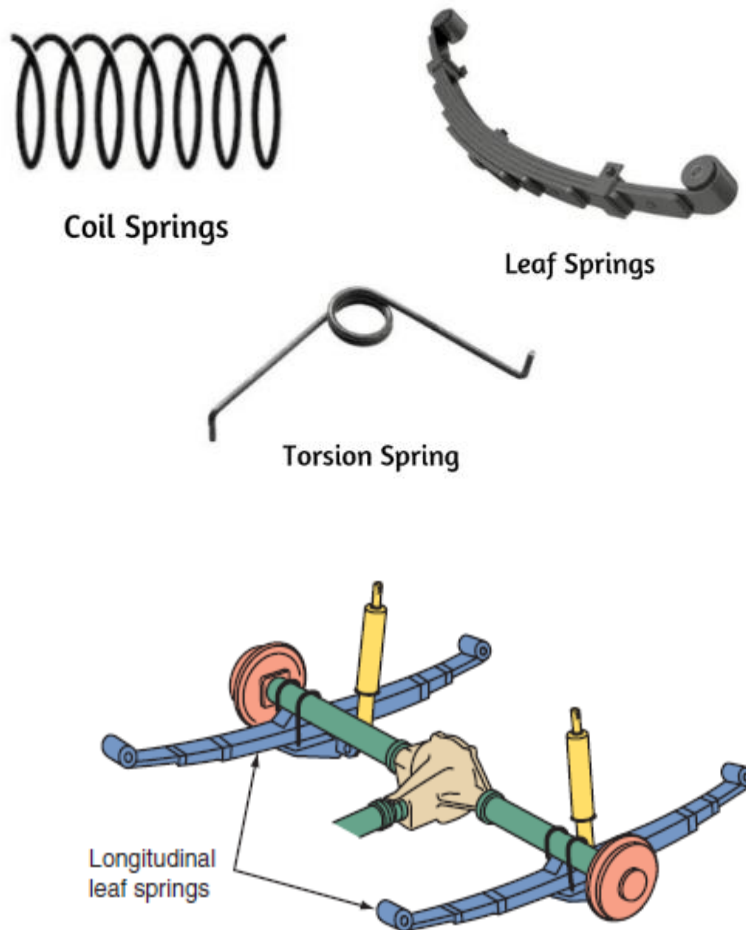
1. Suspension System Components

The Spring is the central component of every suspension system. Springs support and absorb the vehicle's weight. Shock forces while keeping the ride height at the proper level.

They serve as compressible connections between the car's tires, the body, and the frame. By doing this, they reduce road shock and make the ride more comfortable. If the spring is damaged or worn out, alternative suspension components will move from where they should be and will feel more worn.

Different kinds of springs:

Types of Springs



2. Coil Springs

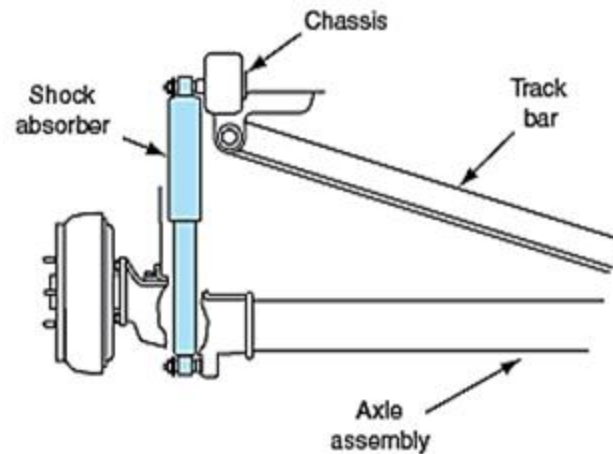
Two fundamental coil spring designs are utilized: variable rate and linear rate. Linear rate springs typically have one fundamental form and a steady wire diameter. In every line a

steel rod is wrapped with springs into a cylindrical form when the coils are evenly spaced apart. As the spring is compressed, the load is raised, and the coils deflect, or twist. When the weight is released, the coils Return to their regular position by flexing (unwinding). The sum amount of force required to deflect the spring by one inch. This is the spring rate (25.4 mm). This is on linear rate springs.is consistent regardless of the spring's size compressed.

- **Leaf Springs** are a suspension spring found in cars. These days, they are mostly only found on light-duty vans, lorries, and a few passenger cars. There are three fundamental kinds of leaf springs: mono leaf, multiple leaf, and fiber composite.
- **Air spring** is employed in a microprocessor-controlled air mechanism that takes the role of the traditional air springs and coil springs to create cozy riding as well as automated load-leveling in the front and back. This system, which is explained in detail later in this chapter, uses four springs of air to support the car's weight. The same area contains the air springs locations that are typically used for coil springs. There is a strengthened rubber bag inside each spring under air pressure. Each airbag's bottom is connected to a mount that resembles an inverted piston that lowers the air bag's internal volume during Jounce.

3. Shock Absorbers

Vehicle motion is dampened or controlled by shock absorbers. After a blow, springs continue to expand and compress if left unchecked until all of the energy has been absorbed. After several shocks, this would not only result in a bumpy, unsteady, and sometimes unpredictable ride, but it would also put a lot of strain on the steering and suspension systems. Shock absorbers stop this from happening. In contrast to their name, they dampen spring action rather than absorb shock. In reality, shock absorbers are called dampers in England and practically everywhere else outside of the US.

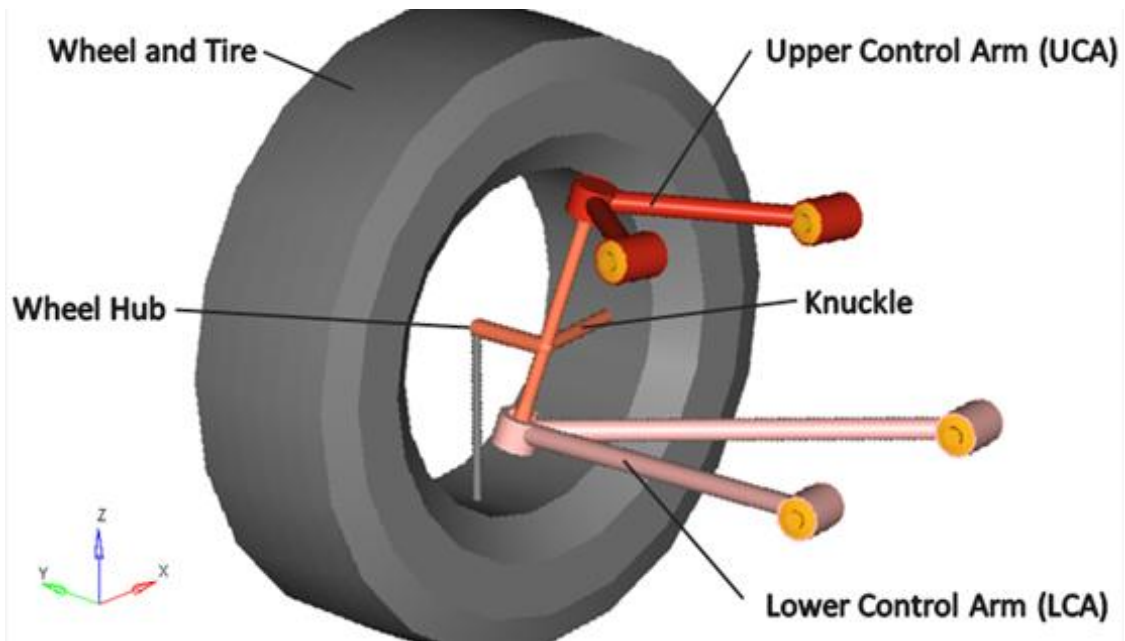


- **Shock Absorber Ratio** The majority of shock absorbers are valved to provide about the same amount of suspension resistance upward (jounce) and motion downward (come back). How much of a shock absorber's capacity to withstand these motions is demonstrated by a numerical equation. The initial number denotes jounce opposition. Rebound resistance is indicated by the second.
- **Air Shock Systems** Two fundamental adjustable systems for air shocks: automatic and manual fill leveling the load. It is possible to install the manual fill system on practically any car made without it. There are numerous varieties of manual filling. There are air shock devices available. One standard handbook, a

fast speed, immediate current is used in the fill air shock system (DC) motor to provide a command signal chosen by hand from the driver's seat.



- **MacPherson** The combination of the primary components is a characteristic into one assembly. Usually, it comprises the shock, spring, and upper suspension locator absorber. It is positioned between the top and the inner fender and the steering knuckle arm panel. The spring's location rather than on the strut as in a lower control arm small road vibrations can be absorbed by the traditional MacPherson strut setup instead of being returned to the driver via the chassis and the steering mechanism. We refer to this system as a modified suspension of MacPherson.



- **Short-long Arm Suspension (SLA)** suspension systems are widely used on domestic automobiles for a long time. Every wheel is attached separately to the frame via a ball joint and steering knuckle assembly, as well as longer lower and short upper control arms. Due to the limited arc of rotation of the upper arm, the wheel's top somewhat shifts in and out, although the tire's road contact doesn't change.

Knowing How the Suspension System Works

A car's suspension system is essential for keeping the vehicle stable and improving ride comfort. It consists of components like control arms, struts, shock absorbers, and springs. Together, these parts absorb road vibrations and shocks.

The Importance of Maintenance of Suspension System

Maintaining the system on a regular basis extends the life of suspension parts, improves steering stability, and prevents uneven tire wear. Ignoring this might lead to improper handling and higher repair expenses.

How to Perform Periodic Maintenance of Suspension System

- Visual Inspection: Look for wear, fractures, or leaks on parts including shock absorbers, springs, and bushings.
- Verify joints and fasteners: Make that nuts, bolts, and other components are corrosion-free and tight.
- Press down on each corner of the car and then let go to test the suspension's response. The shock absorbers might need to be replaced if they bounce more than twice.
- Lubrication: To lessen wear and friction, apply the proper lubricants to moveable components such as control arms and ball joints.
- Examine Tires and Alignment: Check the vehicle's alignment and look for any irregular tire wear. Problems from the suspension system may be indicated by poor alignment.

Safety and Tools

For precise and secure repair, use equipment such as inspection mirrors, torque wrenches, and jack stands. Before operating underneath a vehicle, make sure it is securely raised and on a firm surface.

Wrap-up/Conclusion

Suspension system maintenance is necessary on a regular basis to preserve vehicle safety and performance. Potential problems can be found and fixed early by following the methods listed, which will guarantee a more comfortable ride and lower long-term maintenance expenses. The effectiveness of the maintenance procedure is further increased by using tools correctly and following safety precautions.

References

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