

### Steering and Suspension

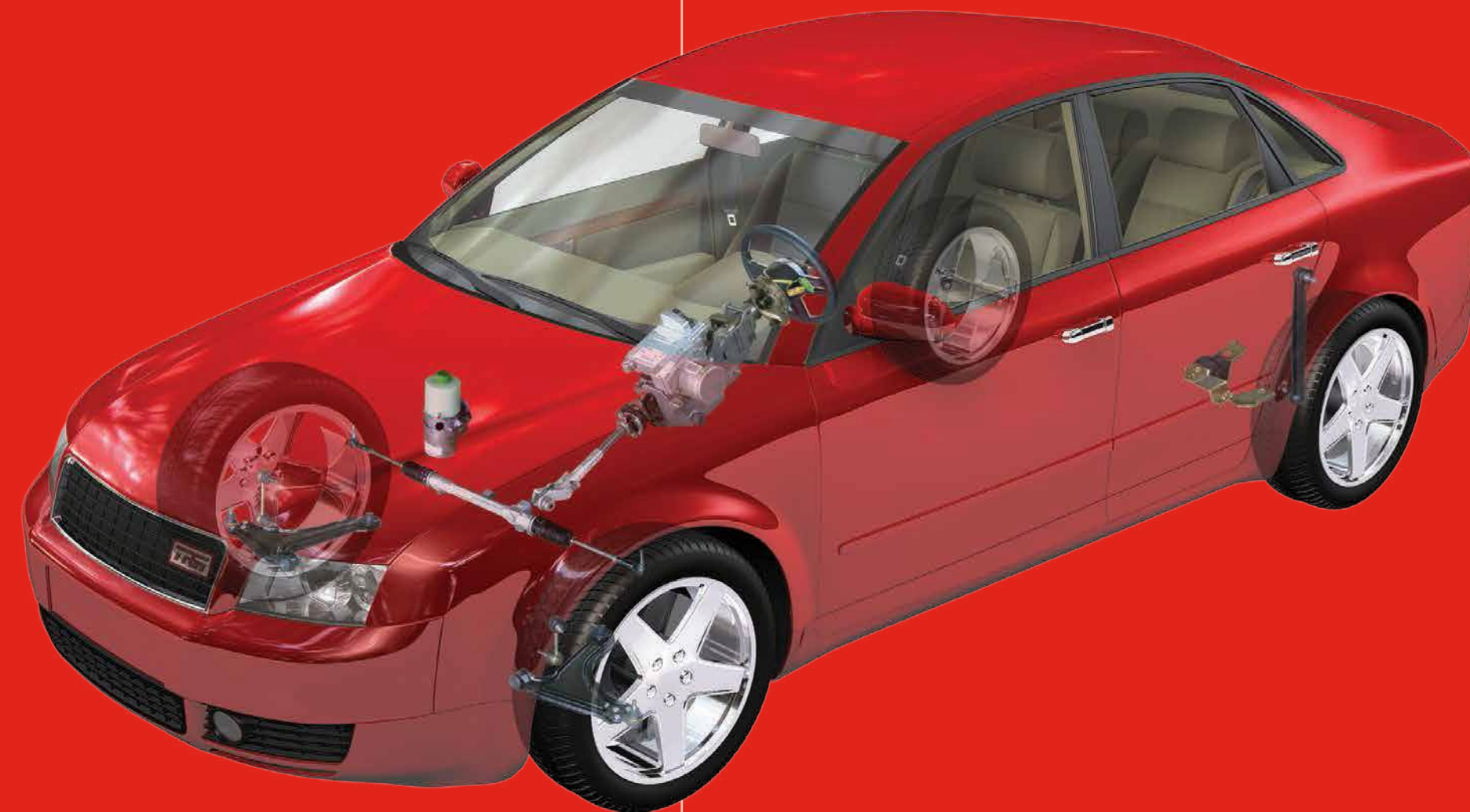
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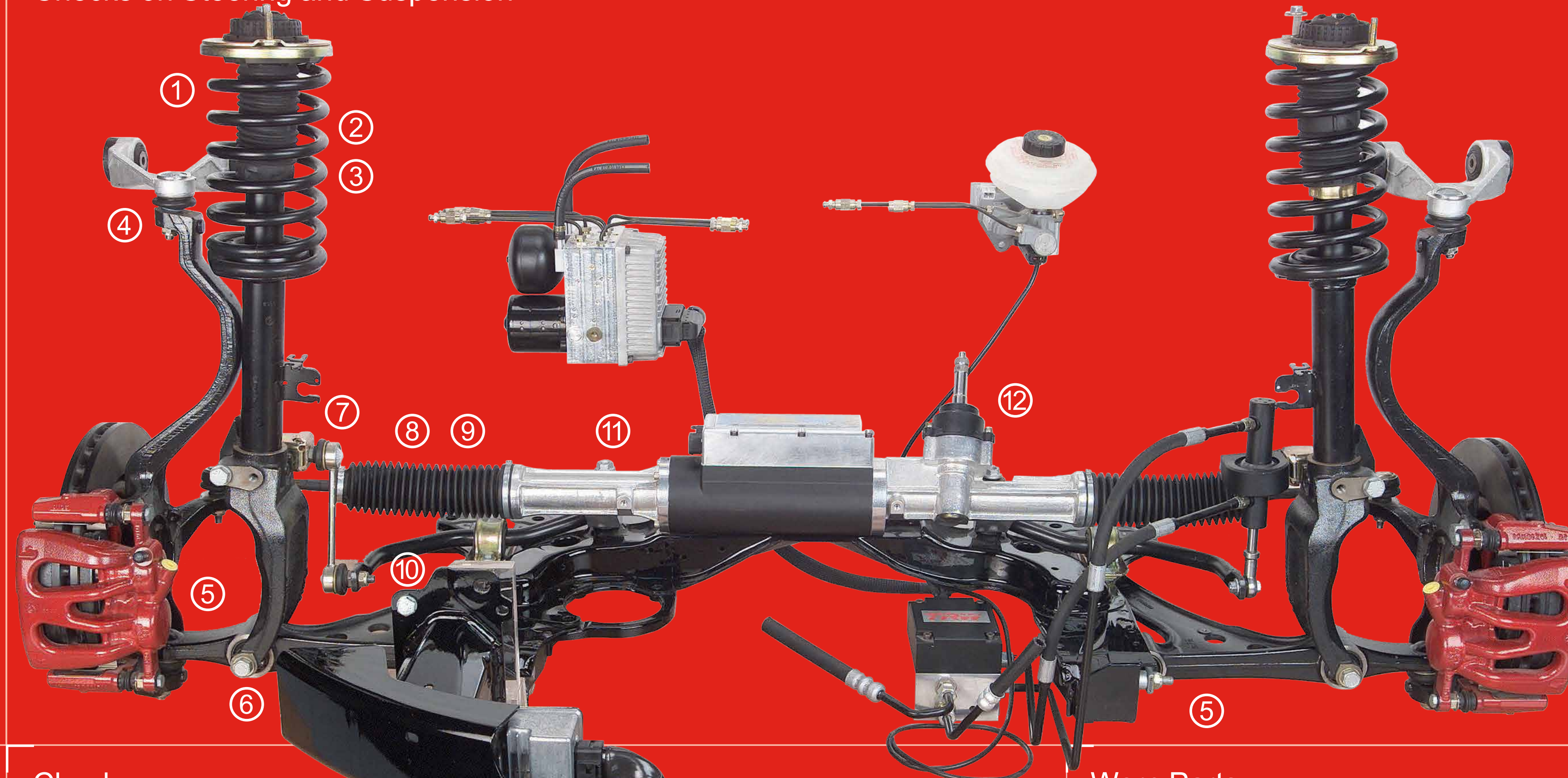
The new TRW steering and suspension programme offers an unequalled range of premium quality components. Now with over 2600 linkage parts and more than 1100 steering references, it offers comprehensive coverage of the European parc for passenger and commercial vehicles, including market-leading coverage of the latest model releases.

The TRW programme includes:

- Remanufactured steering racks
- Track control arms
- Tie rod ends and assemblies
- Ball joints
- Stabiliser links
- Bushes and bellows



### Checks on Steering and Suspension



### Further Checks

#### Steering Fluid Level:

Place the vehicle on level ground. Make sure that the wheels are facing straight ahead and the engine is turned off. The fluid level has to be between the "MIN" and "MAX" marks. Wrong fluid levels can cause leaks, affect steering performance and lead to failure of the complete system. "COLD" and "HOT" marks can be sometimes found on the dipstick. Always follow the vehicle manufacturers guidelines on how to proceed and which oil to use.



#### Steering pump:

Check the steering pump for leaks on hoses and the pipe connection section, noise, loose brackets and the condition and tension of its drivebelt.



#### Cardan joints:

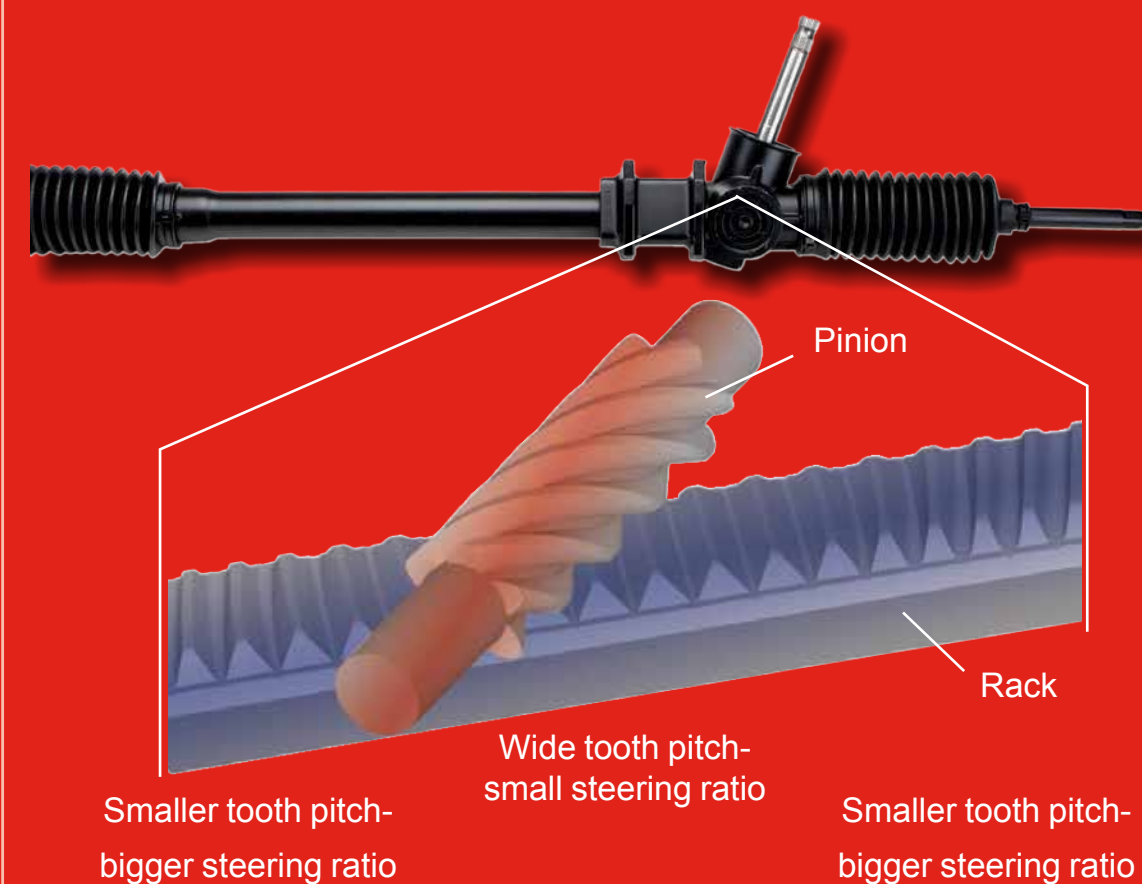
Cardan joints are sometimes the cause for "clank" noises while turning the wheel left and right. Sticking cardan joints may worsen the self aligning torque after cornering.



### Rack and Pinion Steering

Rack and pinion steering consists basically of a rack and a pinion. The steering ratio is defined by the ratio of pinion revolutions (steering wheel revolutions) to rack travel. A weighty steering ratio is not beneficial for all forms of driving. It does provide a more sporting feel with direct feedback, however it requires a larger ratio and therefore increased driver force. On the other hand with a smaller steering ratio the steering has a very unstable mid-position. For the smallest steering movements a relatively big steering wheel rotation is necessary but with less driver effort.

The variable steering ratio is the best solution providing the advantages of both systems.



### Steering Fluids

A new product in our fluid range is the central hydraulic fluid. This fluid can be used for the steering system and fits to applications where CHF11S, CHF202 and LDS are specified. TRW All-System Central Hydraulic Fluid is an advanced synthetic formulation for use in steering, suspension and other hydraulic systems requiring such products.



LHM Plus is a mineral based fluid, designed for use in the hydraulic system of Citroen cars. It is also suitable for brake systems, power steering systems and self-levelling suspension systems where a mineral oil based product of this type has been specified.



The optimized flow characteristics of these products are preventing the common problem of sludge formation and consequential blocking of the filter.

**Always observe the vehicle manufacturers recommendations regarding fluid specification! Mineral based and synthetic oils must not be mixed!**

### Check...

- 1. Top mount**  
Corroded bearings, noise, jerky steering
- 2. Shock absorbers**  
Noise, leakage, corrosion, loose fitting screws or nuts (especially on the piston)
- 3. Coil springs**  
Cracked, low force (car hangs down on one side or front/rear)
- 4. Ball Joints**  
Damaged thread or dust cover, free play, loose mounting screws or nuts, stiffening, corrosion
- 5. Track control arms**  
Condition and form (should not be damaged or cracked), ball joints, rubber bearings, mounting area
- 6. Bushes**  
Separation of rubber from the metal, cracks in the rubber, deformation, loose
- 7. Stabiliser links**  
A creaking noise while turning the steering wheel (e.g. during parking) or a knocking noise while driving over small bumps can be an indication for worn stabiliser links.
- 8. Bellows**  
Cracks, loose clamps, porous
- 9. Axial Rods**  
Free play, free play in the ball joints, bent from an impact, damaged or corroded thread
- 10. Anti-roll bar**  
Loose nuts or screws, separation of rubber from the metal, deformed rubber, bent, play, noise, unstable driving and steering behaviour of the vehicle
- 11. Hoses and Pipes**  
Wrong fitting (mix up of feed and return pipe), damaged threads, leakage, loose, porous
- 12. Rack and Pinion Shaft**  
Play in the shaft, leaking sticking cardan joint (no self aligning torque after cornering), noise, loose connection between shaft and u-joint.

**If there is a fault with the steering rack - always change the complete rack!**

### Worn Parts



### Successful Repair

- Utmost cleanliness is required when working on the power steering system.
- Clean all hydraulic connections and surrounding areas before disassembly
- Split pins must always be replaced
- Check existing tab washers, replace if provided
- Always replace self-locking nuts and bolts
- Thread locking liquid should be applied to the axial rod before assembly to the rack. Always follow the guidelines of the liquid manufacturer
- Always replace port connection sealing and cutting rings
- Welding and straightening work on steering and suspension parts is not permitted.
- Connect all hoses without tension and chafing when tightening.
- Before disassembling the steering gear turn the steering wheel to the straight-ahead position and secure it against turning.
- Check that the rack is set to the straight-ahead position before installation.

**Always refer to the vehicle manufacturer guidelines!**