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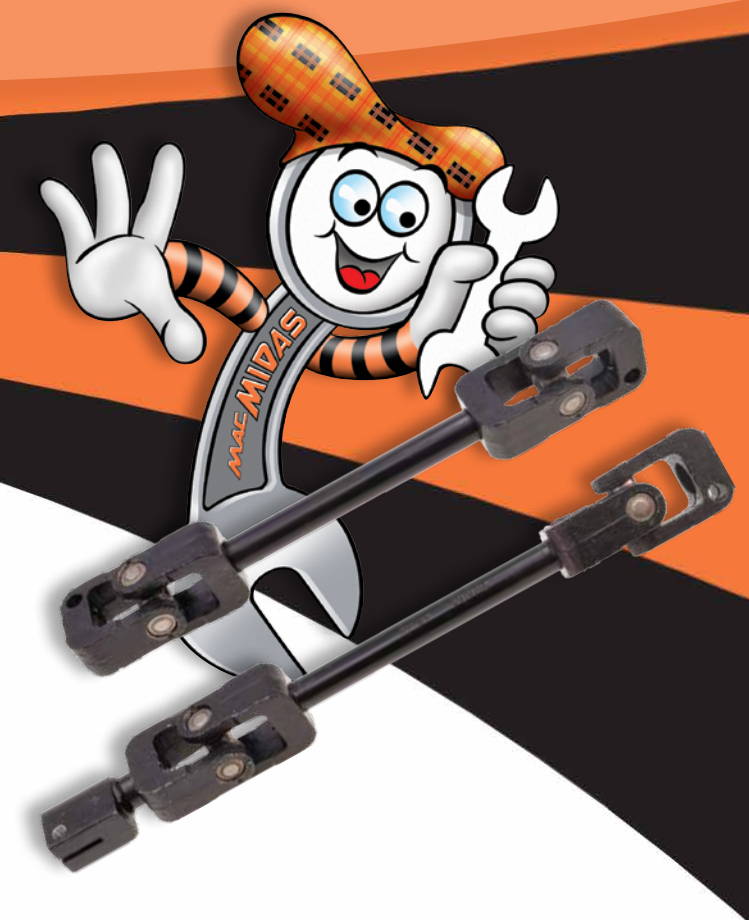
How to Service a STEERING SYSTEM



This workshop procedure guide contains:

Step-by-step instructions on how to service a steering system.

Personal safety:

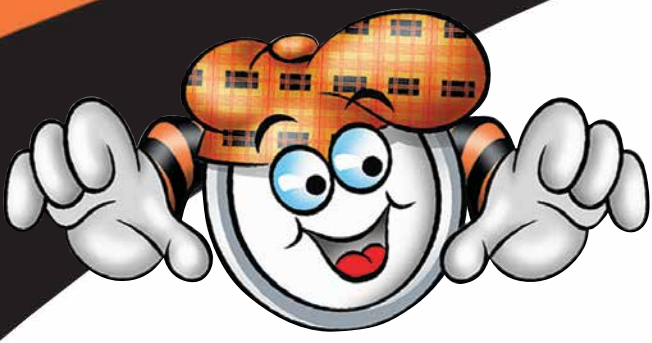
Whenever you perform a task you must use personal protective clothing and equipment that is appropriate for the task. Among other items, this may include:

- Work clothing, such as overalls and steel-capped footwear.
- Eye protection, such as safety glasses and face masks.
- Ear protection, such as earmuffs and earplugs.
- Hand protection, such as rubber gloves and barrier cream.
- Respiratory equipment, such as face masks and valved respirators.

TIPS ON SERVICING A STEERING SYSTEM

Points to note:

- Ensure you have access to the relevant manuals for the vehicle you are servicing.
- Ensure all rubber bellows or boots that are fitted to steering components are in good condition so that they do not allow contaminants to enter.
- Have an assistant help you when you are moving the steering system and checking for wear.



Servicing a Steering System

1. Check pre-loaded tie-rod ends

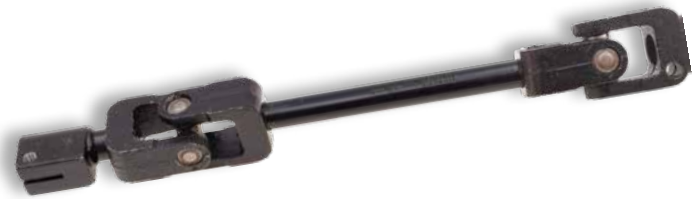
There are two basic types of tie-rod ends, spring-loaded and pre-loaded.

To check the pre-loaded unit, which has no internal clearances inside the unit, you should raise the vehicle's steer wheels free from the ground.

With the vehicle's weight off the steer wheels, move the tyre/wheel assembly from side to side.

As the wheel assembly is moved by this rocking action, note any excessive movement in the front tie-rod end.

If the ball and socket is worn, there will be a noticeable movement in the tie-rod assembly.



2. Check spring-loaded tie-rod ends

On a spring-loaded unit, one test is to compress the spring. Spring-loaded sockets should have a firm spring pressure when compressed all the way.

To check these types of joints use a large pair of channel lock pliers which are also known as multigrip type pliers, and place one jaw under the base of the ball joint...

...and the other on top of the end of the joint.

By squeezing the handles of the pliers, you should be able to see the movement inside the joint.

3. Check the ball joints for wear

Some manufacturers add a wear indicator to their ball joints. The most common type of wear indicator has a shoulder that sticks out of the bottom of the joint by 1. 27mm when new.

Other manufacturers provide a specification for the maximum amount of movement that is permissible. You should consult the vehicle manufacturer's manual for this tolerance, and for the correct procedure for checking it.

In the case of a torsion bar, or a long arm/short arm type suspension, where the spring is acting on the lower arm, you can test ball joints by having the vehicle raised off the ground slightly...

...and supported under the lower arms. This places the weight of the vehicle on the ball joints.

Now place a lever under the tyre and pull the tyre assembly up.

Take note of any movement in the ball joint.

4. Inspect rubber boots

Inspect the rubber boot on the tie-rod end for any signs of being torn or damaged.

If torn or dislodged from its seat, dirt or abrasives may have entered the tie-rod end, accelerating wear in the unit.

5. Check the idler arm bush

If the steering system is a parallelogram type, move the tyre/wheel assembly from side to side, and check the idler arm bush for excess movement.

Alternatively, push and pull on the idler arm, at the same time checking movement in all of the pivoting points attached to the steering linkage.

6. Check the rack and pinion assembly

Check that the rack housing is securely mounted to the cross member...

...and check the tightness of these mounting bolts.

Inspect the rubber boots for any signs of being torn or damaged. If torn or dislodged from its seat, dirt or abrasives may have entered the unit, accelerating wear.

With the vehicle raised, have an assistant turn the steering wheel from side to side.

Squeeze the boots so that you make contact with the inner ball joint, and feel for any excess movement to check for wear in...

... the inner ball joint attached to the rack. You will need to repeat this procedure for the other side.

Check for wear in the steering shaft universal joints.

Rotate the steering wheel from lock to lock and ensure these universal joints rotate smoothly.

7. Check steering boxes for excessive wear

A steering system of the parallelogram type is normally fitted with a steering box assembly. You should check for excessive movement in the steering box itself.

This can be done by having the vehicle on the ground, and feeling the "free play" in the steering wheel with the wheels in the straight ahead position.

While watching the wheels, see how much you can move the steering wheel, before the wheels start to move.

8. Check power steering lines

Inspect both the steel lines and the flexible hoses for any signs of deterioration.

Check the steel lines for signs of chafing. If present, chafing is usually a sign of loose or missing locating clamps.

Chafing can necessitate the replacement of the lines, if rubbed through.

Check the fittings for tightness.

Check the flexible hoses for cracks, wear and hardening.

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