

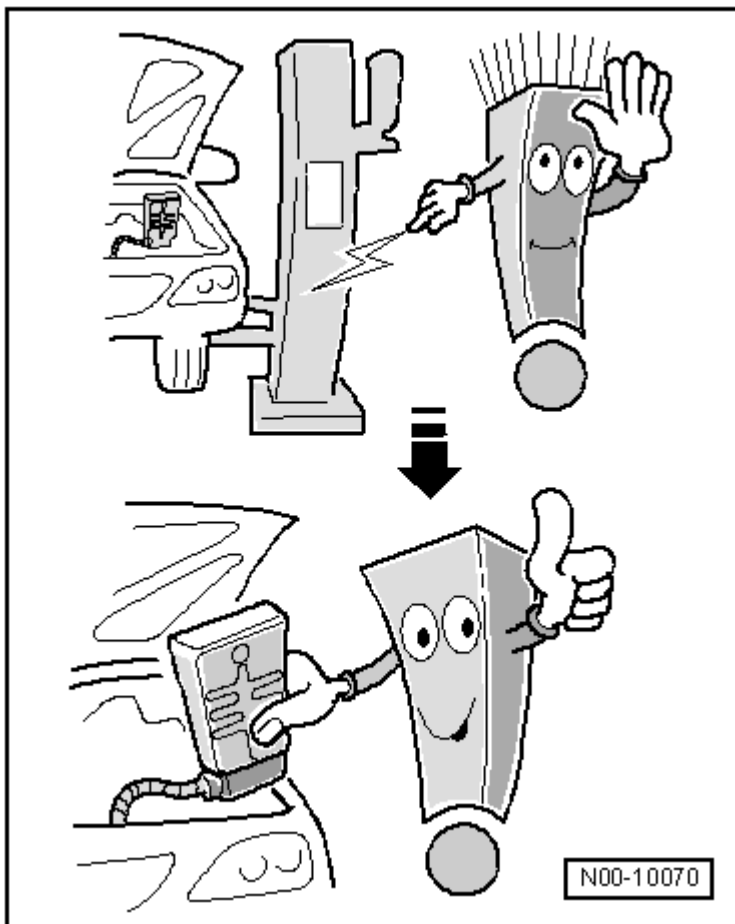
**Fig. 1: Identifying Nut And Bolt**

Courtesy of AUDI OF AMERICA, LLC

- Loosen and tighten the bolts and nuts of covers and housings in a diagonal sequence.
- Do not cant but loosen and tighten especially sensitive parts in diagonal manner in stages, e.g. servo motor with control module.
- Torque specifications for uncoiled bolts and nuts are given.
- Always replace self-locking nuts and bolts.

#### **ELECTRICAL COMPONENTS**

Surely everyone has been shocked at one time or another when coming into contact with a metal object. The reason for this is the build-up of static electricity in the human body. This charge can lead to functional problems by touching the electrical components of steering gear.



**Fig. 2: Electrical Charge Warning**  
 Courtesy of AUDI OF AMERICA, LLC

-- Touch a grounded object - for example a water pipe or a vehicle hoist - before working on electrical components. Do not make direct contact on connector terminals.

#### GUIDED FAULT FINDING, OBD AND TEST INSTRUMENTS

- Before performing repairs on the electro-mechanical steering gear, determine the cause of the damage as closely as possible using the => in the " Guided Fault Finding", "Vehicle Self-Diagnosis" and "Measurement" modes.

#### GENERAL REPAIR INFORMATION

The maximum possible care, cleanliness and proper tools are essential to ensure satisfactory and successful steering gear repairs. Understandably, general safety guidelines apply when performing repairs.

A series of applicable general notes for individual repair procedures - otherwise listed several times at many points in the repair information - has been collected here. They apply for this repair information.

A description of design and function of the electro-mechanical steering can be found in => 317 Electro-

mechanical Power Steering Design and Function.

A description of the design and function of the steering "APA" can be found in => 399 Electro-mechanical steering with axis parallel drive.

#### **STEERING ANGLE SENSOR BASIC SETTING**

- If the steering angle sensor -G85- was removed or replaced,
- After removing or replacing steering column;
- after removing or replacing steering gear;
- If the steering wheel was offset.

#### **CHECKING PLAY AND JOINT BOOTS OF TIE ROD ENDS**

- With vehicle raised (wheels hanging free), check play by moving tie rods and wheels. Play: Zero play
- Check attachments
- Check boots are not damaged and are seated correctly.

#### **STEERING COLUMN, CHECKING FOR DAMAGE**

##### **Visual check**

- Check whether parts of steering column indicate damage.

##### **Functional check**

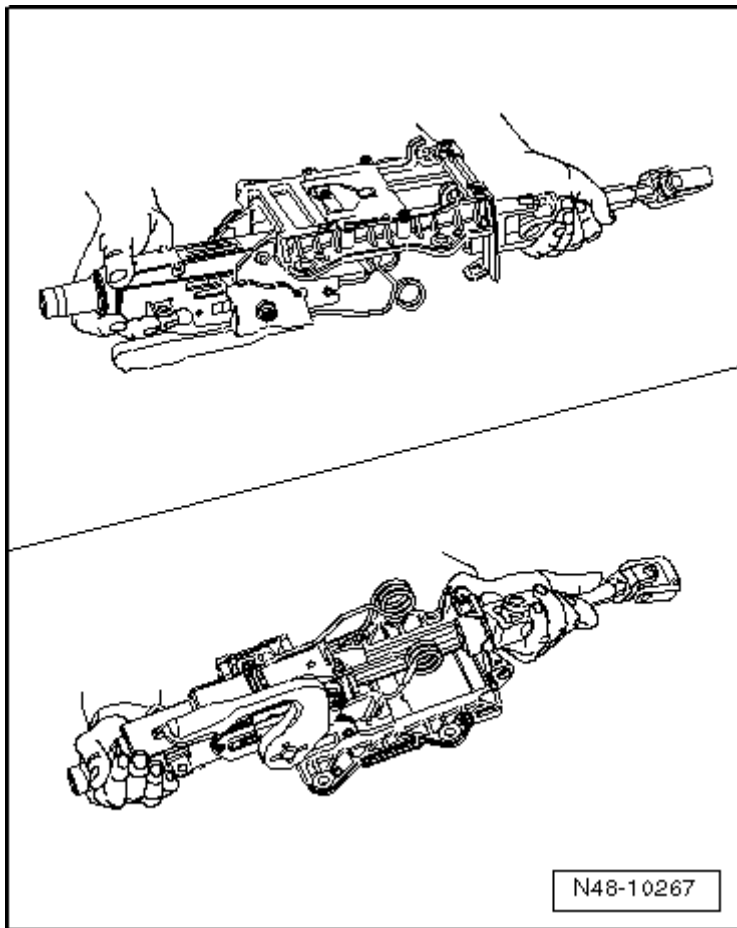
- Check whether steering column can be turned without catching or difficulty of movement.
- Check that the steering column can be adjusted with respect to height and reach.

#### **STEERING COLUMN, HANDLING AND TRANSPORTING**

##### **WARNING:**

- **The correct handling of the steering column must always be observed.**
- **Incorrect handling of steering column may cause damage to steering column and therefore lead to a safety risk.**

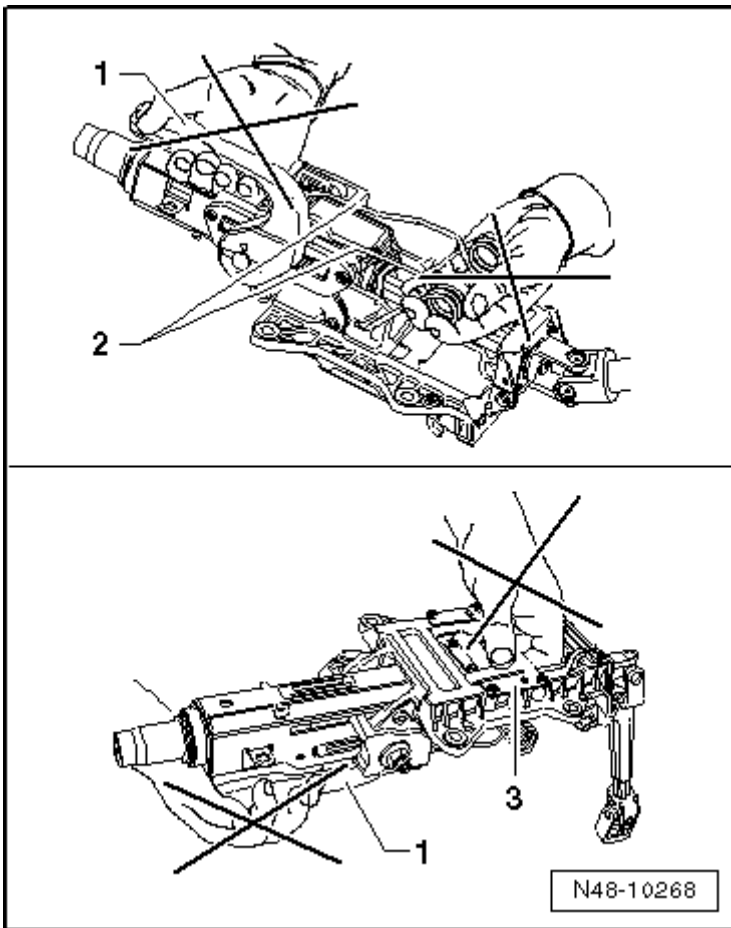
##### **Correct handling and transport of steering column**



**Fig. 3: Correct Handling And Transport Of Steering Column**  
Courtesy of AUDI OF AMERICA, LLC

- Transport steering column with two hands
- Hold steering column at upper steering rod tube and in area of upper universal joint
- Clamping lever -1- must always point upward during transportation so drive axle does not come into contact with steering column lock -2-.

**Incorrect handling of steering column**

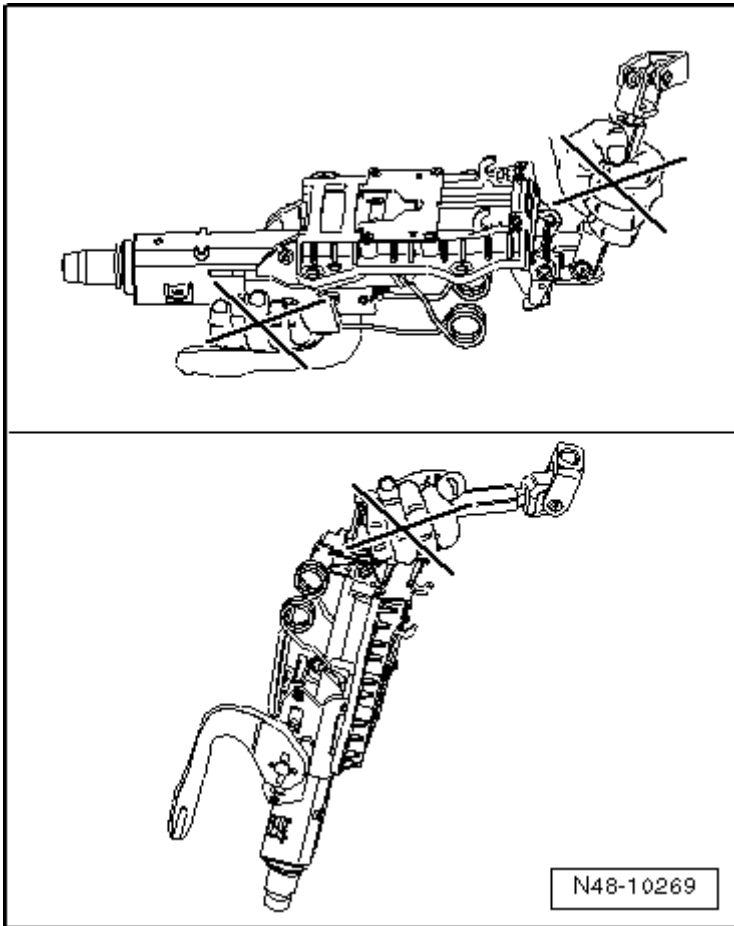


**Fig. 4: Incorrect Handling Of Steering Column**  
Courtesy of AUDI OF AMERICA, LLC

Transporting at the following components leads to pre-damage to steering column:

1. Clamping Lever
2. Weight Compensation Springs
3. Deformation Element

**Incorrect handling of steering column with safety risk**



**Fig. 5: Incorrect Handling Of Steering Column With Safety Risk**  
Courtesy of AUDI OF AMERICA, LLC

The following methods of handling lead to damage of universal joint bushings of lower steering column bushing of steering column:

- Transporting steering column with one hand on joint shaft.
- Bending joints more than 90°.

## DESCRIPTION AND OPERATION

### OVERVIEW: STEERING COLUMN

**NOTE:**        **Welding and straightening work on supporting or wheel carrying components of suspension is not permitted.**

**Always replace self-locking nuts.**

**Always replace corroded bolts/nuts.**