

Suspension

Steering

48 STEERING

GENERAL INFORMATION

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 the construction and function of this steering system can be found in Self Study Program No. 317, Electromechanical Power Steering with Double Pinion.

Steering Gear

- Thoroughly clean connecting points and their surrounding areas before loosening.
- When installing steering gear, make sure centering sleeves are correctly seated between console and steering gear.
- Place removed parts on a clean surface and cover to prevent contamination. Use foils and paper. Do not use fluffy cloths!
- Only install clean components: Only unpack replacement parts immediately prior to installation.
- Use exclusively lubricants and sealants marked with part numbers.
- Carefully cover over opened components or seal, if repairs are not carried out immediately.

Gaskets and Seals

- Always replace seals and gaskets.
- After removing seals, inspect contact surface on housings and shafts for burrs and damage and repair if necessary.
- Remove all residual sealant of fluid seals from sealing surfaces, no sealant residue must enter the steering gear housing when doing this.

Bolts and Nuts

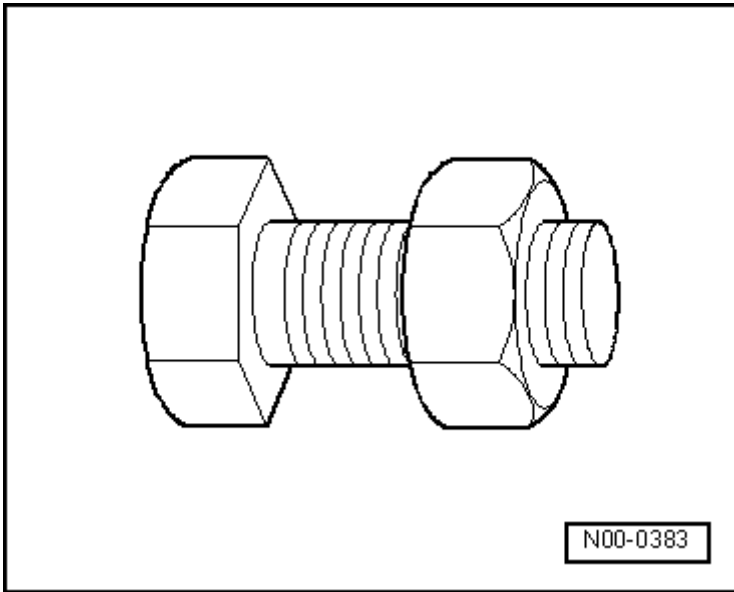


Fig. 1: Identifying Nut And Bolt

Courtesy of VOLKSWAGEN GROUP OF AMERICA, INC.

- 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.

-- 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

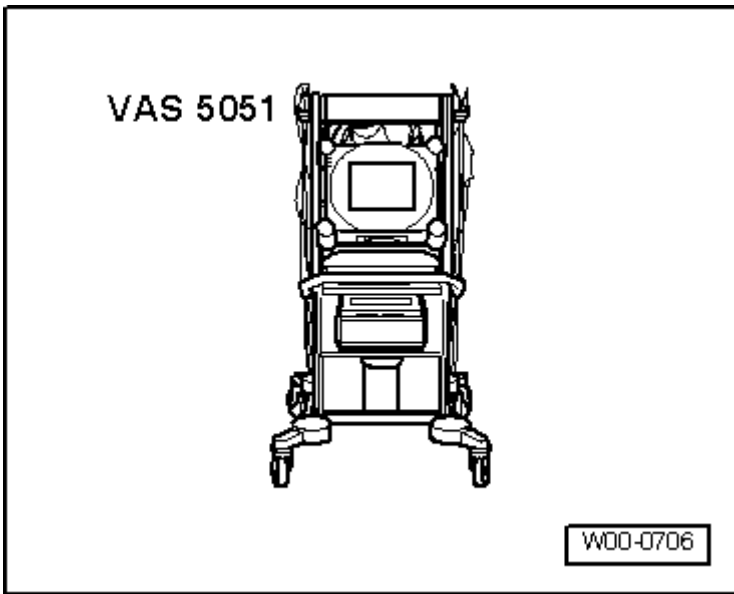


Fig. 2: Identifying VAS 5051

Courtesy of VOLKSWAGEN GROUP OF AMERICA, INC.

- Before performing repairs on electro-mechanical steering, the malfunction cause must be determined as exactly as possible using Vehicle Diagnostic, Testing and Information System VAS 5051 in operating modes "Guided Fault Finding", "Vehicle Self-Diagnosis" and "Test Instruments".

ELECTROMECHANICAL STEERING GEAR, SERVICING

Currently, there is no service work to be performed on steering gear.

DESCRIPTION AND OPERATION

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

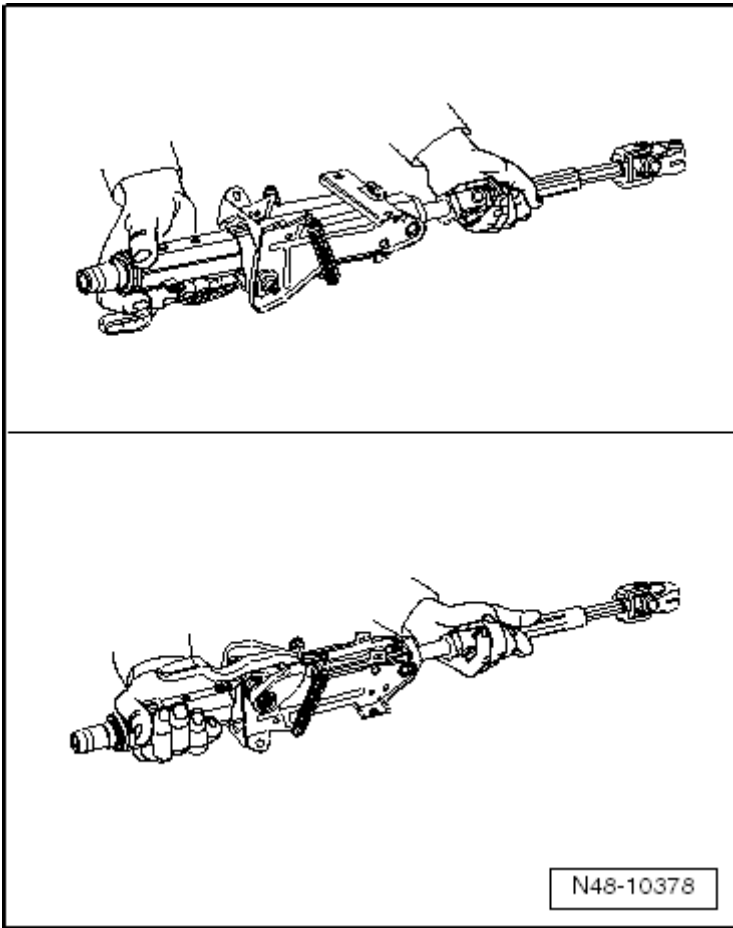


Fig. 3: Identifying Correct Handling And Transport Of Steering Column
Courtesy of VOLKSWAGEN GROUP OF AMERICA, INC.

- Transport steering column using two hands.
- Grasp steering column at upper steering column tube and in area of upper universal joint.

Incorrect Handling of Steering Column

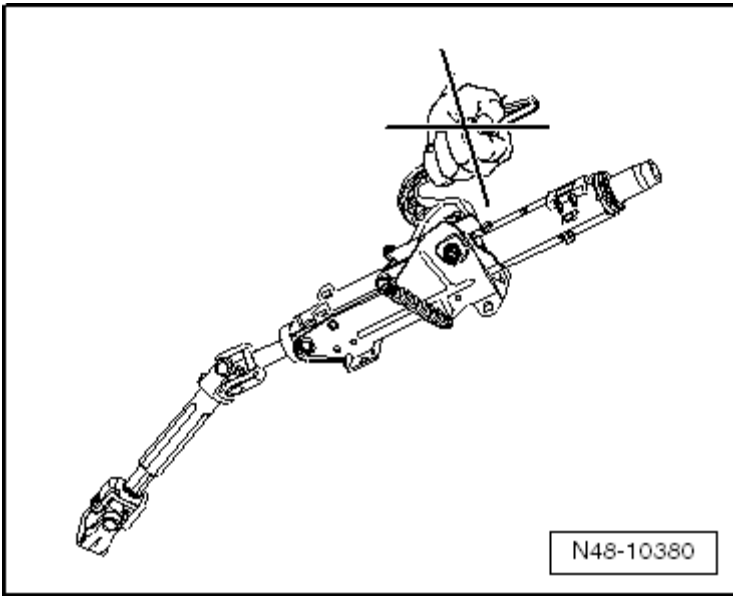


Fig. 4: Identifying Incorrect Handling Of Steering Column
Courtesy of VOLKSWAGEN GROUP OF AMERICA, INC.

Transporting at the clamping lever leads to pre-damage to the steering column.

Incorrect Handling of Steering Column with Safety Risk

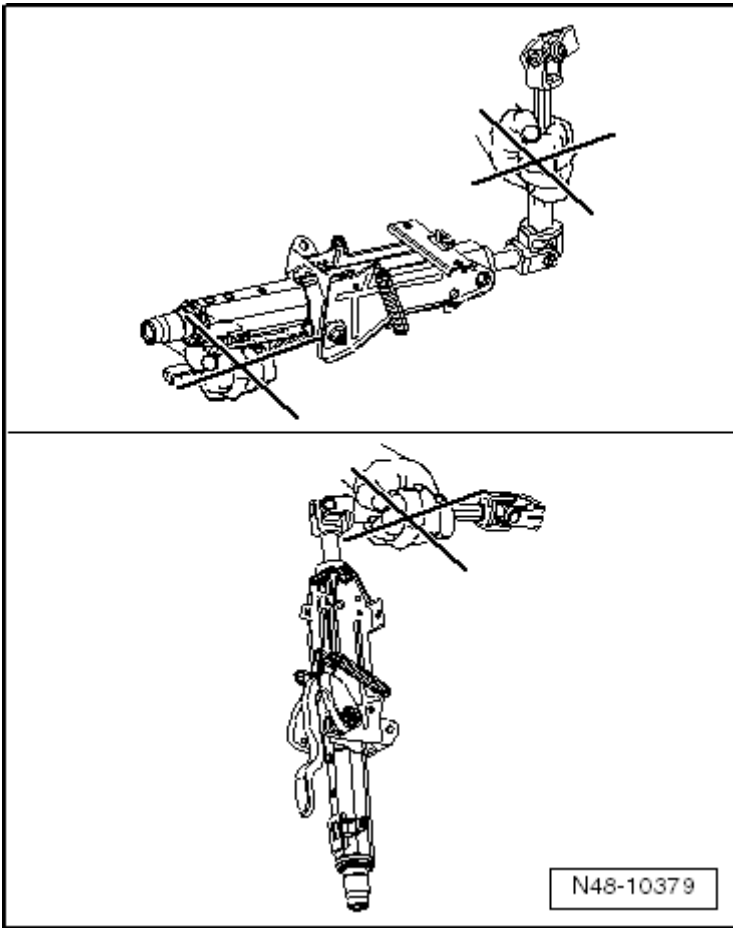


Fig. 5: Identifying Incorrect Handling Of Steering Column And Safety Risk
Courtesy of VOLKSWAGEN GROUP OF AMERICA, INC.

The following handling techniques can lead to damage of the universal joint bushings, the lower steering column bearing and the steering column:

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

STEERING COLUMN ASSEMBLY OVERVIEW, VEHICLES WITHOUT KNEE AIRBAGS

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.

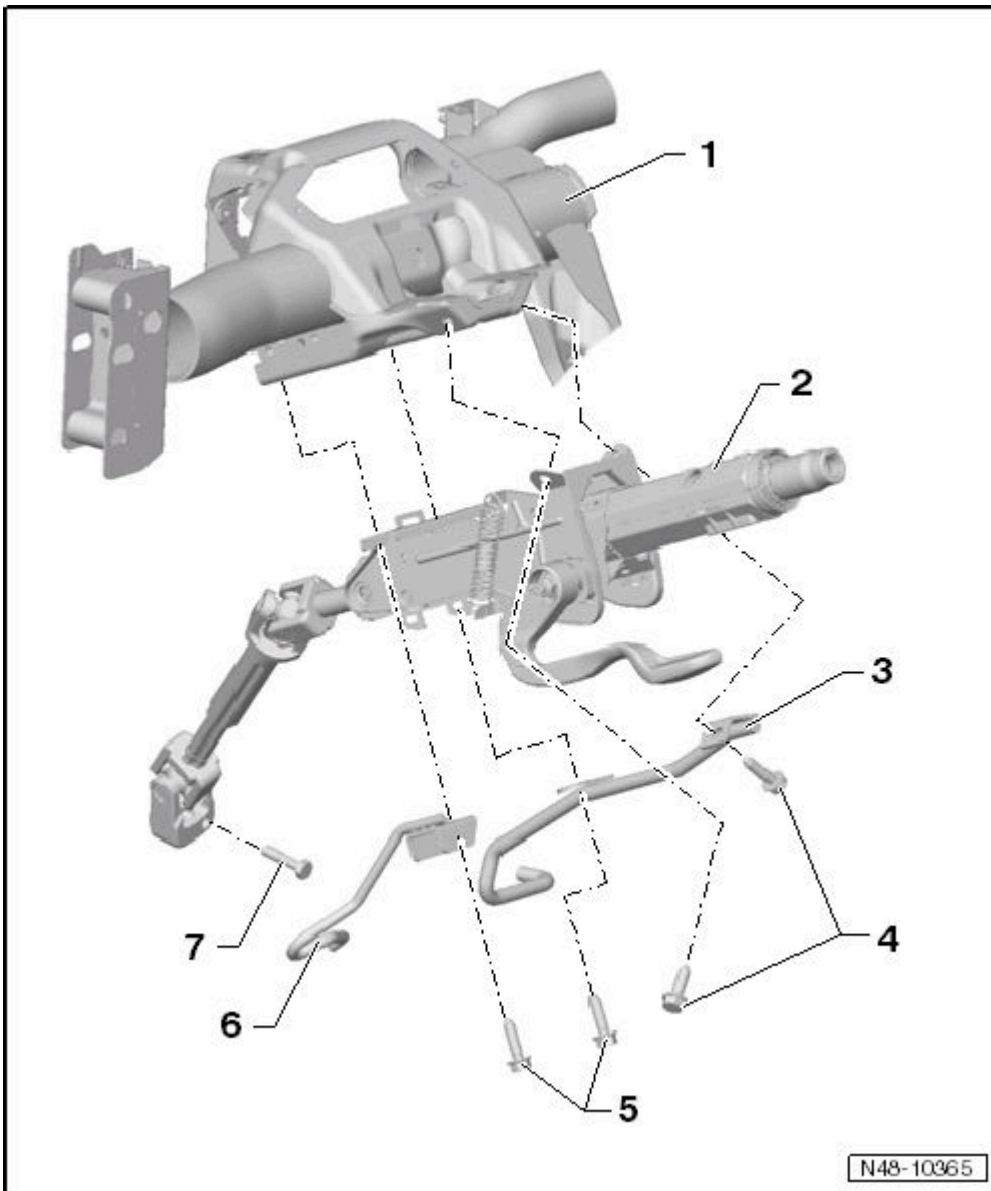


Fig. 6: Identifying Steering Column Assembly Overview, From My 2009
 Courtesy of VOLKSWAGEN GROUP OF AMERICA, INC.

1. Assembly Carrier with Bracket

2. Steering Column

- Removing and installing, refer to **STEERING COLUMN, VEHICLES WITHOUT KNEE AIRBAGS.**

3. Brake Pedal Crash Brace

4. Bolt

- 20 Nm
- Observe tightening sequence. Refer to **TIGHTEN THE BOLTS TO THE TIGHTENING SPECIFICATION IN THE SEQUENCE SHOWN.**