

SUSPENSION - FRONT (4WD)

Article Text

1991 Volkswagen Vanagon
For Volkswagen Technical Site
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Saturday, March 18, 2000 09:50PM

ARTICLE BEGINNING

1991 SUSPENSION
Front - Vanagon 4WD

DESCRIPTION

Suspension consists of upper and lower control arms and ball joints connected to wheel bearing housing. Shock absorbers are part of a strut assembly. Coil springs are held between an upper mount on the frame and a spring support on the lower shock strut housing. Strut rods and stabilizer bar are used for stability. See Fig. 1.

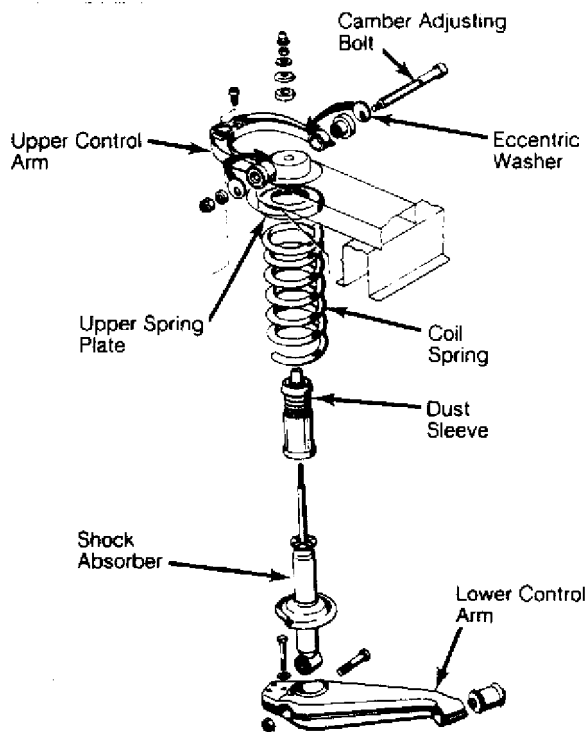


Fig. 1: Identifying Front Suspension Components
Courtesy of Volkswagen United States, Inc.

ADJUSTMENTS & INSPECTION

WHEEL ALIGNMENT SPECIFICATIONS & PROCEDURES

NOTE: See ALIGNMENT SPECIFICATIONS article in the WHEEL ALIGNMENT Section.

WHEEL BEARING

No adjustment is required.

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REMOVAL & INSTALLATION

BALL JOINT

Removal

1) Remove wheel bearing housing. See LOWER CONTROL ARM & WHEEL BEARING HOUSING.

2) Using Ball Joint Remover (VW 267a), separate lower ball joint bracket from ball joint. Remove ball joint circlip. Press ball joint from housing. Remove upper ball joint in same manner. Install upper ball joint with attaching bolts.

Installation

1) Press in lower ball joint with flat side of shoulder facing housing. Loosely attach ball joint bracket to ball joint. Install wheel bearing housing onto vehicle.

NOTE: Ball joint bracket must be aligned with lower control arm when installed or ball joint rubber seal will tear.

2) To complete installation, reverse removal procedure. Tighten bolts and nuts to specification. See TORQUE SPECIFICATIONS TABLE at end of article. Check wheel alignment. See ALIGNMENT SPECIFICATIONS article in the WHEEL ALIGNMENT Section.

COIL SPRING & SHOCK ABSORBER

Removal

1) Move front seat fully forward. Pry out rubber plug located under seat. Raise and support vehicle. Remove wheel assembly. Ensure spring compressor is installed securely. Work to side of spring when removing or installing.

2) Remove bolts which attach upper ball joint to control arm. Move control arm up out of way. Install spring compressor. Compress coil spring. Using Nut Holder (3017a), remove upper shock absorber mounting nut.

3) Push shock absorber piston rod downward. Swing shock absorber and spring outward. Remove coil spring and spring plate. Remove lower shock absorber bolt. Remove shock absorber.

Installation

1) Assemble shock absorber and lower control arm. Hand-tighten nut. Install coil spring with lower spring end in spring end stop. Evenly coiled end of spring faces downward.

2) Tape spring plate to top of spring in at least 3 places. Swing shock absorber and spring inward. Insert "T" Handle Wrench (3141) through body access hole. Thread "T" handle onto shock. Pull shock piston rod up through hole. Remove "T" handle. Install upper mounting hardware.

3) Install upper ball joint to control arm. Raise lower control arm using floor jack. Remove spring compressor. Tighten nuts and bolts to specification. See TORQUE SPECIFICATIONS TABLE at end of

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article. Insert plug into access hole. Install wheel assembly. Check wheel alignment. See ALIGNMENT SPECIFICATIONS article in the WHEEL ALIGNMENT Section.

LOWER CONTROL ARM & WHEEL BEARING HOUSING

Removal

1) Remove axle nut. Raise and support vehicle. Remove wheel assembly. Remove brake line bracket from wheel bearing housing. Remove brake caliper and hang out of way.

2) Remove upper ball joint bolts from control arm. Remove nut from tie rod end. Press tie rod end from control arm. Remove lower ball joint bracket bolts. Separate strut rod, wheel bearing housing, and lower control arm.

3) Pull axle shaft from wheel hub. Remove wheel bearing housing.

NOTE: Use press to remove axle from housing. DO NOT heat housing.

4) Detach stabilizer bar bracket from control arm. Remove lower shock absorber mounting bolt. Remove lower control arm inner pivot bolt. Remove control arm.

Bushing Replacement

Press out old bushings using Adapters (VW 402, VW 408a, and VW 459). Press in new bushings using Adapters (VW 402, VW 411, VW 459, and 3039).

Installation

1) Thoroughly clean and dry splines on axle shaft and in wheel hub. Apply locking compound around splines of axle shaft in bead approximately 1/4" wide. Allow compound to harden at least one hour before driving vehicle.

2) To complete installation, reverse removal procedure. Tighten nuts and bolts to specification. See TORQUE SPECIFICATIONS TABLE at end of article. Check wheel alignment. See ALIGNMENT SPECIFICATIONS article in the WHEEL ALIGNMENT Section.

STABILIZER BAR

Removal & Installation

Disconnect stabilizer bar from strut rod. Remove bolts retaining bracket to chassis. Remove stabilizer bar. Reverse removal procedure to install.

STRUT ROD

Removal

Disconnect stabilizer bar from strut rod. Remove nuts retaining strut rod, lower ball joint bracket and lower control arm together as an assembly. Remove strut rod-to-chassis hardware. Remove strut rod.

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Installation

To install, reverse removal procedure. Tighten nuts and bolts to specification. See TORQUE SPECIFICATIONS TABLE at end of article. Check wheel alignment. See ALIGNMENT SPECIFICATIONS article in the WHEEL ALIGNMENT Section.

SUBFRAME

Removal

1) Remove strut rods from chassis mount. Remove stabilizer mount from strut rod. Remove lower control arm inner bolt. Remove final drive support from subframe. See Fig. 2.

2) Wire final drive support to body. Remove protection bars and rubber bushings. Use Transmission Support (V.A.G 1383) to support subframe. Remove bolts which attach subframe to body. Carefully lower and remove subframe. See Fig. 3.

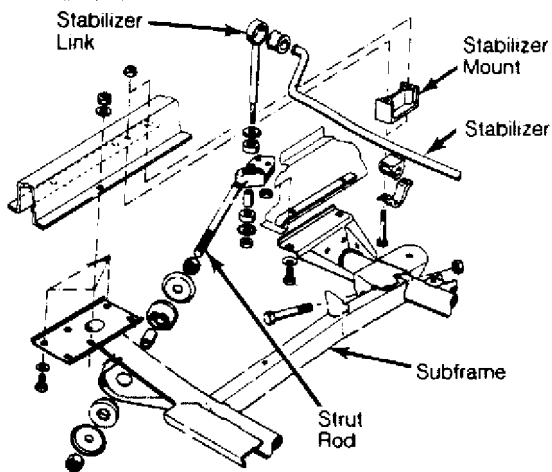


Fig. 2: Identifying Subframe Components
Courtesy of Volkswagen United States, Inc.

Installation

To install, reverse removal procedure. Tighten bolts which attach subframe to body last. Tighten nuts and bolts to specification. See TORQUE SPECIFICATIONS TABLE at end of article. Check wheel alignment. See ALIGNMENT SPECIFICATIONS article in the WHEEL ALIGNMENT Section.

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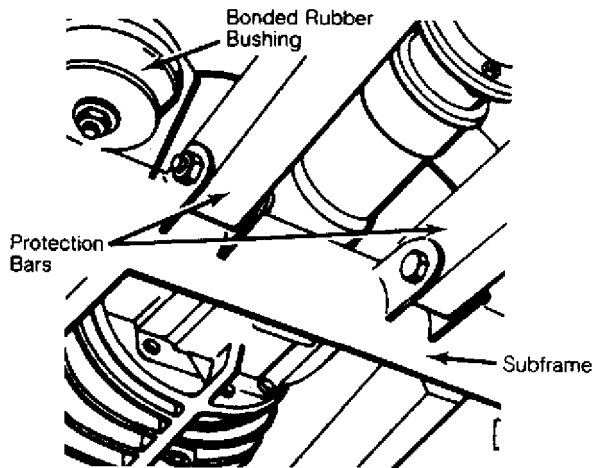


Fig. 3: Locating Protection Bars & Bonded Bushings
Courtesy of Volkswagen United States, Inc.

UPPER CONTROL ARM

Removal

1) Raise and support vehicle. Remove wheel assembly. Remove bolts retaining upper ball joint to upper control arm.

2) Carefully swing wheel bearing housing to one side. Note position of upper control arm pivot shaft. Remove pivot shaft from control arm. Remove control arm.

Bushing Replacement

Press bushings from upper control arm using Adapters (VW 402, VW 412, VW 439, VW 459, VW 522, and 40-105). Press in new bushing using Adapters (VW 402, VW 412, VW 454, VW 460/2, and VW 473).

Installation

Lubricate pivot shaft with grease. Install upper control arm to body. Position pivot shaft as noted during removal. Install ball joint. To complete installation, reverse removal procedure. Tighten bolts to specification. See TORQUE SPECIFICATIONS TABLE at end of article. Check wheel alignment. See ALIGNMENT SPECIFICATIONS article in the WHEEL ALIGNMENT Section.

WHEEL BEARING

Removal

1) Remove bearing housing. See LOWER CONTROL ARM & BEARING HOUSING under REMOVAL & INSTALLATION.

2) Mount wheel bearing housing and Housing Support (VW 401) in press. Press wheel hub from bearing using Adapters (VW 408a and 40-105). See Fig. 4.

NOTE: Wheel bearing will be destroyed when wheel hub is pressed out.

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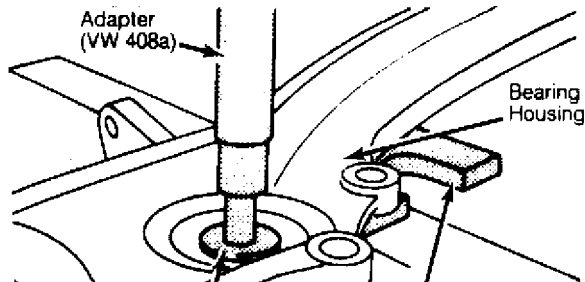


Fig. 4: Pressing Wheel Hub from Housing
Courtesy of Volkswagen United States, Inc.

3) Remove outer seal and bearing circlip. Using Housing Supports (VW 401 and 3144) and Adapters (VW 407 and 3074), press wheel bearing from housing.

4) Remove inner bearing race from wheel hub using Adapter (40-105) and Puller (US1015). Remove inner seal from bearing housing.

Installation

1) Mount wheel bearing housing in press together with Housing Supports (VW 401 and 3144) and Adapters (VW 412 and 3124). Press wheel bearing into housing. Install seals using Installer (31430) and Support (3144).

2) Using Housing Supports (VW 401 and VW 415a), press wheel hub into bearing. To complete installation, reverse removal procedure. See Fig. 5.

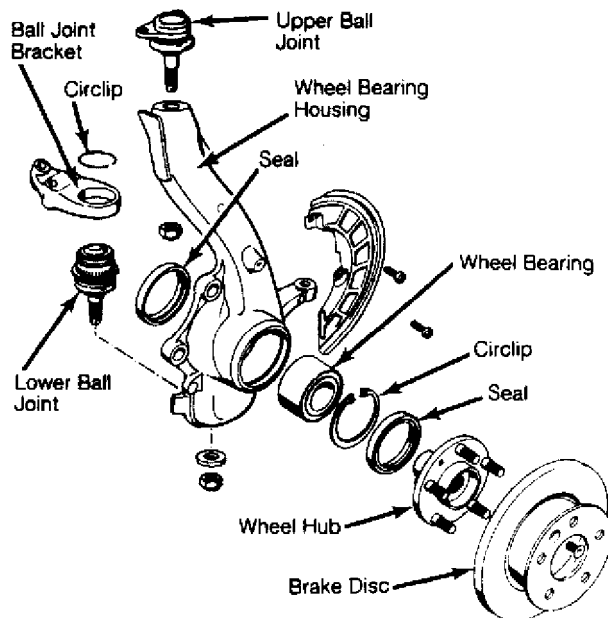


Fig. 5: Identifying Wheel Bearing Housing Components
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TORQUE SPECIFICATIONS

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TORQUE SPECIFICATIONS TABLE

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Application	Ft. Lbs. (N.m)
Axle Shaft Nut	236 (320)
Ball Joint Self-Locking Nut (1)	81 (110)
Brake Caliper-To-Housing Bolt	177 (240)
Brake Rotor-To-Hub Assembly Bolt	14 (19)
Lower Control Arm Pivot Bolt	66 (89)
Shock Absorber Bottom Bolt	110 (149)
Shock Absorber Top Nut	22 (30)
Stabilizer Link-To-Strut Rod	22 (30)
Stabilizer Mount-To-Frame	18 (24)
Strut Rod-To-Chassis Nut	125 (169)
Strut Rod-To-Lower Control Arm Nut	51 (69)
Subframe-To-Body Bolt	33 (45)
Tie Rod End-to-Bearing Housing Nut	22 (30)
Upper Ball Joint-To-Control Arm Bolt	44 (60)
Upper Control Arm Pivot Bolt	54 (73)
Wheel Lug Nut	123 (167)

(1) - Always use new self-locking nuts.

AA

END OF ARTICLE