VOLKSWAGEN TYPE 2

Type 2

DESCRIPTION

Independent ball joint type suspension with torsion bars. Front axle beam consists of two horizontal tubes held together at ends by endplates welded to tubes. Torsion bars are mounted inside tubes and anchor in center. Torsion arms are connected to end of torsion bars and mount to steering knuckles by means of ball joints. Hydraulic shock absorbers are mounted between lower torsion arms at bottom and to axle beam endplates at top. A stabilizer bar is mounted to lower torsion arms. Complete front axle assembly is removable.

ADJUSTMENT

WHEEL ALIGNMENT SPECIFICATIONS & PROCEDURES

See Wheel Alignment Specifications & Procedures in WHEEL ALIGNMENT Section.

WHEEL BEARING ADJUSTMENT

See Wheel Bearing Adjustment in WHEEL ALIGNMENT Section.

BALL JOINT CHECKING

See Ball Joint Checking in WHEEL ALIGNMENT Section.

REMOVAL & INSTALLATION

FRONT AXLE ASSEMBLY

Removal – Most repairs to front axle components can be done with front axle assembly in vehicle, but complete assembly can be removed. Raise vehicle and place safety stands under body. Remove wheel and tires. Disconnect brake lines from flex hoses at brackets and plug brake lines. Disconnect speedometer cable at left steering knuckle. Remove cover plate under pedal assembly and remove gear shift rod and lever. Disconnect clutch cable at pedal and hand brake cables at lever. Remove nut from drag link stud and press out of pitman arm. Remove steering damper bolt at bracket. Secure a suitable holding fixture to axle (VW610) and place a floor jack under fixture. Remove four bolts securing axle assembly to chassis, lower jack and remove axle assembly.

Installation – Reverse removal procedure for installation. Tighten all bolts and nuts to specifications. Bleed brake system and check wheel alignment.

STEERING KNUCKLE

Removal – 1) Raise vehicle and place safety stands under body. Remove wheel and tire. If left side knuckle is being removed, pull out speedometer cable. Disconnect brake caliper and support out of way. Remove cotter pin and castellated nut from tie rod end. Use a press type tool and seperate tie rod from steering knuckle.

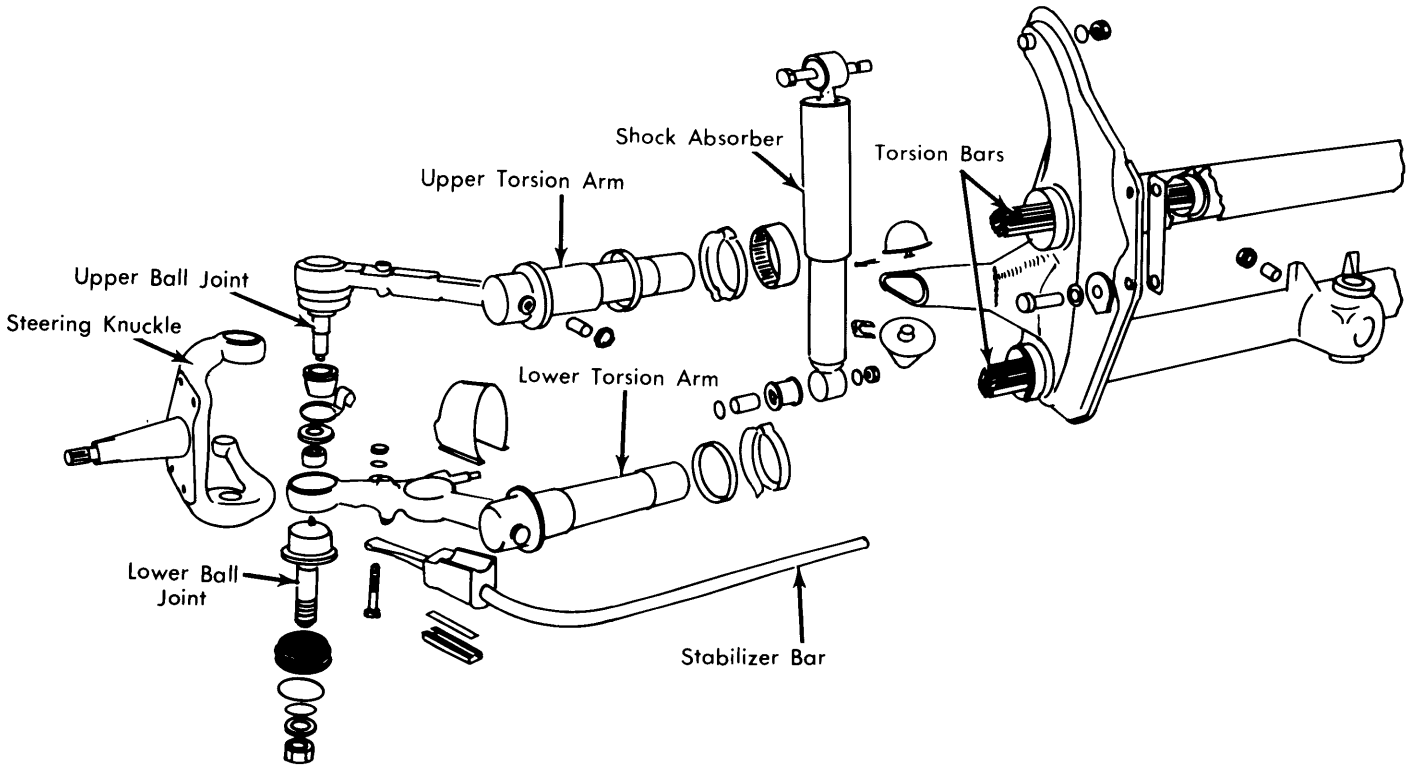

Fig. 1 Exploded View of Front Suspension Assembly

VOLKSWAGEN TYPE 2 (Cont.)

2) Remove splash shield from steering knuckle. Take off lower ball joint nut and press joint from knuckle. Remove upper ball joint nut, then with suitable wrench, turn camber eccentric adjusting bushing until joint is free from knuckle. See *Fig 2*.

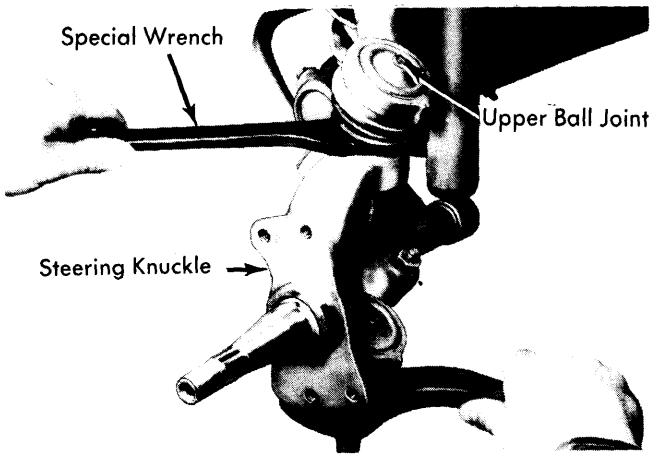

Fig 2 Removing Upper Ball Joint from Steering Knuckle

Installation – 1) Inspect all components for wear or distortion. Loosely attach steering knuckle to lower torsion ball joint. Raise lower torsion arm until steering knuckle engages upper ball joint.

CAUTION – *Position notch on camber adjusting bushing so it faces forward.*

2) Install all new self locking nuts to ball joints. Insert cotter pin in tie rod stud. Install brake components. Adjust wheel bearings and check wheel alignment.

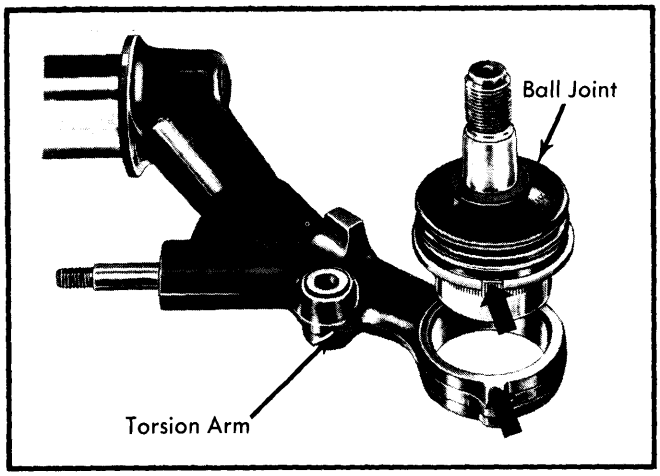

Fig. 3 Align Notch in Ball Joint with Boss on Torsion Arm

STABILIZER BAR

Removal – Knock retaining clip from clamp. Bend up clamp and remove plates. Remove nut from retaining bolt and remove bolt. Remove stabilizer bar from vehicle.

Installation – Inspect rubber components for wear or cracking. Inspect stabilizer bar for wear or distortion. Install stabilizer bar and retaining bolt and tighten nut to specification. Install clamp with cutout facing wheel. Press edges of clamp together with a pair of pliers and install clip. Made sure tongue edge of clip is facing axle beam. Lock clip by bending over tongue.

TORSION ARMS & BALL JOINTS

Removal – Raise vehicle and place safety stands under body. Remove wheel and tire. Remove steering knuckle and stabilizer bar as previously outlined. Back lock nuts from set screws and remove set screws. Pull torsion arms out of axle tubes. Press ball joints out of torsion arms.

Installation – Press ball joints into torsion arms. When pressing ball joints into control arms make sure that notches in shoulder of ball joint align with forged projections on torsion arm. Install a suitable peening tool (VW471) on press and peen ball joint 3 times with a pressure of 6 tons to insure ball joint is properly seated in torsion arm. Thoroughly grease pivot portion of torsion arm and install in axle tube. Reverse removal procedure for installation of remaining components. Tighten all bolts and nuts to specifications. Bleed brake system and check wheel alignment.

SHOCK ABSORBER MOUNTING STUD

Removal – Remove lower torsion arm as previously outlined. Drive dowel pin out and pull stud from torsion arm. If stud is broken, center punch in center of remaining piece and drill a .12" pilot hole in stud. Then drill remaining piece out with a .423" drill.

Installation – Replacement studs are oversized. Drill out hole with a .483" drill and ream to .4904" - .4914". A press fit of .0004" - .002" is required for proper fit. Press stud in arm until distance between shoulder of arm and end of stud is 1.77" - 1.79". Drill through dowel pin hole with .157" - .161" drill and drive in dowel pin. Install torsion arm in vehicle as previously outlined.

SHOCK ABSORBER

Removal – Raise and suitably support vehicle. Remove tire and wheel. Remove upper mounting nut and bolt. Pull shock absorber top rearward and remove nut holding lower end of shock absorber on stud.

Installation – To install shock absorber, reverse removal procedure and note: With vehicle still raised, incline shock absorber 30° to rear while torquing nuts. This will prevent lower rubber bushing from twisting as suspension moves upward. CAUTION – *DO NOT incline shock absorber if vehicle weight* is on ground.

TORSION BARS, AXLE TUBE BUSHINGS & BEARINGS

Removal – 1) Raise vehicle and place safety stands under body. Remove both tires and wheels. Remove steering knuckle from both sides. Remove torsion arm from one side of torsion bar. If lower bar is being removed, remove shock absorber. If upper bar is being removed, remove gear shift rod at coupling and set to one side.

2) Loosen lock nut and remove screw from center of axle tube. Pull out on remaining torsion arm and remove torsion bar. Remove torsion arm from bar. Measure inside diameter of

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bushing in axle tube, if more than 1.708" (43.40 mm), replace bushing. Remove bushing by pulling out bearing and then bushing with puller.

Installation – 1) Throughly clean bearing and bushing seats in axle tube. Measure inside diameter of bearing seat. Make sure correct standard and oversize bearings are used. Lubricate bearings and drive bearing in using a punch. Drive bearing in approximately .276" (7.0 mm) from edge of axle tube.

2) Drive bushing into axle tube using a punch. Drive bushing into axle tube approximately 5.551" (141 mm) from edge of axle tube. Install seal retainers with lugs in vertical position. Reverse removal procedure for installation of remaining components. Throughly grease front axle assembly.

NOTE – *White paint spot on end of torsion bar identifies LEFT SIDE of bar.*

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (mkg)
Ball Joint Stud Nuts	72 (10.0)
Torsion Arm Set Screw	29 (4.0)
Torsion Arm Set Screw Lock Nut	29 (4.0)
Stabilizer Bar Retaining Nut	31 (4.3)
Shock Absorber	
Lower Mount Nut	36 (5.0)
Upper Mount Nut	36 (5.0)
Torsion Bar Set Screw	29 (4.0)
Torsion Bar Set Screw Lock Nut	29 (4.0)
Axle Assembly-to-Body	78 (10.8)
Tie Rod End Stud Nut	22 (3.0)