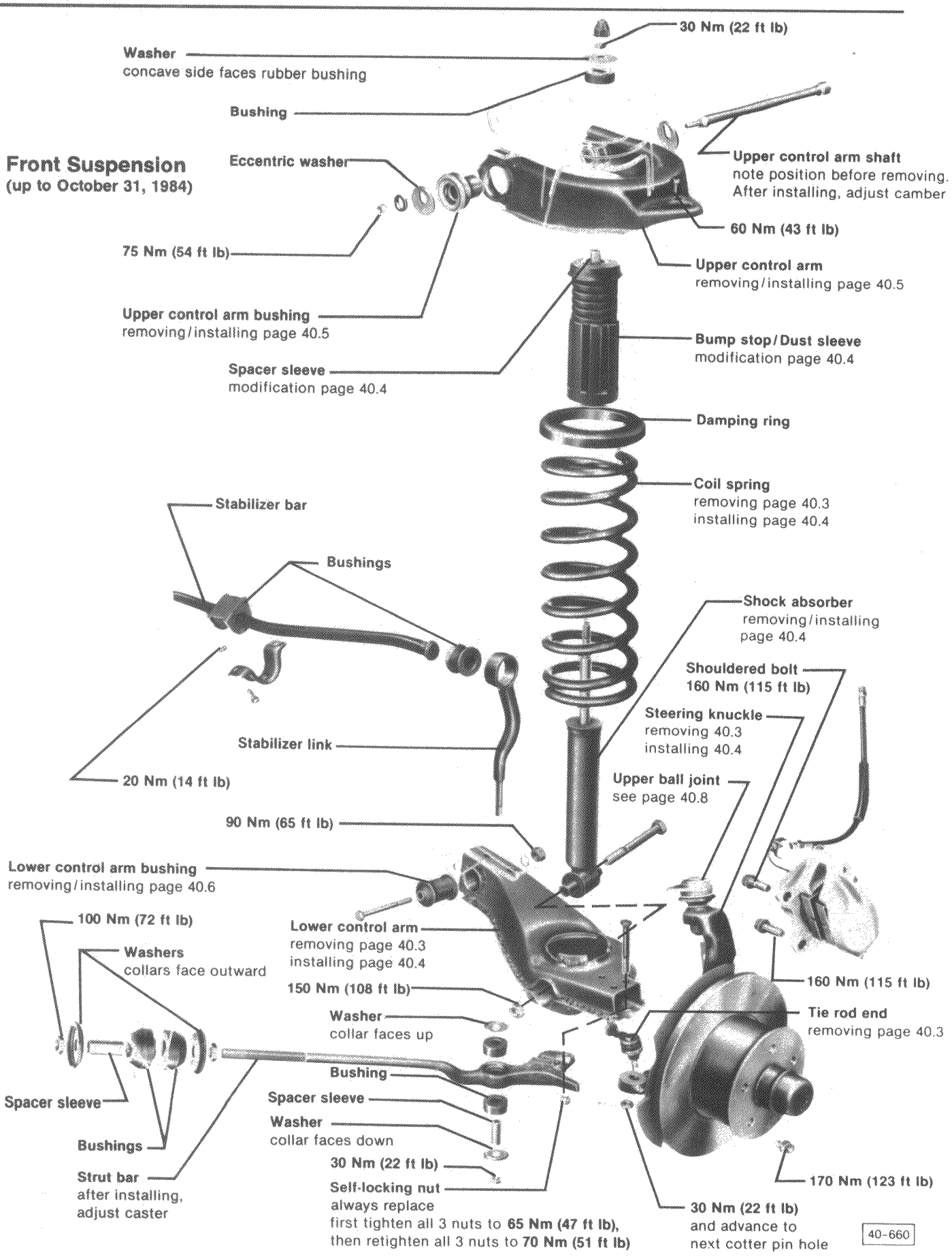
40

Front Wheel Suspension
Shafts & Axle

Quick Data

Index

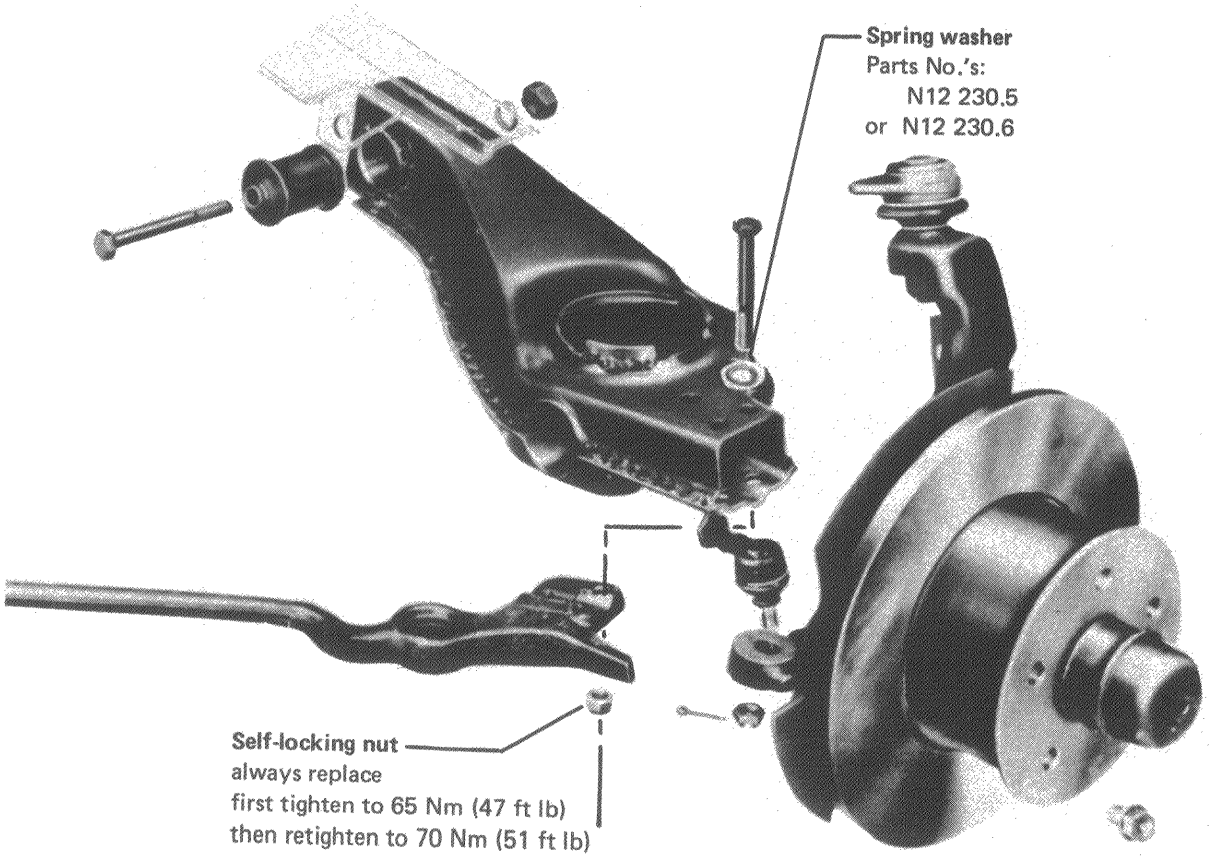

Front Suspension
(up to October 31, 1984)
30 Nm (22 ft lb)
Washer
concave side faces rubber bushing
Bushing
Eccentric washer
Upper control arm shaft
note position before removing.
After installing, adjust camber
60 Nm (43 ft lb)
75 Nm (54 ft lb)
Upper control arm
removing/installing page 40.5
Upper control arm bushing
removing/installing page 40.5
Bump stop/Dust sleeve
modification page 40.4
Spacer sleeve
modification page 40.4
Damping ring
Coil spring
removing page 40.3
installing page 40.4
Stabilizer bar
Bushings
Shock absorber
removing/installing
page 40.4
Shouldered bolt
160 Nm (115 ft lb)
Steering knuckle
removing 40.3
installing 40.4
Stabilizer link
20 Nm (14 ft lb)
Upper ball joint
see page 40.8
90 Nm (65 ft lb)
Lower control arm bushing
removing/installing page 40.6
100 Nm (72 ft lb)
Washers
collars face outward
Lower control arm
removing page 40.3
installing page 40.4
160 Nm (115 ft lb)
150 Nm (108 ft lb)
Washer
collar faces up
Tie rod end
removing page 40.3
Bushing
Spacer sleeve
Spacer sleeve
Washer
collar faces down
Bushings
30 Nm (22 ft lb)
Strut bar
after installing,
adjust caster
Self-locking nut
always replace
first tighten all 3 nuts to 65 Nm (47 ft lb),
then retighten all 3 nuts to 70 Nm (51 ft lb)
170 Nm (123 ft lb)
30 Nm (22 ft lb)
and advance to
next cotter pin hole
40-660

Strut bar bolts
(up to October 31, 1984)

When repairing front axle **always** install spring washer under bolt head

Note

Do not install spring washer under self-locking nut

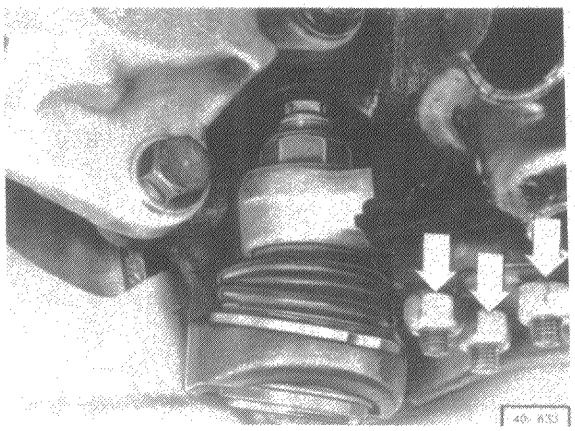


40-A006

Steering knuckle/coil spring/lower control arm, removing

Work sequence

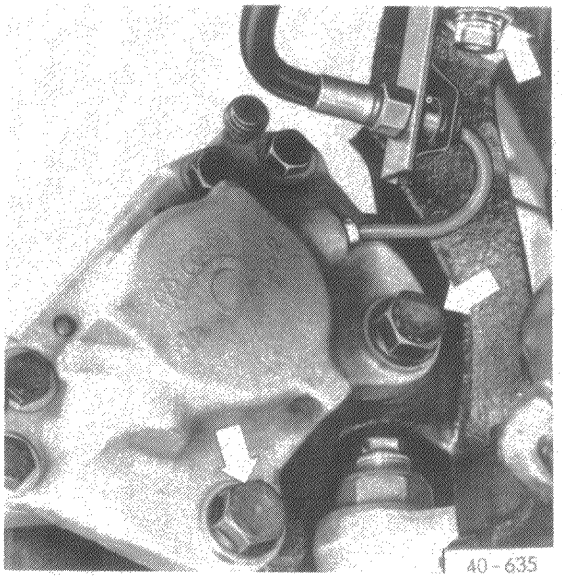
— remove wheel
— remove stabilizer bar from strut bar



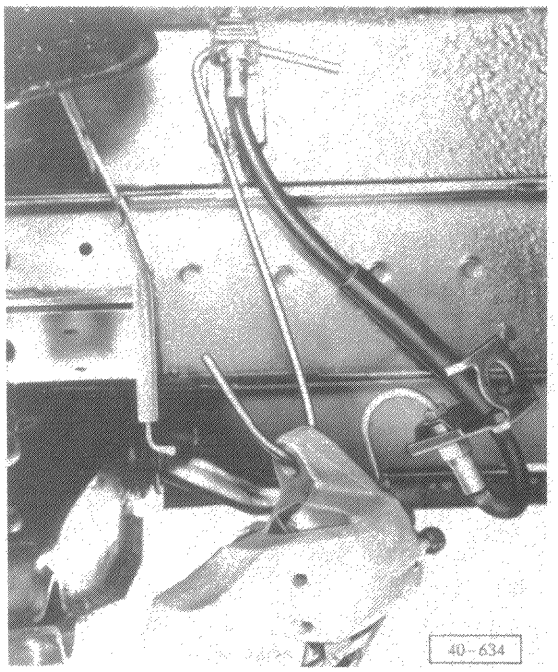
— remove nuts (arrows) holding strut bar, steering knuckle and lower control arm together

Note

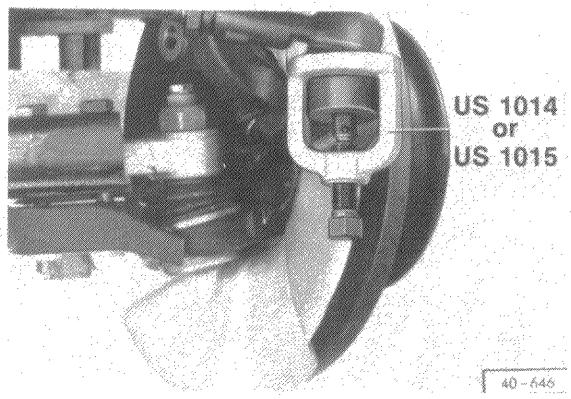
Length of strut bar determines caster angle. If setting at body mounting is changed, caster must be readjusted, see Repair Group 44



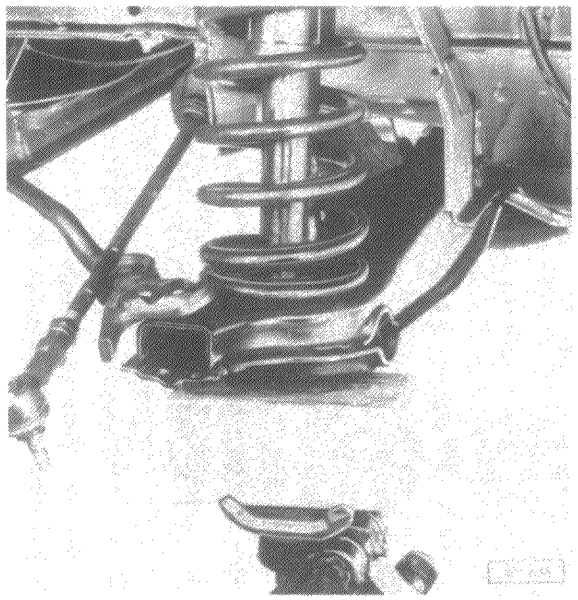
— remove brake caliper and brake hose bracket (arrows)



— hang caliper up on body with hook



— remove tie rod end nut and press tie rod end out
— remove upper ball joint from upper control arm
— detach steering knuckle from upper and lower control arms
— loosen shock absorber on lower control arm

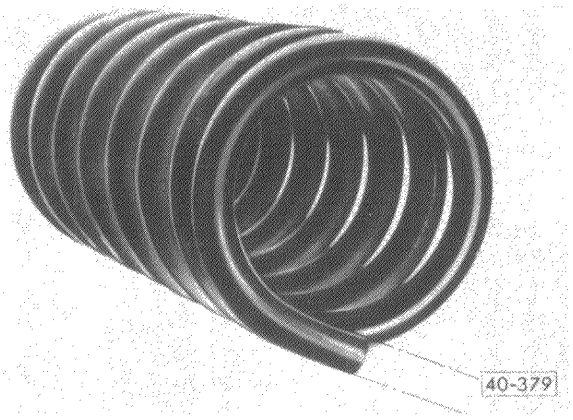


— support lower control arm with jack, and pull shock absorber bolt out of lower control arm
— lower jack slowly and remove coil spring
— remove control arm from body

Steering knuckle/coil spring/lower control arm, installing

Work sequence

— install control arm



— check correct position of spring (straight end of spring must be at bottom)
— attach damping ring to top of spring with tape
— install coil spring in correct position (lower end of spring in depression in control arm)
— lift control arm with jack and attach shock absorber to control arm
— attach steering knuckle to control arm. At lower connection, strut bar must also be attached
— install stabilizer bar, tie rod and brake caliper
— reinstall wheel

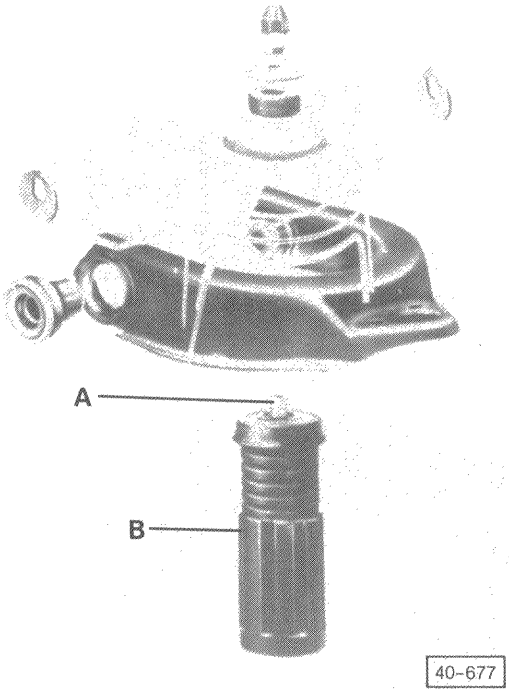
Shock absorber, removing/installing

— remove shock absorber from control arm at bottom
— lower vehicle onto wheels and pull shock absorber bolt out of control arm
— lift vehicle
— remove shock absorber from body and install new shock absorber to body
— lower vehicle and tighten shock absorber to control arm

Note

When lifting vehicle without shock absorber, avoid damage to upper ball joint

Bump stop/Dust sleeve and spacer sleeve, modification



A = spacer sleeve
B = bump stop/dust sleeve

Note

From VIN 25A 007 7959, following parts have been modified:
- new spacer sleeve (length 28.5 mm/1.122 in.), Part No. 251 413 439A
- contact surfaces of bump stop and body

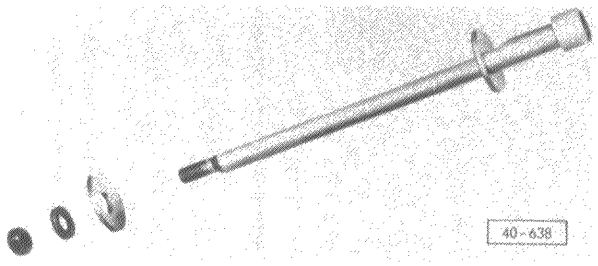
If new bump stop must be installed in vehicles up to VIN 25A 007 7958, spacer sleeve, length 24.5 mm (0.965 in.), Part No. 251 413 439B, must be installed

Upper control arm, removing

— remove wheel
— remove bolts holding upper ball joint to control arm
— swing steering knuckle carefully to one side
— remove control arm shaft and detach upper control arm

Upper control arm, installing

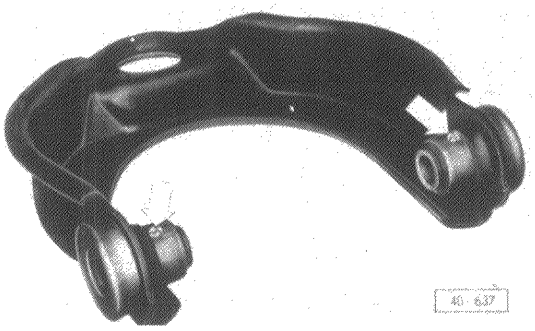
— attach control arm to body and note position of control arm shaft



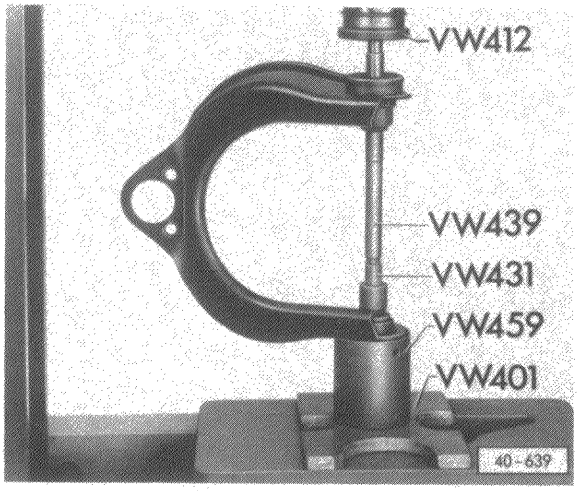
- flat on control arm shaft must be vertical and face center of vehicle. Larger side of eccentric washers face down

— lubricate control arm shaft with multi-purpose grease
— install ball joint in control arm

Upper control arm bushing, removing

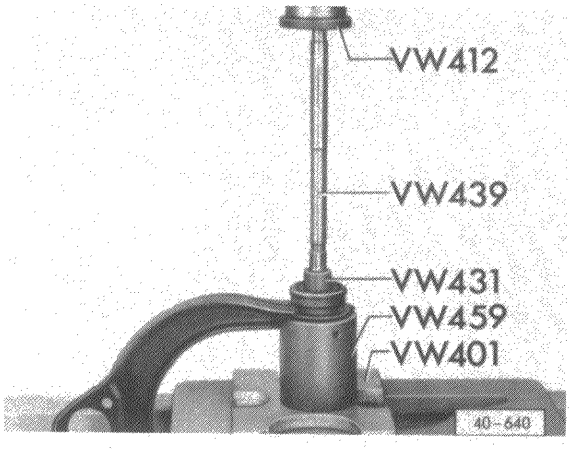


— grind off spot welds (arrows)

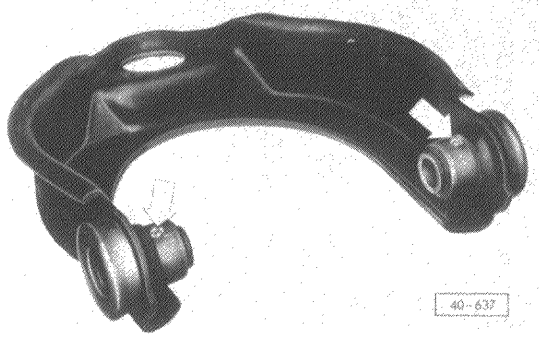


— press bushing out

Upper control arm bushing, installing

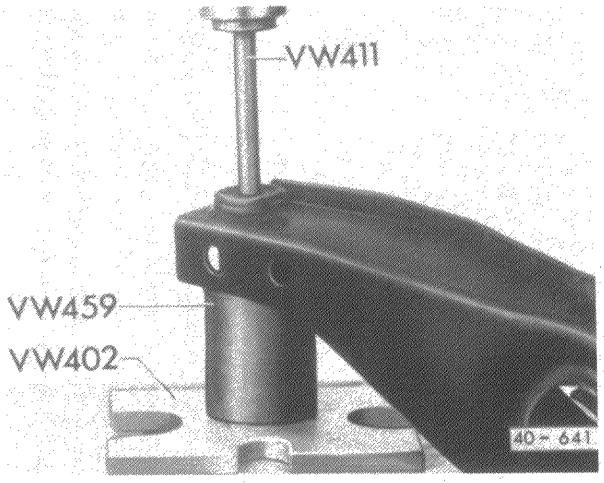


— press bushing in

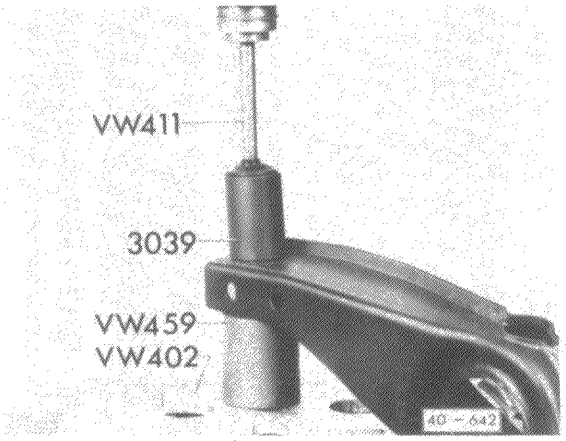


— secure bushings with spot welds (arrows) to prevent them from turning
— clean up welds and paint

Lower control arm bushing, removing/installing



— press bushing out



— press bushing in

Front suspension modifications
(from November 1, 1984)

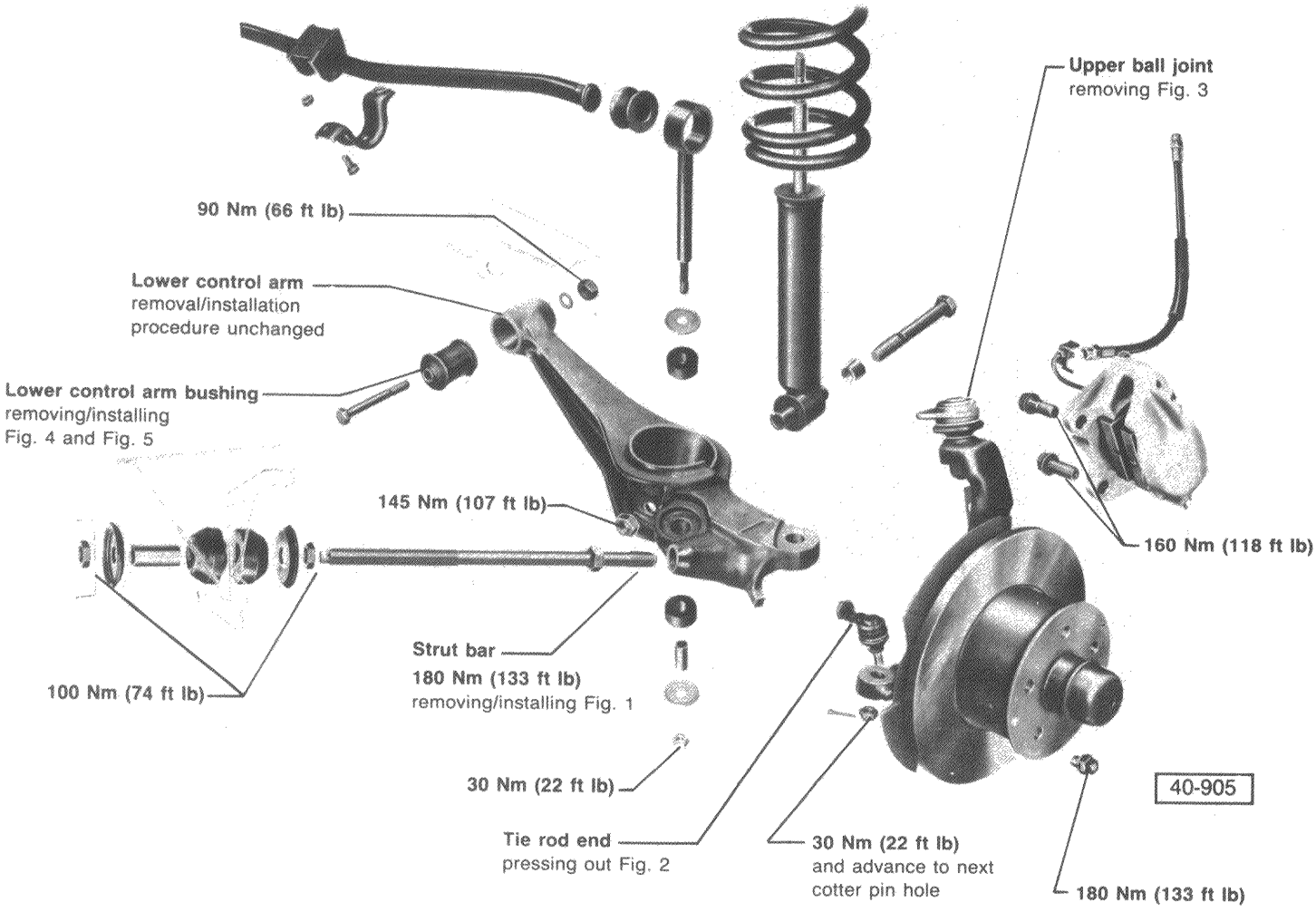
Beginning in November 1984, the sheet metal lower control arm has been replaced by a cast arm.

The strut bar, which was previously bolted to the arm with the ball joint adapter, is now screwed into the cast arm. The ball joint is installed directly in the arm and the adapter has been discontinued.

Also, the eye in the steering arm for the tie rod end has been made wider.

Note

New version parts cannot be installed together with parts of the old version. Parts of the old version will remain available.



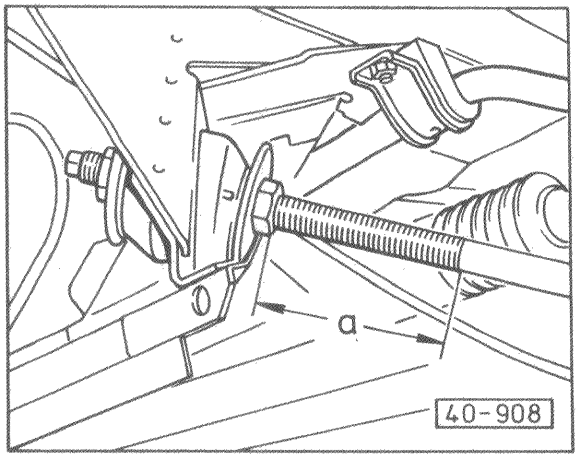


Fig. 1 Strut bar, removing/installing

— measure dimension **a** from end of thread to rear nut before removing

Note

When installing rod, the rear nut must be set to the old position or the caster angle reset.

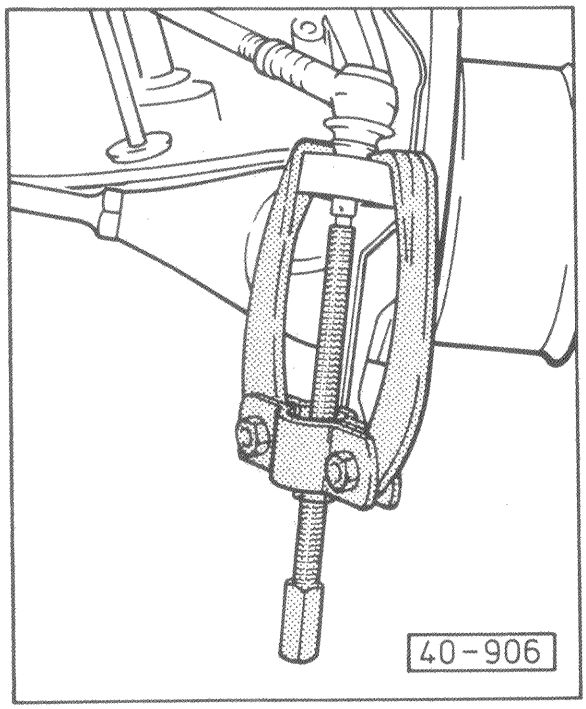


Fig. 2 Tie rod end, pressing out

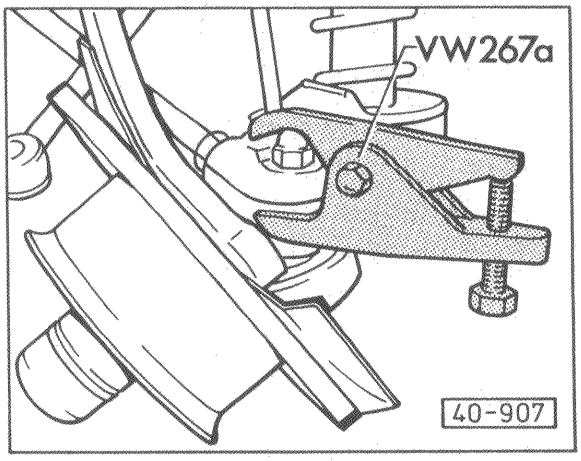


Fig. 3 Steering knuckle, removing

— press ball joints out of arms

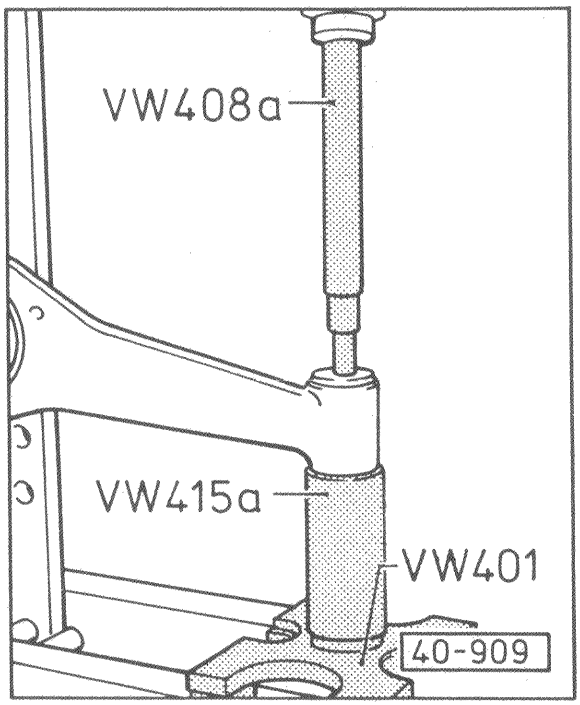


Fig. 4 Control arm bushing, pressing out

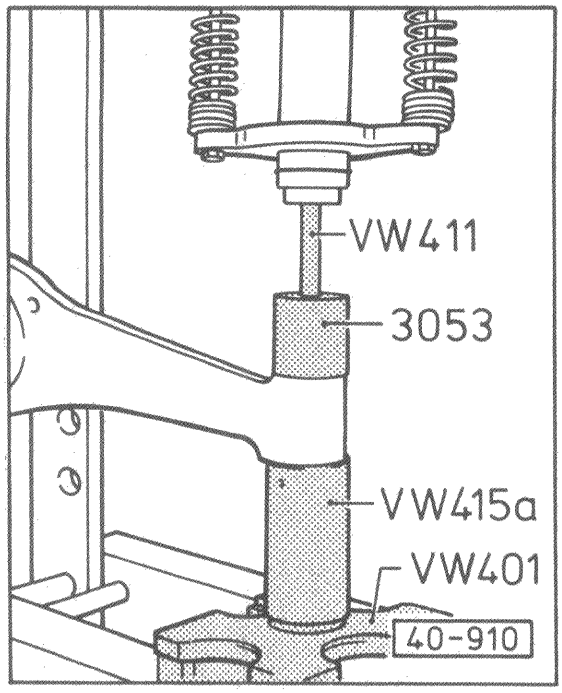
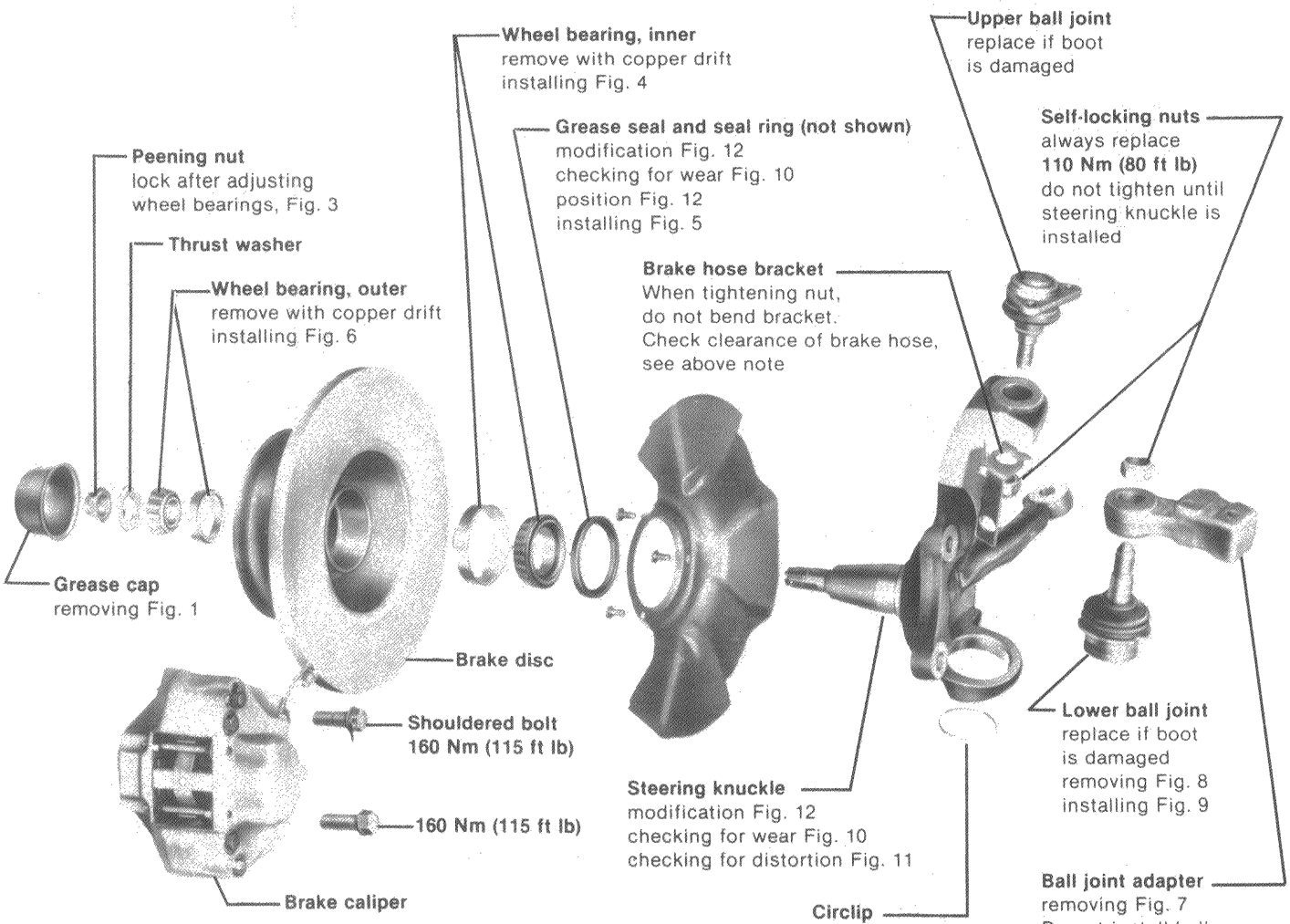


Fig. 5 Control arm bushing, pressing in



Note

If brake hose bracket is removed, clearance between wheel and hose must be checked when reinstalling. With wheels at full left and right locks, there must be a minimum clearance of 25 mm (1 in.). If not, bend bracket to adjust

40-647

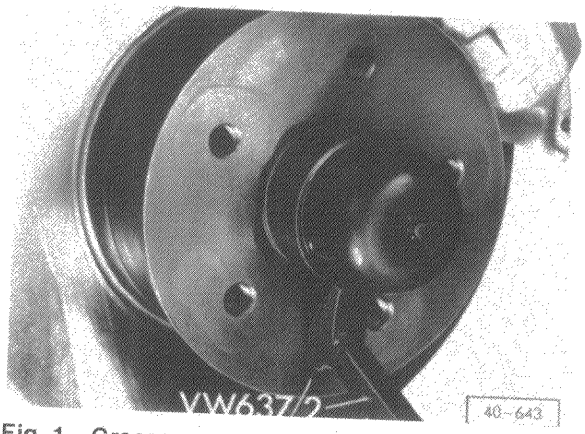


Fig. 1 Grease cap, removing

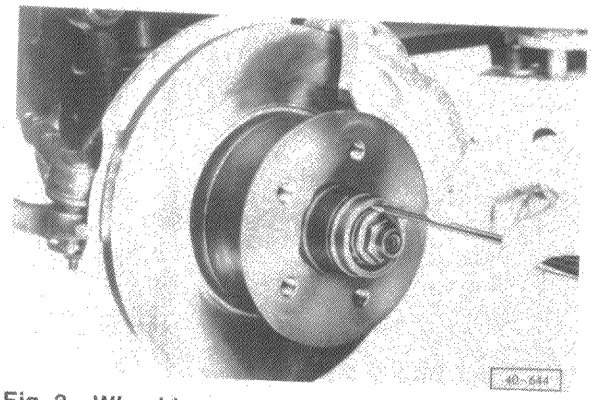


Fig. 2 Wheel bearing, adjusting

— tighten nut firmly to seat bearing, at same time turn wheel so bearing does not jam
— back off nut
• wheel bearing clearance is correctly adjusted when thrust washer can be moved slightly with screwdriver (arrow) and finger pressure. Do not pry or twist screwdriver
— peen nut (see Fig. 3)
— install grease cap

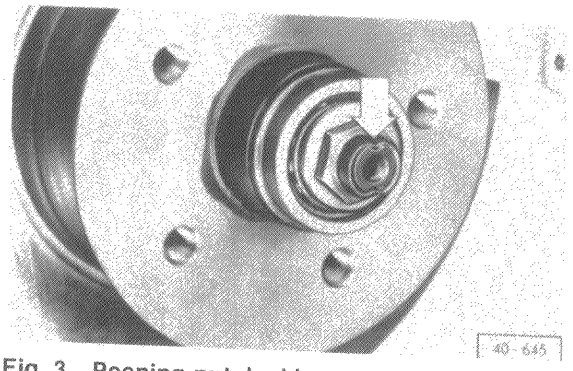


Fig. 3 Peening nut, locking

— peen nut on shoulder (arrow)
— do not reuse peened nut, always replace

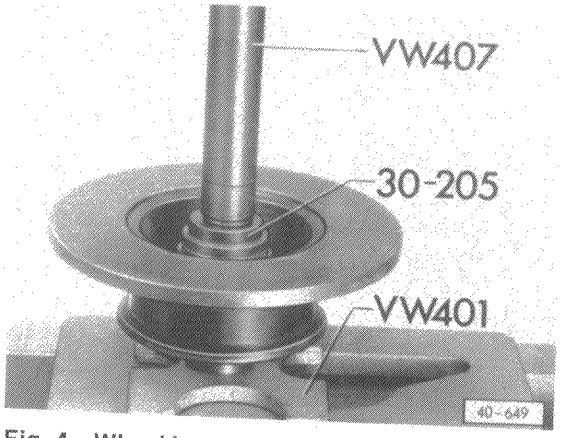


Fig. 4 Wheel bearing (inner), installing outer race

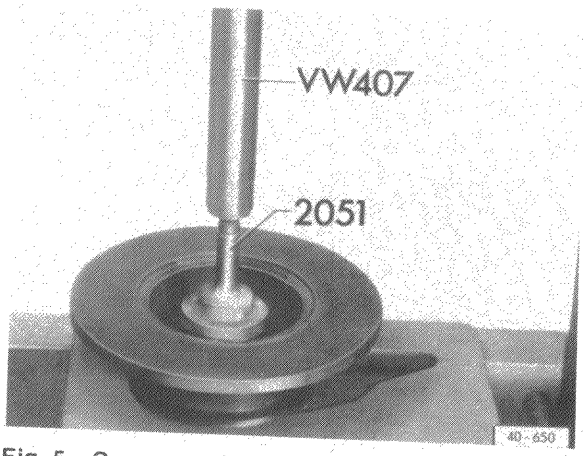


Fig. 5 Grease seal, installing

— press in flush

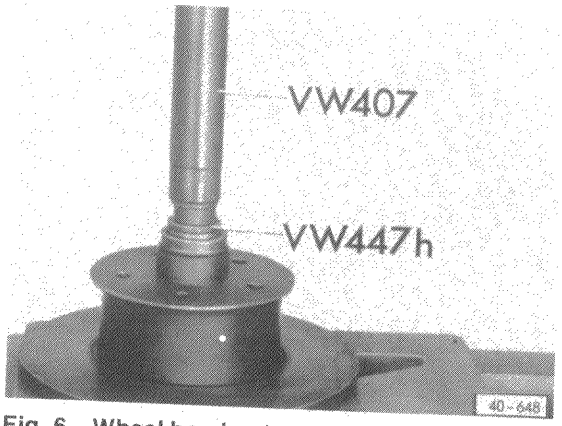


Fig. 6 Wheel bearing (outer), installing outer race

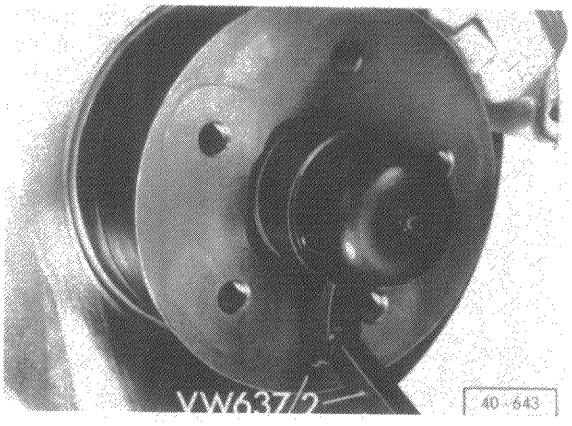


Fig. 1 Grease cap, removing

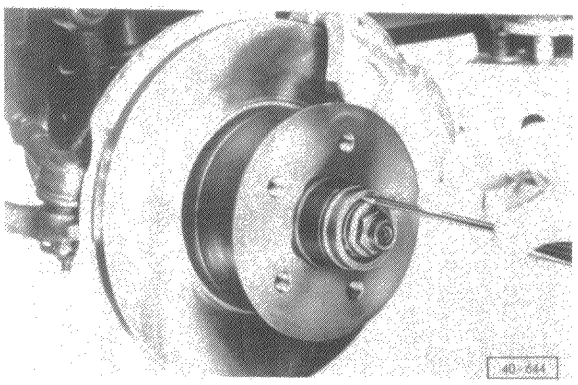


Fig. 2 Wheel bearing, adjusting

— tighten nut firmly to seat bearing, at same time turn wheel so bearing does not jam
— back off nut
• wheel bearing clearance is correctly adjusted when thrust washer can be moved slightly with screwdriver (arrow) and finger pressure. Do not pry or twist screwdriver
— peen nut (see Fig. 3)
— install grease cap

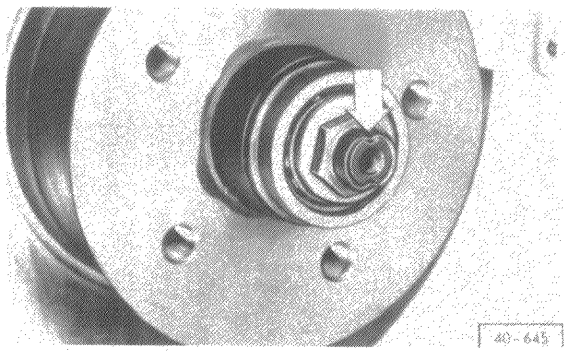


Fig. 3 Peening nut, locking

— peen nut on shoulder (arrow)
— do not reuse peened nut, always replace

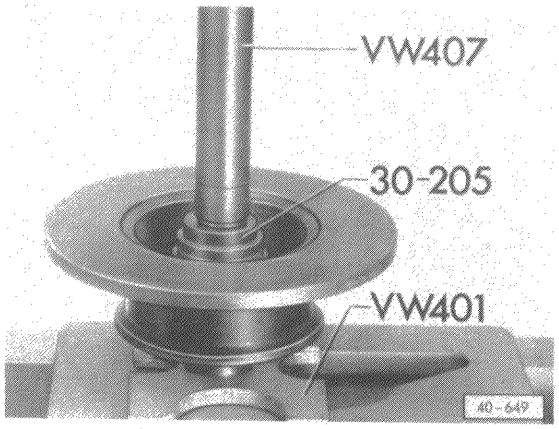


Fig. 4 Wheel bearing (inner), installing outer race

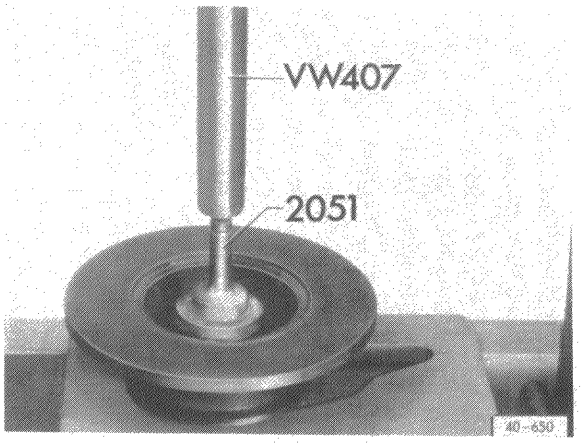


Fig. 5 Grease seal, installing

— press in flush

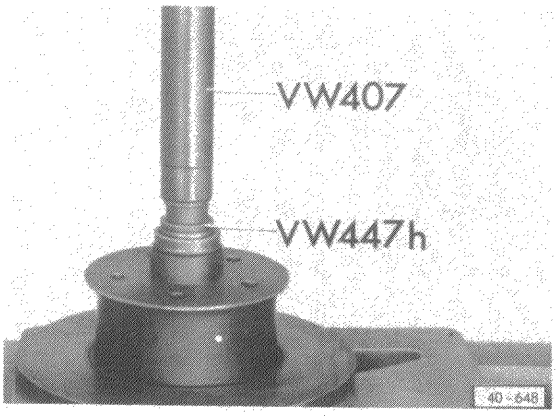


Fig. 6 Wheel bearing (outer), installing outer race

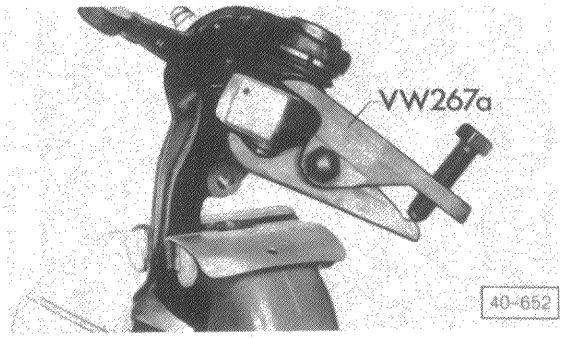


Fig. 7 Ball joint adapter, removing

— press lower ball joint adapter off lower ball joint
— press upper ball joint out with same tool

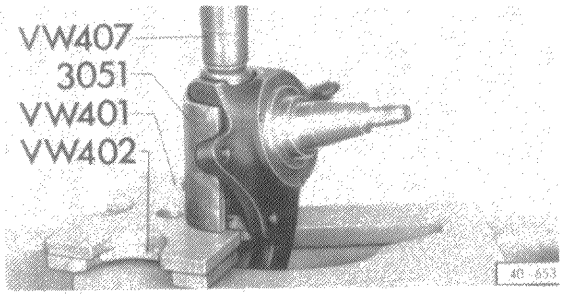


Fig. 8 Lower ball joint, removing

— remove circlip for ball joint
— press lower ball joint out of steering knuckle

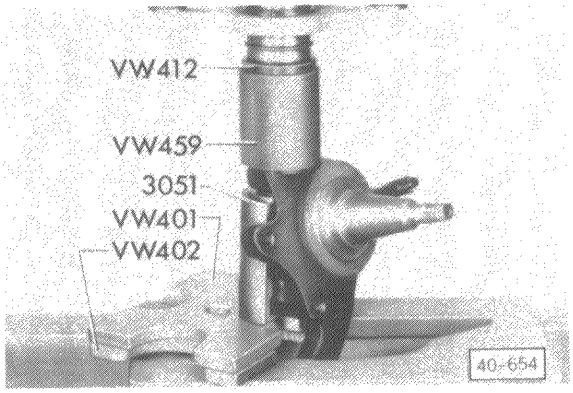


Fig. 9 Lower ball joint, installing

— press in, flat side of shoulder faces spindle
— attach adapter loosely to ball joint

Note

Do not tighten adapter fully. Adapter must be aligned with control arm when steering knuckle is installed; otherwise, rubber boot will be stretched and torn when steering is in full lock position

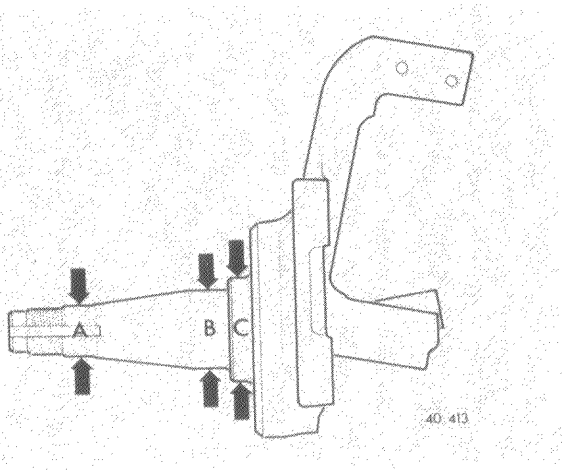


Fig. 10 Wheel bearing/grease seal seats, checking for wear

— check for scoring or ridges at these points
A = outer bearing seat
B = inner bearing seat
C = oil seal seat/seal ring
— replace seal ring or steering knuckle if neeessary

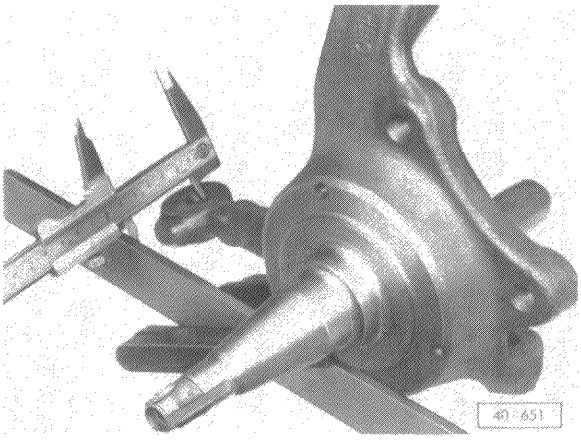


Fig. 11 Steering arm on steering knuckle, checking

- measurement must be: 54–56 mm (2.126–2.205 in.)

CAUTION

Bent steering knuckles must be replaced. Do not straighten

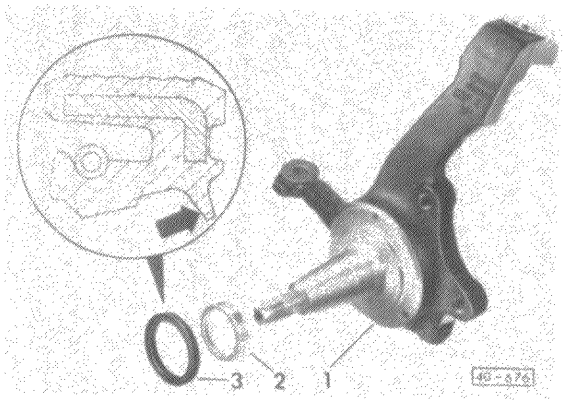


Fig. 12 Steering knuckle, modification

1 = steering knuckle
2 = seal ring (not shown on page 40.10)
3 = oil seal

- steering knuckle has a seal ring for grease seal
- if seal ring is scored, seal ring and grease seal must be replaced
- position of grease seal: dust lip (arrow) points away from seal lip

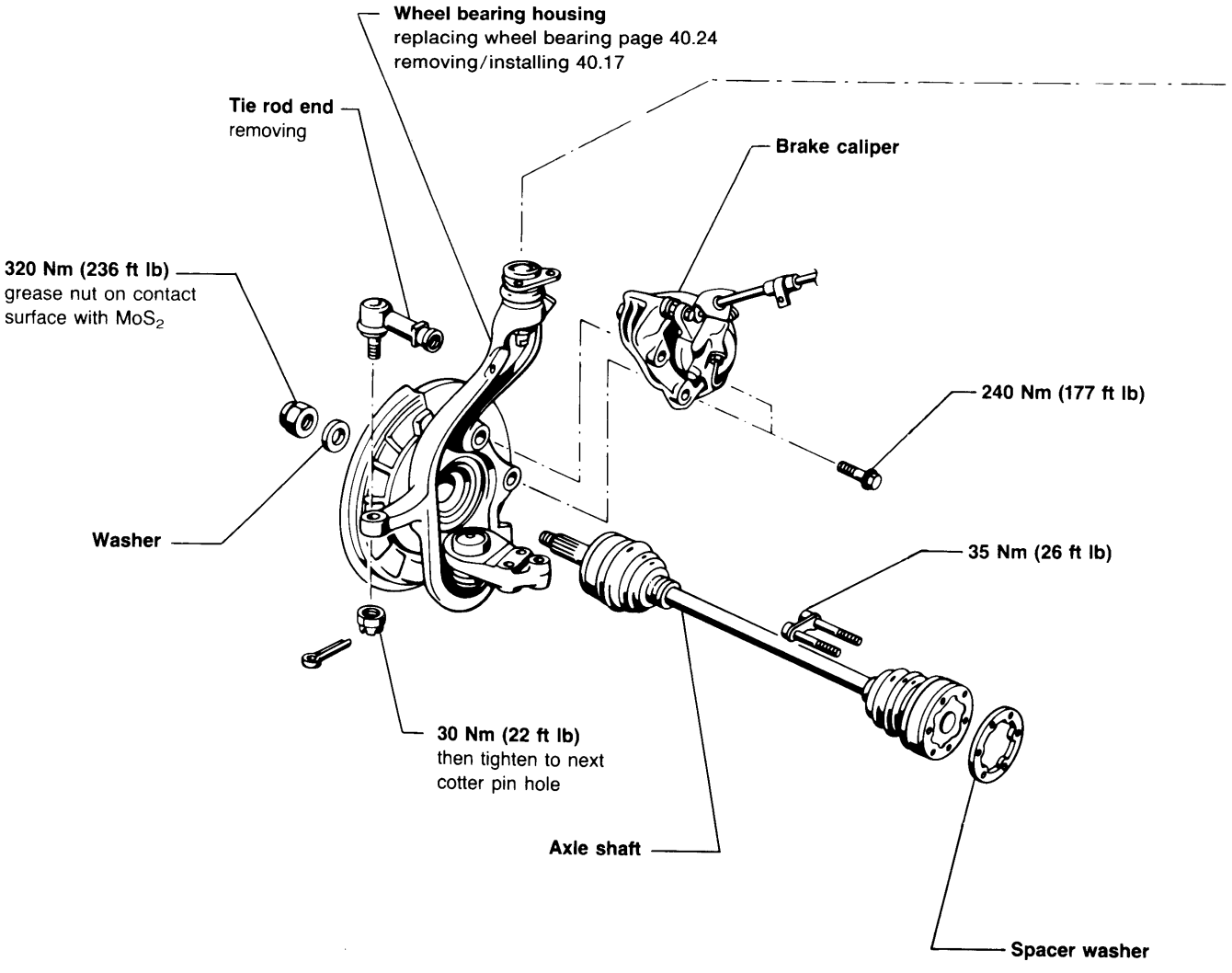
— fill up space between seal lips with multi-purpose grease

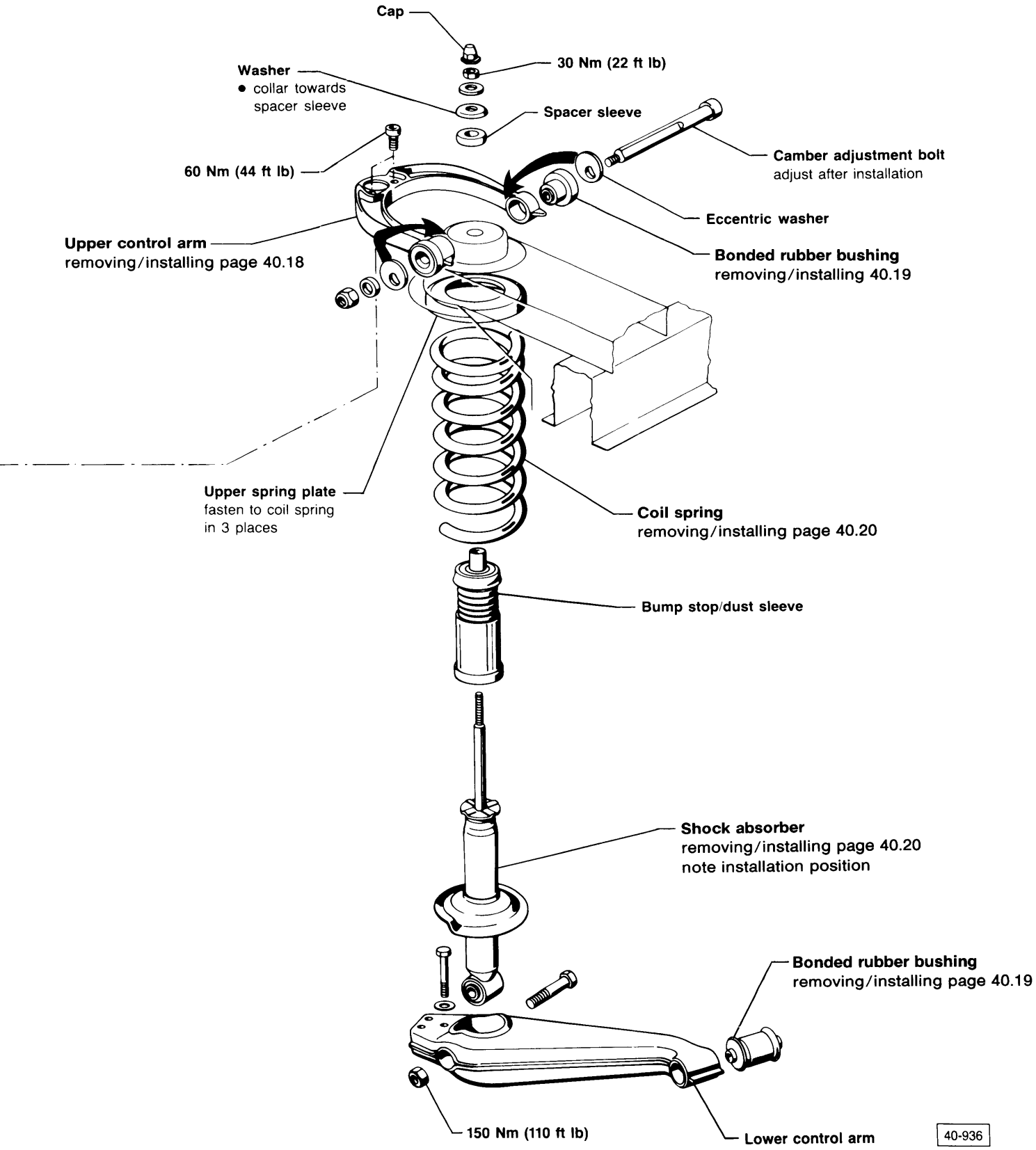
CAUTION

Welding or straightening procedures must not be performed on load bearing front suspension components and components that position the wheels.

Always replace self-locking nuts.

If vehicles that have an axle shaft removed must be moved, an outer joint must be installed to prevent damage to wheel bearing.



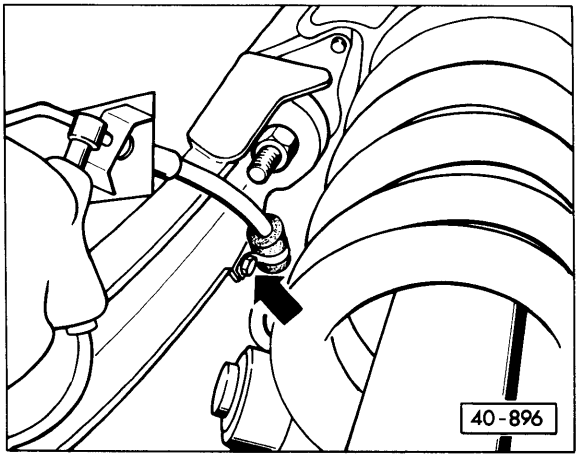

Cap
30 Nm (22 ft lb)
Washer
• collar towards spacer sleeve
Spacer sleeve
Camber adjustment bolt
adjust after installation
60 Nm (44 ft lb)
Eccentric washer
Upper control arm
removing/installing page 40.18
Bonded rubber bushing
removing/installing 40.19
Upper spring plate
fasten to coil spring in 3 places
Coil spring
removing/installing page 40.20
Bump stop/dust sleeve
Shock absorber
removing/installing page 40.20
note installation position
Bonded rubber bushing
removing/installing page 40.19
150 Nm (110 ft lb)
Lower control arm
40-936

Wheel bearing housing, removing/installing

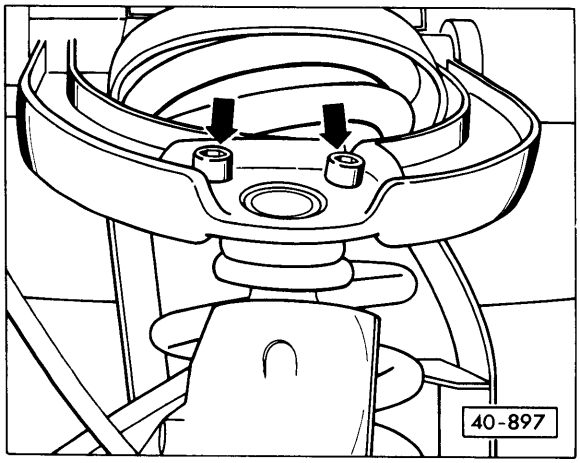
Work sequence

Removing

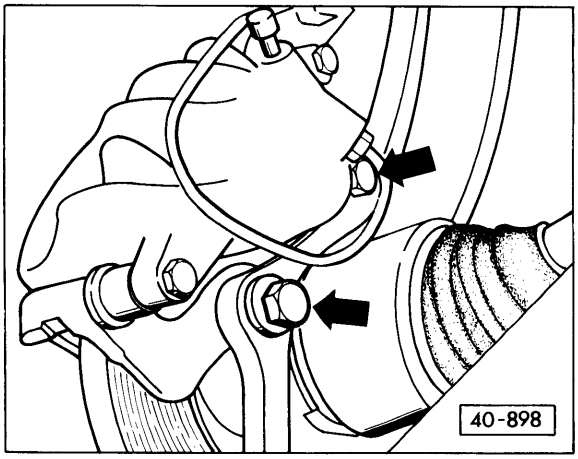
— remove axle nut (vehicle on wheels)
— remove wheel



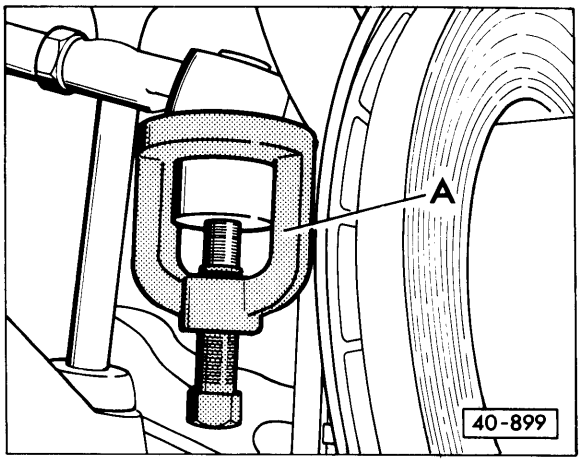
— remove brake line bracket from wheel bearing housing (**arrow**)



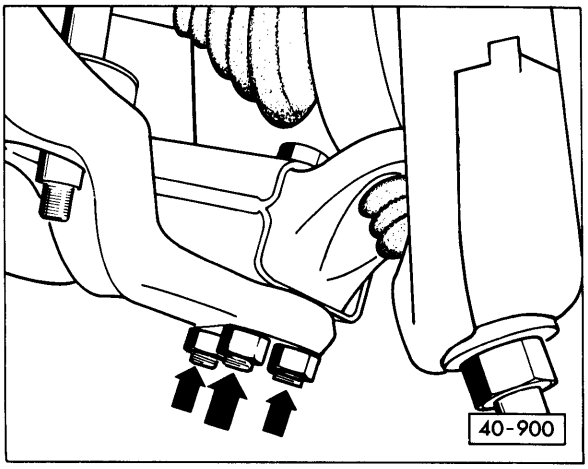
— remove upper ball joint from control arm by removing bolts (**arrows**)



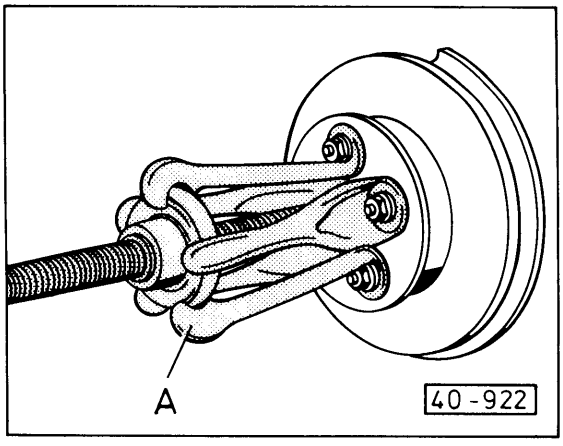
— remove brake caliper (**arrows**) and tie to body



— press tie rod end out
A = US 1014



— remove bolts (**arrows**) and separate radius rod, wheel bearing housing and lower control arm



— press axle shaft out of wheel hub
A = standard commercial puller

CAUTION

Always remove stub axle with mechanical or hydraulic hub puller **only**. Do **not** heat up wheel bearing housing or wheel bearing will be damaged

Installing

CAUTION

Splines on drive shaft and wheel hub must be free of oil, grease and old locking compound

— apply locking compound **D6** around splines of outer CV joint in a bead approx. 6 mm (1/4 in.) wide

Remainder of installation procedure is the reverse of removal.

Note

Allow locking compound **D6** at least 60 minutes to harden before driving vehicle.

Upper control arm, removing/ installing

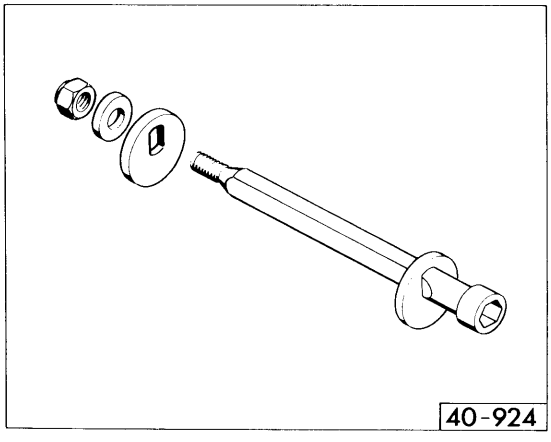
Work sequence

Removing

— remove wheel
— remove bolts attaching upper ball joint to control arm
— remove camber adjustment bolt and take out control arm

Installing

— fasten control arm to body



- installation position:
  flat surfaces of adjustment bolt must be vertical and larger side of eccentric washers downward

CAUTION

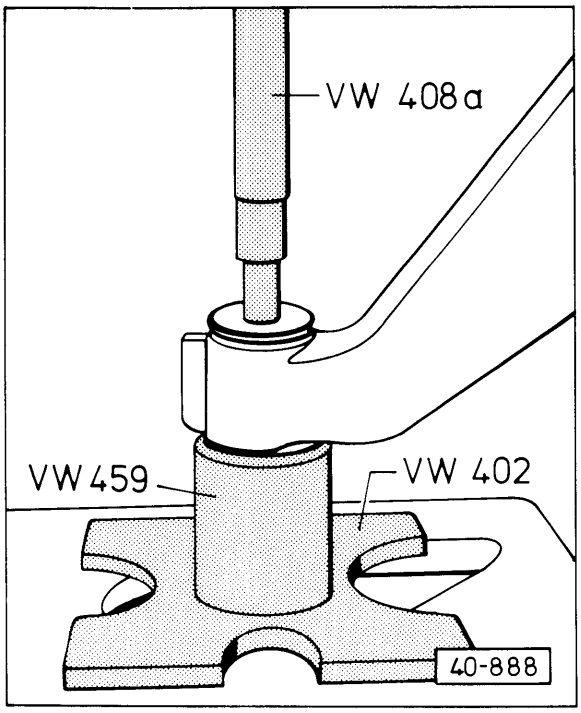
A maximum play of 0.5 mm (0.020 in.) is allowable on each side between the bonded rubber bushing in the control arm and the eccentric washer when the bolt is loosened.

The following eccentric washers are available to adjust the clearance:

Thickness	Part No.
4.0 mm	251 407 133 A
5.0 mm	251 407 133 B
5.5 mm	251 407 133 C

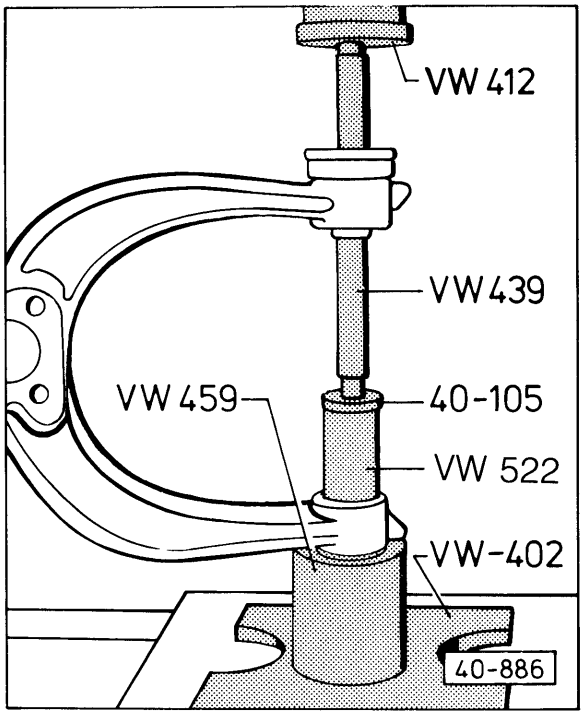
— lubricate camber adjustment bolt with all purpose grease
— attach upper ball joint to control arm

Lower control arm bonded rubber bushing, removing/installing

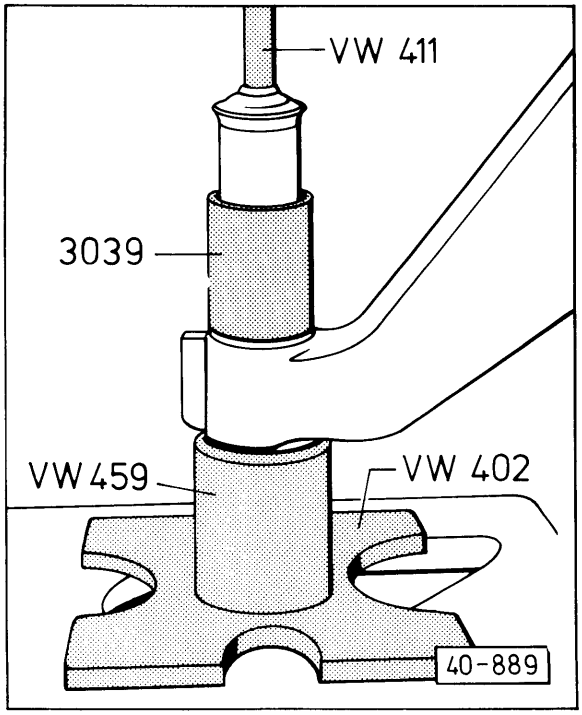


Bonded rubber bushing, pressing out

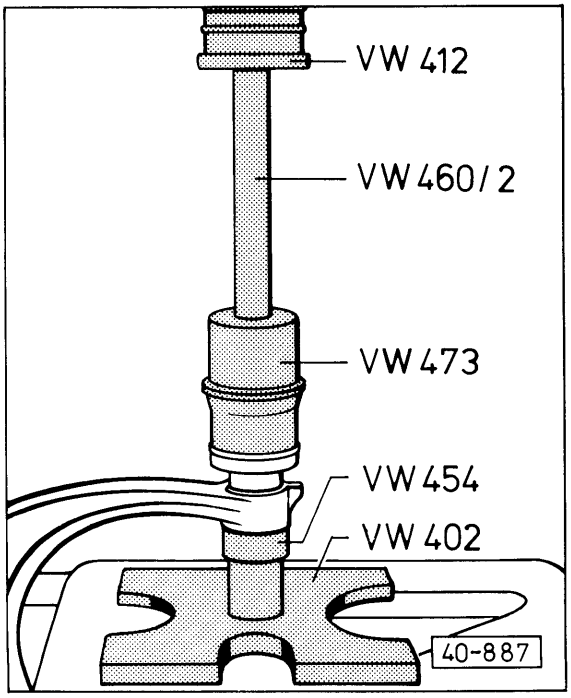
Upper control arm bonded rubber bushing, removing/installing



Bonded rubber bushing, pressing out



Bonded rubber bushing, pressing in

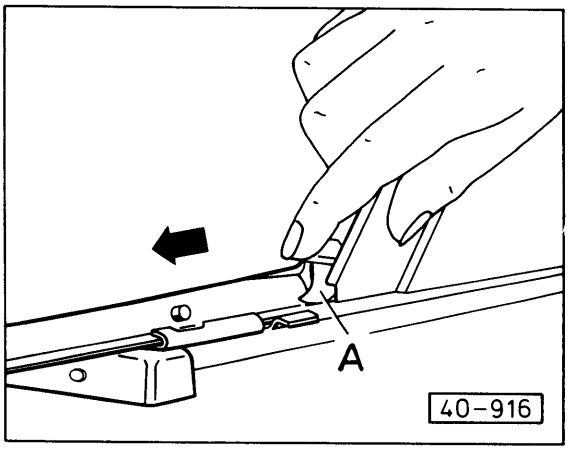


Bonded rubber bushing, pressing in

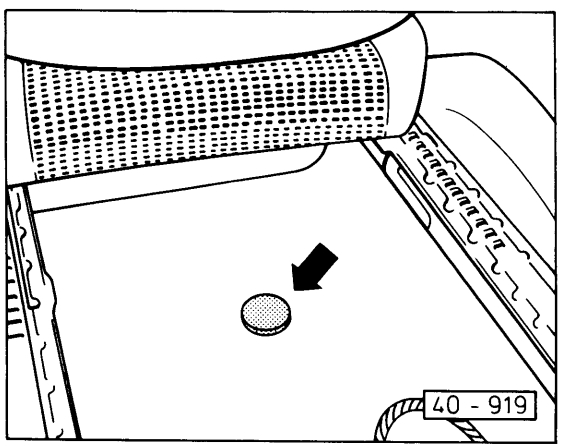
Coil spring/shock absorber, removing/installing

Work sequence

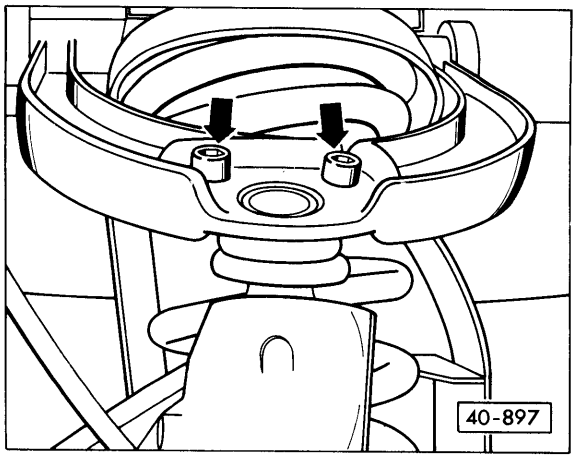
Removing



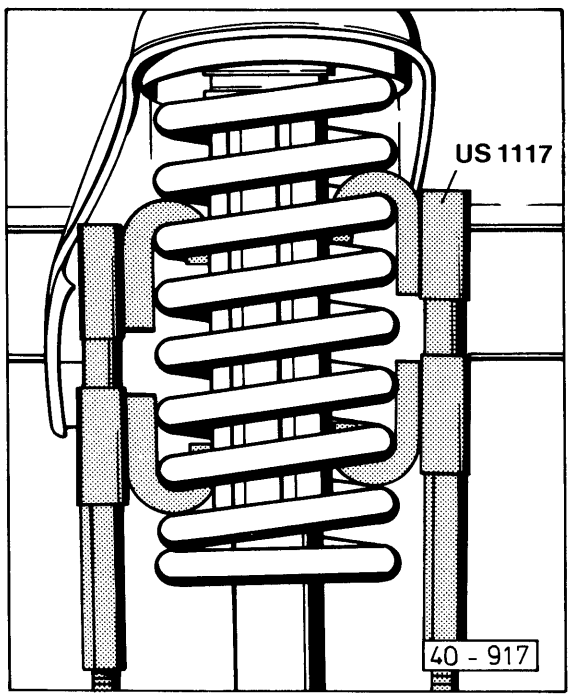
— depress lock catch **A**, push seat to full forward position and release lock catch



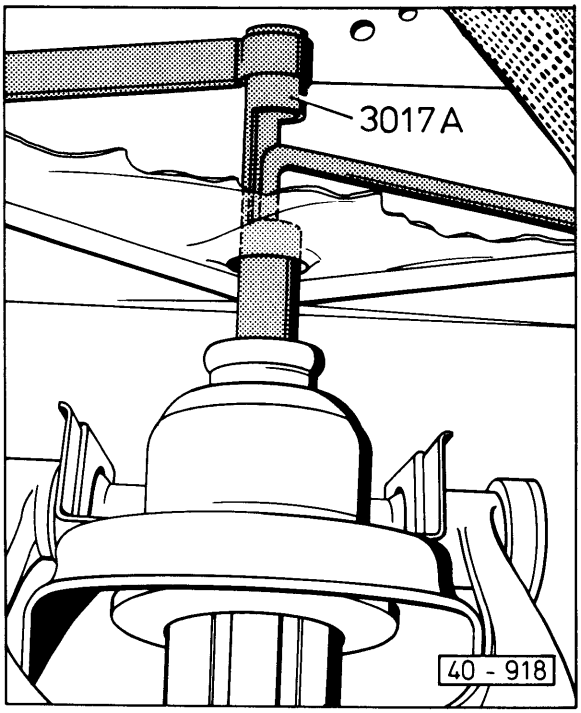
— pry out rubber plug (**arrow**) under seat
— remove wheel



— remove upper ball joint from control arm (**arrows**)



— attach spring compressor and compress spring



— remove shock absorber from upper attachment on body
— push piston rod down
— swing shock absorber and spring outward

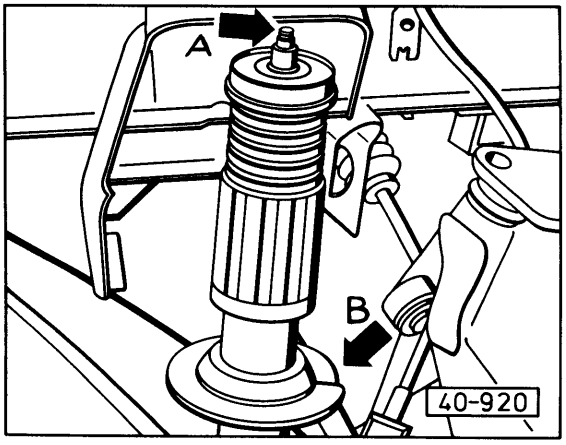
— remove spring and spring plate
— remove bolt from shock absorber attachment to lower control arm and take shock absorber out

Note

Install only original replacement shock absorbers.

Shock absorbers of different manufacturers that have the same part number are interchangeable. It is not necessary to replace both shock absorbers if only one is defective.

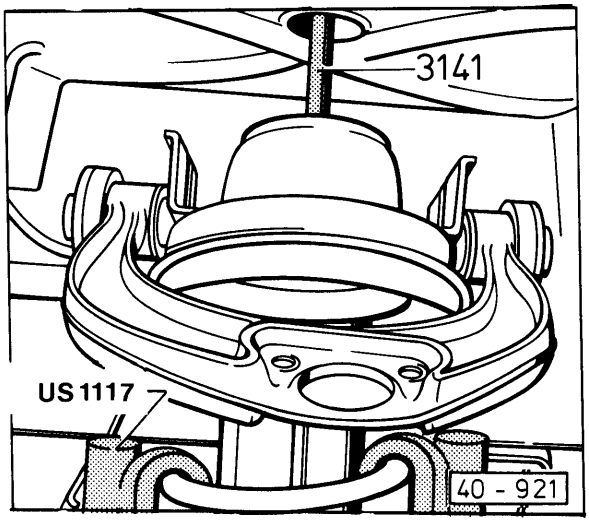
Installing



— install shock absorber to lower control arm and hand tighten nut
  • installation position
    right side: spring end stop **B** at front
    left side: spring end stop **B** at rear

— push piston rod **A** in enough for installation clearance
— install coil spring with lower spring end in spring end stop
  • installation position:
    evenly coiled end downwards

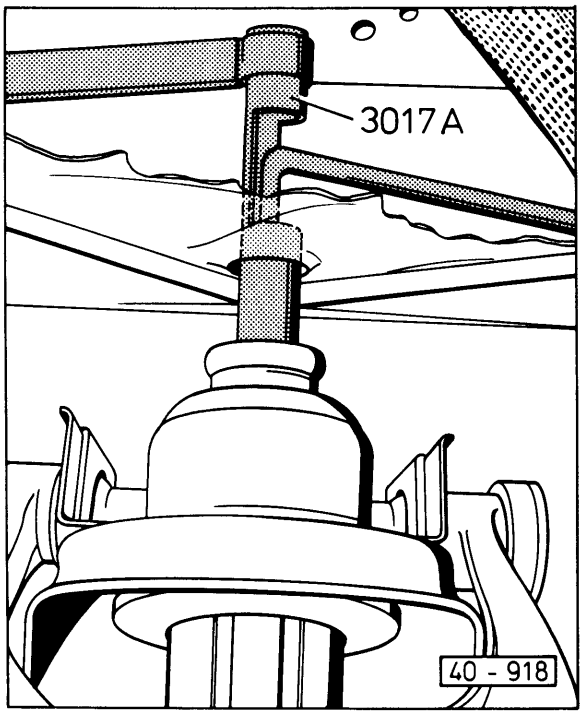
— fasten spring plate to top of spring with tape in at least 3 places
— swing shock absorber and spring inward



— insert T-handle wrench into piston rod through access hole

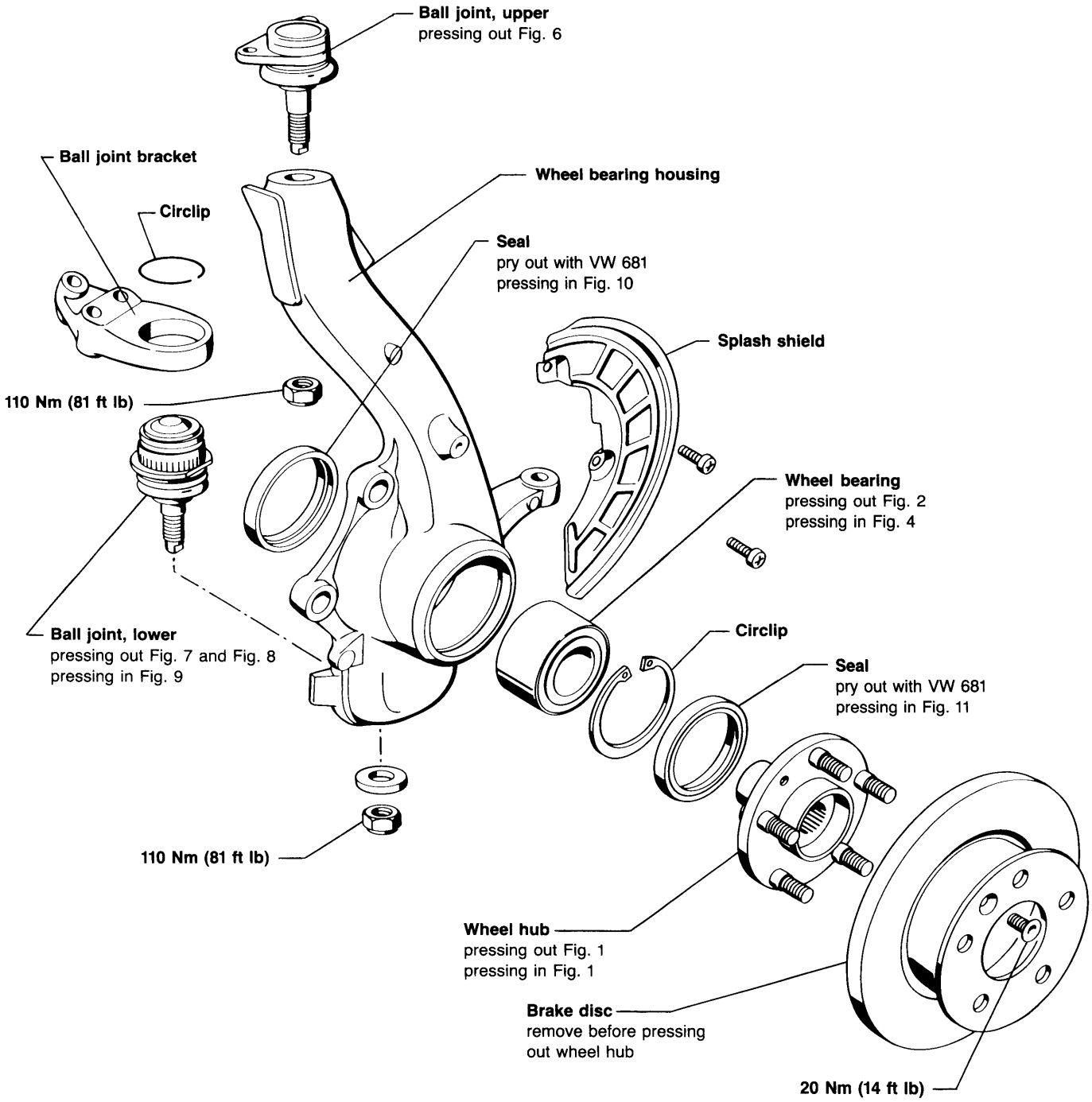
— pull piston rod up
— tighten nut attaching shock absorber to lower control arm to 150 Nm (110 ft lb)
— install upper ball joint to control arm and torque to 60 Nm (44 ft lb)

— lift control arm with jack and take out spring compressor



— attach shock absorber to body and torque to 30 Nm (26 ft lb)

— insert plug in access hole
— push seat back
— install wheel


Ball joint, upper
pressing out Fig. 6
Ball joint bracket
Circlip
Wheel bearing housing
Seal
pry out with VW 681
pressing in Fig. 10
Splash shield
110 Nm (81 ft lb)
Wheel bearing
pressing out Fig. 2
pressing in Fig. 4
Ball joint, lower
pressing out Fig. 7 and Fig. 8
pressing in Fig. 9
Circlip
Seal
pry out with VW 681
pressing in Fig. 11
110 Nm (81 ft lb)
Wheel hub
pressing out Fig. 1
pressing in Fig. 1
Brake disc
remove before pressing
out wheel hub
20 Nm (14 ft lb)

40-895

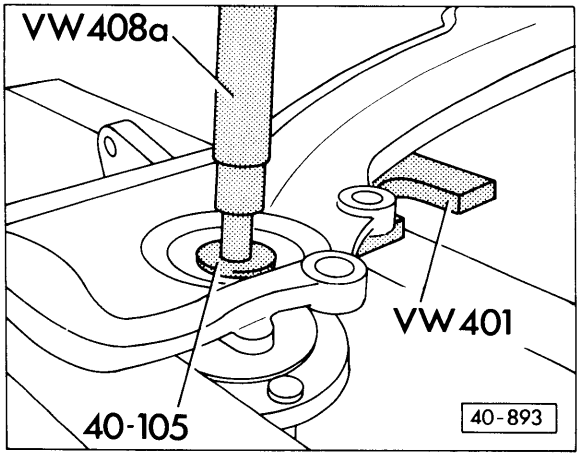


Fig. 1 Wheel hub, pressing out and in

Note

When pressing out hub, wheel bearing is destroyed.

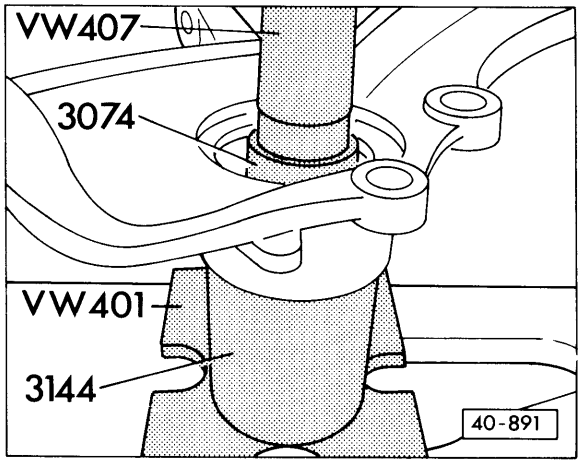


Fig. 2 Wheel bearing, pressing out

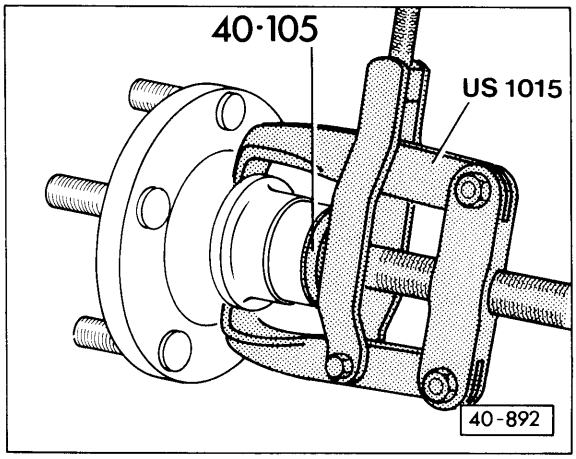


Fig. 3 Inner bearing race, pulling out

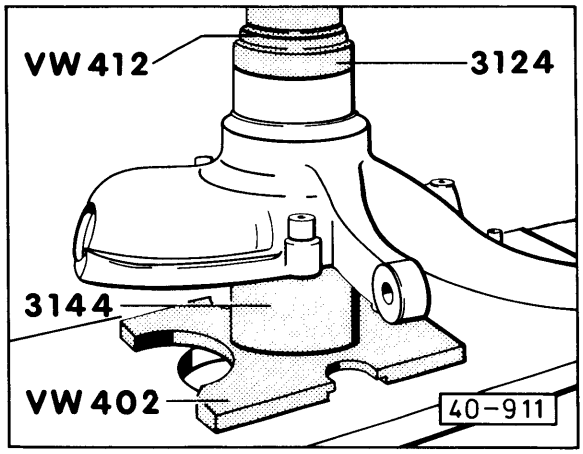


Fig. 4 Wheel bearing pressing in

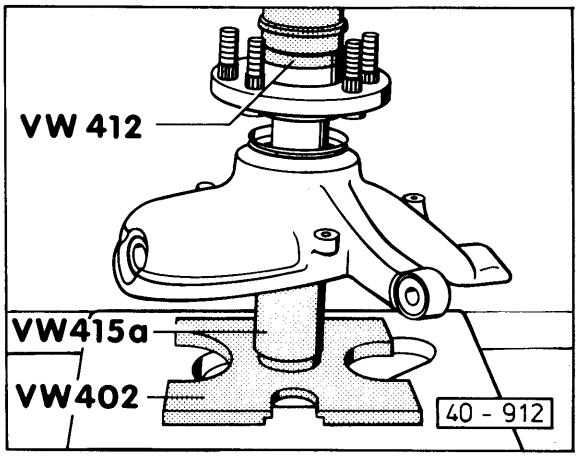


Fig. 5 Wheel hub, pressing in

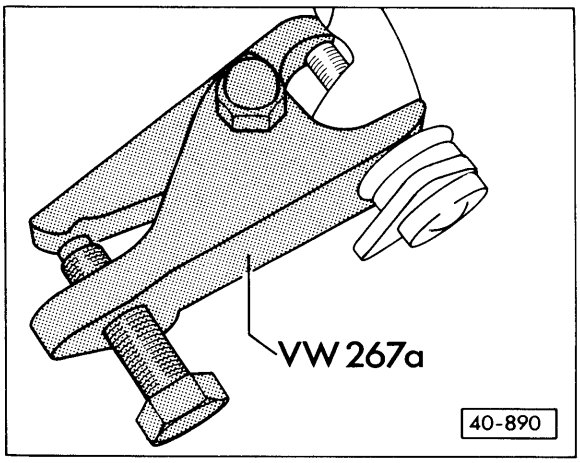


Fig. 6 Upper ball joint, pressing out

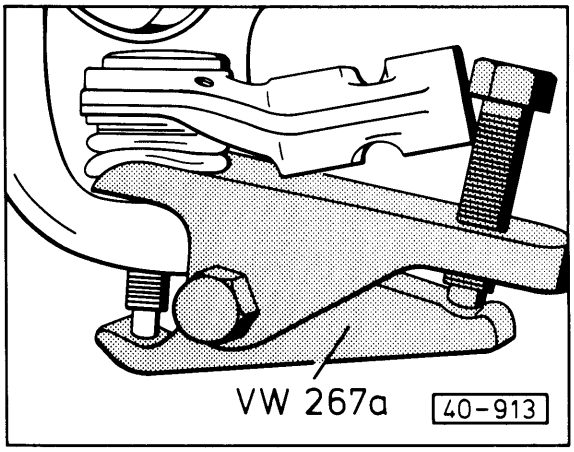


Fig. 7 Lower ball joint, pressing out of wheel bearing housing

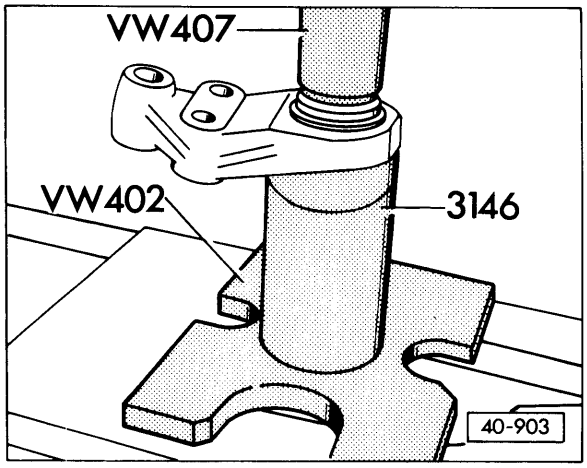


Fig. 8 Lower ball joint, pressing out of bracket

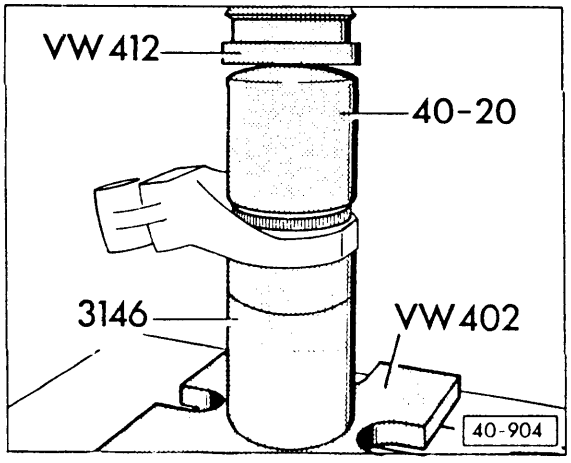


Fig. 9 Lower ball joint, pressing into bracket

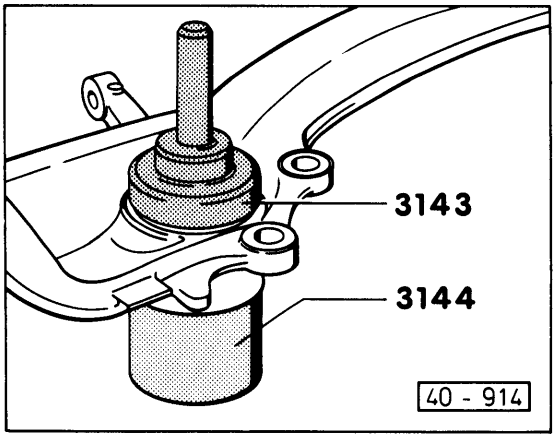


Fig. 10 Inner seal, driving in

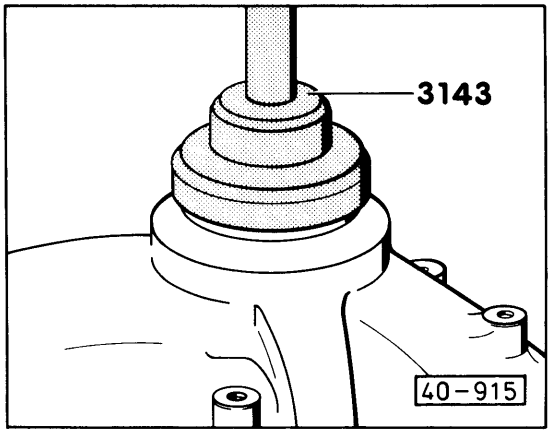
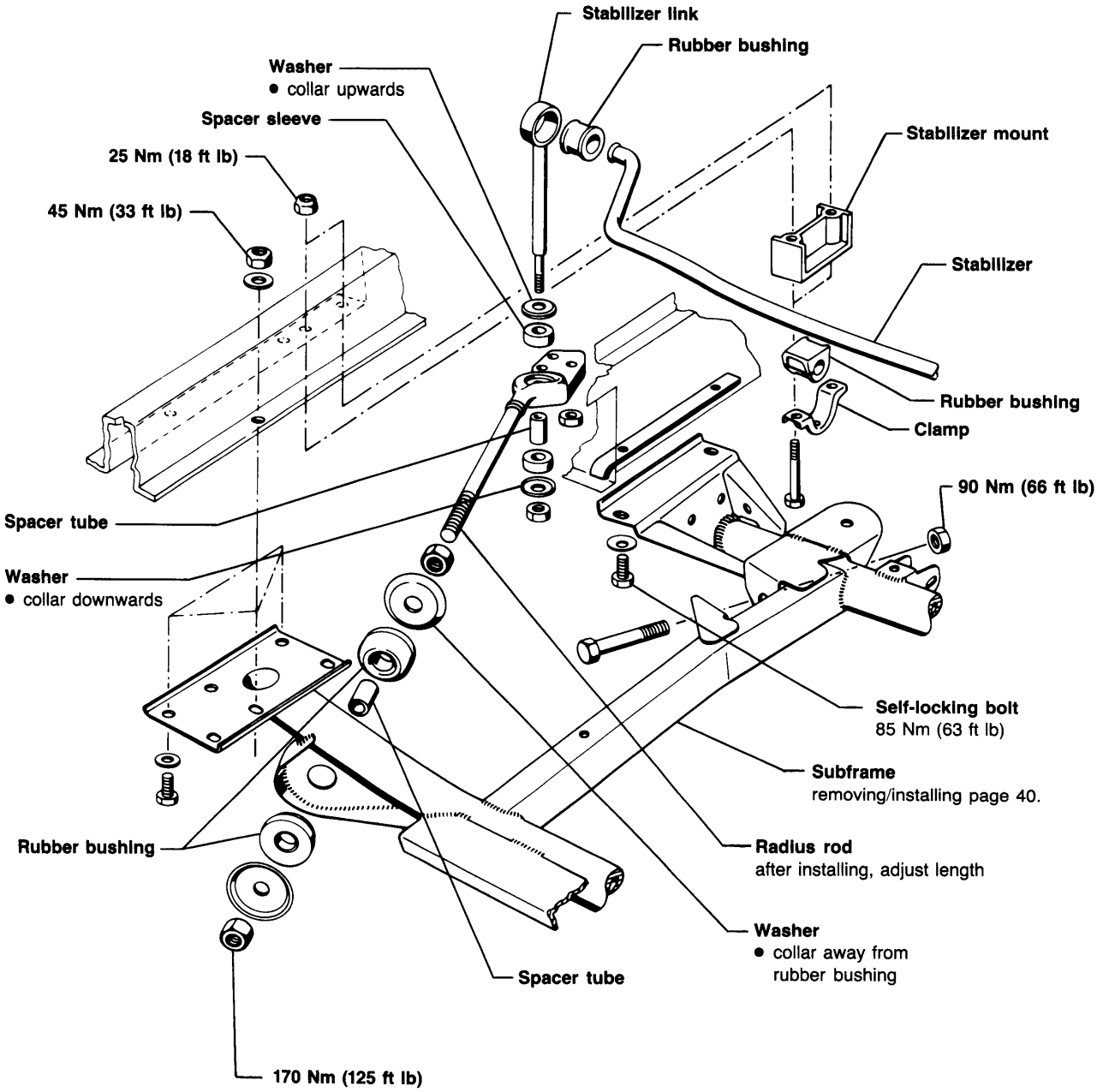


Fig. 11 Outer seal, driving in

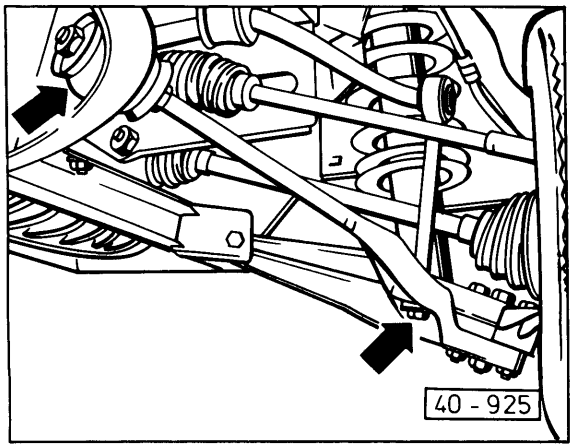

Stabilizer link
Rubber bushing
Washer
• collar upwards
Spacer sleeve
25 Nm (18 ft lb)
45 Nm (33 ft lb)
Stabilizer mount
Stabilizer
Rubber bushing
Clamp
90 Nm (66 ft lb)
Spacer tube
Washer
• collar downwards
Self-locking bolt
85 Nm (63 ft lb)
Subframe
removing/installing page 40.
Rubber bushing
Radius rod
after installing, adjust length
Washer
• collar away from
rubber bushing
Spacer tube
170 Nm (125 ft lb)

40-937

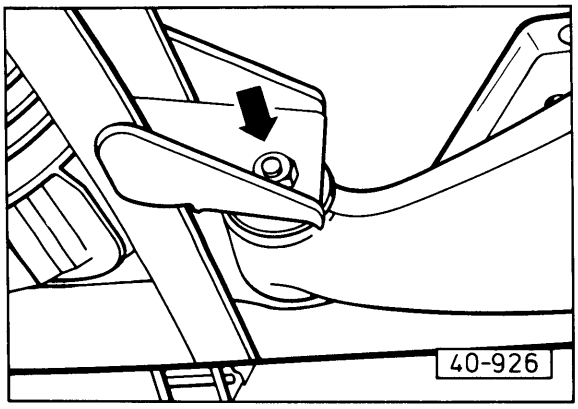
Subframe, removing/installing

Work sequence

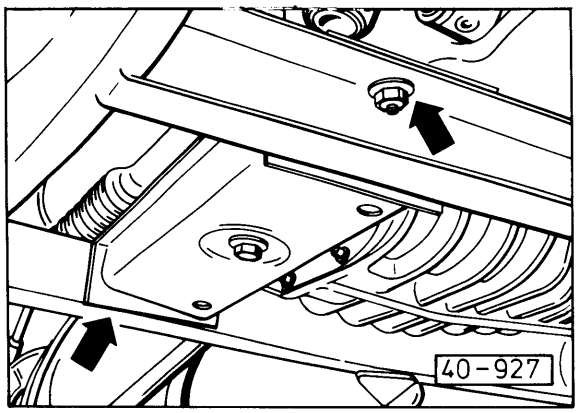
Removing



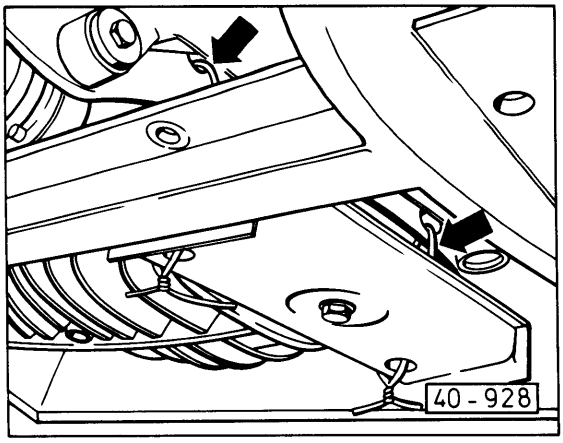
— remove radius rods from subframe and stabilizer (**arrows**)



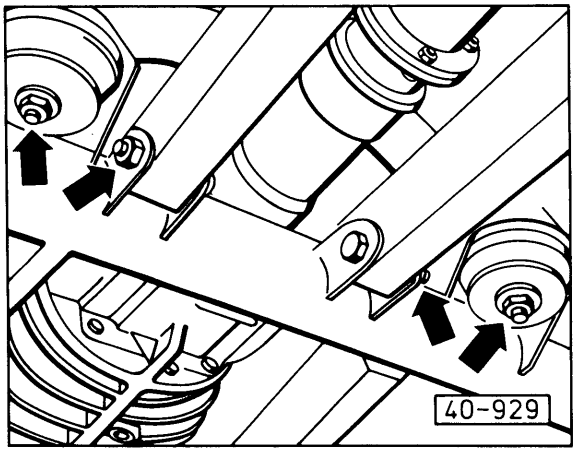
— remove control arm from subframe (**arrow**)



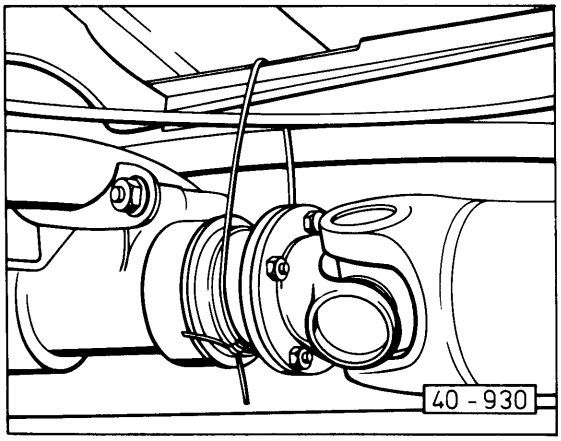
— remove final drive support from subframe (**arrows**)



— tie final drive support up to body (**arrows**)



— remove protection bars and bonded rubber bushings (**arrows**)



— tie up final drive

— use transmission support V.A.G. 1383 to support subframe
— remove bolts that attach subframe to body
— carefully lower subframe and remove

Installing

Proceed in reverse order of removal and note the following:

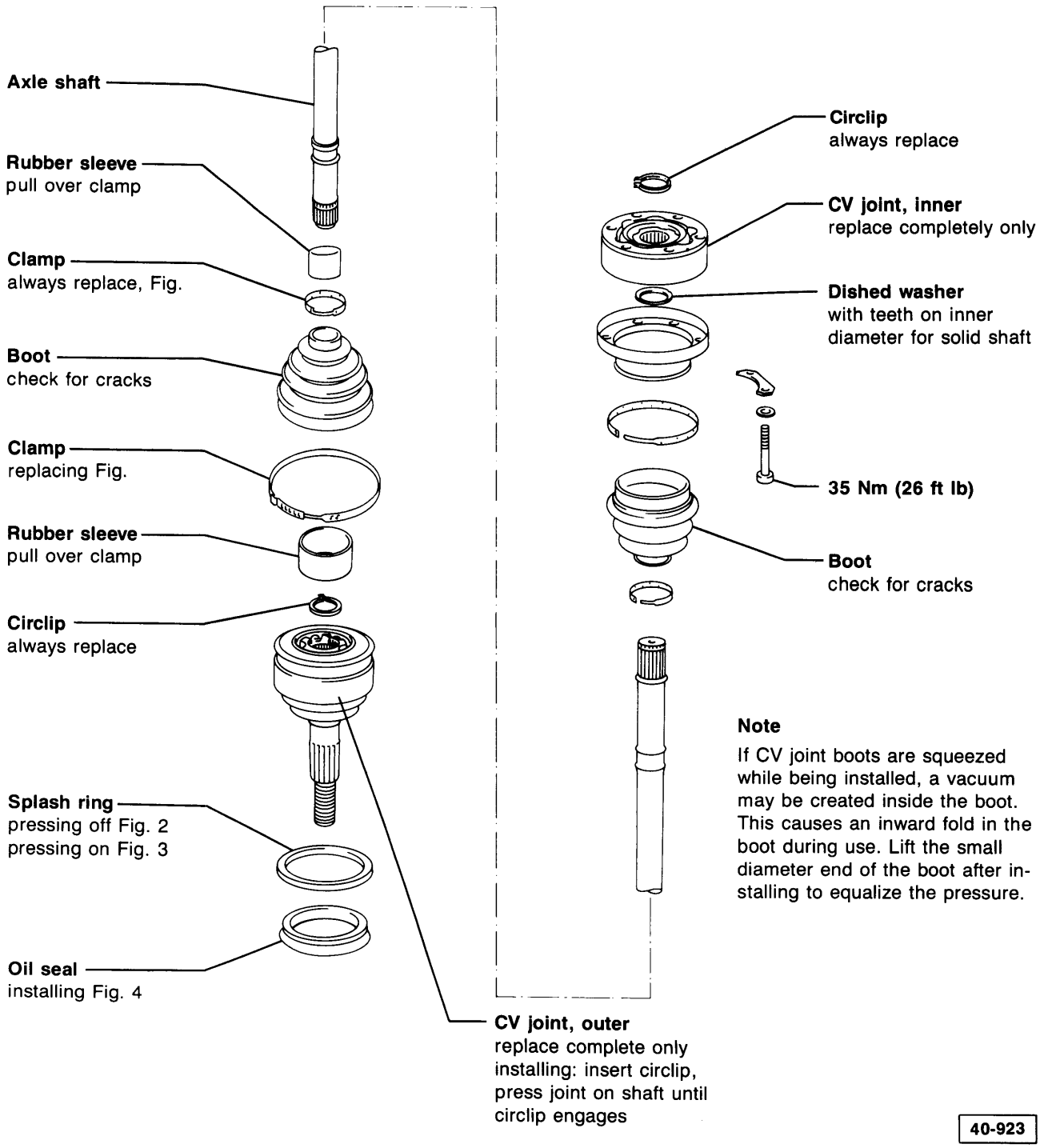
— tighten bolts fastening subframe to body last (see page 40.26 for tightening torques)

Note

After installation of subframe, vehicle must be aligned. (see group 44)

Note

When replacing CV joint boots, grease joint if necessary.
inner: 45 grams G6 grease each side (total 90)
outer: 90 grams G6 grease



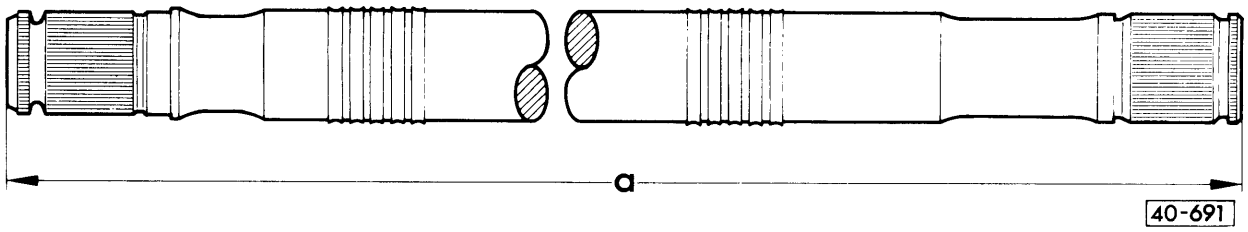


Fig. 1 Axle shaft length

Final drive code	Measurement a	
	right side	left side
ACU	570 mm (22.440 in.)	570 mm (22.440 in.)

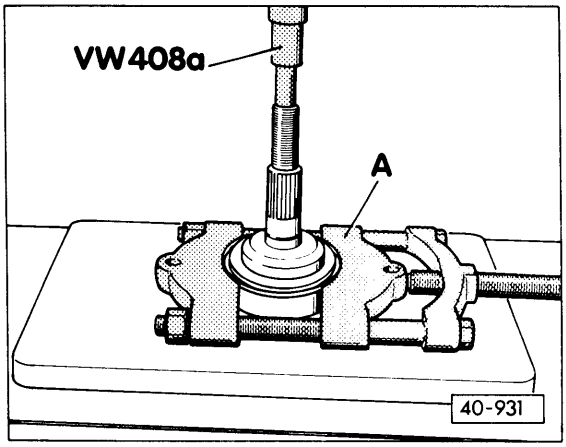


Fig. 2 Splash ring, pressing off

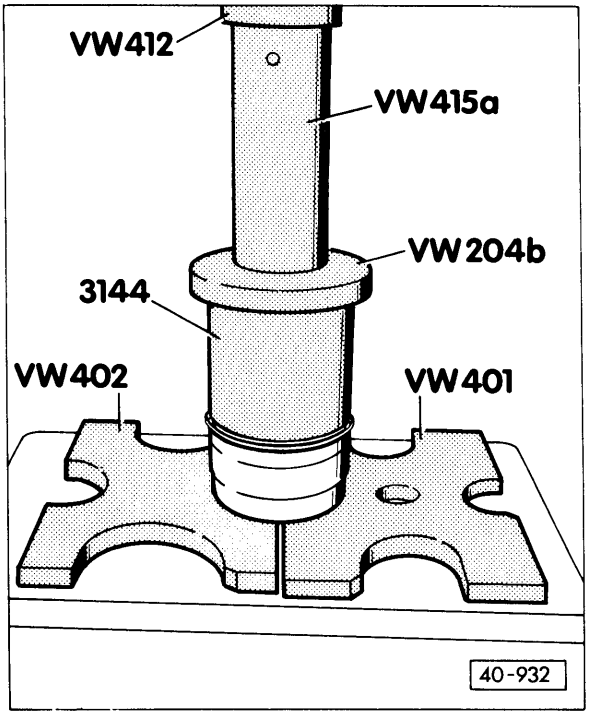


Fig. 3 Splash ring, pressing off

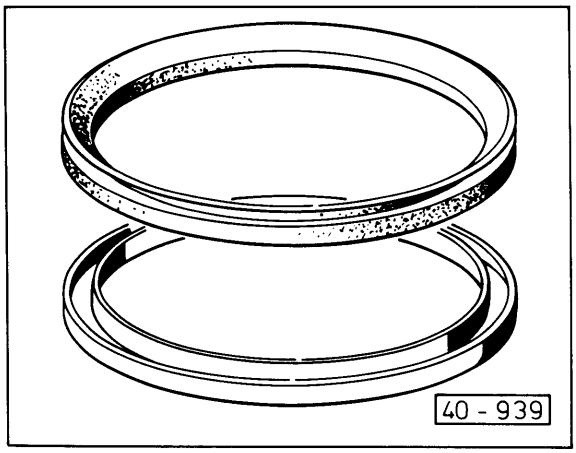


Fig. 4 Oil seal, pressing into splash ring

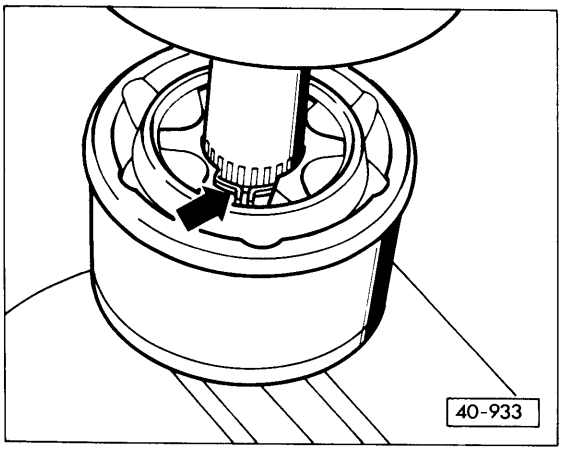


Fig. 5 Outer CV joint, removing
— expand circlip and pull joint off shaft