

Opel Astra Opel Kadett

Workshop Manual

Section F

Rear Axle and Rear Wheel Suspension

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GENERAL INFORMATION

When removing the wheels from the vehicle, mark the position in line with the wheel bearing unit. These marks should be noted when reattaching the wheel.

Always tighten the wheel bolts with a torque of 110 Nm.

For bolt connections which are inserted with locking compound, the threads must be cleaned with the appropriate screw tap.

If the new bolts are not microencapsulated, they should be installed with Sealing Compound.

Clean the threads of microencapsulated bolts which are used again.

When installing, ensure that no dirt gets between the brake disc and the wheel hub. The contact surfaces must be plane and without weals.

Always use new nuts when installing wheel bearing unit. Contact surfaces and threads in the wheel bearing unit must be free of grease, paint and dirt.

Always replace damping bushings, damper rings, shockabsorbers, rear springs and brake discs in pairs.

If an operation is described referring only to one side of the rear axle, the directions apply equally to the other side.

All operations must be carried out at the technician's own responsibility according to the regulations of the local authorities regarding health protection, accident prevention and environmental protection.

Rear Axle with Drum Brake

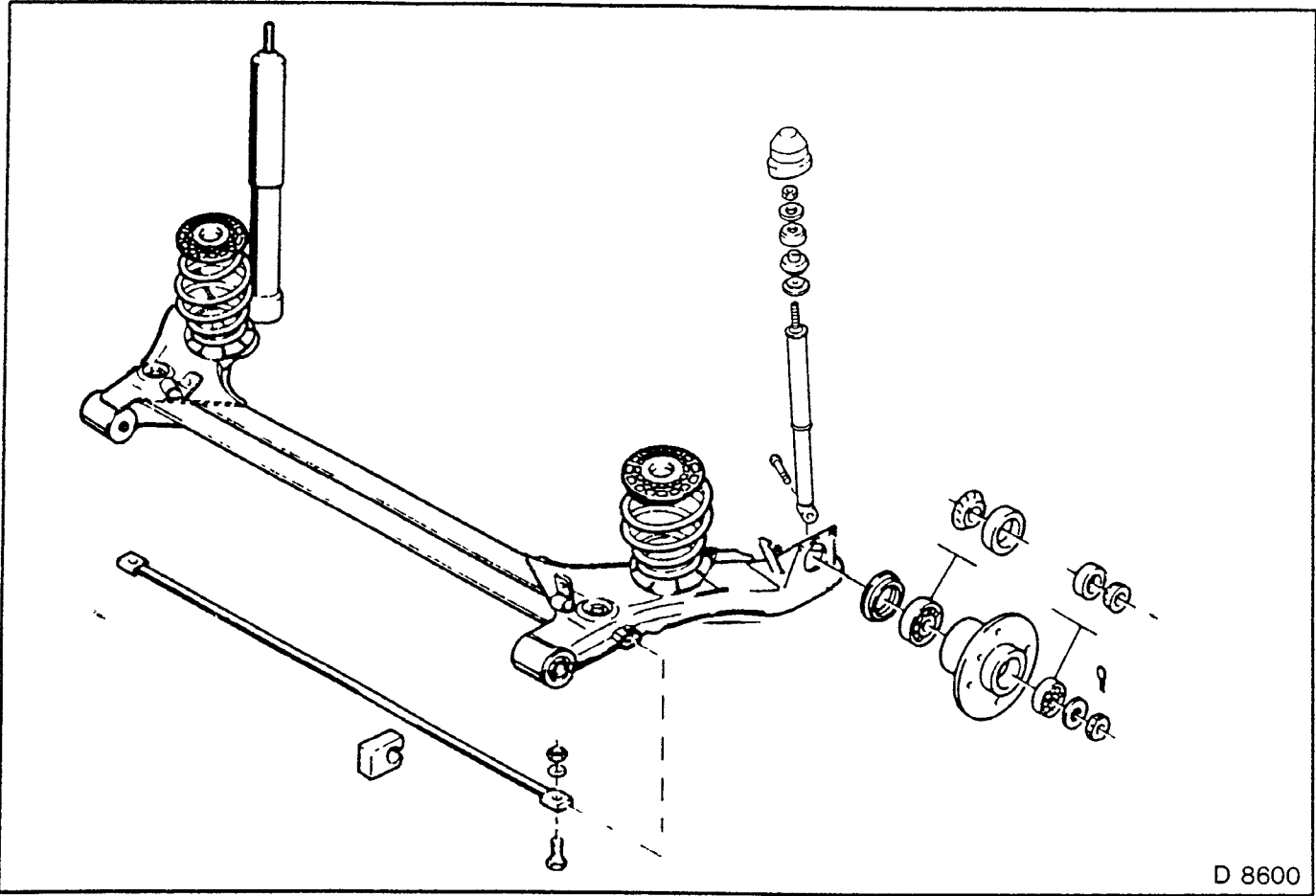


Fig. 1

D 8600

REAR AXLE — WITH DISC BRAKE

- 1 — Additional stabilizer
- 2 — Wheel bearing unit without ABS
- 3 — Wheel bearing unit with ABS
- 4 — Brake backing plate
- 5 — Brake disc
- 6 — Detent screw
- 7 — Rear axle body
- 8 — Damping bushing
- 9 — Stabilizer
- 10 — Damping block

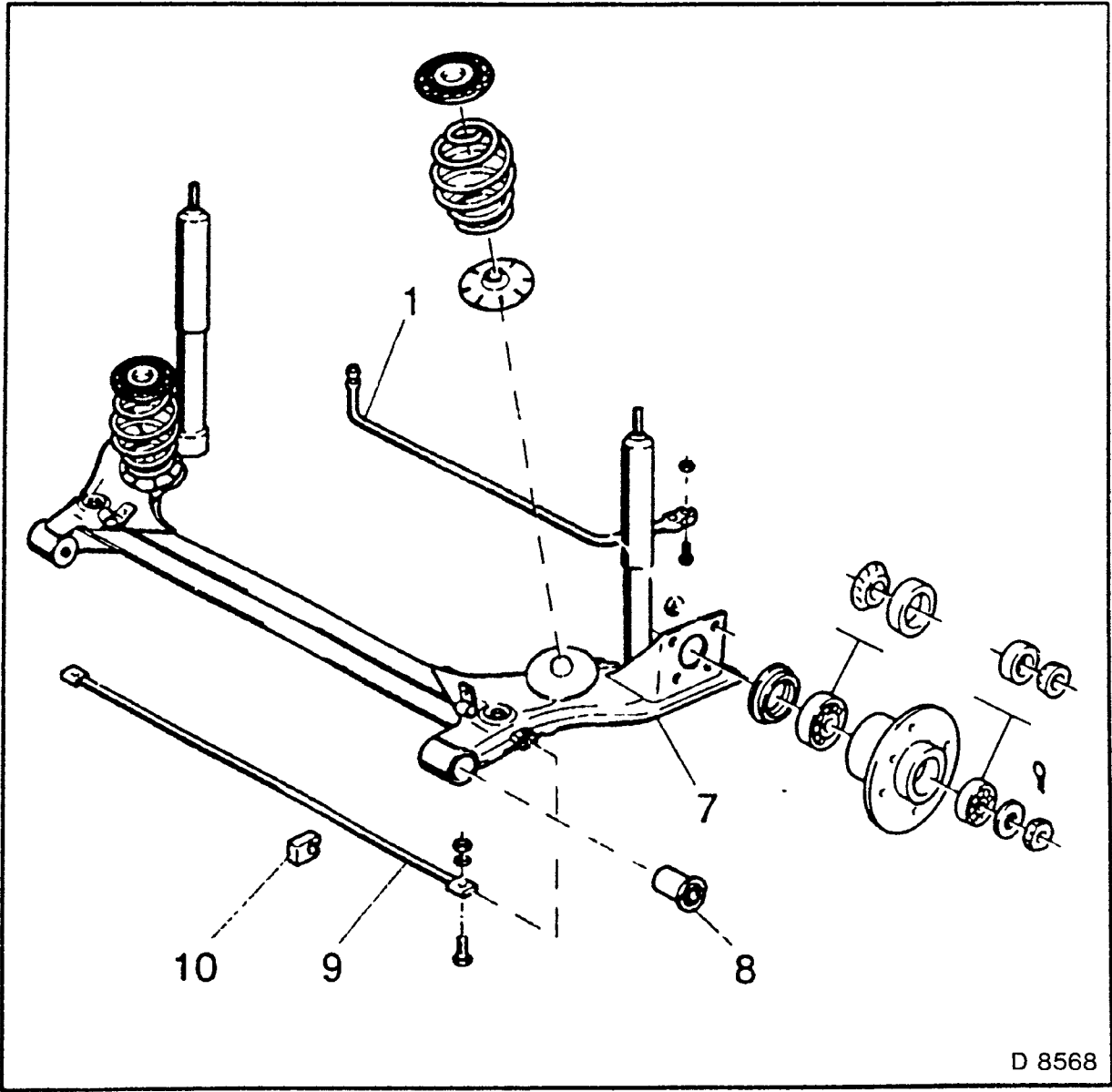


Fig. 2

CHECKING AND ADJUSTING OPERATIONS

Rear Axle Alignment

Camber and Toe-in, Check

IMPORTANT

1. Tread on all tyres uniform and in good condition.
2. Tyre pressures must be equal on both sides of the axle — see section E and Owner's and Driver's Manual.
- 3 The rim flange of each disc wheel to be checked must be in satisfactory condition.
- 4 Prepare vehicle for measurement.

Load each of the front seats with 70 kg

Ensure fuel tank is half full.

Stabilise the springs by rocking the vehicle several times.

If this measure is omitted, the camber angle measured will be too great, as the semi-trailing arm will not have resumed its normal position.

When using axle alignment turntables which cannot record lateral forces, the vehicle must initially be rolled back about 1 m and then pushed forward again

Establish "actual value" using optical alignment tester, see "Technical Data" page 27.

Please note manufacturer's instructions and specifications.

Complete alignment measurement card

TILT PLAY AT WHEEL BEARING

Wheel Bearing Unit with Disc Brake

In case of noticeable play at mounted wheel, carry out measurement as follows:

1. Remove rear wheels, clean affected surfaces.
2. KM-468 (1) to wheel bearing unit.
- 3 Attach Dial Gauge MKM—571—B (2) with dial indicator and magnetic base (3) to brake caliper.
4. Place probe of dial gauge at outer edge of wheel hub (arrow).
5. Check play by levering slightly with KM—468.
6. Counterhold brake disc with hand, to avoid twisting.
Permissible play: max. 0.3 mm.
If the permissible play is exceeded, replace the wheel bearing unit — see operation “Wheel Bearing, Remove and Install” page 19.

Wheel Bearing Unit with Drum Brake

In case of noticeable play at mounted wheel, carry out measurement as follows:

- 1. Remove rear wheels and brake drums, clean wheel hubs thoroughly.
- 2. Rear Wheel Bearing KM—468 to wheel bearing unit.
- 3. Fasten Dial Gauge MKM—571—B with Dial Indicator MKM—572 to brake anchor plate.
- 4. Place probe of dial gauge at outer edge of wheel hub (arrow)

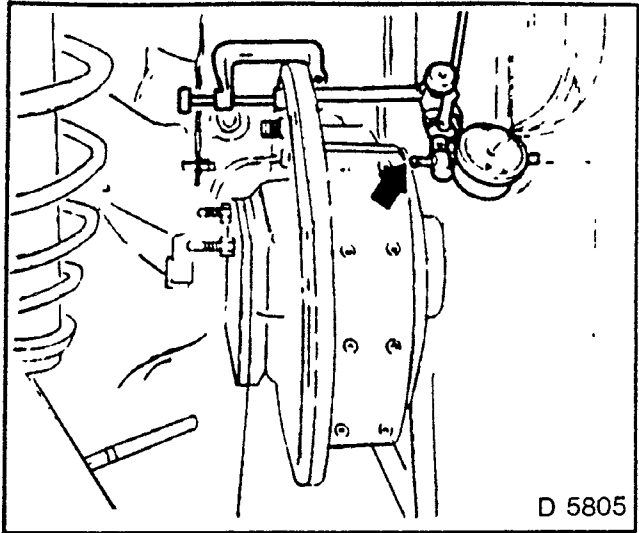


Fig. 4

- 5. Check play by levering slightly with KM—468.
- 6. Counterhold wheel hub with hand, to avoid twisting.
Permissible play: max. 0.3 mm.
If the permissible play is exceeded, replace the wheel bearing unit — see operation “Wheel Bearing, Remove and Install” page 19.

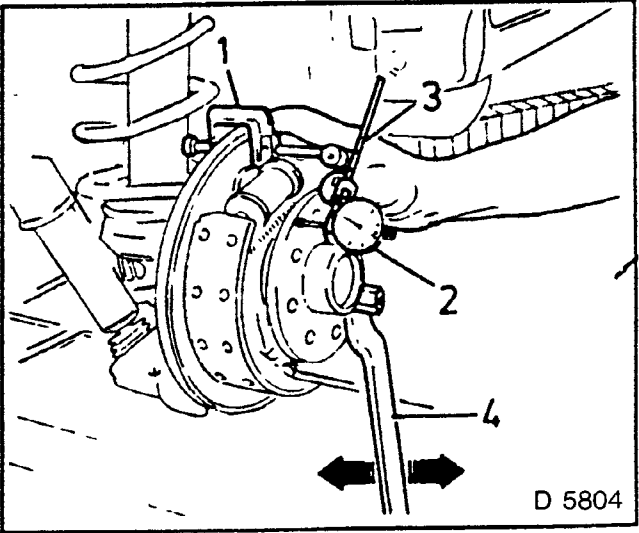


Fig 5

Radial and Lateral Runout, Measure

REMOVE, DISCONNECT

- 1. Brake drum or brake caliper and brake disc.

CLEAN

Clean surfaces affected by the measurement.

- 1. Fasten Dial Gauge (3) with Dial Indicator MKM—572 (1) to brake anchor plate.
- 2. Place probe of dial gauge (2) to plane surface.
- 3. Turn wheel hub slowly.
Permissible lateral run-out max. 0,05 mm.

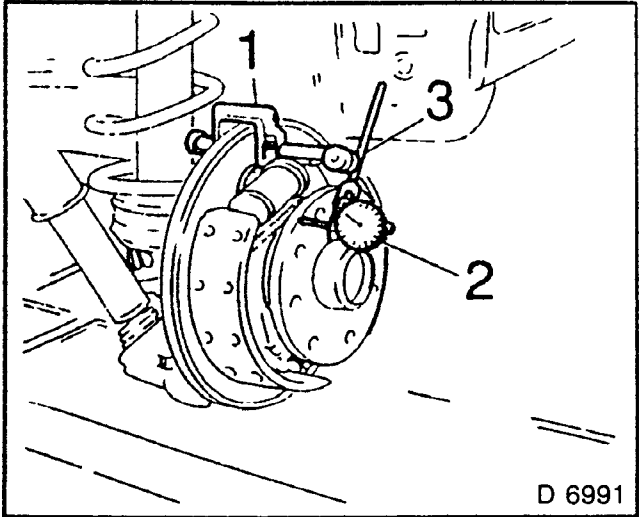


Fig. 6

Proceed similarly for radial run-out.

- 1. Place probe at outer circumference of wheel hub.
 - 2. Turn hub slowly.
- Permissible radial run-out max. 0,05 mm.

For vehicles with disc brakes, use magnetic base instead of vice. To do so, screw on brake caliper again if necessary, to fasten the magnetic base to it.

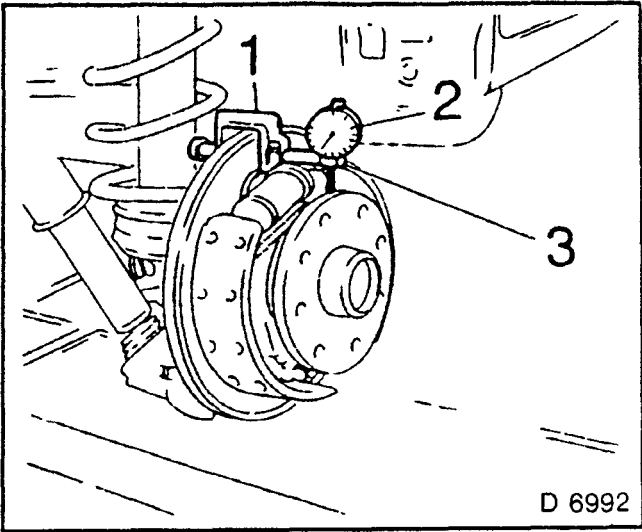


Fig. 7

REAR AXLE — DAMPING BUSHINGS

Rear Axle, Remove and Install

Close break fluid reservoir with blind screw cap.

REMOVE, DISCONNECT

- 1 Rear wheels.
- 2. Release air from filler valve on car level control.
- 3. Loosen brake cable compensating yoke — measure length of threads.
- 4. Parking brake cable from tie rod (1)

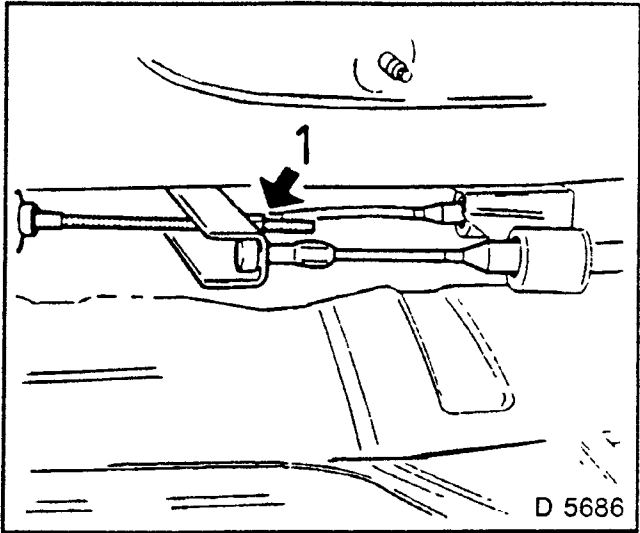


Fig. 8

REMOVE, DISCONNECT

- 1. Parking brake cable from retainer on vehicle underbody
- 2. Brake lines from brake pressure hoses
- 3. Close openings.
- 4. Wiring harness plug for ABS sensor from wheel bearing unit.
- 5 ABS cable from retainers.
- 6. Place hydraulic jack centrally under rear axle.
- 7 Loosen bolts for rear axle bearing and lever out.
- 8. Shock absorbers from outrigger —support outrigger.
- 9. Lower hydraulic jack until springs with damping rings can be removed from rear axle.
- 10. Lower rear axle.

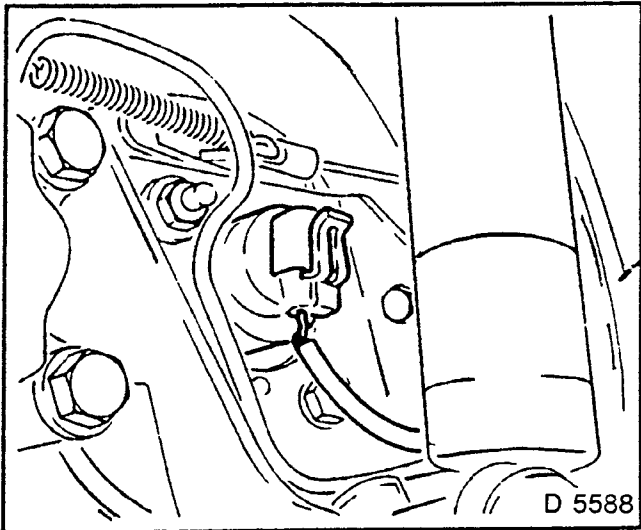


Fig. 9

Rear Axle, Modify

Clamp rear axle in vice with protective jaws.

DISASSEMBLE

- 1. Brake disc from wheel bearing unit — disc brake.
Brake drum from wheel bearing housing — drum brake.
- 2. If necessary, press back parking brake shoe lever.
- 3. Brake cable — detach from cable guide.

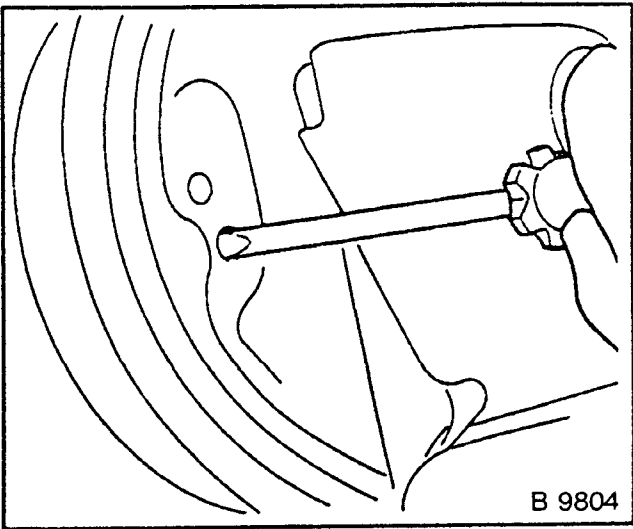


Fig. 10

DISASSEMBLE

- 1. Wheel bearing unit with brake backing plate/brake anchor plate.
Drum brake. brake lines from retainer
- 2. Stabilizer and additional stabilizer, where fitted, from rear axle.

INSPECT

- 1. Brake shoes, brake linings — see Section H.

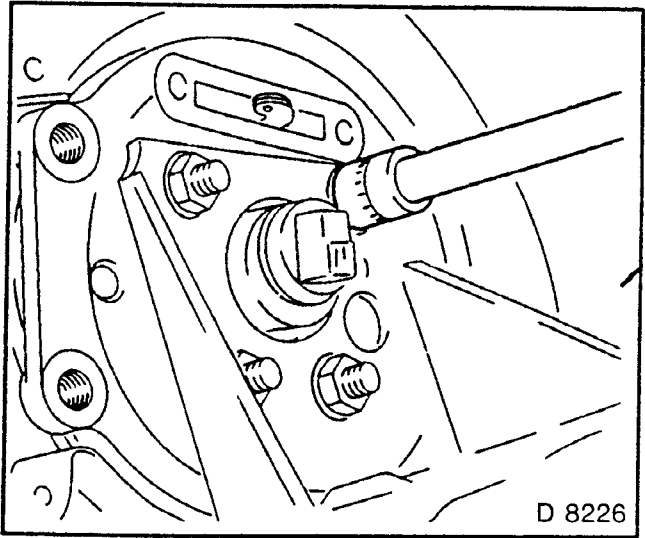


Fig. 11

TIGHTEN, (TORQUE)

- 1. Wheel bearing unit with brake backing plate/brake anchor plate to rear axle — 50 Nm + 30° to 45°, use new nuts.
- 2. Stop screw to wheel bearing unit (arrow) — 4 Nm for drum and disc brakes.
- 3. Stabilizer to rear axle — 30 Nm + 30° to 45°.
- 4. Additional stabiliser (where fitted) to rear axle — 60 N.m + 60° to 75°.

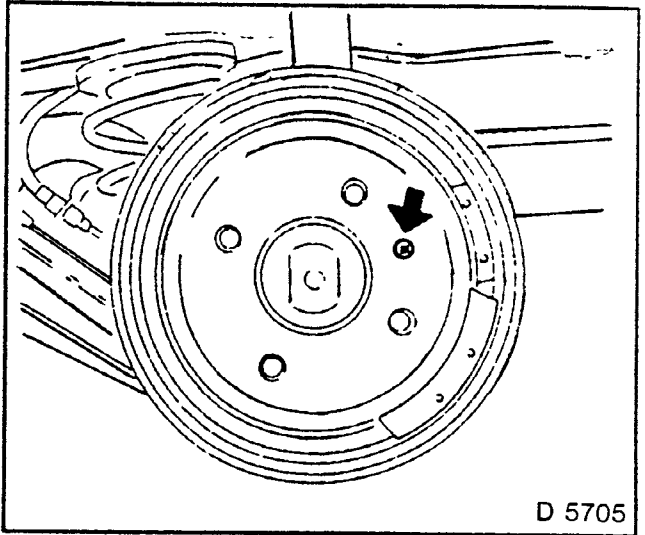


Fig. 12

ASSEMBLE

- 1. Parking brake cable in brake cable guide.

INSTALL, CONNECT

- 1. Rear axle to vehicle underbody.
- 2. Raise rear axle on centre — hydraulic jack.
- 3. Tighten bolts initially only.
- 4. Install springs with damping rings.
- 5. Place hydraulic jack under outriggers.

TIGHTEN (TORQUE)

- 1. Shock absorber to outrigger — 70 Nm.
- 2. Raise outrigger.
- 3. Fix installation position with drift.

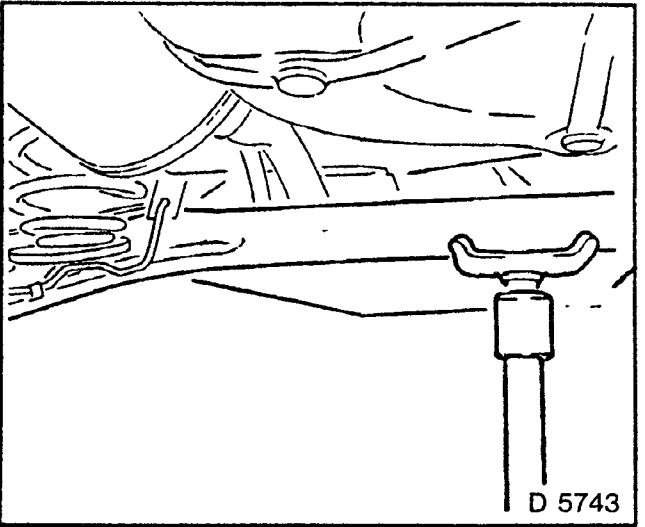


Fig. 13

INSTALL, CONNECT

- 1. Cable for ABS sensor to retainer.
- 2. Wiring harness plug for ABS sensor to wheel bearing unit.
- 3. Parking brake cable to tie rod — adjust brake cable compensating yoke.

TIGHTEN (TORQUE)

- 1. Secure brake lines to brake pressure hoses — 16 Nm

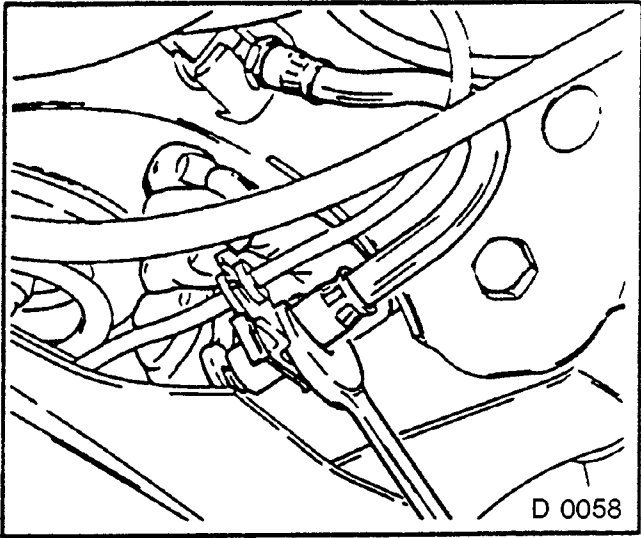


Fig. 14

TIGHTEN (TORQUE)

- 2. Rear axle to vehicle underbody —105 Nm.
Load each front seat with 70 kg.

INSPECT

- 1. Parking brake — adjust if necessary.
- 2. Bleed brake installation and check for leaks. See Section H.

Adjustment and functioning of load-dependent brake proportioning valve.

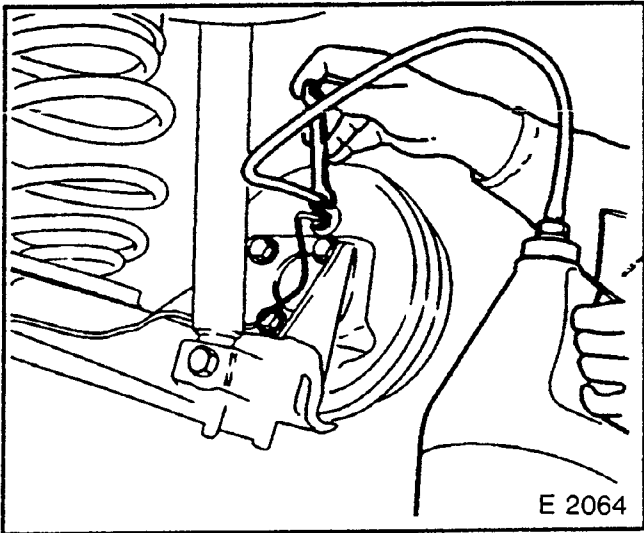


Fig. 15

Rear Axle Damping Bushings, Replace

REMOVE, DISCONNECT

1. Rear wheels.
2. Remove locking plates from brake lines.
3. Brake lines from retainers at underbody.
4. Rear axle from vehicle underbody
5. Place hydraulic jack centrally under rear axle.
6. Lever out bolts.
7. Lower rear axle slightly.
8. Connect KM—452—5 on one side.
9. Damping bushing from rear axle.
10. Saw off collar of damping bushing (plastic) (dotted line).
11. Connect KM—671 — installation position (arrow).
12. Heat seat of damping bushing at outrigger with hot air dryer — approx 70°C/158°F, thermocolour pencil, if present, or with suitable temperature gauge
13. Remove from rear axle by turning hex nut from KM—452—A.

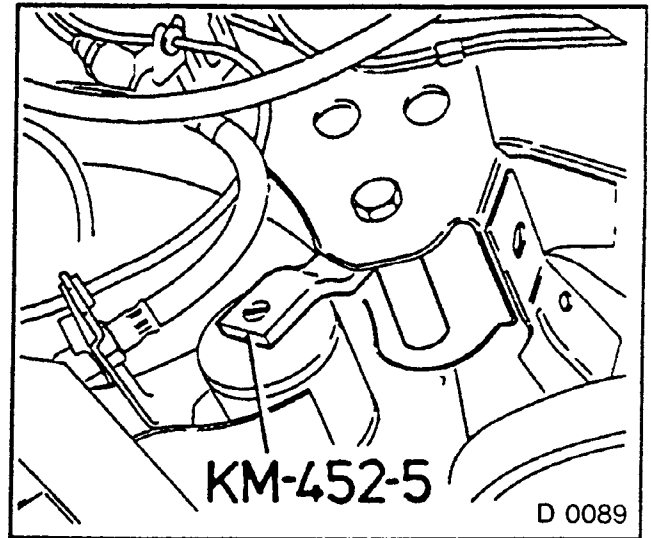


Fig. 16

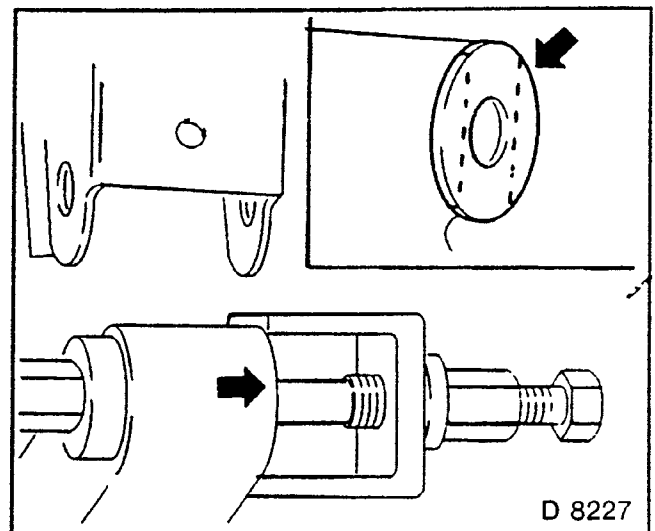


Fig. 17

INSTALL, CONNECT

1. Draw damping bushing into rear axle with KM—671, coated with washing-up fluid — not grease, to prevent bushing turning as well.

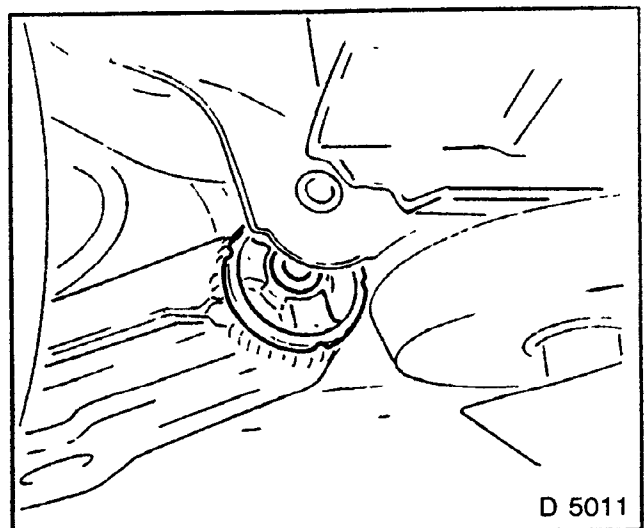


Fig. 18

NOTE

- 1. Note installation position: damping bushing is eccentric. The narrow part of the damping rubber points upwards.
- 2. Draw in up to position of collar on rear axle.
- 3. Fasten brake lines with locking plates.
- 4. Brake lines in brackets.

TIGHTEN (TORQUE)

- 1. Rear axle to vehicle underbody — 105 Nm.
- 2. Attach rear wheels — 110 Nm.
- 3. Load each front seat with 70 kg.

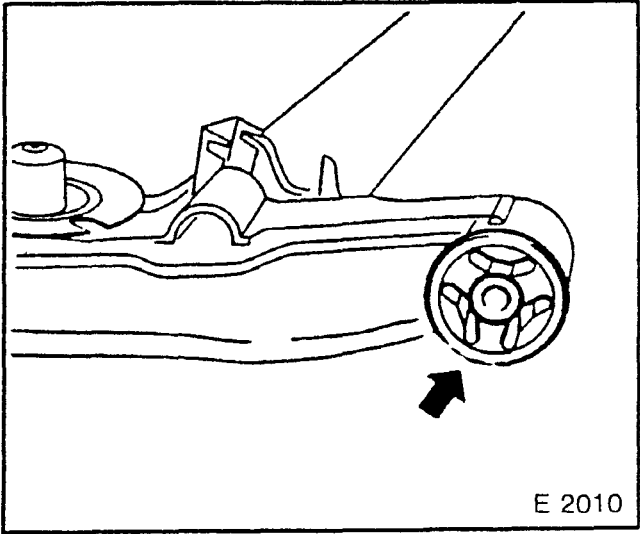


Fig. 19

REAR SPRINGS

Rear Springs and/or Damping Rings of Rear Springs — Remove and Install

Bleed air at filler valve on vehicles with vehicle level control.

REMOVE, DISCONNECT

- 1 Shock absorber from outrigger — support with hydraulic jack.
2. Rear spring with damping rings from spring seat.
3. Press rear axle with mounting iron as far down as possible, so that rear springs can be removed.

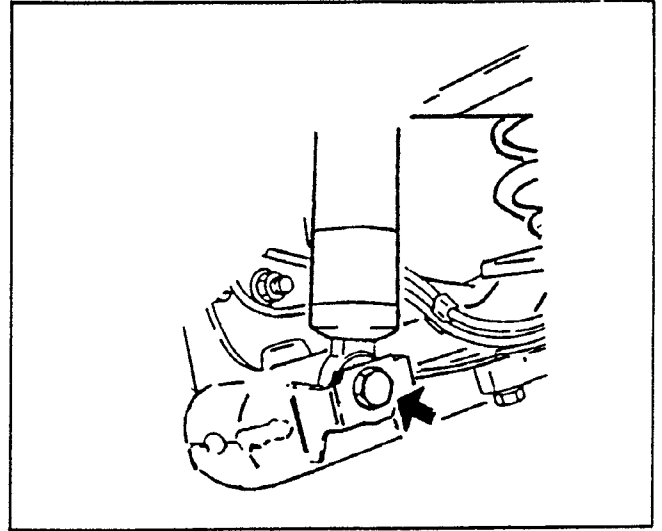


Fig. 20

INSTALL, CONNECT

- 1 Rear spring with damping rings in spring seat, simultaneously press down rear axle. Note installation position.

TIGHTEN (TORQUE)

1. Shock absorbers to outrigger — 70 Nm
2. Raise outrigger.

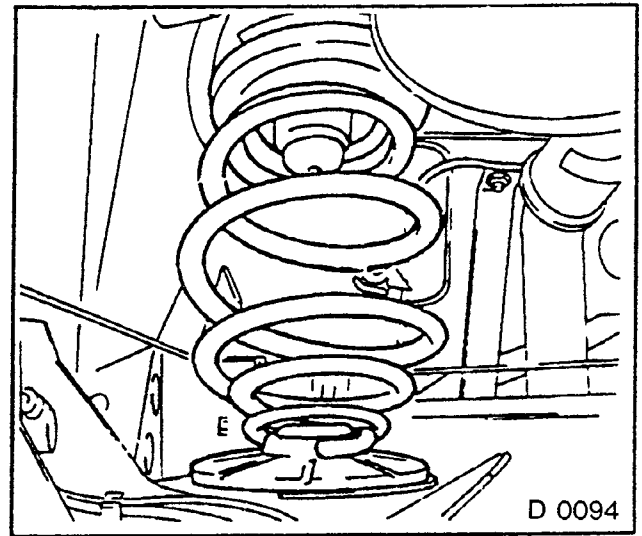


Fig. 21

WHEEL HUB, WHEEL BEARING, WHEEL SPINDLE, SEAL RING

Rear Wheel Hub (Disc Hub), Replace One

- 1. Release parking brake
- 2. Raise vehicle.
- 3. Remove rear wheel.
Mark installation position of rear wheels on hub.

ON MODELS WITH DRUM BRAKES

- 1. Remove brake drum.
- 2. Unscrew retaining bolt.
- 3. Loosen parking brake cable at brake cable compensation yoke if required.
- 4. Press parking brake shoe lever inwards using screwdriver
- 5. Lever off dust cap from wheel hub
- 6. Remove split pin from wheel spindle nut and unscrew nut.
- 7. Remove wheel hub with lock washer from wheel spindle.
- 8. Clean wheel spindle and check visually for damage

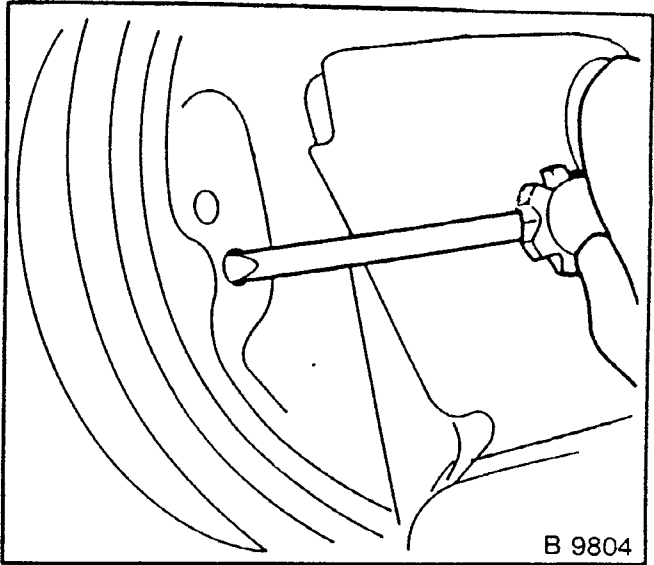


Fig. 22

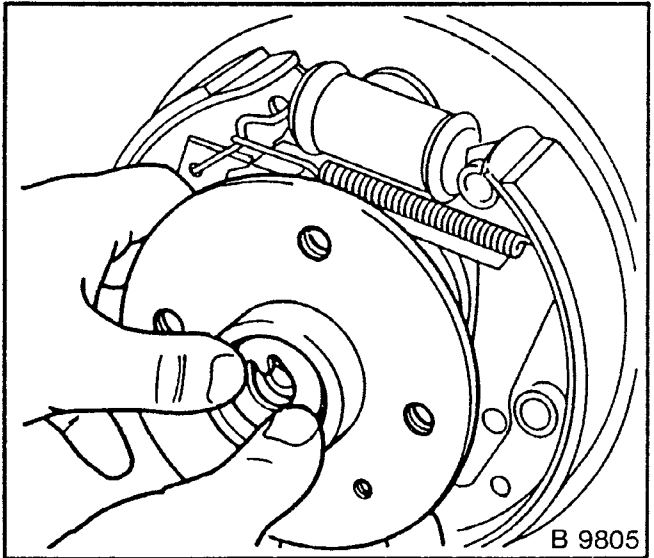


Fig. 23

ON MODELS WITH DISC BRAKES

NOTE:
TO ENSURE EVEN BRAKING ON BOTH SIDES, BOTH DISC HUBS MUST HAVE THE SAME SURFACE AS REGARDS POLISHED SURFACE AND PEAK-TO-VALLEY HEIGHT. FOR THIS REASON, BOTH DISC HUBS MUST BE REPLACED IN EVERY CASE.

- 1. Unbolt brake caliper and tie up with wire. Brake system remains closed.

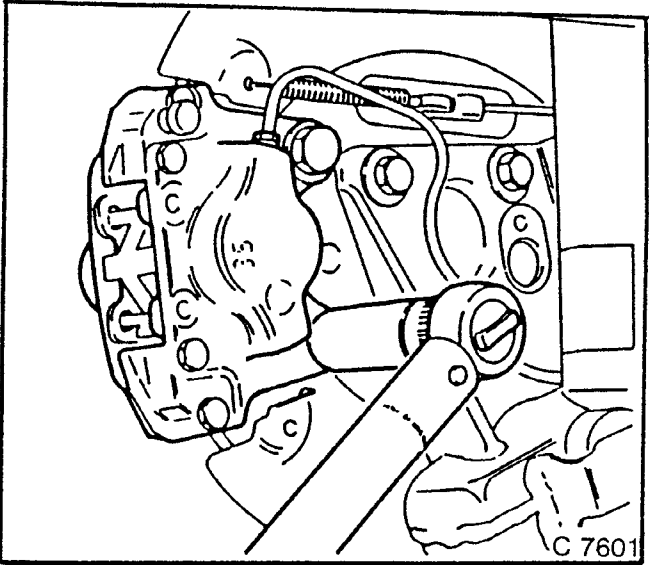


Fig. 24

- 2. Lever off dust cap.
- 3. Remove split pin from wheel spindle nut and unscrew nut.

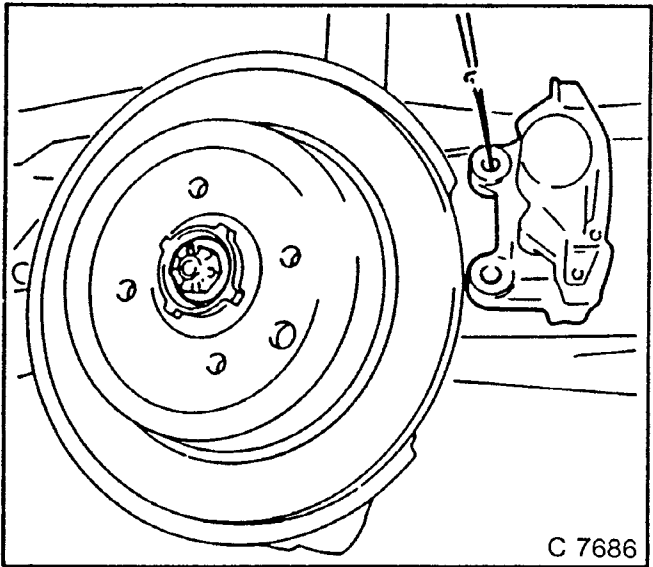


Fig. 25

- 4. Remove disc hub with lock washer from wheel spindle

If necessary detach parking brake cable from brake cable lever.

NOTE:
IF THE DISC HUB CANNOT BE REMOVED, THE ADJUSTMENT SCREW OF THE PARKING BRAKE SHOE MUST BE LOOSENED. SEE SECTION H.

- 5. Clean wheel spindle and check visually for damage.
- 6. Check parking brake shoe visually for wear. See Section H.

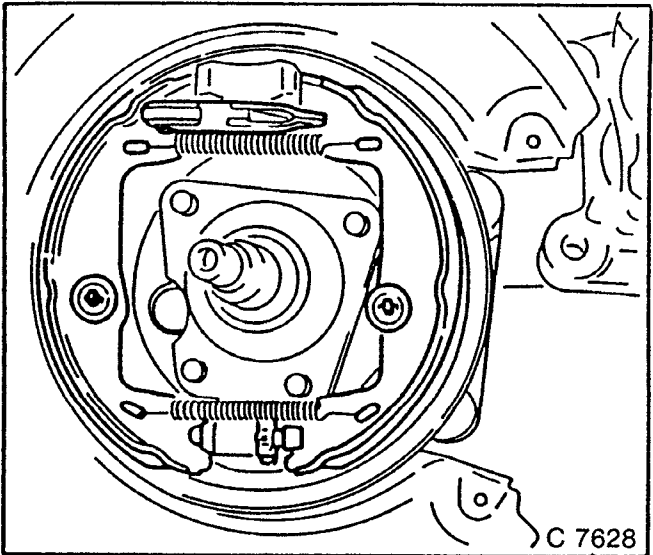


Fig. 26

INSTALL

ON MODELS WITH DISC BRAKES

- 1 Press outer race of **OUTER** bearing into disc hub as far as stop with KM—266—4 and KM—466—2.
- 2 Press outer race of **INNER** bearing into disc hub as far as stop with KM—266—4 and KM—466—2.

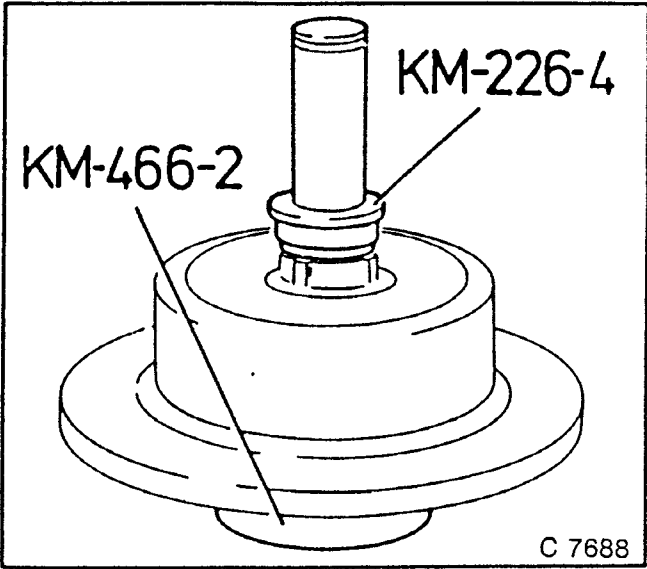


Fig. 27

- 3. Insert inner tapered roller bearing in disc hub
 - 4. Press seal ring with suitable sleeve into disc hub.
 - 5. Coat and/or fill both wheel bearings, sealing lip of seal ring and hollow space in disc hub with Lithium Grease.
 - 6. Place disc hub with lock washer on wheel spindle and screw on wheel spindle nut.
 - 7. Adjust wheel bearing.
 - 8 Attach parking brake cable "A" and return spring "B" to parking brake lever.
- If necessary adjust parking brake.
See Section H.

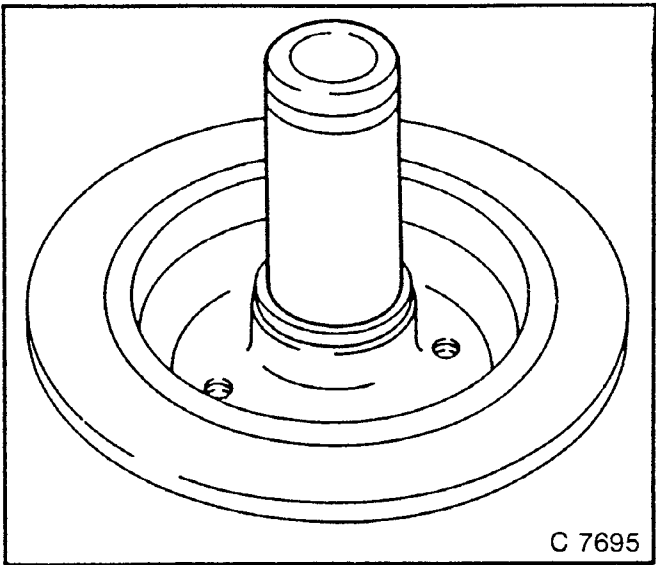


Fig. 28

- 9. Install brake caliper and tighten to torque of 65 Nm.

NOTE:
CHECK THAT BRAKE PADS ARE IN PERFECT CONDITION AND FREE OF WEAR.
SEE SECTION H.

- 10. Replace disc hub on other side in same way.
- 11. Replace rear wheels and tighten to torque of 90 Nm.
- 12. Lower vehicle.
- 13. Adjust air play by depressing brake pedal fully several times.

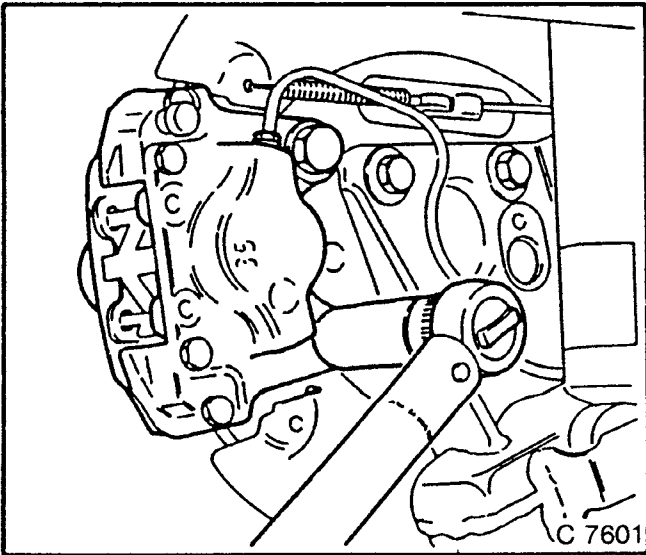


Fig. 29

ON MODELS WITH DRUM BRAKES

- 1 Press outer race of **OUTER** bearing into wheel hub as far as stop using KM—266—4.
2. Press outer race of **INNER** bearing into wheel hub as far as stop using KM—266—4
3. Insert inner tapered roller bearing in wheel hub.

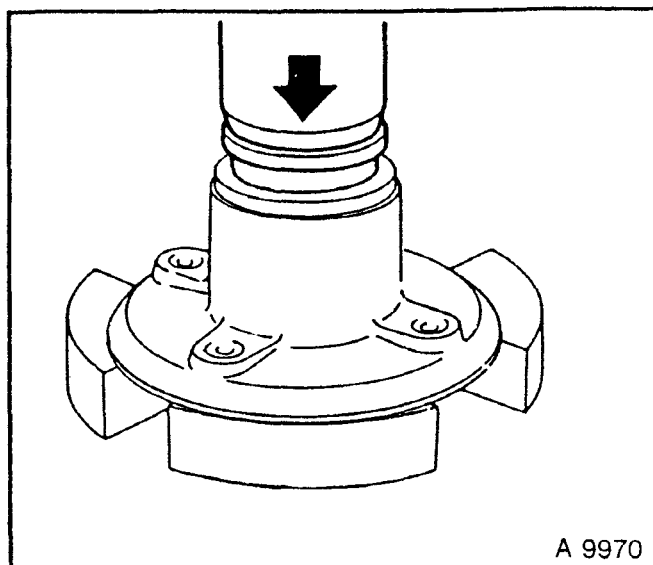


Fig. 30

4. Press seal ring into wheel hub using suitable sleeve
- 5 Coat/fill both wheel bearings, seal ring seal lip and wheel hub hollow space with Lithium Grease.
6. Tighten subsequent adjustment unit if required.
7. Place wheel hub with lock washer on wheel spindle.
8. Screw on wheel hub nut.
9. Mount brake drum. Tighten brake drum detent screw
10. Mount rear wheel and tighten — 90 Nm.
11. Adjust wheel bearing play
12. Lower vehicle.
13. Adjust rear wheel brake. Adjust parking brake if required.

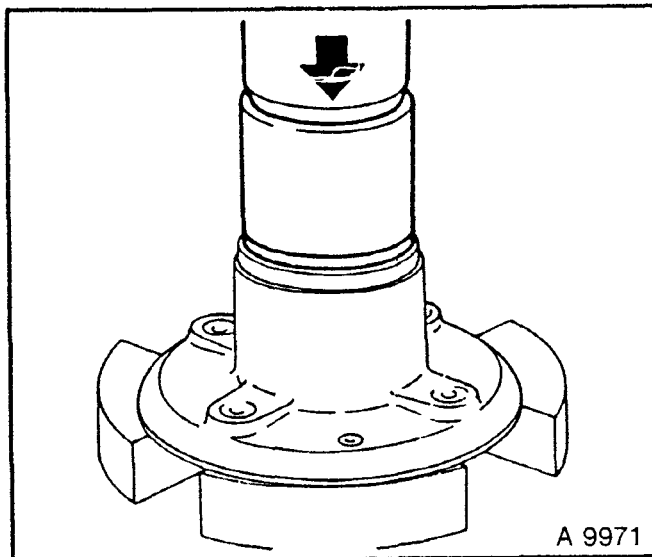


Fig. 31

Wheel Spindle, Remove and Install or Replace

ONLY ON MODELS WITH DISC BRAKES

As this operation is almost identical to the operation "Rear Wheel Hub, Replace One", in the following only the **ADDITIONAL** work required will be described. See page 15.

- 1 Loosen wheel spindle retaining bolts and remove.

NOTE:
USE NEW BOLTS EACH TIME THEY ARE LOOSENED.

Remove wheel spindle.

Check wheel spindle visually and check if necessary for radial and lateral runout.

See appropriate operation on page 19.

Install wheel spindle.

NOTE:
MOUNTING SURFACES AND THREADS MUST BE FREE OF GREASE, PAINT AND OTHER IMPURITIES.

Tighten new retaining bolts to torque of 50 Nm

Tighten further by $30^{\circ} \pm 5^{\circ}$.

Coat wheel spindle thinly in area of anchor plate with Antifriction Bearing Grease.

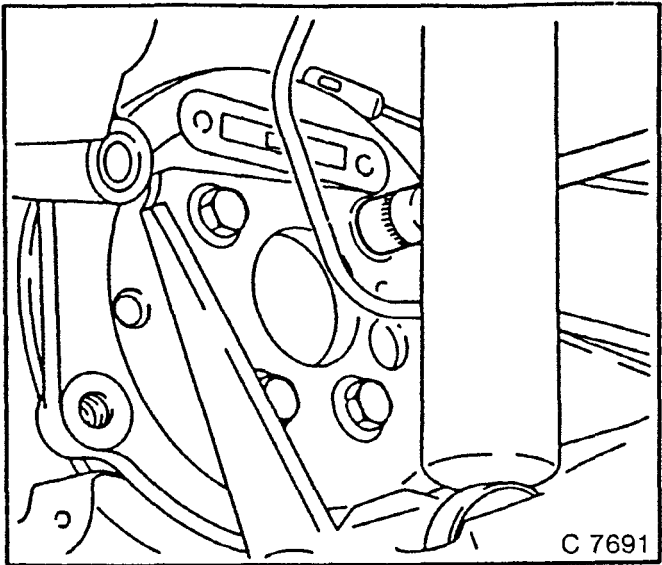


Fig. 32

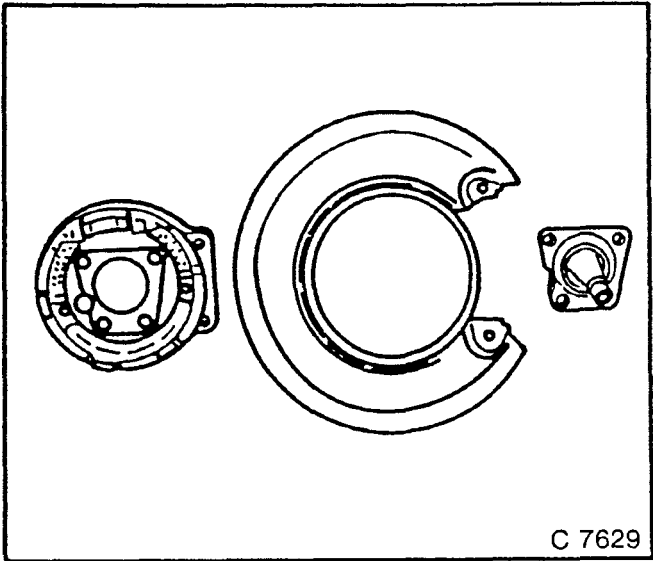


Fig. 33

Wheel Bearings of Rear Wheel Hub (Disc Hub), Replace Both

Since this operation is basically identical to the operation "Rear Wheel Hub, Replace One", only the additional work required is described below.

ON MODELS WITH DRUM BRAKES

- 1. Lever seal ring from wheel hub using screwdriver.
- 2. Remove inner tapered roller bearing from wheel hub.

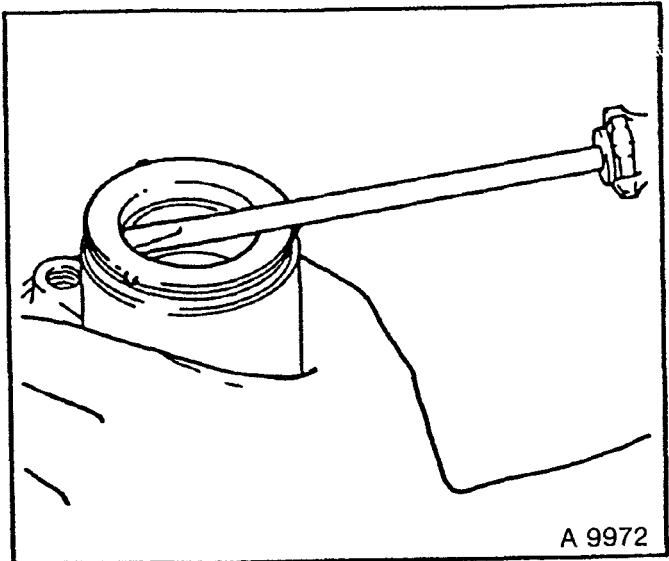


Fig. 34

- 3. Press outer race of inner bearing out of wheel hub using KM—266—2 and KM—266—3 in conjunction with KM—466—2.
- 4. Press outer race of outer bearing out of wheel hub using KM—266—1 and KM—266—3 in conjunction with KM—466—2.

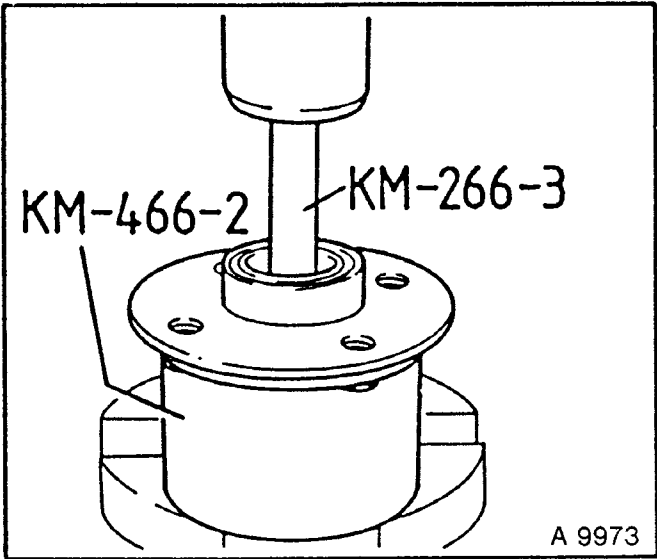


Fig. 35

ON MODELS WITH DISC BRAKES

- 1. Lever seal ring out of disc hub with mounting iron.
- 2. Remove inner tapered roller bearing from disc hub

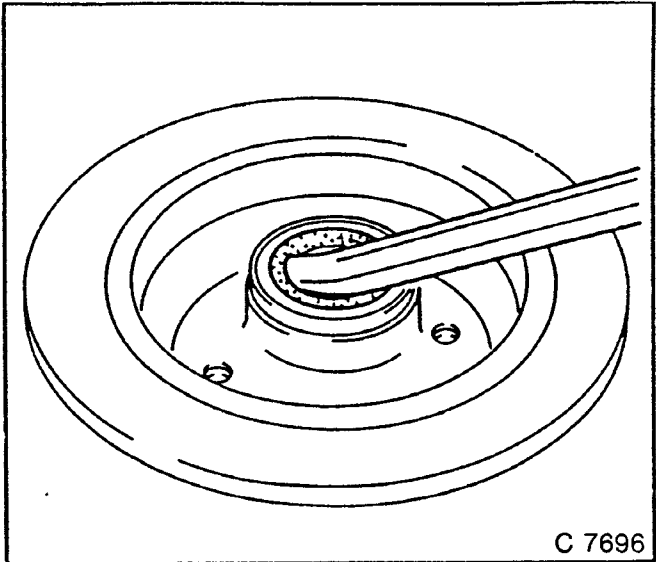


Fig. 36

- 3. Drive outer race of **INNER BEARING** out of disc hub with a soft metal drift (see fig. 39).

NOTE:
TURNING DISC HUB WHILE DRIVING OUT RACE WILL PREVENT RACE FROM TWISTING.

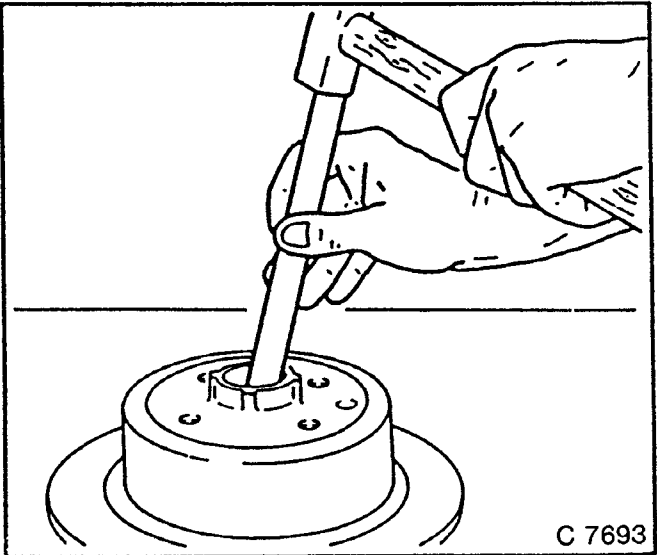


Fig. 37

- 4. Drive outer race of **OUTER BEARING** out of disc hub with a soft metal drift (see fig 39) or suitable length of pipe. Place KM—466—2 under it.

NOTE:
TURNING DISC HUB WHILE DRIVING OUT RACE WILL PREVENT RACE FROM TWISTING.

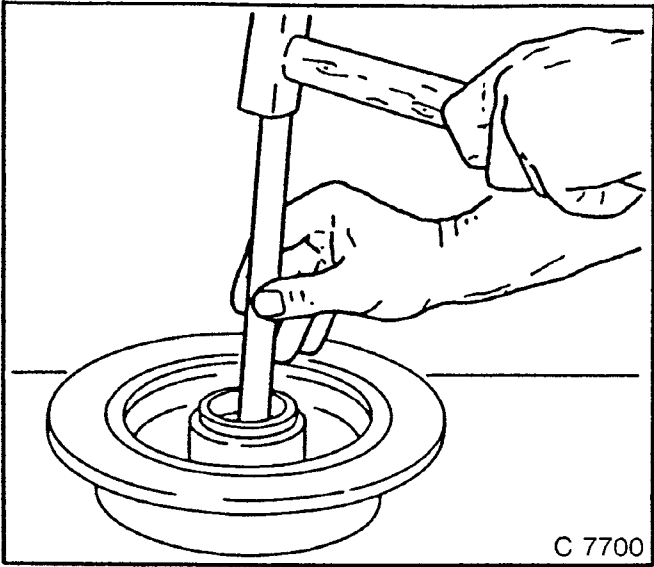


Fig. 38

If necessary, a soft metal drift can be made up using the measurements illustrated here.

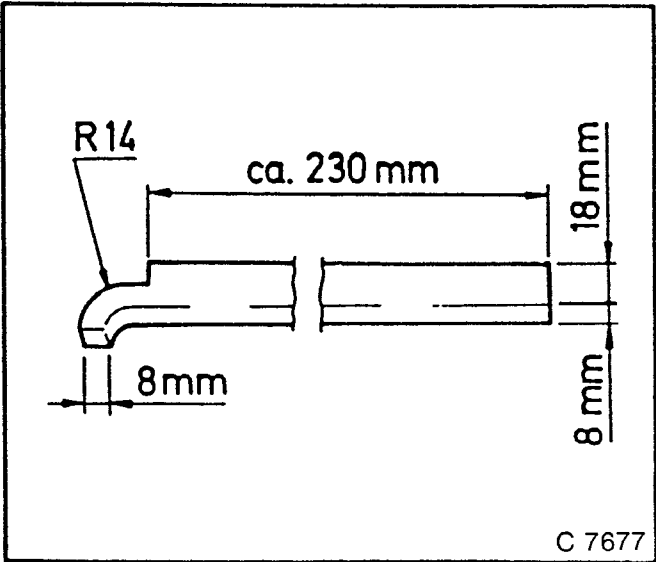


Fig. 39

Seal Ring of One Rear Wheel Hub (Disc Hub), Replace

ON MODELS WITH DRUM BRAKE

- 1. Remove wheel hub.
“Rear Wheel Hub, Replace One”, page 15.
- 2. Lever seal ring from wheel hub.

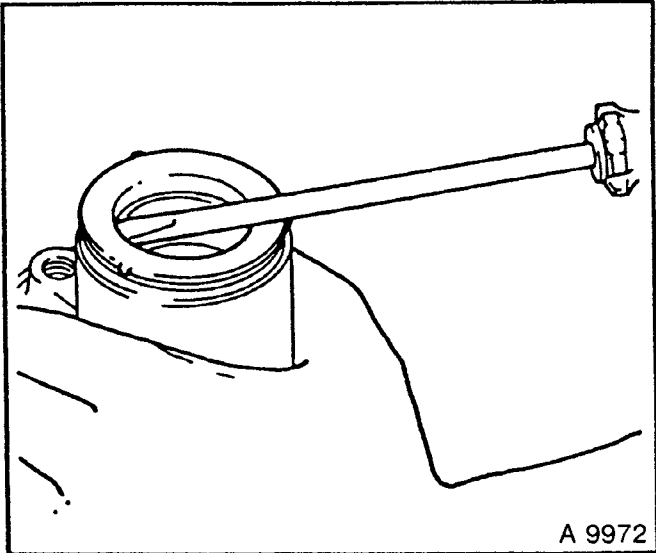


Fig. 40

3. Press seal ring into wheel hub using suitable sleeve.
4. Thinly coat seal lip of new seal ring with Lithium Grease.
5. Install wheel hub.
See "Rear Wheel Hub, Replace One"
Page 15.

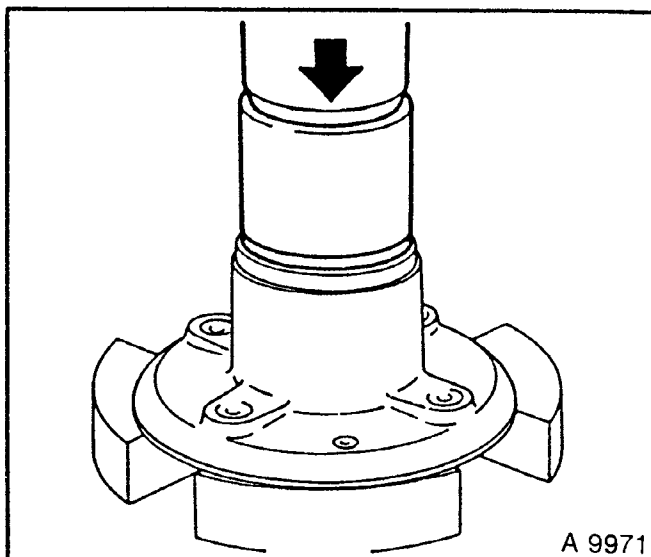


Fig. 41

ON MODELS WITH DISC BRAKES

- 1 Remove disc hub.
See "Disc Hub, Replace One", page 15.
2. Lever seal ring off disc hub.

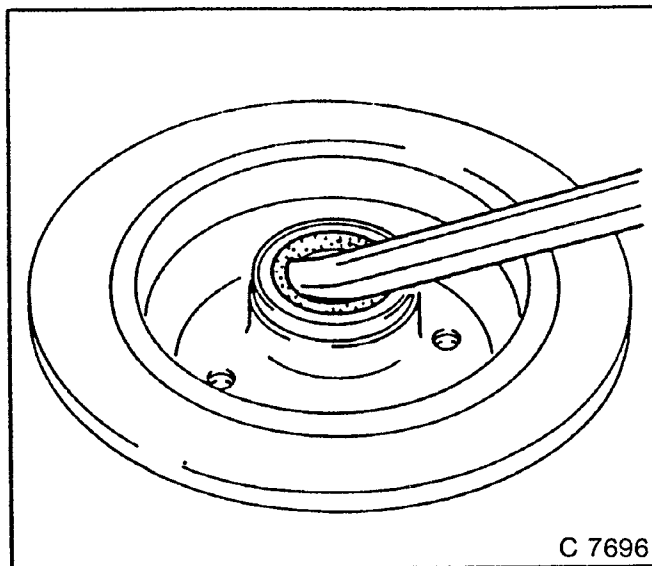


Fig. 42

3. Press seal ring into disc hub with suitable sleeve.
4. Coat sealing lip of new seal ring thinly with Lithium Grease.
5. Install disc hub.
See "Disc Hub, Replace One" page 15.

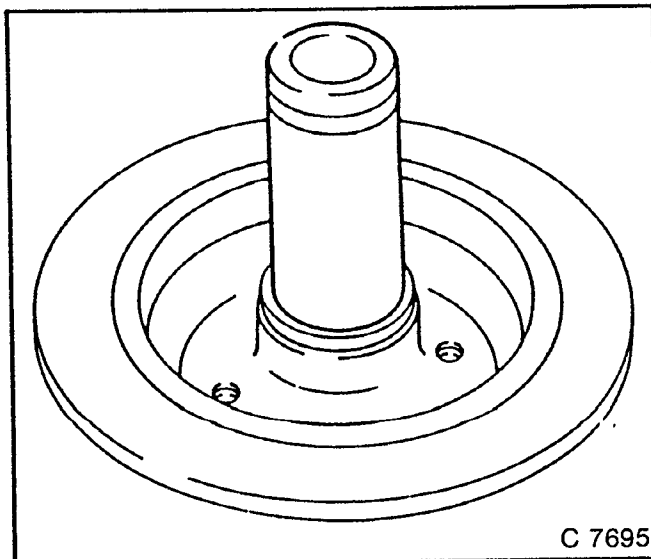


Fig. 43

**STABILIZER, SHOCK
ABSORBER**

**Shock Absorber and/or
Rubber Buffer of Shock
Absorber — Remove and
Install**

NOTE:
**ONLY REMOVE SHOCK ABSORBERS ONE
AT A TIME.**

REMOVE, DISCONNECT

- 1 Protective cap from shock absorber dome.
- 2 Shock absorber from underbody.
- 3 Washer and rubber buffer from shock absorber.
If rubber buffer only is to be replaced,
raise vehicle slightly and pull shock
absorber downwards.

- 4 Shock absorber from rear axle —
mounting lever.
- 5 Place hydraulic jack under outrigger of
rear axle.

TIGHTEN (TORQUE)

- 1 Shock absorber to rear axle — 70 Nm
- 2 Shock absorber to underbody — 20 Nm
— with washer and rubber buffer.

INSTALL, CONNECT

Protective cap on shock absorber dome.

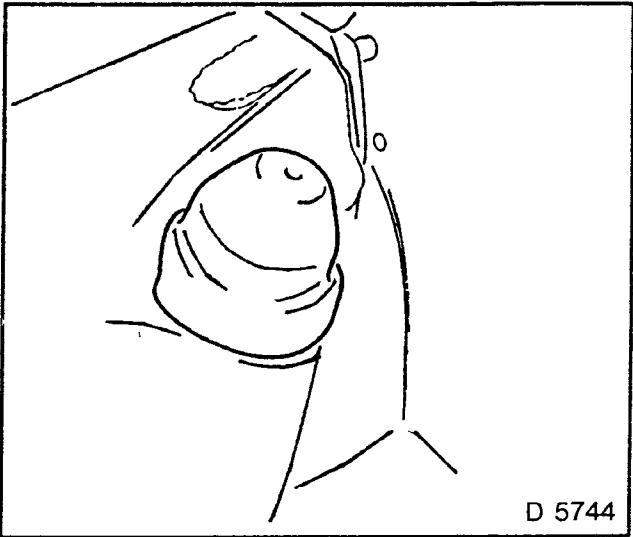


Fig. 44

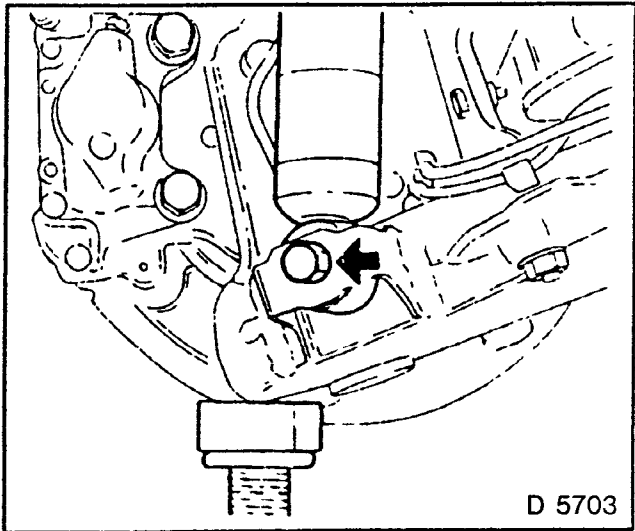


Fig. 45

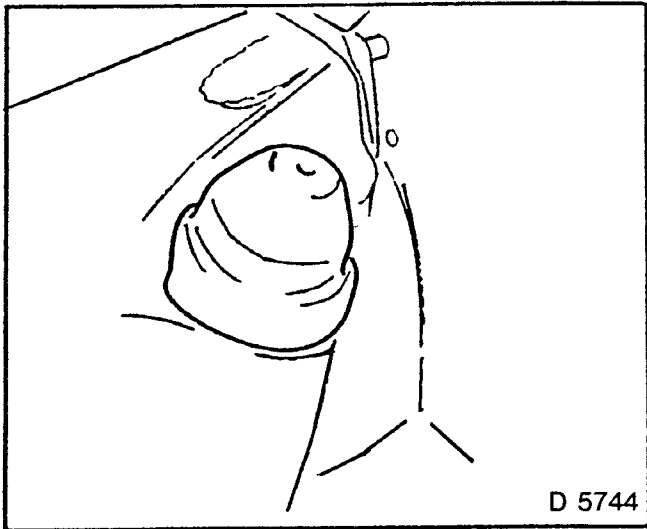


Fig. 46

Stabilizer, Remove and Install

REMOVE, DISCONNECT

- 1. One rear wheel.
- 2. Stabilizer mount on both sides of rear axle.
- 3. Rubber damper from rear axle body
- 4. Slide stabilizer out of one end of axle (towards side where stabilizer is flattened) for aproximately 150 mm and then remove from open end of torsion profile.

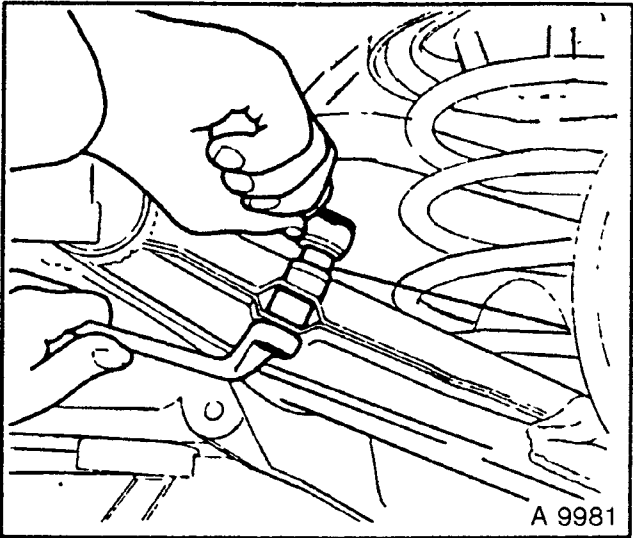


Fig. 47

INSTALL, CONNECT

- 1. Stabilizer in rear axle body and damper
For better mounting, thinly coat stabilizer with lubricating compound.

TORQUE — ANGLE METHOD

- 1. Stabilizer to rear axle — 30 Nm + 30° to 45°
- 2. Rear wheel — 110 Nm.

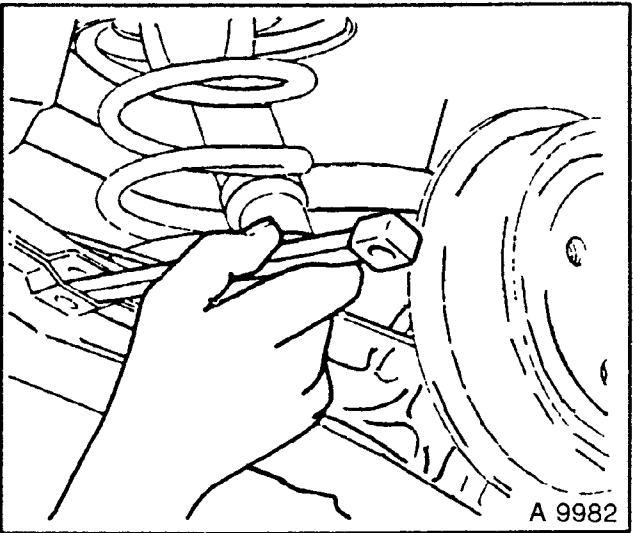


Fig. 48

Additional Stabilizer, Remove and Install (where fitted)

REMOVE, DISCONNECT

- 1. Additional stabilizer from rear axle (four fastening points — arrows).

TORQUE — ANGLE METHOD

- 2. Additional stabilizer to rear axle — 60 Nm + 60° to 75°.

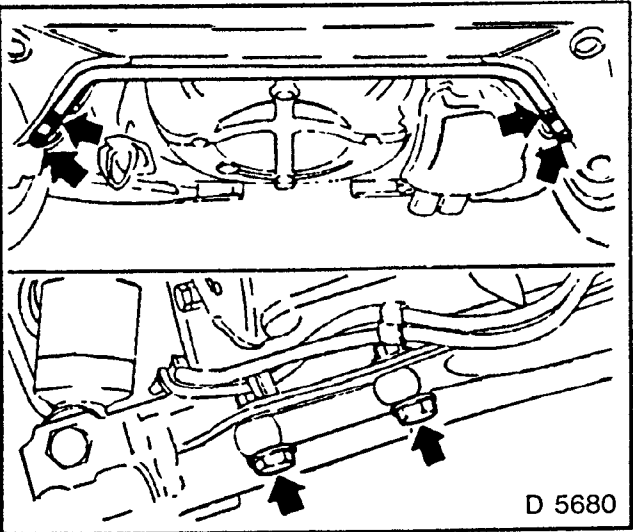
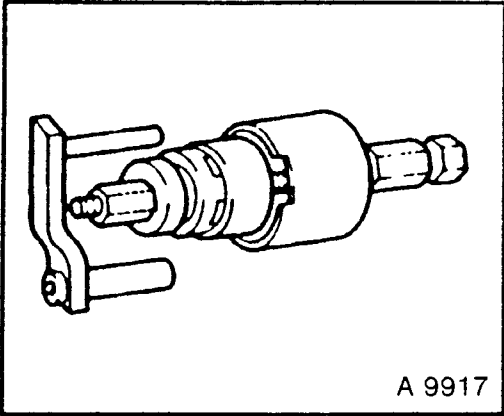


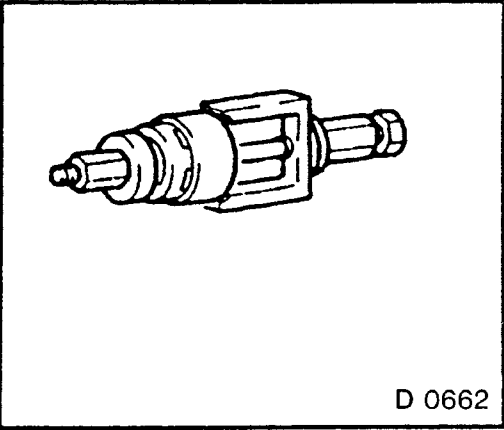
Fig. 49

SPECIAL SERVICE TOOLS

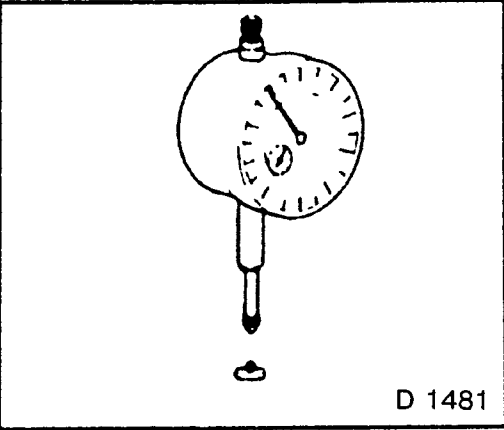
KM — 452 —A Remover/Installer.
To remove and install rear axle damping
bushings.



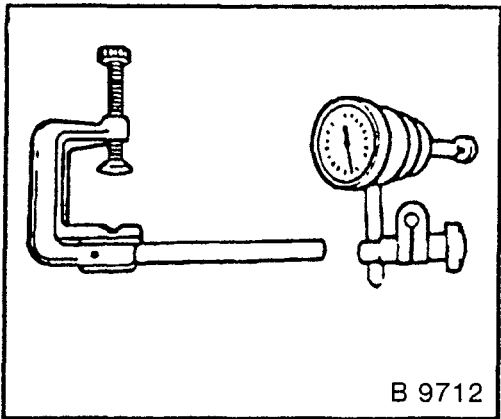
KM — 671 Remover/Installer.
To remove and install rear axle damping
bushings.



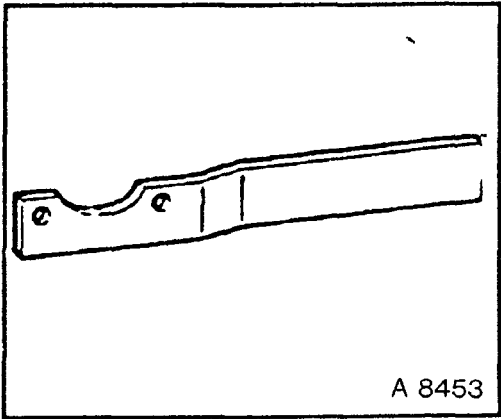
MKM — 571 — B Dial Gauge.



MKM — 572 Dial Indicator.



KM — 468 Holding Wrench.



TECHNICAL DATA

Camber, Toe-in, Check (not adjustable)

Wheel camber:	-1° 40'
Tolerance range	± 30'
	Variation from left to right wheel max. 0° 30'
Toe-in (applies to both wheels):	10' + 30'/-20' (approx. - 1 to + 4 mm)
Tolerance range	Variation from left to right wheel max. 0° 15'
Lateral run-out:	0,05 mm
Radial run-out:	0,05 mm

CHECK CAMBER AND TOE-IN (NOT ADJUSTABLE)

	DRUM BRAKE	DISC BRAKE
Camber:	-0° 30'	-1° 40'
Tolerance range:	-1° to 0° (Deviation from left to right wheel max. 0° 30')	-2° 10' to -1° 10'
Toe-in (both wheels)	10' toe-out to 40' toe-in Deviation from left to right wheel max. 0° 15'	approx. -1 to + 4 mm

NOTE:
TO CHECK CAMBER AND TOE-IN, LOAD EACH FRONT SEAT WITH 70 kg; THE TANK MUST BE HALF FULL.

In vehicles with manual level control, a pressure of 100 kPa is to be maintained on the shock absorbers when making measurements.

In addition, ensure that the pressure in all four tyres corresponds to that specified in Group E for the particular model under a full load.

Marking of rear springs

Models	Identification	Part No.	No. of coils	Length in mm - 20 (unladen) - 10
All models (excl 200i S & 200 TS)	AV	90 189 408	6,8	228
200iS	HU	90 372 592	6.4	191
200i TS	HU	90 372 592	6.4	191

RECOMMENDED TORQUE VALUES

COMMENTS

	Nm
Additional stabilizer to rear axle	***
Brake caliper to brake backing plate	80
Brake disc to wheel bearing unit	4
Brake drum to wheel bearing unit	4
Brake line to brake pressure hoses	16
Rear axle to vehicle underbody	105
Shock absorber to rear axle	70
Shock absorber to underbody	20
Stabilizer to rear axle	**
Wheel bolt to wheel hub	110

** Must be tightened in three stages: 30 Nm + 30° + 15°

*** Must be tightened in three stages: 60 Nm + 60° + 15°