

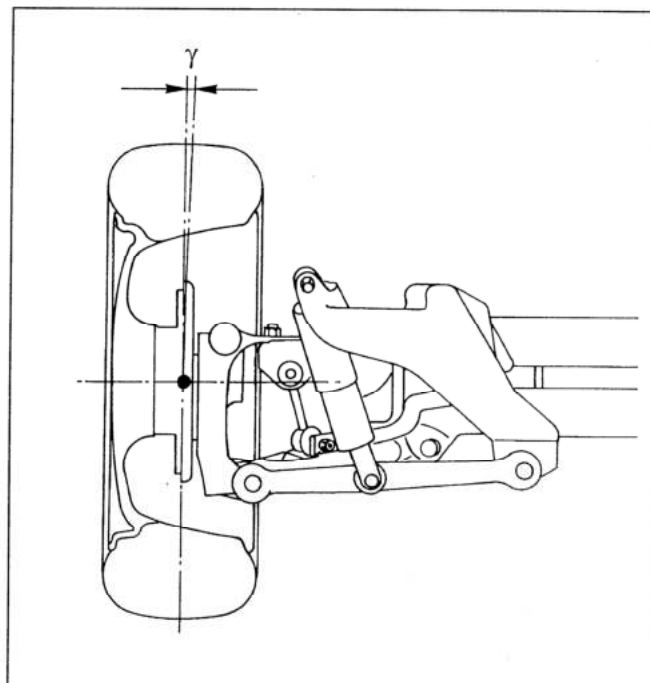
CHECKING THE REAR WHEEL CAMBER

– Check that the camber angle (not adjustable) is within the specified limit.



Rear wheel camber "γ"		
SPIDER		GTV
3.0 V6	1.8 T.S. 16v 2.0 T.S. 16v	1.8 T.S. 16v 2.0 T.S. 16v
$-1^{\circ}10' \pm 20'^*$	$-1^{\circ}5' \pm 20'^*$	$-1^{\circ}8' \pm 20'^*$
$-0^{\circ}52' \pm 20'^{**}$	$-0^{\circ}59' \pm 20'^{**}$	$-1^{\circ}14' \pm 20'^{**}$

* To '97 versions
** '98 versions

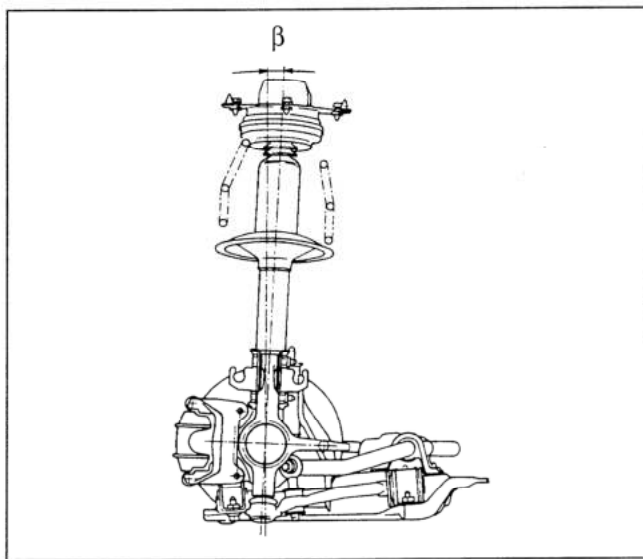




Caster "β"		
SPIDER		GTV
3.0 V6	1.8 T.S. 16v 2.0 T.S. 16v	1.8 T.S. 16v 2.0 T.S. 16v
$3^{\circ}8' \pm 30'^*$	$3^{\circ}9' \pm 30'^*$	$3^{\circ}12' \pm 30'^*$
$2^{\circ}45' \pm 30'^{**}$	$2^{\circ}55' \pm 30'^{**}$	$2^{\circ}59' \pm 30'^{**}$

* To '97 versions

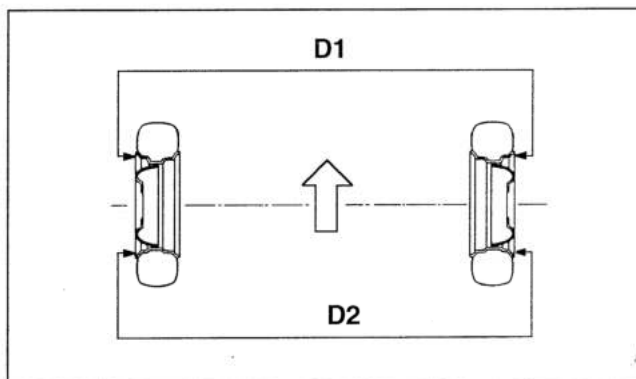
** '98 versions



NOTE: If the values are not within the specified limits, body squaring should be checked (see GROUP 70).

CHECKING THE REAR WHEEL TOE-IN

– Using suitable tools, check that the toe-in is within the specified limits.



Rear wheel toe-in D2 - D1

SPIDER - GTV

+2.5 ± 0.5 mm*

+3.0 ± 0.5 mm**

* To '97 versions

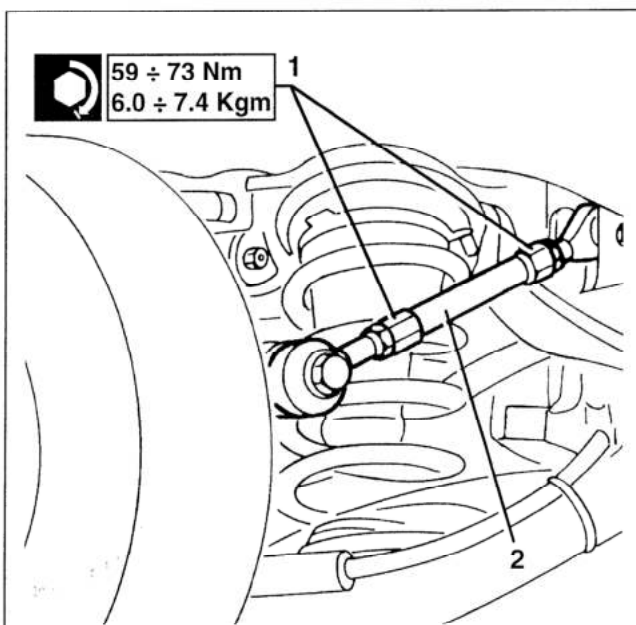
** '98 versions

If the toe-in is other than specified proceed as follows:

1. Slacken the fastenings of the adjustment rods.
2. Turn the rods, until reaching the specified value

NOTE: Adjustment should be carried out working on the rods of both wheels.

– Tighten the rod fastenings to the specified torque.



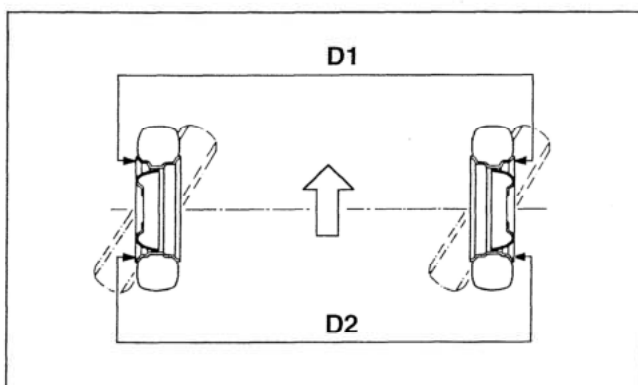
59 ÷ 73 Nm
6.0 ÷ 7.4 Kgm

CHECKING THE CHARACTERISTIC ANGLES**Preliminary operations**

- Inflate the tyres to the specified pressure.
- Fill with fuel and the specified oils and fluids.
- Check that the eccentricity and orthogonality of the wheel rims does not exceed:
 - 1 mm for steel rims
 - 0.3 mm for alloy rims

CHECKING THE FRONT WHEEL TOE-IN

- Using suitable tools, check that the toe-in is within the specified limits.



Front wheel toe-in D2 - D1
SPIDER - GTV
-1.5 ± 0.5 mm*
-2.0 ± 0.5 mm**

* To '97 versions
** '98 versions

If the toe-in is other than specified, proceed as follows:

1. Slacken the fastenings for adjusting the track rods.

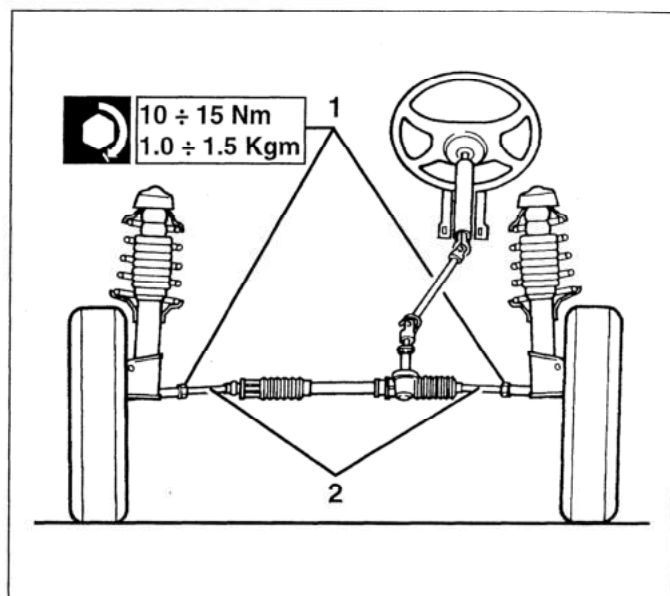
**WARNING:**

Each time the front wheel toe-in is adjusted, it is necessary to check that the boots turn freely on the rod and if necessary remove them and lubricate with the specified grease.

2. Turn the rods, until reaching the specified value without changing the position of the steering wheel spokes

NOTE: Adjustment should be carried out on the rods of both wheels.

- Tighten the track rod adjustment fastenings to the specified torque.

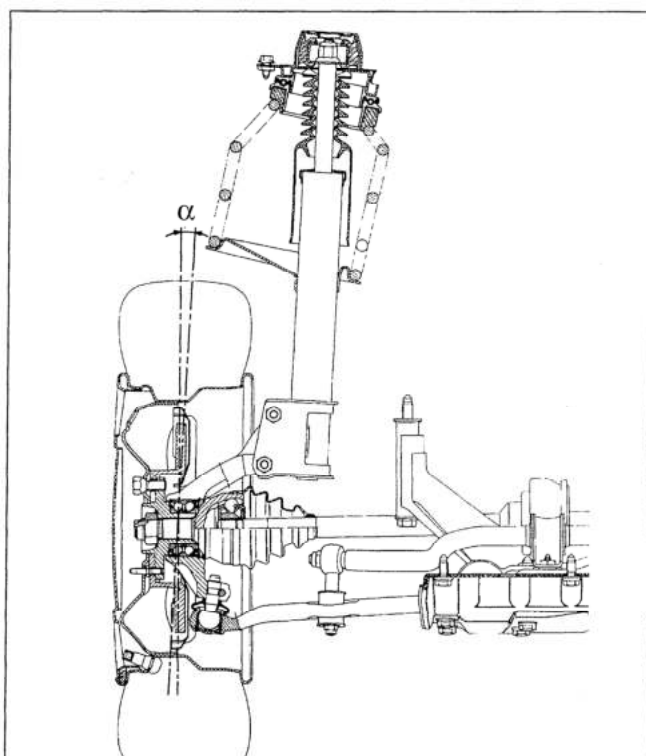
**CHECKING THE FRONT WHEEL CAMBER AND CASTER**

- Check that the camber and caster angles (not adjustable) are within the specified limits.



Front wheel camber "α"		
SPIDER		GTV
3.0 V6	1.8 T.S. 16v 2.0 T.S. 16v	1.8 T.S. 16v 2.0 T.S. 16v
-0°39' ± 20'*	-0°39' ± 20'	-0°39' ± 20'
-0°56' ± 20'**	-0°30' ± 20'**	-0°30' ± 20'**

* To '97 versions
** '98 versions

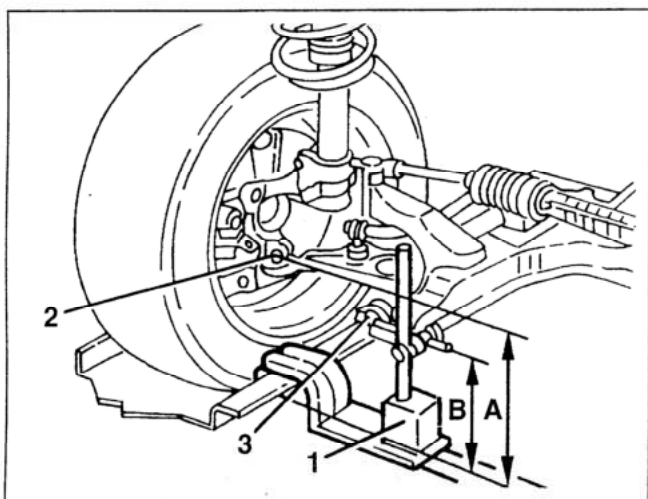


WHEEL ALIGNMENT

CHECKING THE FRONT WHEEL ALIGNMENT

- Inflate the tyres to the specified pressure.
- Fill with fuel and the specified oils and fluids.
- Set the car on a lift.
- Sway the car a few times to settle the suspensions.

1. Position the reference tool on the on the car resting surface.
2. Using a surface gauge measure the distance "A" between the car resting surface and the centre of the steering knuckle fastening screw.
 - With the help of a millimetred rule measure the distance found.
3. Using the surface gauge measure the distance "B" between the car resting surface and the centre of the wishbone pin.
 - With the help of the millimetred rule measure the distance found.



- Calculate the difference between dimension "B" and dimension "A" and check that it is with the specified limits.



Front alignment B-A		
SPIDER 3.0 V6	SPIDER 1.8 T.S. 16v 2.0 T.S. 16v	GTV 1.8 T.S. 16v 2.0 T.S. 16v
-36 ± 5 mm*	-33 ± 5 mm*	-32 ± 5 mm*
-46 ± 5 mm**	-42 ± 5 mm**	-43 ± 5 mm**

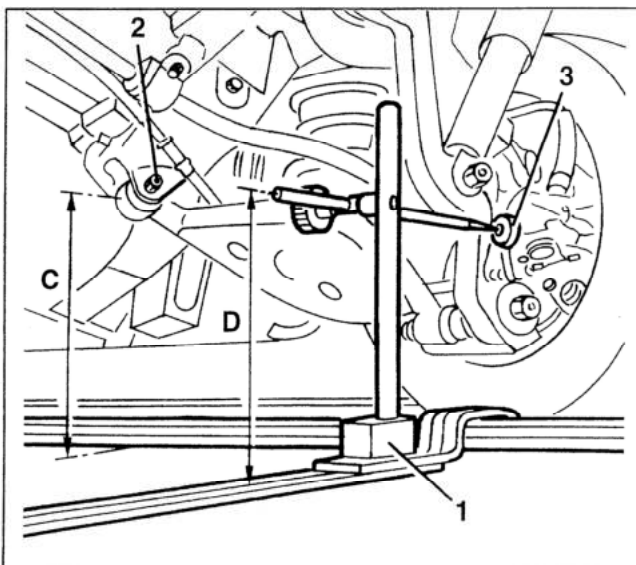
* To '97 versions
** '98 versions

NOTE: If the alignment values are not within the specified values change both suspension springs.

CHECKING THE REAR WHEEL ALIGNMENT

- Inflate the tyres to the specified pressure.
- Fill with fuel and the specified oils and fluids.
- Set the car on a lift.
- Sway the car a few times to settle the suspensions.

1. Position the reference tool on the car resting surface.
2. Using a surface gauge measure the distance "C" between the car resting surface and the fulcrum of the spring carrier arm.
 - With the help of a millimetred rule measure the distance found.
3. Using the surface gauge measure the distance "D" between the car resting surface and the rear wheel centre.
 - With the help of the millimetred rule measure the distance found.



- Calculate the difference between dimension "C" and dimension "D" and check that it is with the specified limits.



Rear alignment C - D		
SPIDER 3.0 V6	SPIDER 1.8 T.S. 16v 2.0 T.S. 16v	GTV 1.8 T.S. 16v 2.0 T.S. 16v
-74 ± 5 mm*	-74 ± 5 mm*	-77 ± 5 mm*
-72 ± 3 mm**	-74 ± 5 mm**	-77 ± 5 mm**

* To '97 versions
** '98 versions

NOTE: If the alignment values are not within the specified values change both suspension springs.

WHEELS

The wheels (rims and tyres) are the most suitable ones for the features of the car and ensure the highest degree of safety and comfort under all normal conditions of driving. Before changing the rims and tyres installed on the vehicle always consult the table of the types allowed. Always keep to the original rim-tyre match.

RIMS

The steel or alloy rims must be installed using specific studs for each type of rim.

Therefore, when replacing steel rims with alloy rims or vice-versa, it is absolutely necessary to use the specific studs for the type of wheel fitted.

TYRES

The tyres fitted on the vehicle are "tubeless", i.e. without inner tube. In order to maintain driving comfort, and ensure long life of the tyres, it is advisable to:

- Pay attention to the balancing of the wheels and the correct balancing of the front and rear carriage.
- Do not insert tools of any kind between the rim and the tyre.
- If the rim is distorted, change it.
- When balancing use specific counterweights for tubeless tyres.
- The tyre pressure (including the spare wheel) must be as specified.
- With tubeless tyres no inner tube must be used.

To ensure uniform wear between the front and rear wheels, it is advisable to switch the tyres between the axles every 10.000 - 15.000 km keeping them on the same side of the car to avoid inverting the direction of rotation.



CAUTION:
Do not cross the tyres over.

Some types of tyres have wear indicators; they must be changed as soon as these indicators can be seen on the tread.

Also check the tyres for uneven wear of the tread.

Tread wear gradually increases the risk of aquaplaning on wet surfaces.

Violent shocks against kerbs, holes in the road and obstacles of various kinds, as well as prolonged driving on rough roads may cause damage to the tyres that may not always be easily visible.

This results in swelling, distortion or cuts on the side of the tyre that often cannot be seen, but which can cause deflation or bursting of the tyre.

TYRE PRESSURE AND WEAR

The observance of the correct tyre pressure not only determines the life of the tyre, but also driving safety as it affects roadholding of the actual vehicle.

The pressure of each tyre, including the spare, must be checked at regular intervals and before long journeys.

The tyre pressure should be checked cold; use a pressure gauge keeping to the specified ratings.

Incorrect pressure causes abnormal wear of tyres:

A. Normal pressure

The correct inflating pressure of the tyre ensures maximum life on its whole width and wear is more even.

This condition also involves:

- Better vehicle roadholding.
- The highest degree of steering smoothness and accuracy
- Lower fuel consumption, due to the lower resistance to roll of the wheel.

B. Low pressure

A low tyre pressure causes uneven wear of the tread (higher on the side bands) and overheating can lead to the detachment of parts of the tyre and cause damage to the carcass. Such damage may cause sudden swelling or bursting of the tyre.

C. Excessive pressure

Excessive pressure involves:

- Uneven tread wear, more accentuated in the centre.
- Lower comfort of the vehicle.
- Higher vulnerability of the car.

WHEEL BALANCING

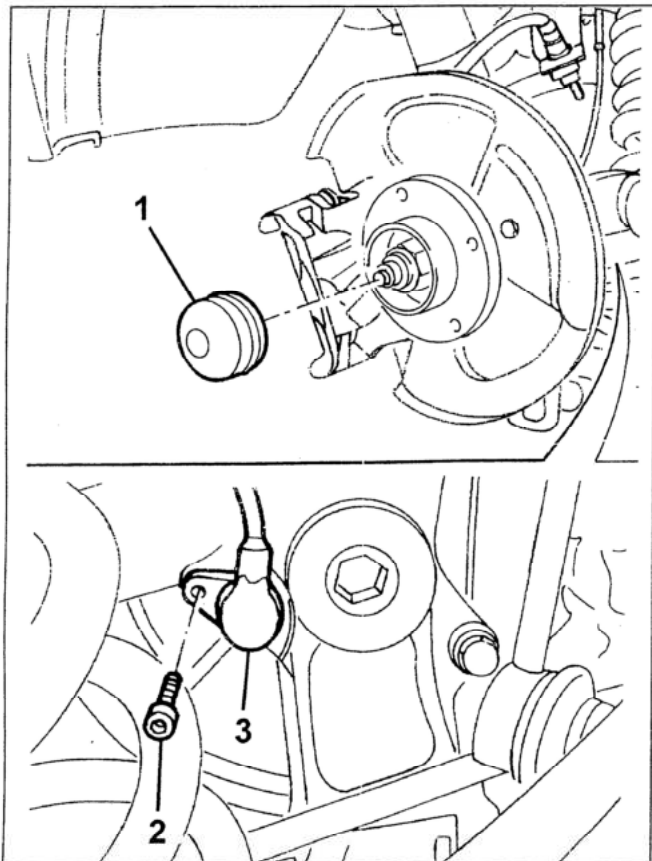
Each wheel, complete with tyre, has been balanced dynamically and statically in the factory. When changing tyres the wheels must be re-balanced, to avoid unstable driving, wear of the steering components and uneven wear of the tyres.



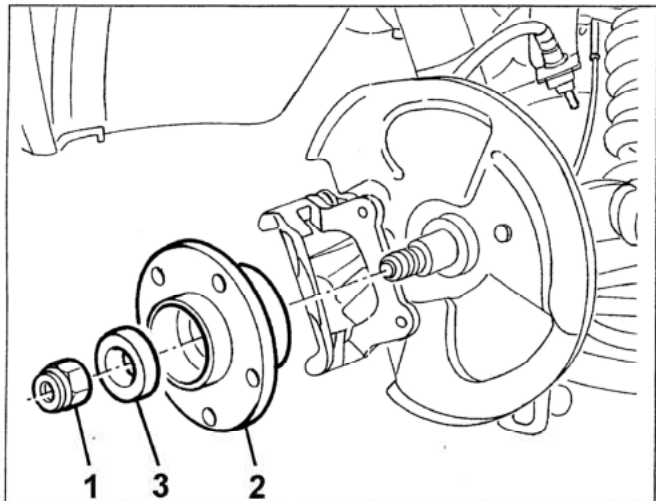
WARNING:
For balancing light alloy wheels only use original Alfa Romeo counter-weights.

**REAR WHEEL HUB
(6 Cylinder Version)****REMOVING / REFITTING**

- Remove the wheel.
- Remove the brake calipers and discs (see GROUP 33)
- 1. Remove the protective dust cover.
- 2. Undo the bolt fixing the active sensor.
- 3. Remove the active sensor from the housing.

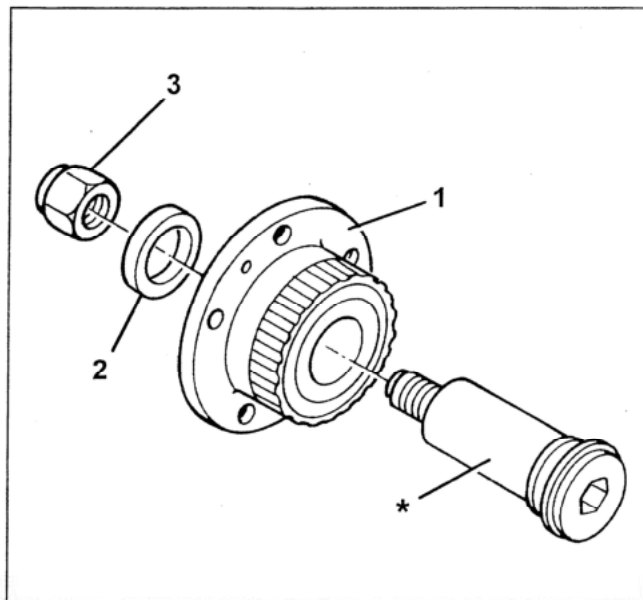


1. Undo the nut fixing the hub.
2. Remove the hub from the steering knuckle.
3. Recover the spacer.

**INSPECTIONS AND CHECKS****WARNING:**

If the steering knuckle fixing nut is removed, it is vital for this nut to be replaced when refitting.

1. Check the wheel bearing fitted inside the hub for wear. If there is excess wear or excess noise, the complete hub should be replaced.
 2. Check the spacer for wear and, if necessary, replace it.
 3. Proceed with replacing the wheel hub fixing nut.
- NOTE: If necessary, check the bearing (*) for wear, cracks or distortions and, if necessary, replace it.
- N.B. A press must be used in order to remove the bearing from the steering knuckle because it is a forced fit.

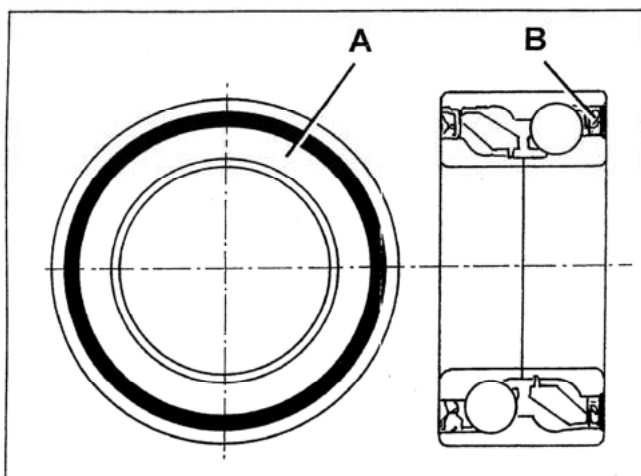


Proceed with the refitting, reversing the order of the operations carried out for the removal.

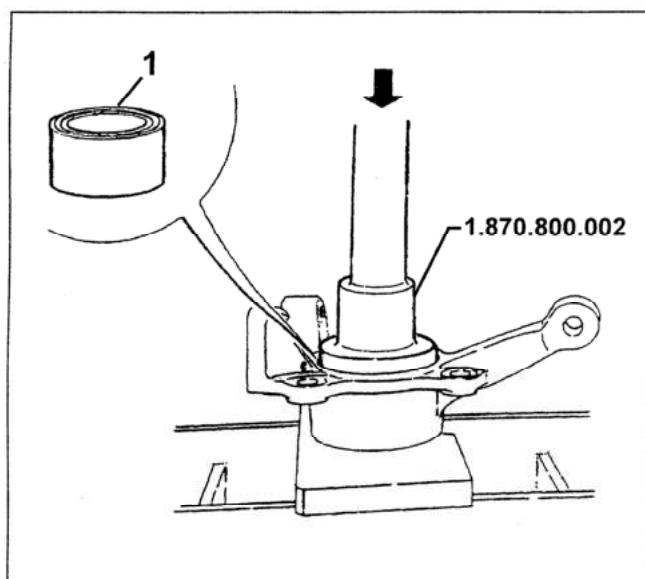
REASSEMBLY**WARNING:**

For fitting bearing (A) with multi-pole magnetic codifier (B)

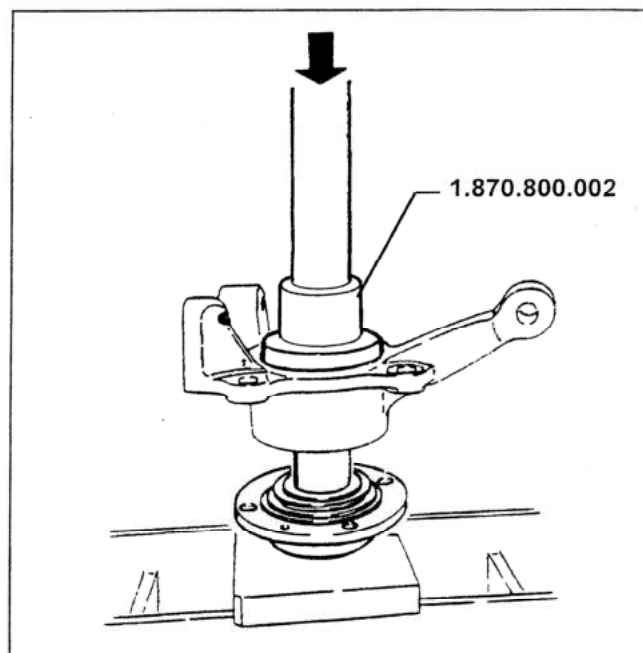
- Remove the plastic protection for the magnetic codifier (B) (black) just before fitting the bearing.
- The bearing should be fitted with the magnetic codifier facing towards the ABS sensor.
- Avoid any impacts to the magnetic codifier.
- Do not get the surface of the magnetic codifier dirty.
- Avoid any contact between the magnetic codifier and magnetic sources.
- At the end of the magnetic codifier fitting operation, check that it is clean, if not clean it with a clean cloth.



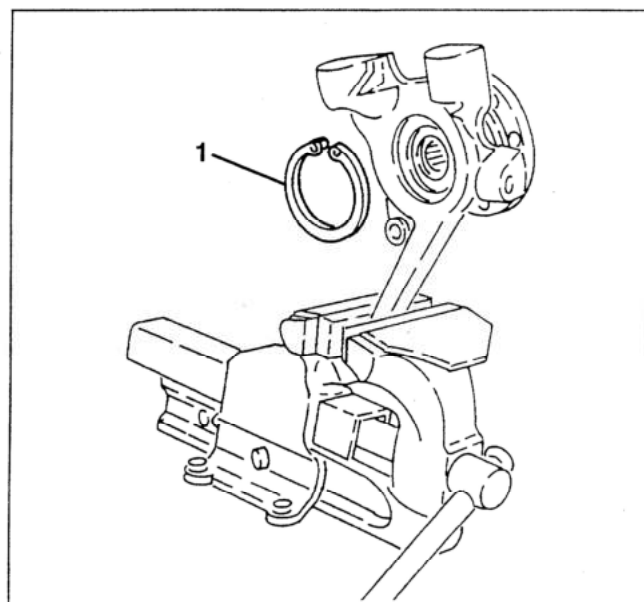
1. Working on the press and using tool N° 1.870.800.002, fit the bearing on the steering knuckle.



1. Working on the press and using tool N° 1.870.800.002, fit the hub on the steering knuckle.

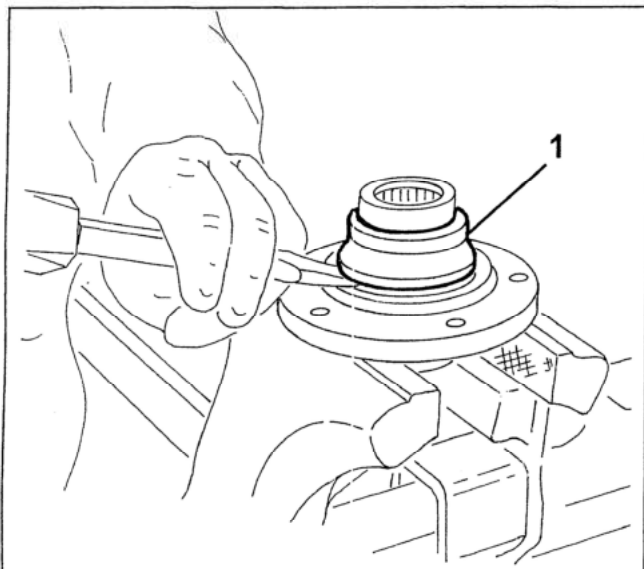


1. Fit the bearing retaining circlip in the housing in the steering knuckle.

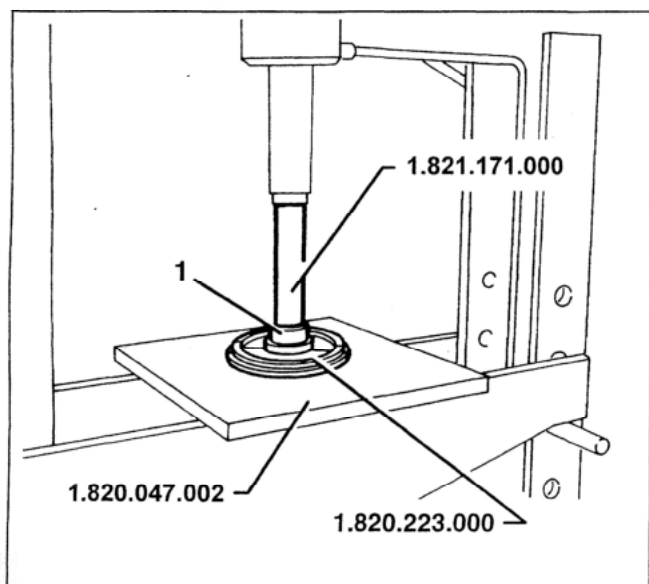


1. Using a suitable chisel, move the bearing inner race away from the wheel hub.

NOTE: the inner race must be moved sufficiently to allow the plate described in the next point to be inserted.



1. Working on the press and using plate N° 1.820.047.002, half-rings N° 1.820.223.000 and extractor (grip) N° 1.821.171.000, remove the bearing inner race from the wheel hub.

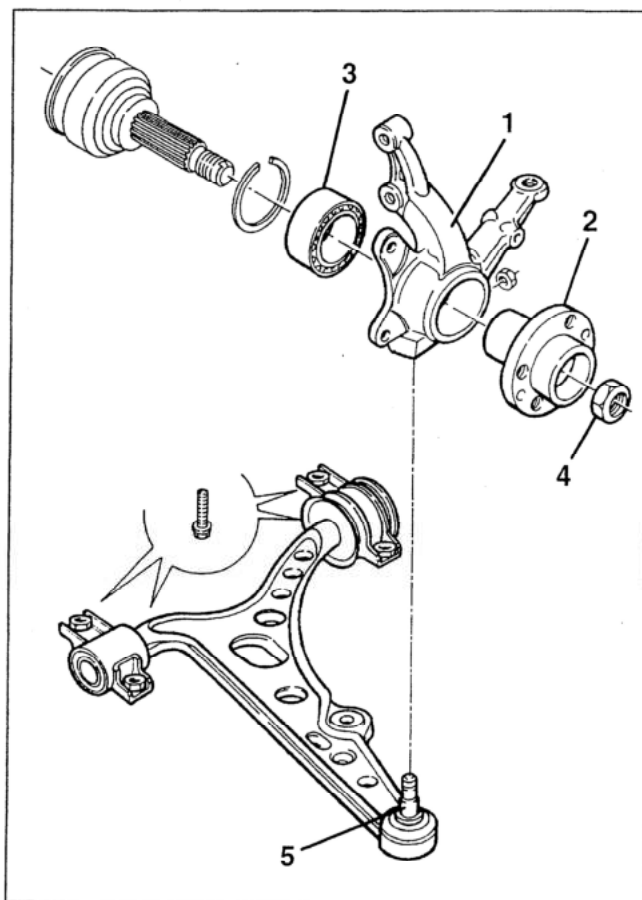


INSPECTIONS AND CHECKS

1. Check that the inner surfaces of the steering knuckle do not show signs of seizing, that the arms are not damaged and do not show signs of impact, distortions or breaks; if this is not the case, proceed with replacing the steering knuckle.
2. Check that the surfaces of the wheel hub are not damaged and do not show signs of impact or breaks;

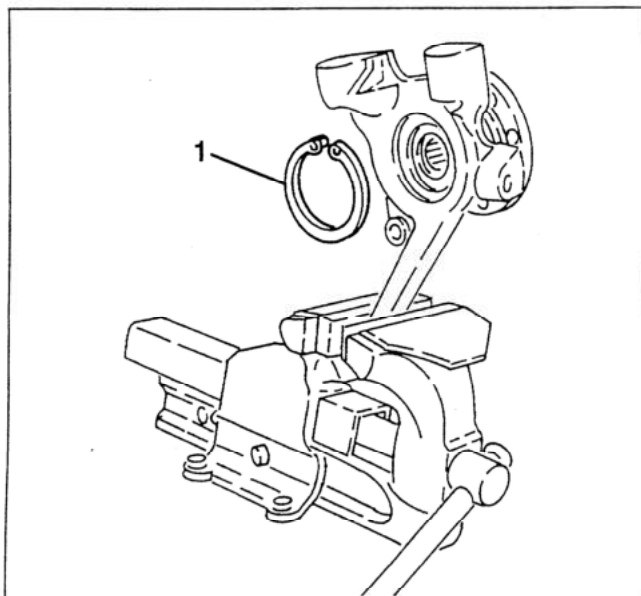
if this is not the case, proceed with replacing the wheel hub.

3. Check the rolling bearing for signs of cracks, seizing or sticking; if necessary, replace the bearing.
4. Proceed with replacing the nut securing the constant velocity joint before refitting.
5. Check the condition of the ball joint fixing the steering knuckle to the track control arm looking for distortions, excess wear, cracks, sticking or signs of oxidation and, if necessary, replace the ball joint.

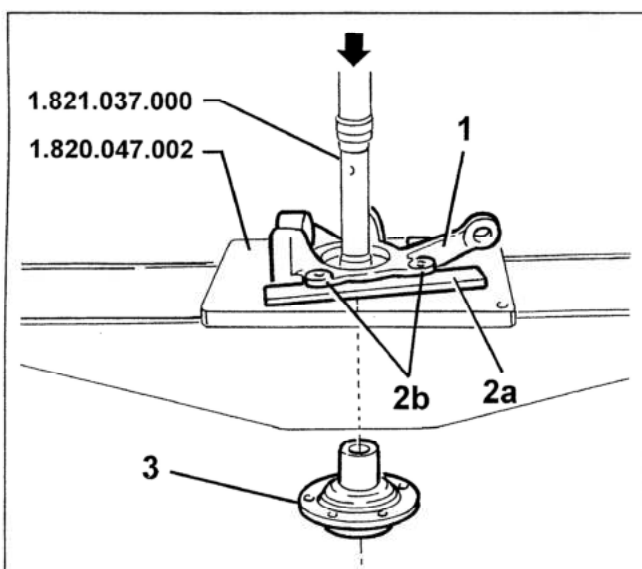


DISMANTLING

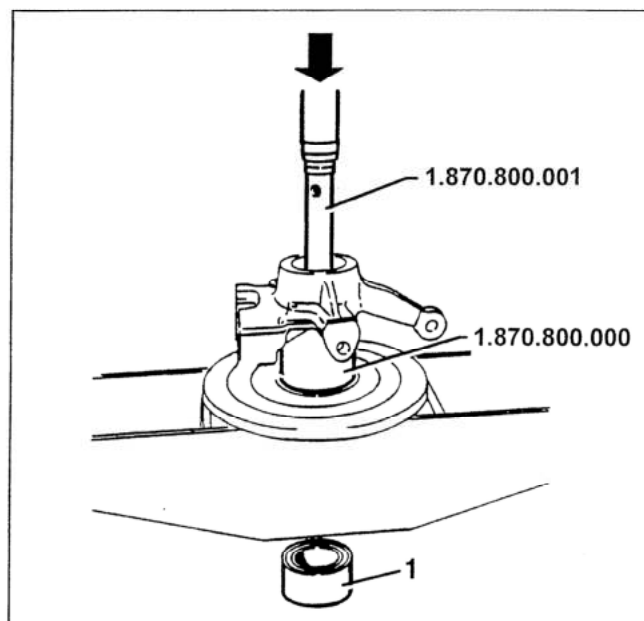
1. Tighten the steering knuckle/wheel hub assembly in a vice and remove the hub retaining circlip.



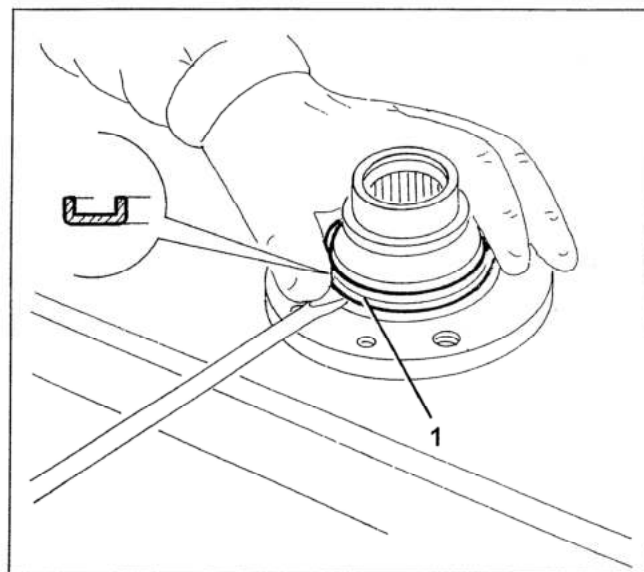
1. Position the steering knuckle/hub assembly on the press using plate N° 1.820.047.002.
2. Fit a suitable shim (2a), under the fixing tabs (2b), in order to ensure that the steering knuckle is in a flat position.
3. Working on the press, remove the wheel hub from the steering knuckle using extractor N° 1.821.037.000.



1. Working on the press, extract the bearing outer race from the steering knuckle using support N° 1.870.800.000 and extractor N° 1.870.800.001.

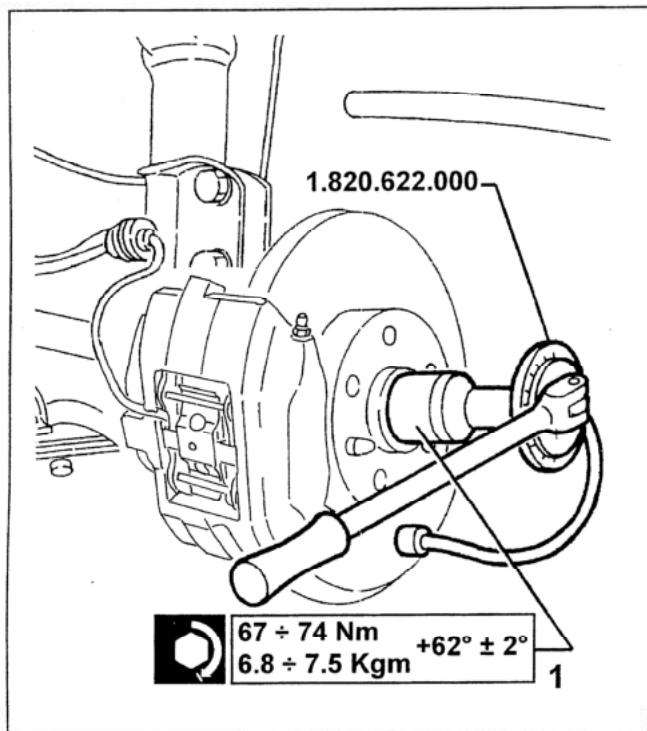


1. Using a screwdriver, remove the dust seal from the wheel hub.

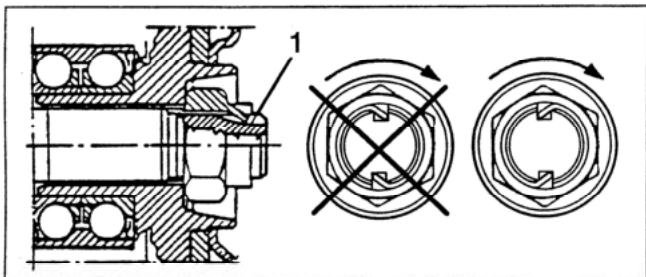


WARNING: suitable protective clothing (protective goggles) must be worn for the next operation involving the use of a chisel.

1. Tighten the new nut to the recommended torque and then rotate the nut further as described using tool No. 1.820.622.000.



1. Using a chisel, stake the collar of the nut twice (the same as the nut which was removed).



NOTE: The cuts in the collar are made in the notch in the hub on the opposite side to which the nut is tightened: in this way, the safety element is more resistant to any accidental loosening.

ADJUSTING FRONT SUSPENSION STEERING KNUCKLE POSITION

NOTE The operation described below, which must be carried out each time the two bolts fixing the steering knuckle to the shock absorber stem have to be loosened or removed, is aimed at keeping the wheel camber angle within the recommended limits by cancelling the clearance between the fixing bolts and the openings for the actual bolts (see specific paragraph).

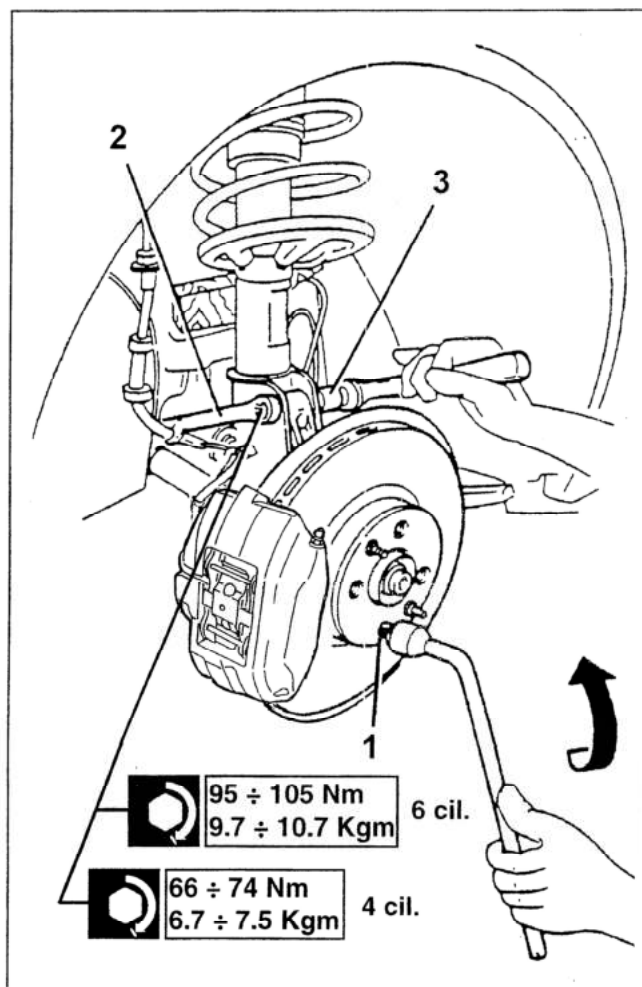
– Position a suitable wooden reaction element between the spring plate and the bodyshell.



WARNING:

Make sure that the reaction element support point corresponds to the spring plate and not the coils because if that were the case it could cause involuntary movements and/or distortion of the actual spring during operation.

1. Temporarily position one of the wheel bolts and adjust it in the direction illustrated in the diagram using a spanner.
2. Position a fixed spanner in order to retain the fixing bolt nut.
3. Tighten the fixing bolts to the recommended torque.



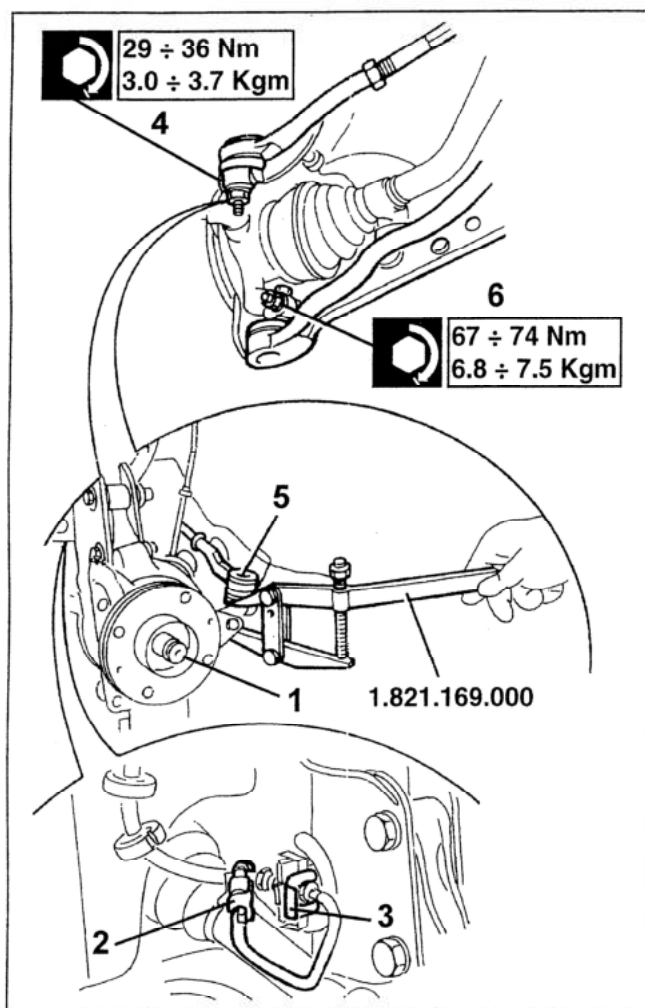
WHEELS AND HUBS

(Versions with ABS active sensors)

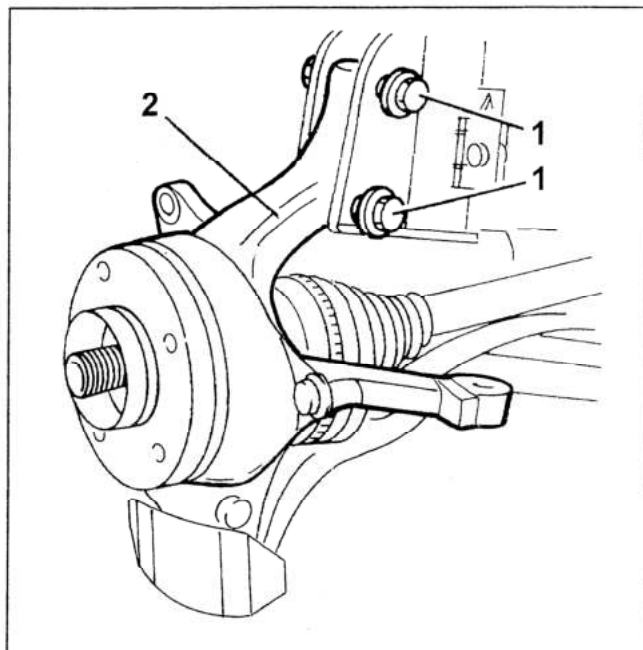
FRONT STEERING KNUCKLE (6 cylinder version)

REMOVING/REFITTING

- Remove the wheel.
- 1. Remove the bevelling and undo the nut fixing the wheel hub to the constant velocity joint.
- 2. Disconnect the pad wear electrical connection.
- 3. Remove the retainer.
- Remove the complete caliper and move it aside, without disconnecting the braking system pipes (see GROUP 33).
- Remove the brake disc (See Group 33).
- 4. Undo the nut for the ball joint connecting the side steering rod to the steering knuckle.
- 5. Using tool N° 1.821.169.000, disconnect the ball joint from the steering knuckle.
- 6. Undo the bolt connecting the track control arm to the steering knuckle and remove it from the ball joint.



1. Undo the two bolts.
2. Remove the steering knuckle/wheel hub assembly.



Proceed with the refitting, reversing the order of the operations carried out for the removal, tightening the nuts and bolts to the recommended torque and following the instructions below for staking the wheel hub fixing nuts and adjusting the position of the steering knuckle.

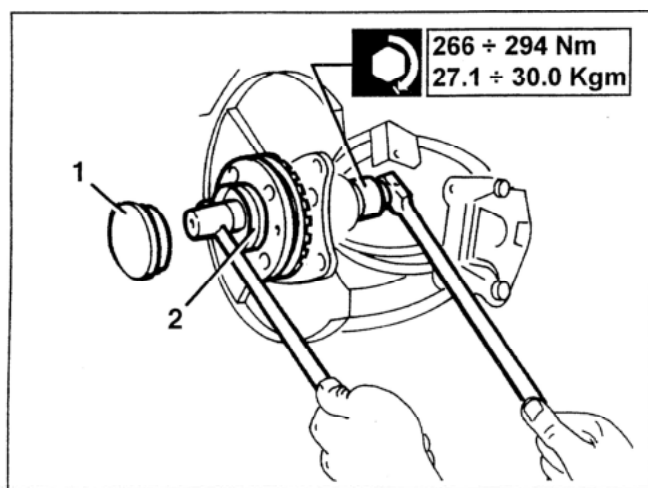
STAKING FRONT WHEEL HUB FIXING NUT

- Always use a new nut.
- Thoroughly clean the threaded end of the drive-shaft using a wire brush and then blow through with compressed air.
- Clean the thread of the nut and the element using ethyl alcohol or heptane.

REAR WHEEL HUB

REMOVING / REFITTING

- Remove the wheel.
- Remove the brake caliper and disks (see GROUP 33).
- 1. Remove the dust cover.
- 2. Slacken the fastening nut and remove the hub from the wheel upright.



CHECKS AND INSPECTIONS



CAUTION:

When removing the nut fastening the upright, it is absolutely necessary to change the nut when refitting.

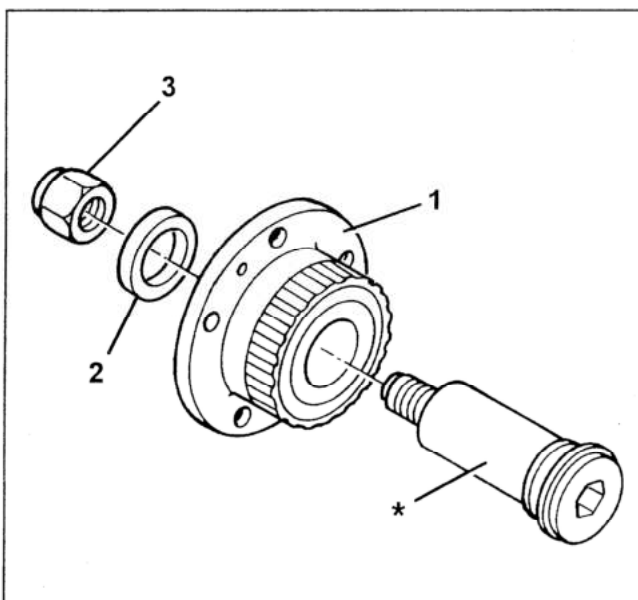
1. Check the wheel bearing splined inside the hub for wear. In the event of excessive play or noise, change the complete hub.

2. Check the spacer for wear and replace it if necessary.

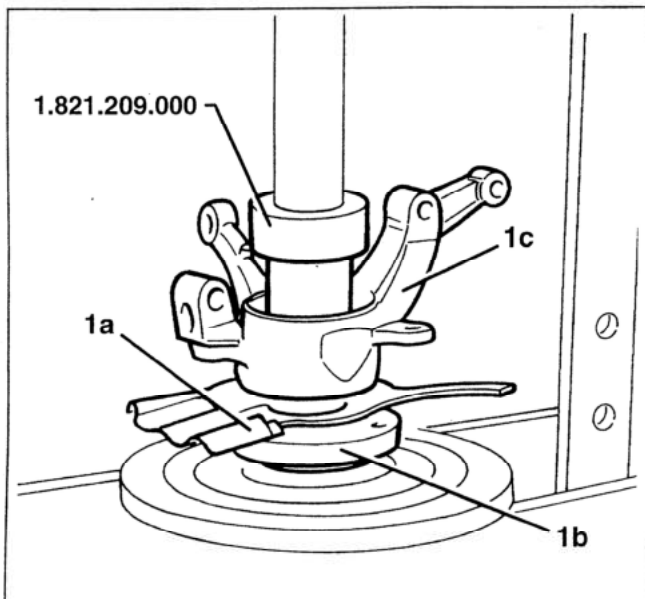
3. Replace the wheel hub fastening nut.

NOTE: If necessary, check the pin (*) for wear cracks or distortion and replace it if necessary.

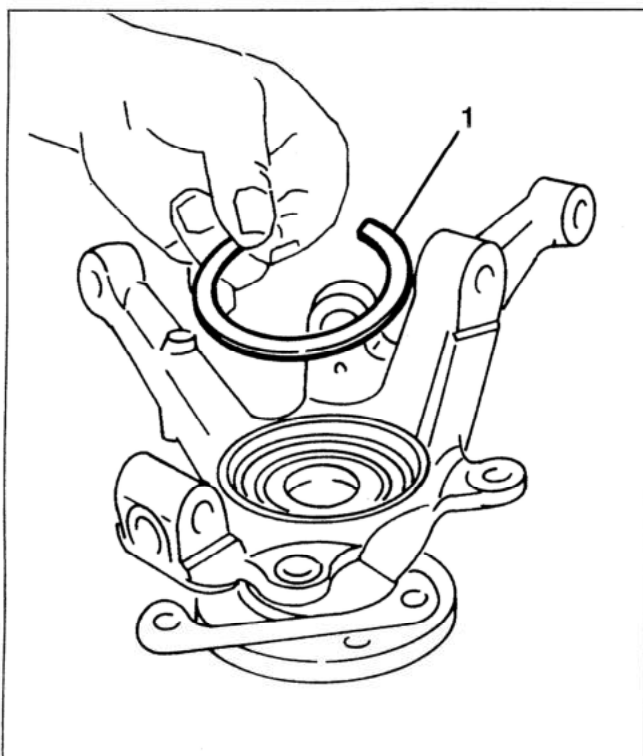
N.B. To remove the pin from the wheel upright the use of a press is necessary as it is force-fitted.



1. Arrange the brake disk protection (1a) on the wheel hub (1b) then, working under the press and overturning installing tool no. 821.209.000 compared with the previous step, insert the hub in the wheel upright (1c).

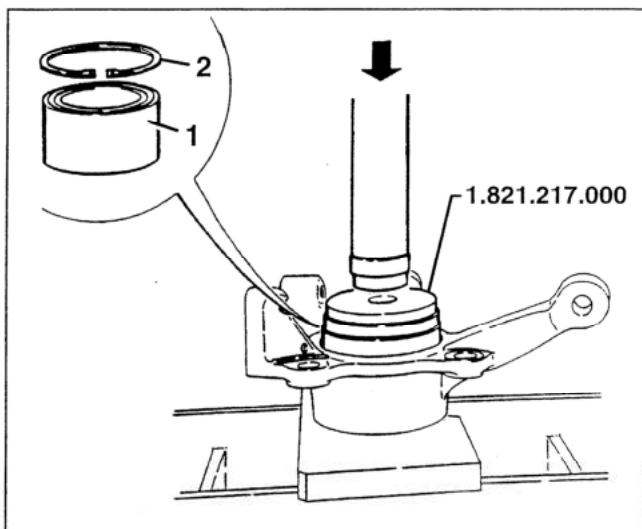


1. Assemble, in the seat provided on the wheel upright, the flexible bearing retainer ring.

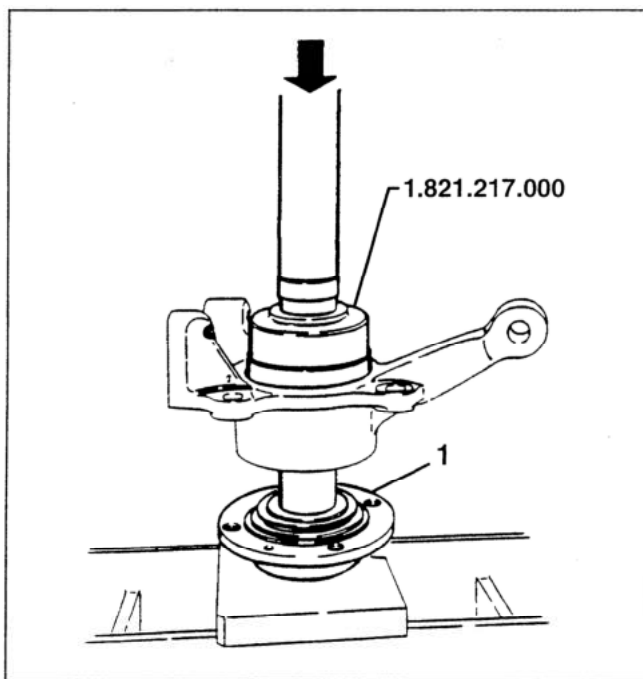


Only for 6-cylinder vehicles

1. Working under the press and using installing tool no. 1.821.217.000, insert the bearing in the wheel upright.
2. In the seat on the wheel upright, install flexible bearing retainer ring.

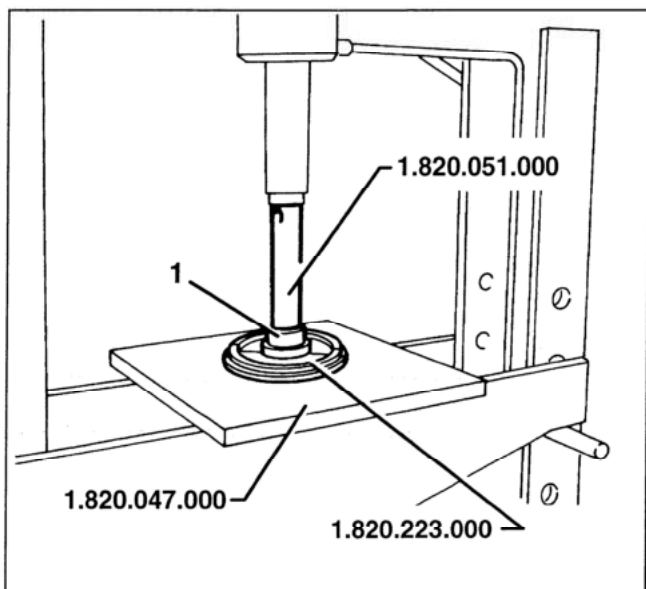


1. Working under the press and using installing tool no. 1.821.045.000, insert the hub in the wheel upright.



– Move aside, using a suitable tool, the bearing inner race from the contact area of the wheel hub.

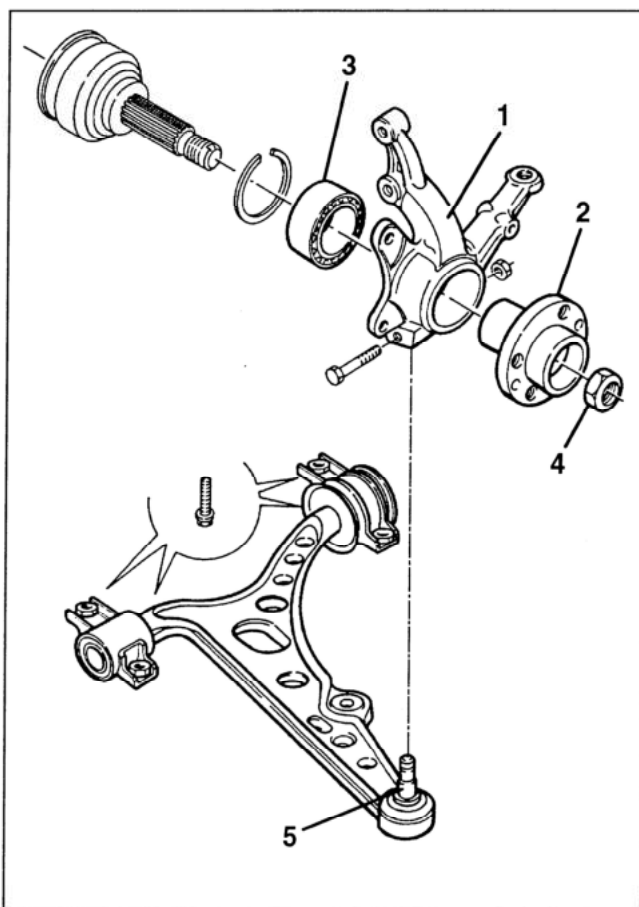
1. Working under the press, and using plate no. 1.820.047.002, half rings no. 1.820.223.000 and pul-
ler tool no. 1.821.051.000, withdraw the bearing inner
race from the wheel hub.



CHECKS AND INSPECTIONS

1. Check that the inner surfaces of the wheel upright show no signs of seizure, that the arms are not damaged or reveal clear signs of shocks, distortion or traces of breakage, if so change the upright.
2. Check that the surfaces of the wheel hub are not damaged or reveal clear signs of impact or signs of wear, if so change the wheel hub.
3. Check the conditions of the rolling bearing for cracks, seizing or jamming, cracks, seizure or sticking, if necessary replace the bearing.
4. Always, in any case, change the nut locking the constant velocity joint before refitting.

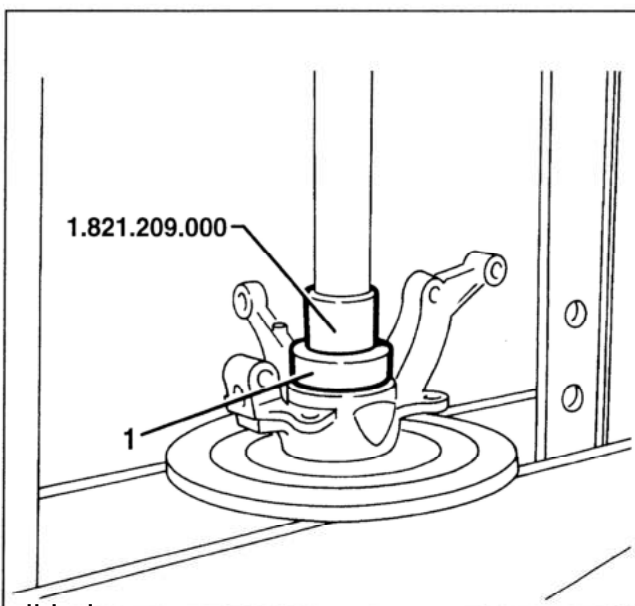
5. Check the conditions of the ball pin fastening the wheel upright to the wishbone, for distortion, excessive wear, cracks, sticking or signs of rust and, if necessary, replace the ball pin.



REASSEMBLY

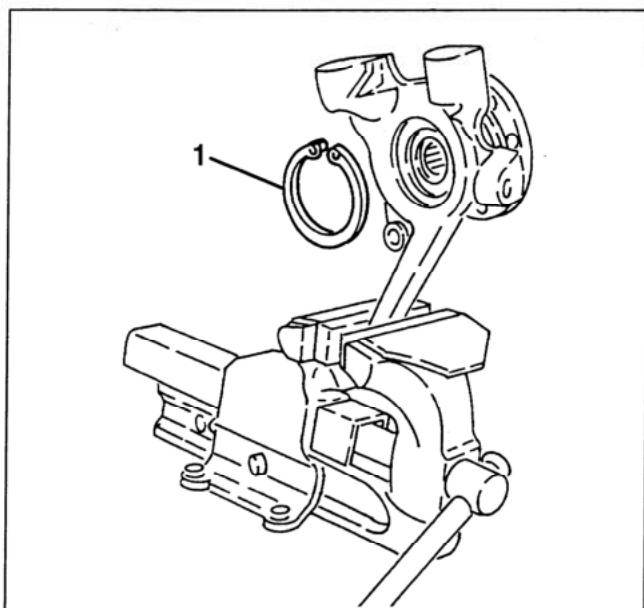
Only for 4-cylinder vehicles

1. Working under the press and using installing tool no. 1.821.209.000, insert the bearing in the wheel upright.

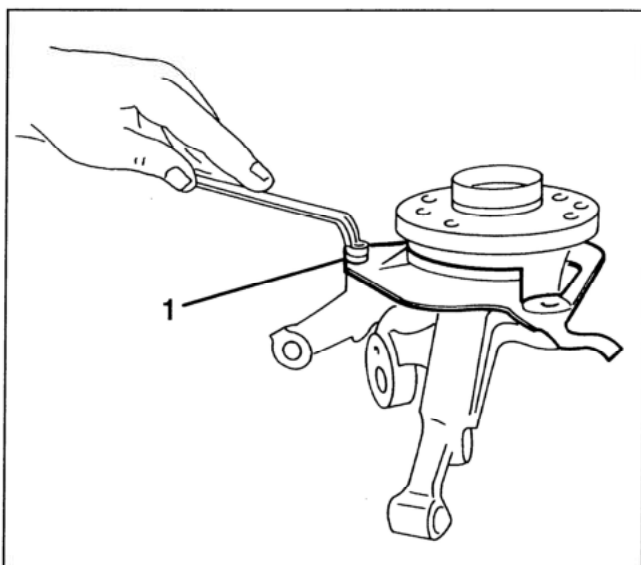


DIS-ASSEMBLY

1. Clamp the upright/wheel hub assembly in a vice and remove the flexible hub retainer ring.

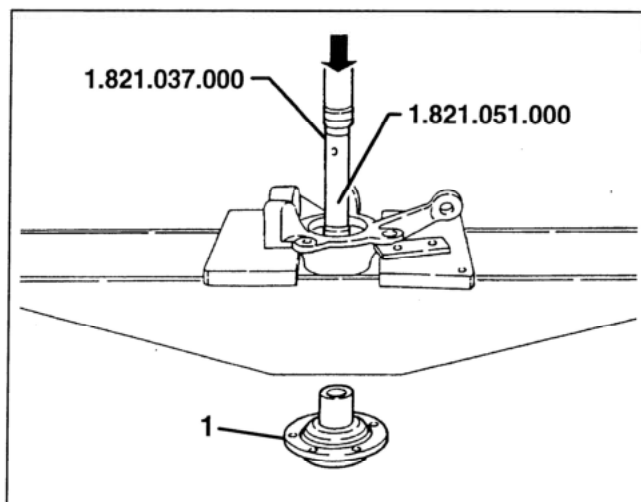


1. Slacken the screw fastening the brake disk protection.



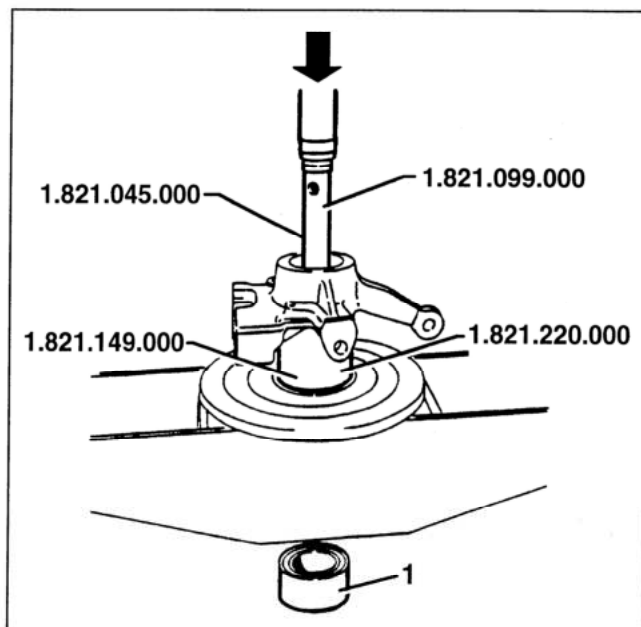
1. Working under the press, withdraw the wheel hub from the upright using:

- (for 4-cylinder only) puller tool no, 1.821.051.000
- (only for 6-cylinder) puller tool no, 1.821.037.000

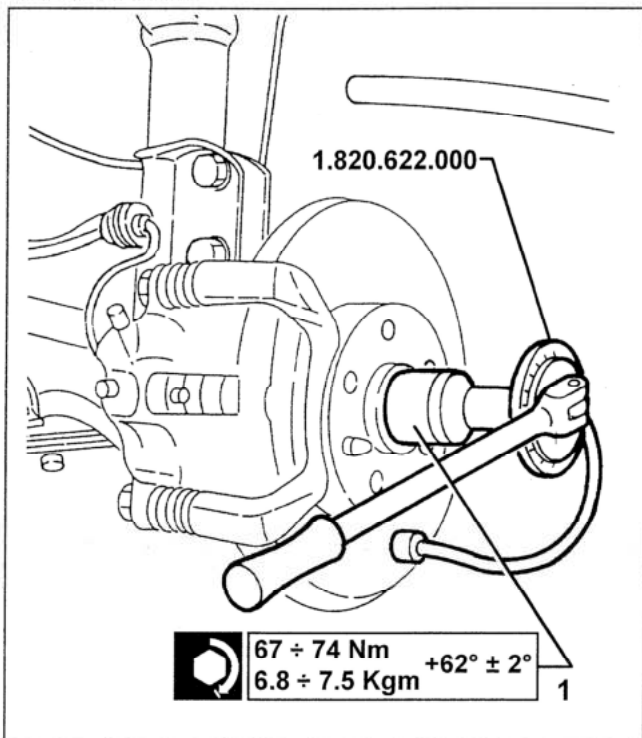


1. Working under the press, remove the outer bearing ring from the upright using:

- (for 4-cylinder only) support no. 1.821.149.000 and puller tool no, 1.821.045.000
- (only for 6-cylinder) support 1.821.220.000 and puller tool no, 1.821.099.000.



1. Tighten the new nut to the specified torque and then turn it further as specified, using tool no. 1.820.622.000.



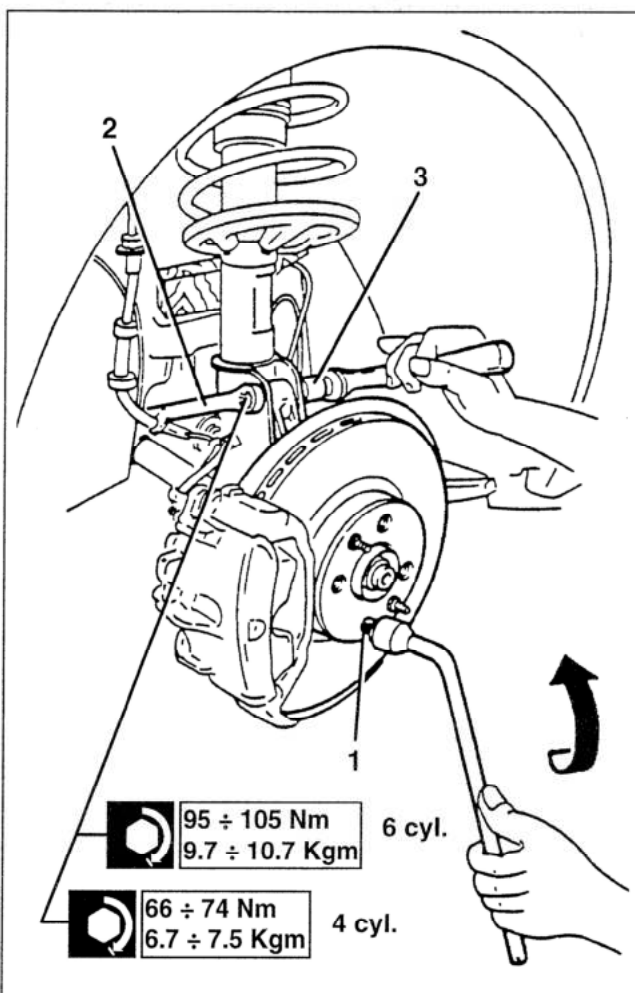
– Position a suitable wooden reaction piece between the spring plate and the body.



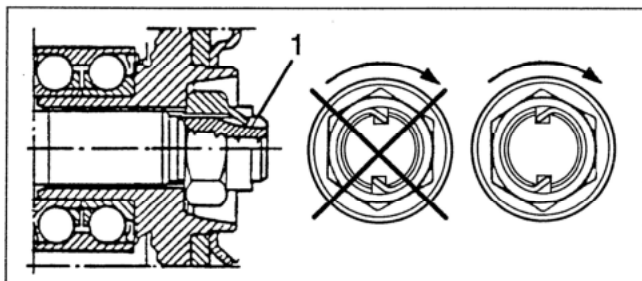
CAUTION:

Make sure that the rest point of the reaction piece is in correspondence with the plate and not with the spring coils, which could cause accidental movements and/or distortion during the operation of the spring itself.

1. Temporarily position one of the wheel studs and work on it in the direction illustrated using a wrench.
2. Position a fixed wrench to hold the nut of the fastening bolt.
3. Tighten the fastening bolt screws to the specified torque.



1. Using a scalpel, caulk the collar of the nut with two caulks (restore the condition of the removable nut).



NOTE: The cuts of the collar must be made on the notch of the hub from the opposite side from nut tightening: this way the safety tang is more resistant to accidental slackening.

ADJUSTING THE POSITION OF THE FRONT SUSPENSION UPRIGHT

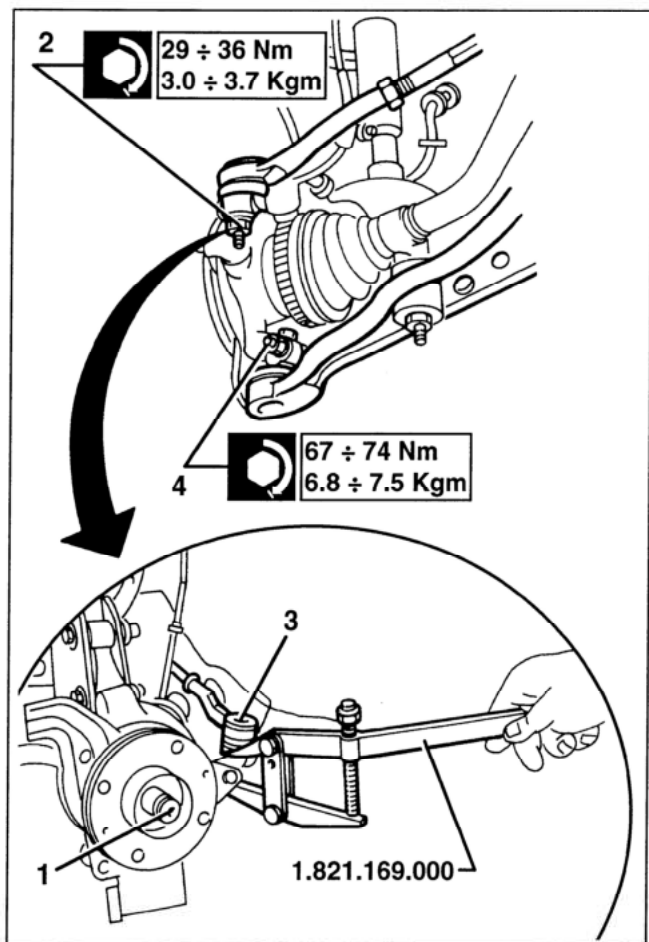
NOTE The operation described below, to be carried out each time it is necessary to slacken or remove the two bolts fastening the wheel upright to the shock absorber stem, is to eliminate the clearance between the fastening screws and the screw holes, to maintain the wheel camber angle within the specified limits (see: specific paragraph).

WHEELS AND HUBS

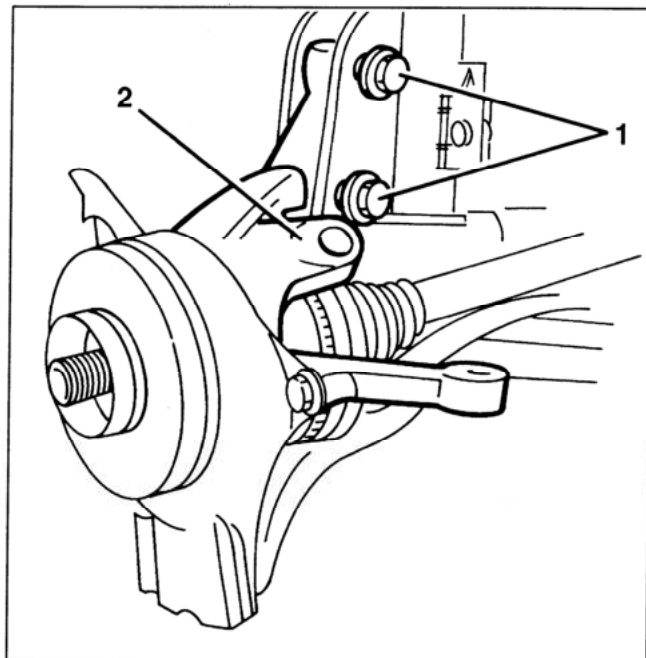
FRONT WHEEL UPRIGHT

REMOVING/REFITTING

- Remove the wheel.
- 1. Eliminate the caulking and slacken the nut fastening the wheel hub to the constant velocity joint.
- Remove the complete caliper and move it aside, without disconnecting the pipes from the braking system (see GROUP 33).
- 2. Slacken the steering knuckle nut connecting the side track rod to the wheel upright.
- 3. Using tool no. 1.821.169.000 disconnect the knuckle from the wheel upright.
- 4. Disconnect the bolt connecting the wishbone to the upright and remove it from the ball pin.



1. Slacken the two bolts.
2. Remove the upright/wheel hub assembly..

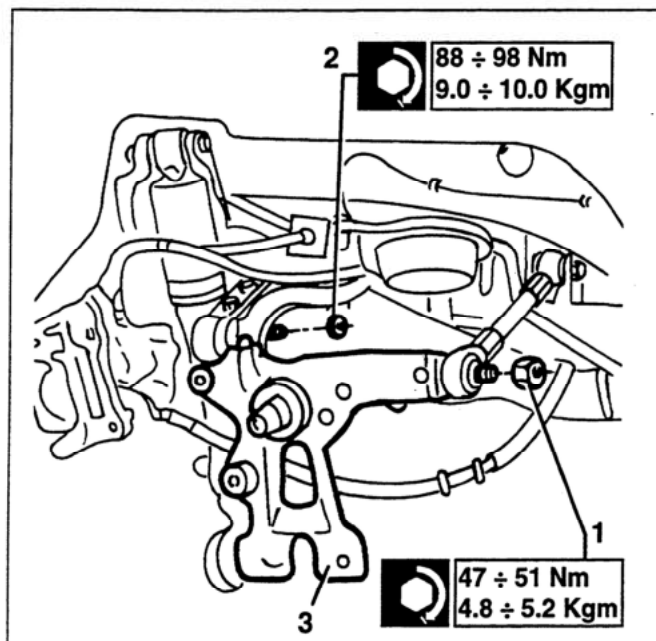


Refit, reversing the sequence followed for removal, tightening the nuts and screws to the specified torque and following the instructions for caulking the wheel hub fastening nut and the caulking procedures for the wheel hub fastening nut and adjustment of the position of the wheel upright.

CAULKING THE FRONT WHEEL HUB FASTENING NUT

- Always use a new nut.
- Accurately clean the thread and tang of the axle shaft using a metal brush and then blow with compressed air.
- Clean the nut and tang thread with ethyl spirits or ethane.

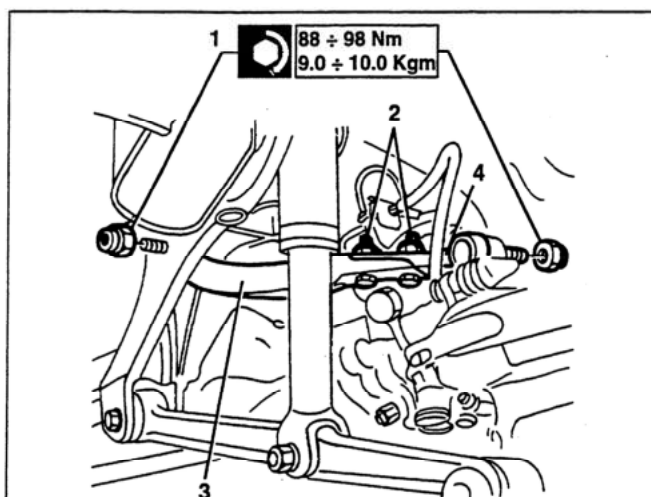
1. Remove the adjustment tie-rod fastening screw.
2. Remove the nut fastening the fork.
3. Retrieve the wheel upright complete with hub fastening pin. (If necessary remove the hub and use a press because the upright is force-fitted on the pin).



FORK

REMOVAL / REFITTING

- Set the car on a lift and remove the wheel on the side concerned.
1. Remove the two nuts fastening the fork to the frame.
 2. Remove the two nuts fastening the fork to the stabilizer bar connecting rod bracket
 3. Remove the corresponding screws and retrieve the front section of the fork.
 4. If necessary also remove the rear section of the fork slackening the nut fastening to the wheel upright.



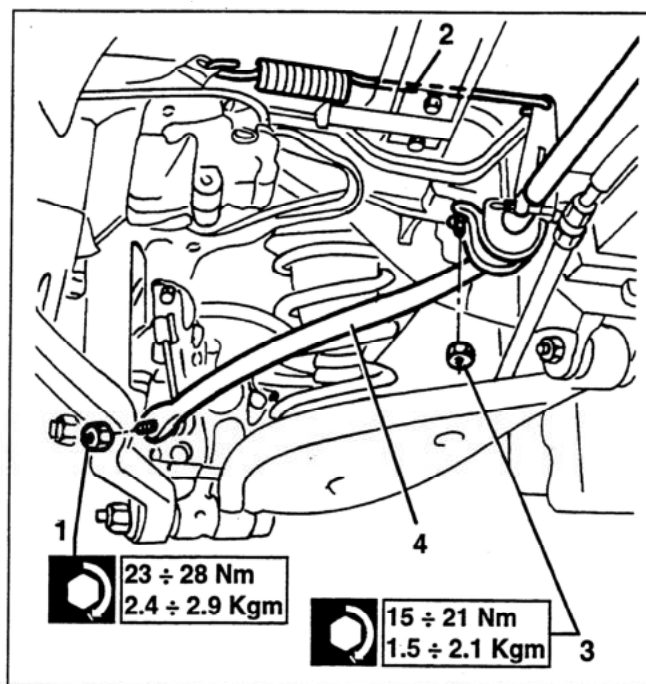
CHECKS AND INSPECTIONS

- Visually check the fork for cracks, signs of wear and distortion.
- Check the conditions of the flexible parts; if excessive noise or play is noted replace the fork.

STABILIZER BAR

REMOVAL / REFITTING

- Set the car on a lift and remove both wheels.
 - Remove the rear section of the exhaust pipe (see GROUP 10).
1. Remove the nuts fastening the connecting rods to the stabilizer bar
 2. Remove the braking load proportioning valve spring.
 3. Slacken and remove the two supports.
 4. Retrieve the stabilizer bar



WARNING

When refitting adjust the braking load proportioning valve (see GROUP 33)

CHECKS AND INSPECTIONS

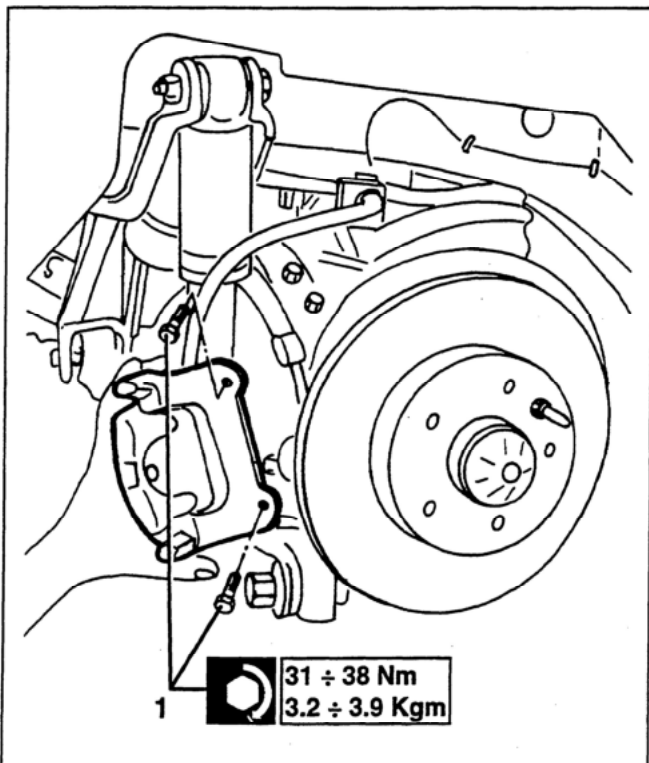
- Visually check the stabilizer bar for cracks and distortion, if so, replace it.
- Check that the connection supports between the stabilizer bar and chassis are intact and do not show signs of distortion or rust, otherwise, change them.
- Check the flexible pads for traces of ageing, if so, replace them

WHEEL UPRIGHT

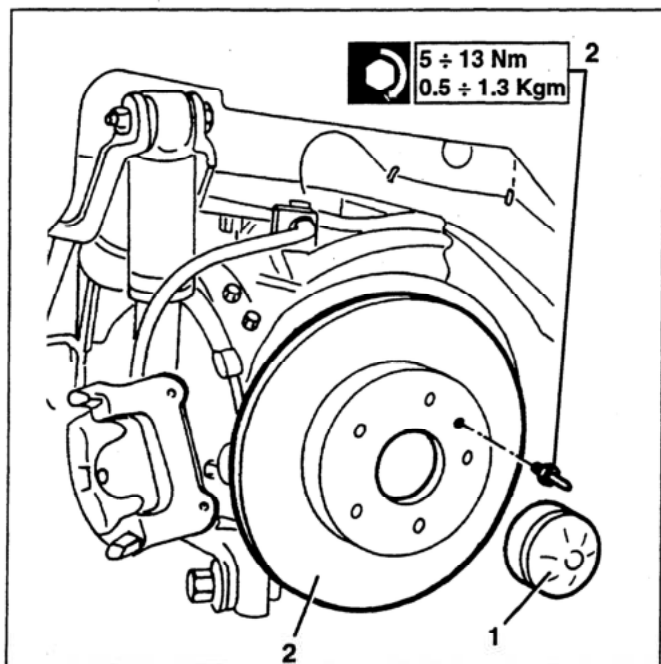
REMOVAL / REFITTING

– Set the car on a lift and remove the wheel on the side concerned

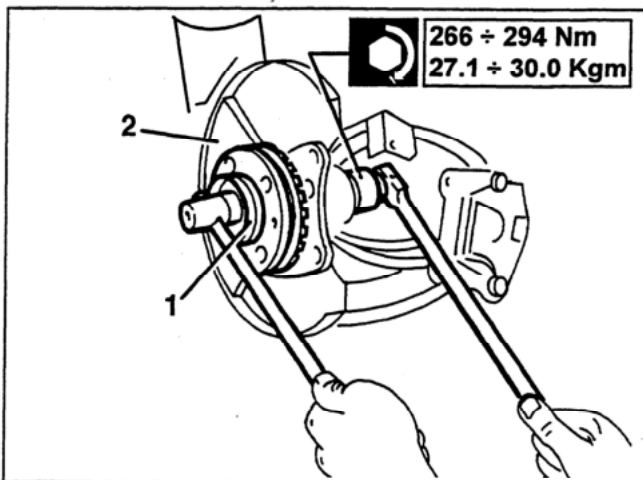
1. Slacken the two screws fastening the brake caliper to the support and move it aside without disconnecting the pipe and the handbrake cable.



1. Remove the hub cover plate.
2. Slacken the fastening pin and remove the brake disk.

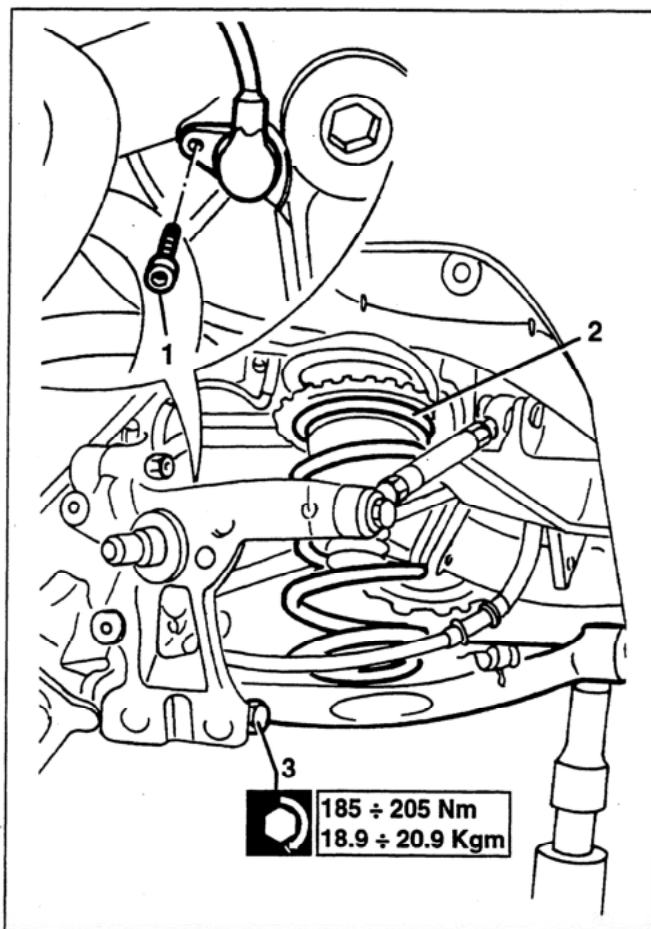


1. Slacken the hub fastening nut and remove the hub complete with phonic wheel.
2. Remove the brake disk guard.



N.B.: it is absolutely necessary to replace the nut when refitting.

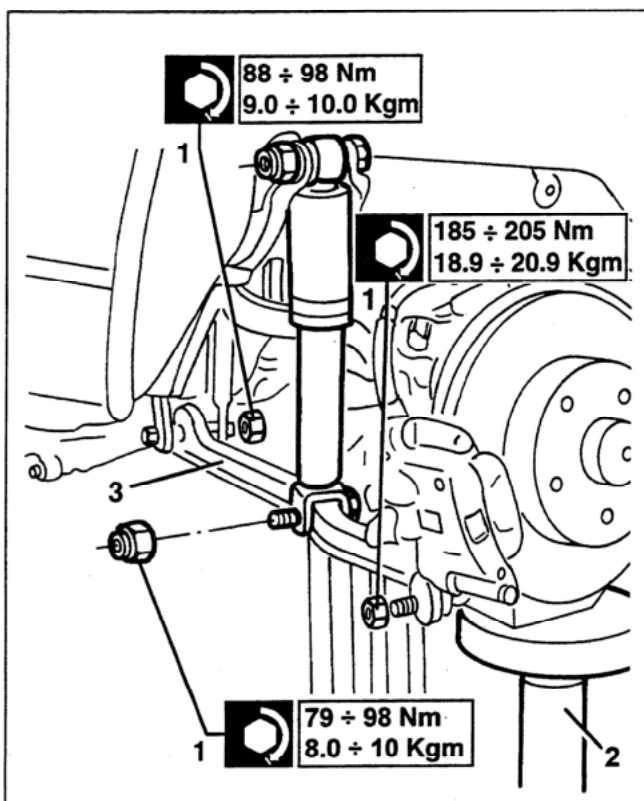
1. Remove the ABS sensor.
2. Remove the spring (see specific paragraph)
3. Remove the lower fastening bolt and retrieve the spring carrier arm.



SHOCK ABSORBER CARRIER ARM

REMOVAL / REFITTING

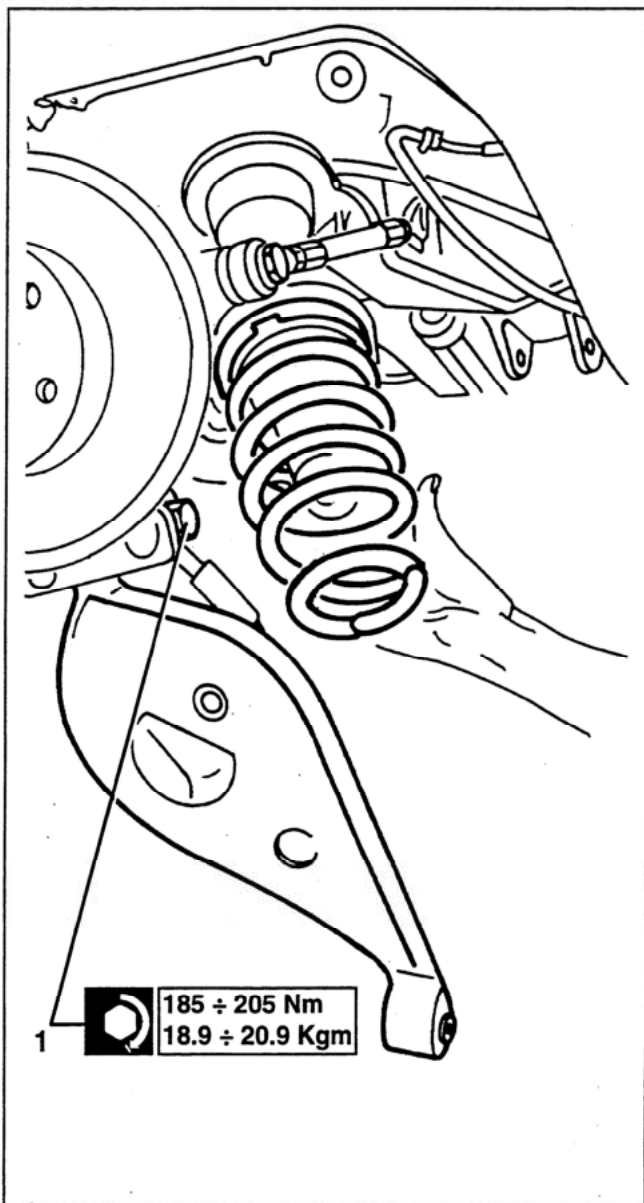
- Set the car on a lift and remove the wheel on the side concerned.
- 1. Remove the three nuts fastening the arm
- 2. Position a hydraulic jack with plastic plate under the wheel upright.
- 3. Remove the screws and retrieve the shock absorber carrier arm.



SPRING CARRIER ARM

REMOVAL / REFITTING

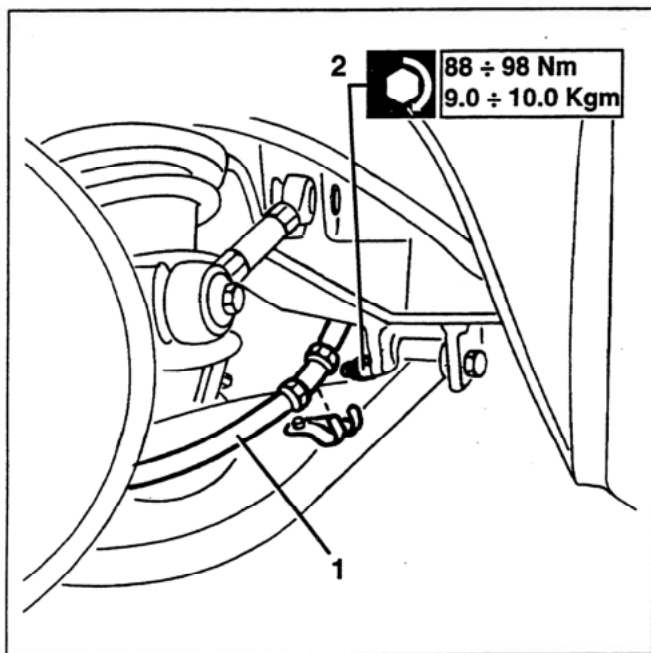
- Set the car on a lift and remove the wheel on the side concerned
- Remove the spring (see specific paragraph)
- 1. Slacken the bolt fastening the spring carrier arm to the wheel upright and retrieve the arm



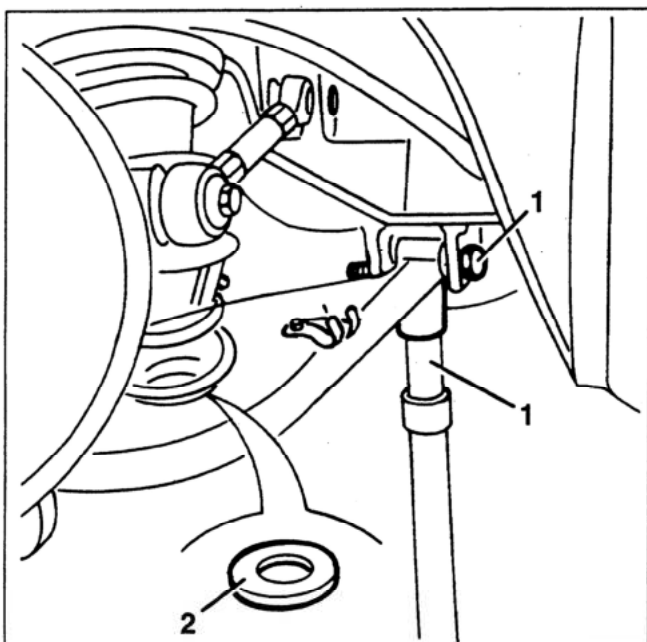
CHECKS AND INSPECTIONS

- Visually check the arm for cracks, signs of wear on the wheel side surface and distortion.
- Check the condition of the flexible parts; if excessive noise or play is noted, replace the arm.

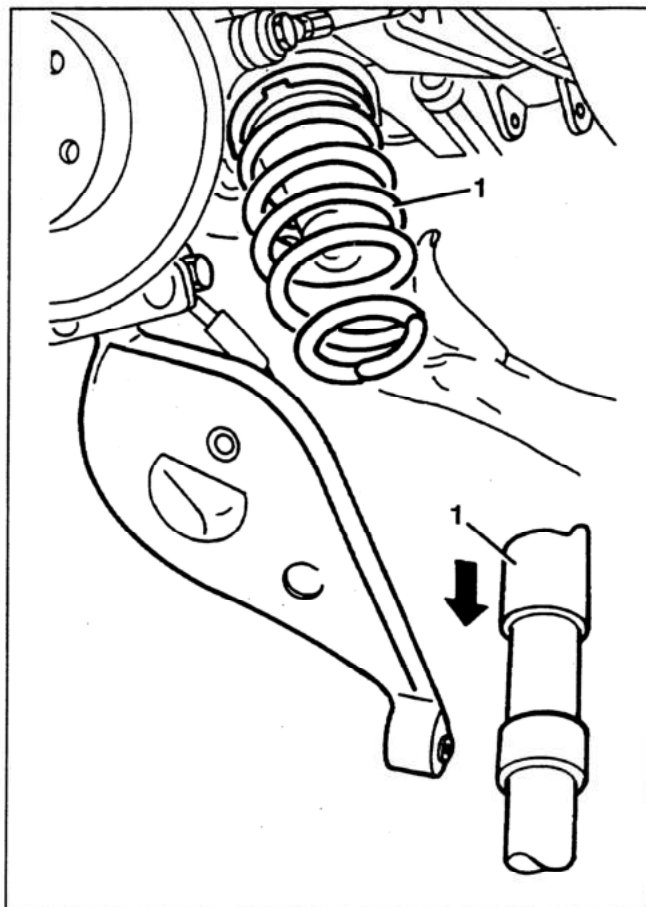
1. Remove the handbrake cable.
2. Slacken the nut fastening the spring carrier arm to the frame.



1. Set a hydraulic jack - with the support described previously - under the spring carrier arm and remove the fastening screw
2. Remove the lower spring rebound buffer



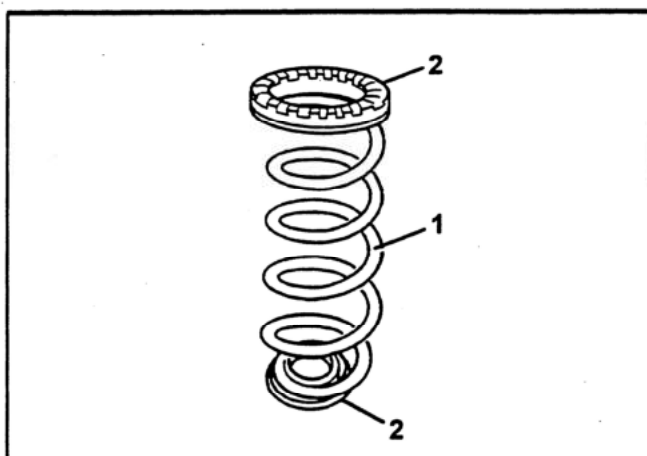
1. Lower the jack and remove the spring



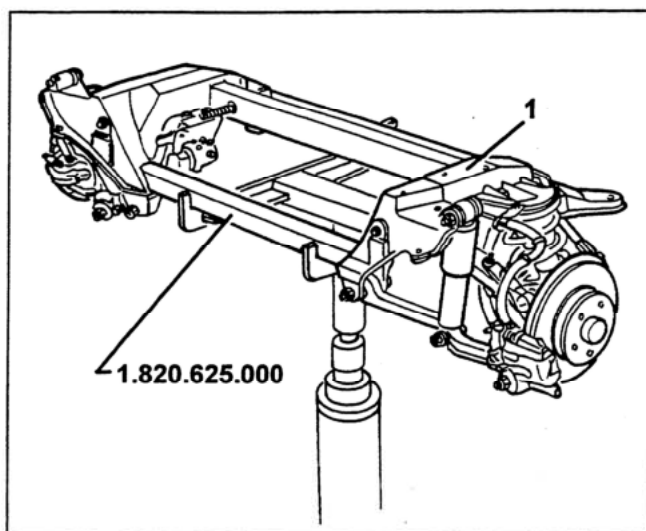
CHECKS AND INSPECTIONS

1. Visually check the springs for cracks, distortion and faults in general that might adversely affect their operation.
2. Check that the rubber parts are intact and change them if they are damaged, distorted or heavily worn.

NOTE: Coil springs are subdivided into classes of rigidity and distinguished by spots of paint of different colours. When replacing one or both springs, check that the new springs are marked with the same colour as the old ones



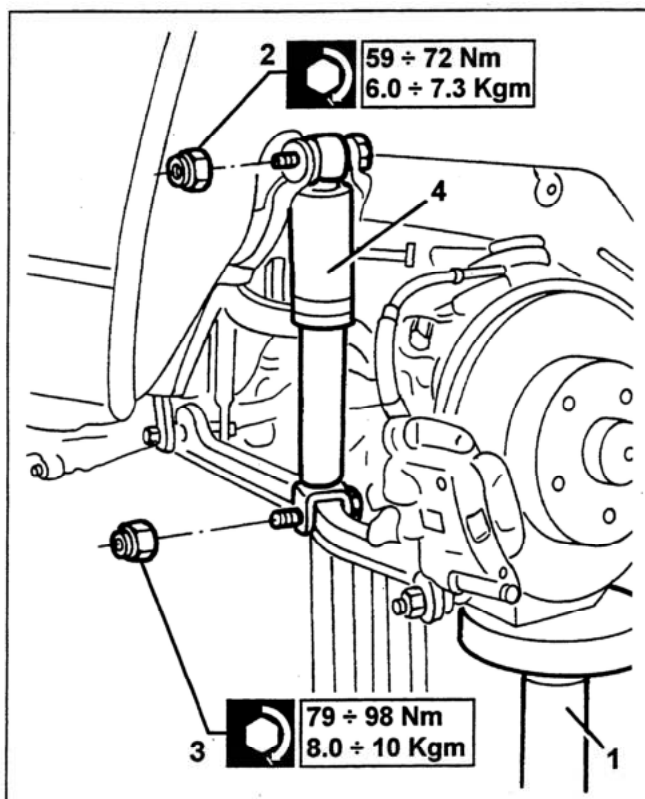
1. Lower the complete suspension frame.



SHOCK ABSORBER

REMOVAL / REFITTING

- Set the car on a lift and remove the wheel on the side concerned.
- 1. Position a hydraulic jack with plastic plate under the spring carrier arm to lightly compress the spring.
- 2. Remove the shock absorber upper fastening bolt.
- 3. Remove the shock absorber lower fastening bolt.
- 4. Remove the shock absorber.



CHECKS AND INSPECTIONS

- Check the conditions of the shock absorber for functionality and oil leaks; if necessary change the shock absorber.

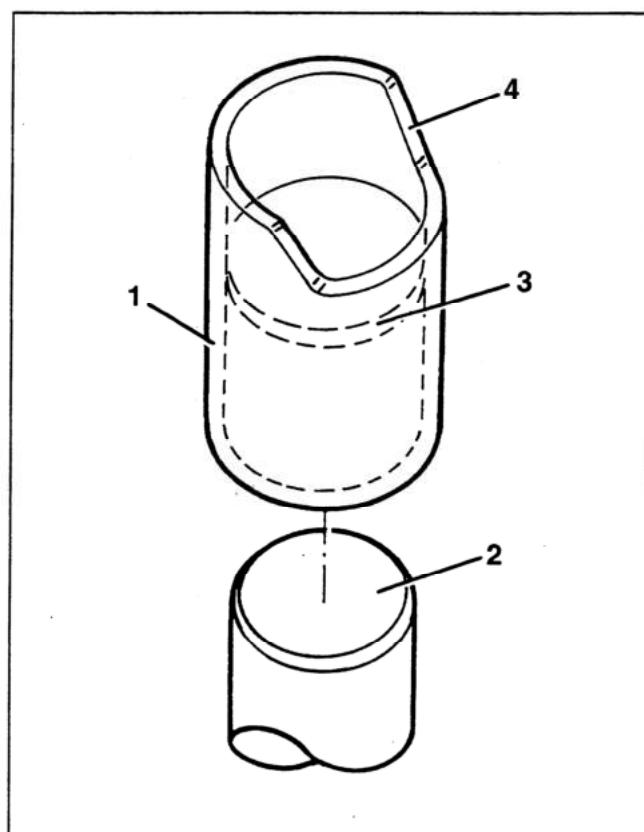
COIL SPRING

REMOVAL / REFITTING

- Set the car on a lift and remove the wheel on the side concerned.

NOTE:

When removing the spring, a special end piece, to be made as illustrated, should be installed on the hydraulic jack.

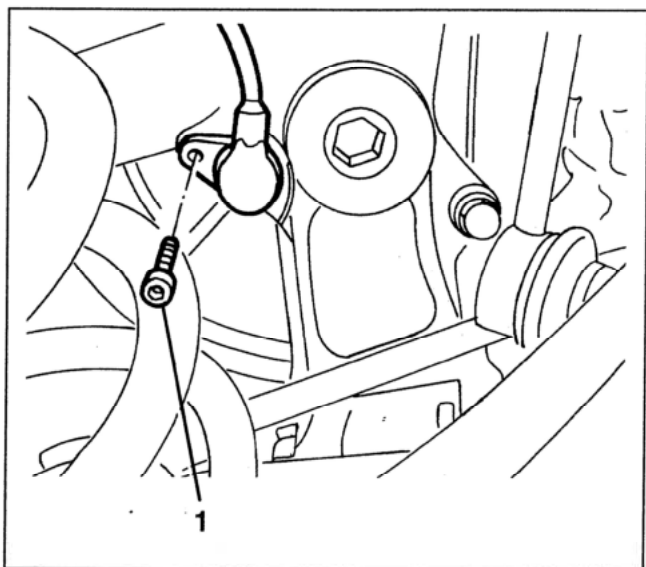


1. Piece of pipe
2. Hydraulic jack stem
3. Contact cap (welded)
4. Rest seat for spring carrier arm

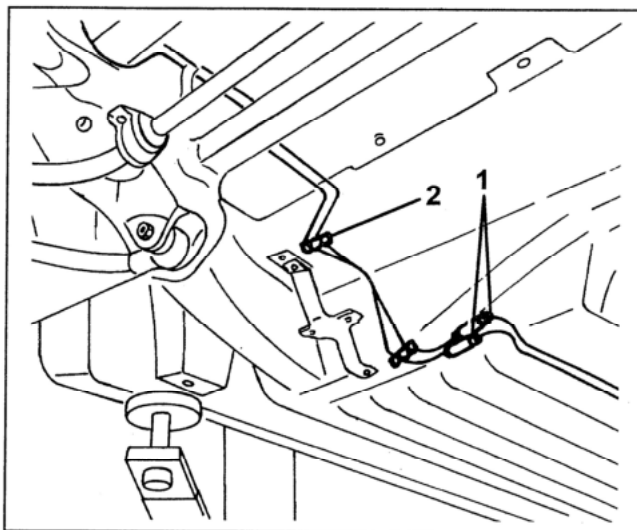
COMPLETE SUSPENSION FRAME

REMOVAL / REFITTING

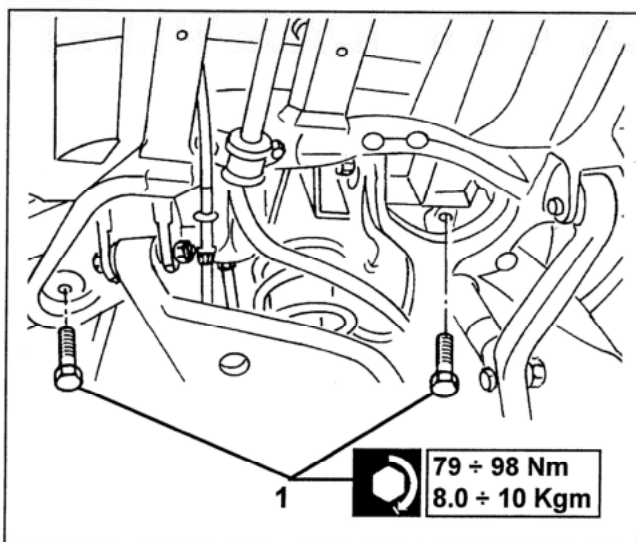
- Set the car on a lift.
 - Working inside the car, loosen the handbrake lever adjustment nut. (see GROUP 33).
 - Raise the car.
 - Remove the rear section of the exhaust, including the heat shields (see GROUP 10).
1. Disconnect the ABS sensor connections.



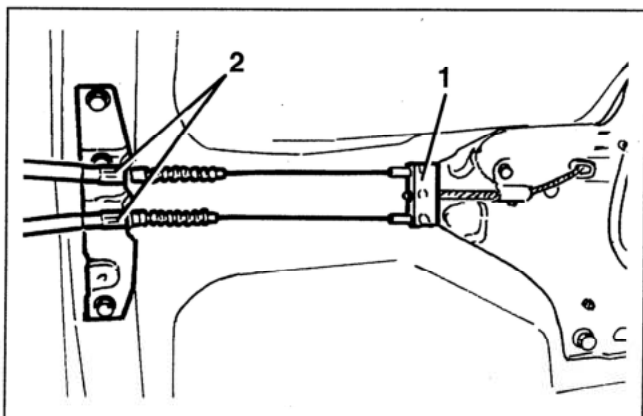
1. Disconnect the brake pipes, suitably plugging the holes.
2. Disconnect the pipes from the fastenings to the body.



1. Prepare a hydraulic jack with support 1.820.625.000 and set it under the suspension unit, and slacken the four screws fastening the frame to the body (two per side).



1. Disconnect the two handbrake cables from their clamp.
2. Disconnect them from the rear fastening.



On the Alfa Romeo SPIDER and GTV a light alloy frame has been fitted in correspondence of the rear suspension which is hooked to the floor panel of the car in the anchorage points provided for conventional suspension.

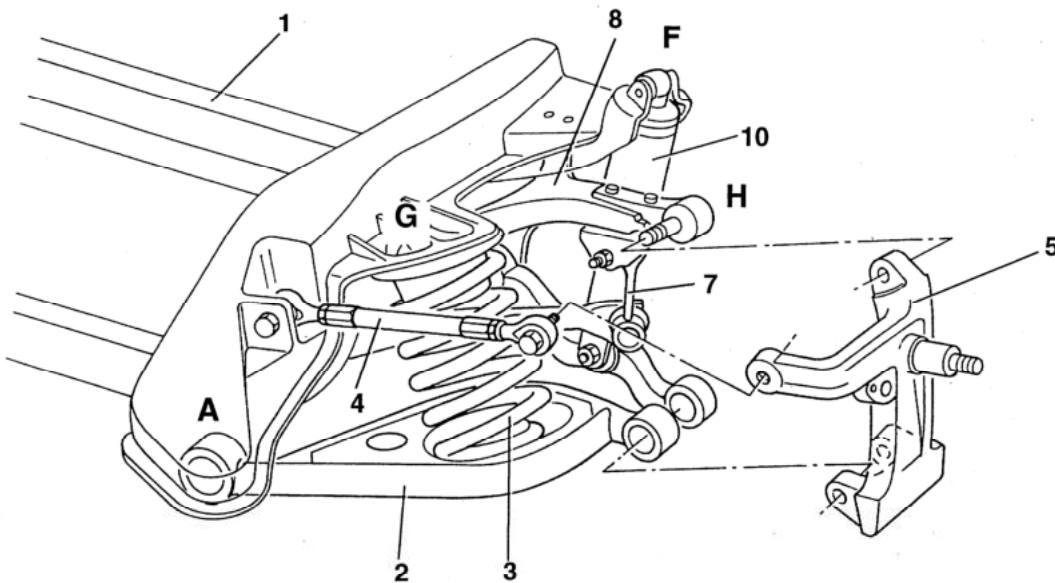
This frame has the supports needed for the installation of the multilink suspension.

Fastening of the components to the frame:

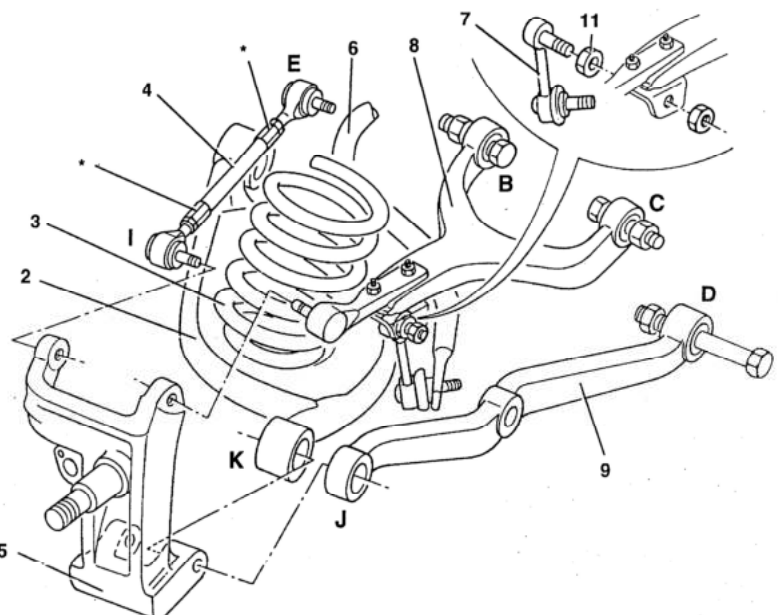
The spring carrier arm (2) is in position A; in B and C the fork (8) is coupled, to which also the stabilizer bar (6) is connected by link (7) with the spacer (11); in D there is the coupling of the arm (9) on which the shock absorber (10) is fitted; in E there is the adjustment arm (4).

En el chasis (1) también se fija la parte superior del amortiguador (10) en F y el muelle (3) en G.

En el montante de la rueda se engancha la horquilla (8) en H, el brazo con el tornillo de reglaje (4) en I, el brazo porta-amortiguador (9) en J y el brazo porta-muelle (2) en K.



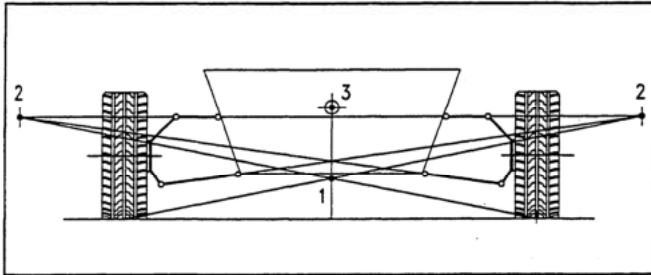
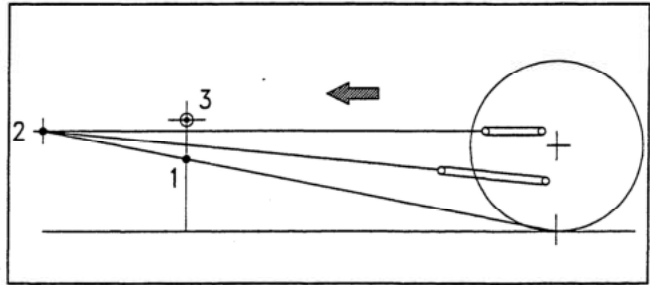
1. Rear suspension frame
2. Spring holder arm
3. Spring
4. Adjustment tierod
5. Wheel upright
6. Stabilizer bar
7. Stabilizer bar connecting rod
8. Fork
9. Shock absorber carrier arm
10. Shock absorber
11. Spacer



NOTE : the adjustment tierod (4) enables correct toe- in adjustment of the rear wheels through the two lock nuts (*) (see paragraph "GEOMETRIES").

Through a suitable arrangement of the links, it is possible to set the centre of roll (1) near the centre of gravity (3); this means that when lateral forces are applied, it is possible to **limit the extent of roll** and changes of camber.

The movement of the suspension caused by roll of the car also ensures that the wheels are kept vertical also when cornering: this way the **entire tyre tread is exploited to develop lateral adherence**.



1. Centre of roll
2. Centre of instantaneous rotation
3. Centre of gravity of the car

Multilink suspension **also limits pitching movement**; therefore, in addition to improving comfort, during acceleration the weight on the front wheels is reduced less, thus the **traction force that can be transmitted to the ground is not limited**.

The position of the centre of instantaneous rotation (2) of the car depends on the position of the connection points to the body of the suspension arms.

Also during braking, the multilink system, even though it has only been adopted on the rear suspension, **makes it possible to keep the car parallel to the ground**.

1. Centre of pitching
2. Centre of instantaneous rotation
3. Centre of gravity of the car

Multilink suspensions involve the use of a number of links between the wheel hub and the body. The trajectories of the points of anchorage are of different radius and they are arranged on planes that are not parallel with one another.

The resulting complex geometrical system which is the outcome of extensive experiments, makes it possible to maintain the centre of instantaneous rotation (2) in such a position as to allow a reduced distance between the centre of pitching (1) and the centre of gravity of the car (3); thus it is possible to minimise the pitching movement.

It is a known fact that a car with front wheel drive, tends to understeer when cornering, due to the prevalence of drift on the driving wheels.

Multilink suspension systems, have better control over the wheel angles (camber and toe-in) and make it possible to **recover the understeering effect** with better performance when entering a bend, therefore it is not necessary to carry out a series of corrections of the steering angle.

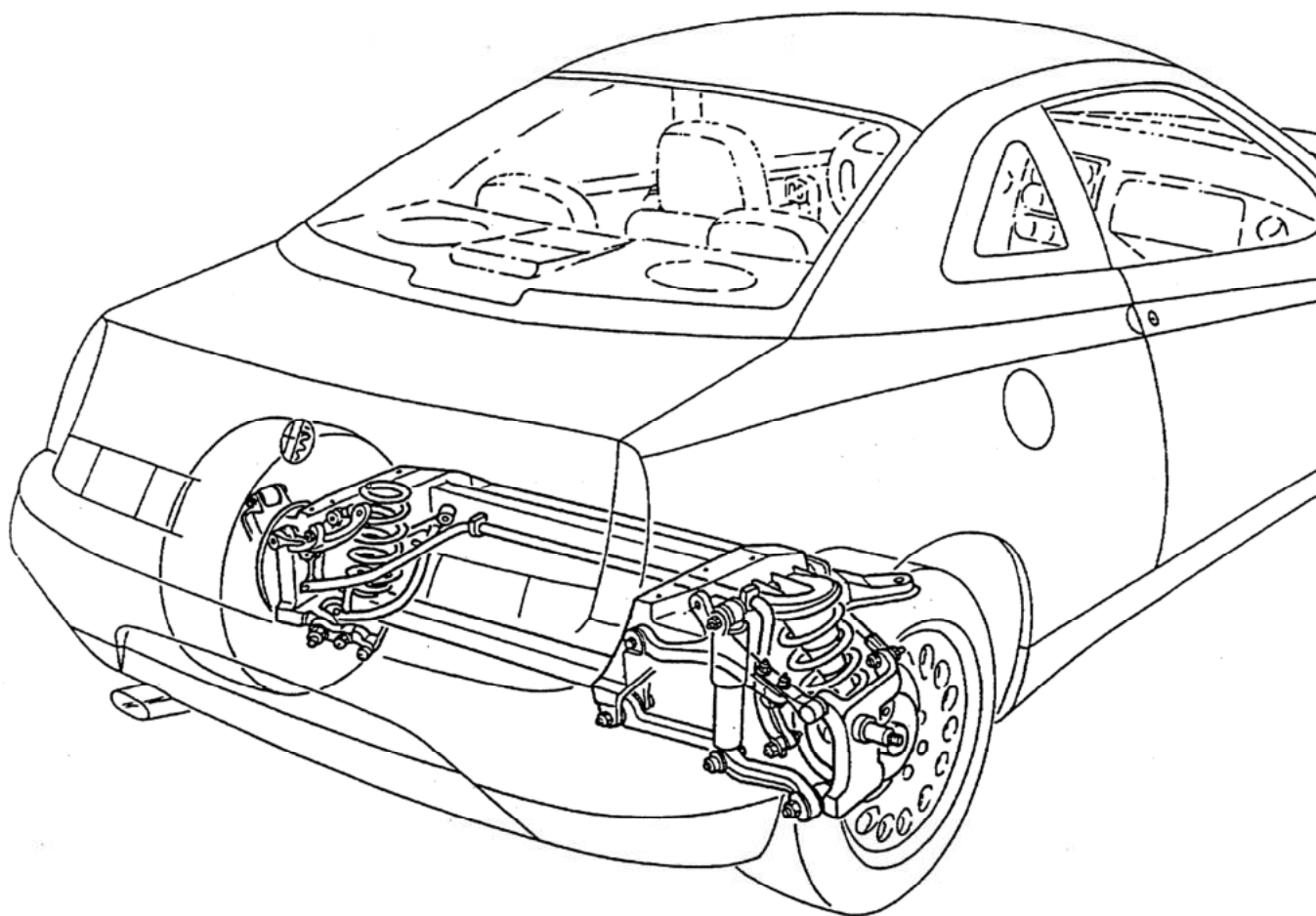
In fact, these suspensions make it possible to control (and optimise both in the project and experimentally) the wheel angles under the effect of lateral and vertical loads developed when cornering and in changes of direction and also the longitudinal ones induced by braking independently.

REAR "MULTILINK" SUSPENSION

DESCRIPTION

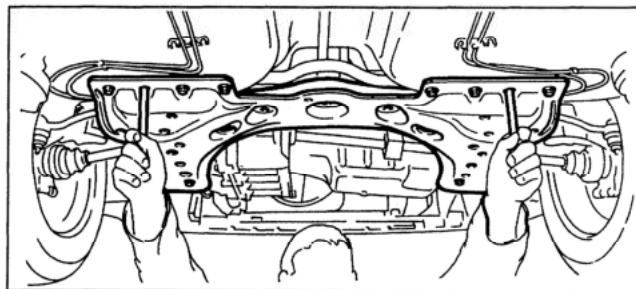
Multilink suspensions are the most advanced in the specific field.

On the Alfa Romeo SPIDER and GTV multilink suspension has been adopted on the rear axle.



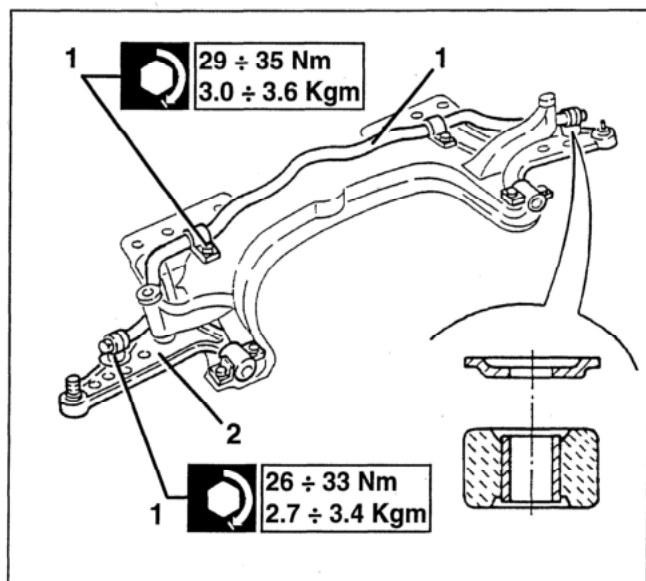
1. If necessary, remove the stabilizer bar slackening the nuts fastening the U-bolts supporting the bar itself to the crossmember and the nuts fastening the stabilizer bar connecting rod to the wishbones.
2. If necessary, remove the wishbones.

Tighten the bolts fastening the wheel upright to the shock absorber stem as described in the specific paragraph (Front Wheel Upright).



CHECKS AND INSPECTIONS

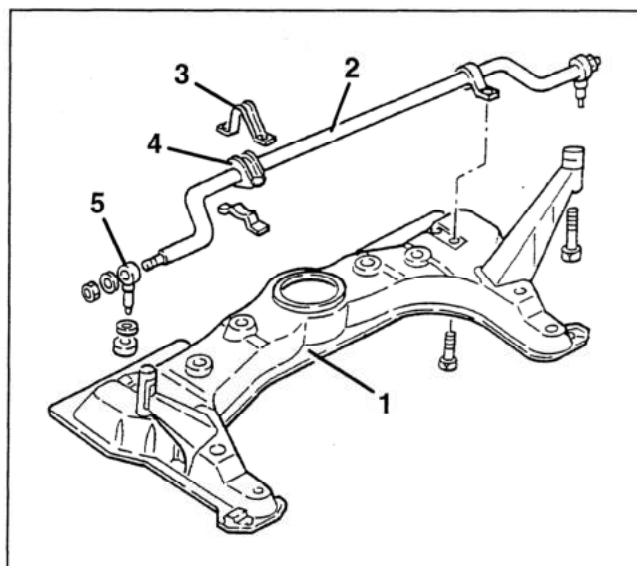
1. Visually check the crossmember making sure there are no cracks or distortions that might adversely affect operation, if so, change it.
2. Visually check the stabilizer bar for cracks and distortion, if so change it.
3. Check that the U-bolts connecting the stabilizer bar to the crossmember are intact without signs of distortion or rust, if so, change them.
4. Check the conditions of the rubber pads and change them if they are not satisfactory.
5. Check that the ball pins between the stabilizer bar and the wishbones are intact and free of distortion or signs of rust, in which case, change them.



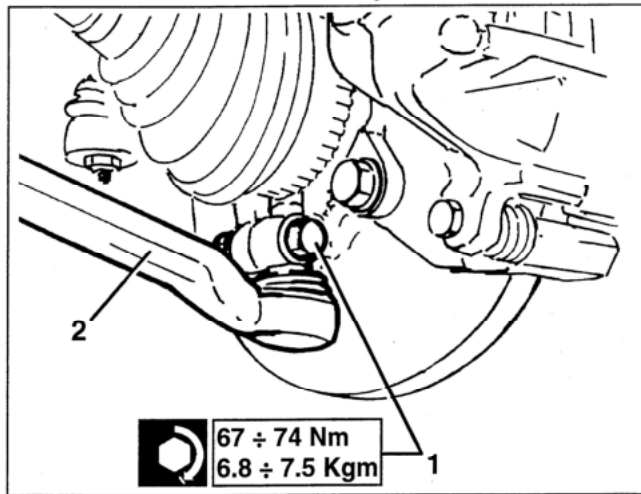
When refitting the stabilizer bar on the crossmember check that the washers face towards the rubber pad, as incorrect assembly could adversely affect the life of the pad itself.



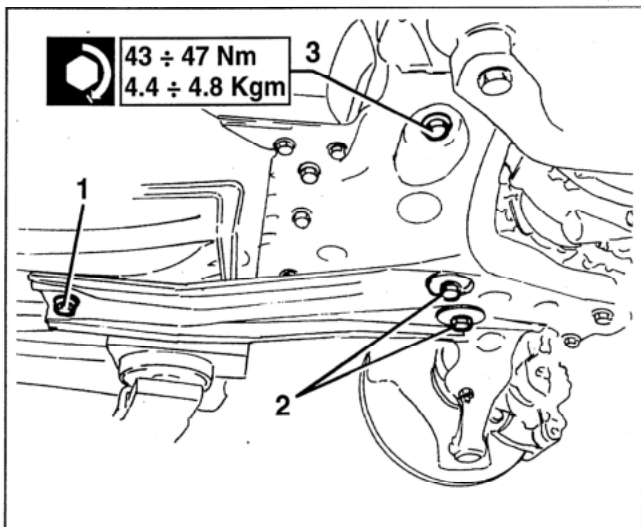
When refitting the front crossmember it is necessary temporarily fasten it, then, using two 17.5 mm diameter pins, centre it with the holes on the body and lastly fasten it definitively tightening the screws to the specified torque.



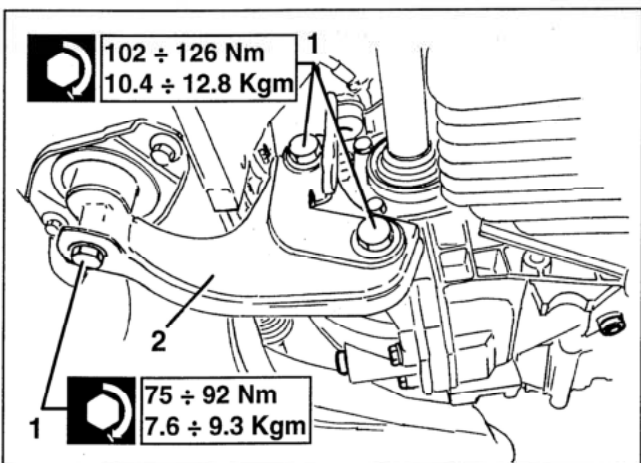
1. Slacken the bolt fastening the ball pin connecting the wishbone to the wheel upright.
2. Remove the wishbone ball joint.



1. Working from under the car, slacken the four screws fastening each of the front crossmember reinforcement struts.
2. Remove the reinforcement struts.
3. Slacken the screws fastening the steering box to the crossmember.

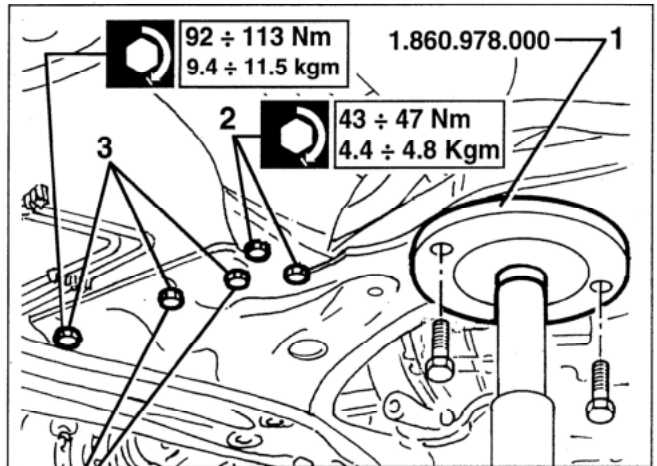


1. Slacken the three fastening screws.
2. Remove the rear engine mount.

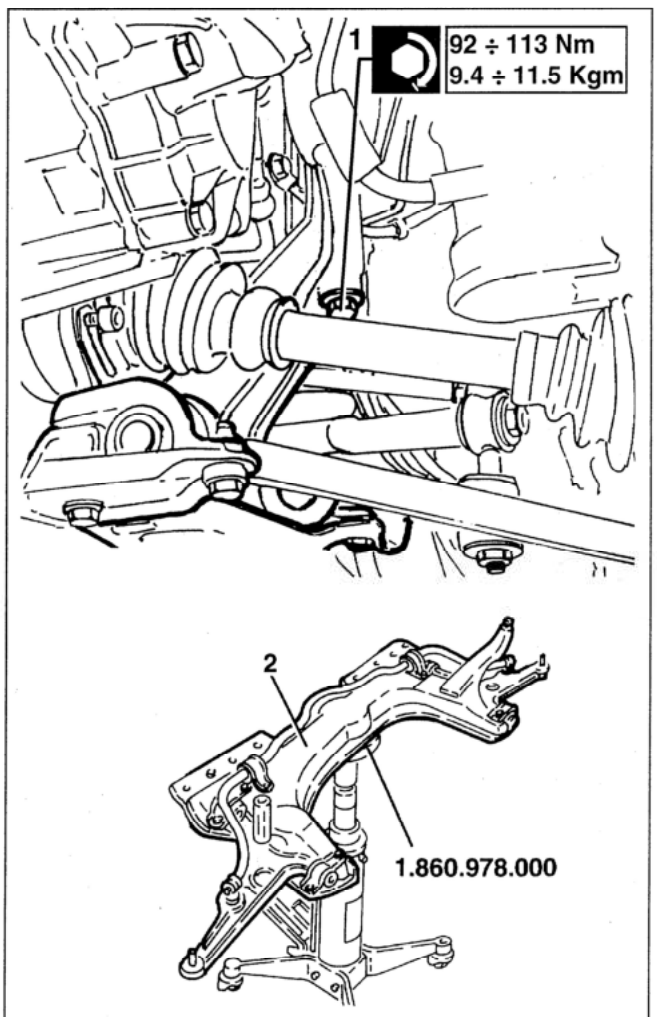


- Install tool 1.860.978.000 on a hydraulic jack.

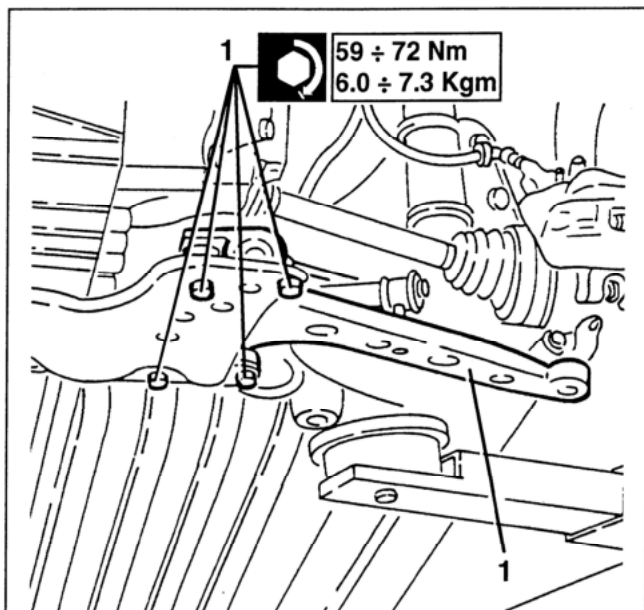
 1. Fasten the tool to the centre of the crossmember
 2. Slacken the nuts fastening the crossmember to the gearbox controls support.
 3. Slacken the screws fastening the crossmember to the body.



1. Slacken on each side the crossmember upper fastening screw.
2. Slowly lower the hydraulic jack and remove the crossmember complete with wishbones and stabilizer bar.



1. Slacken the screws fastening the wishbone U-bolts to the front crossmember and remove the wishbone.

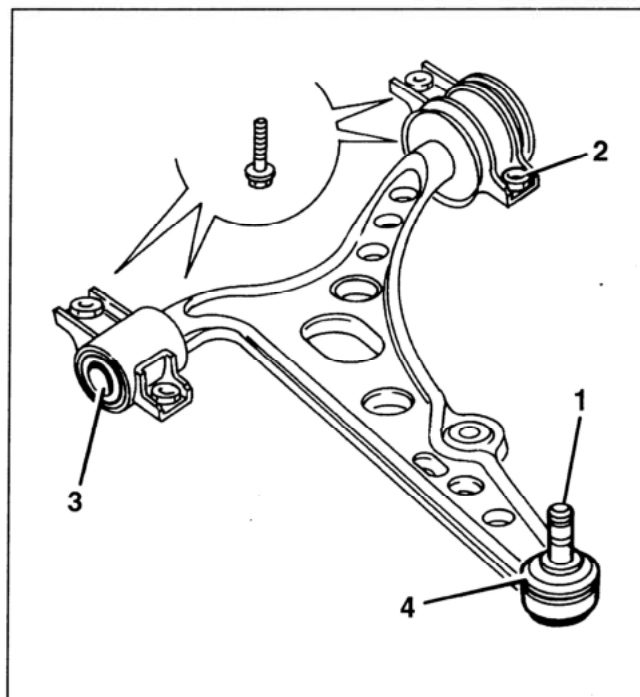


Refit the wishbone reversing the sequence followed for removal.

- Tighten the bolts fastening the wheel upright to the shock absorber stem as described in the specific paragraph (Front Wheel Upright).

CHECKS AND INSPECTIONS

1. Check the intactness and wear conditions of the ball pin between the wishbone and wheel upright and, if necessary, change it.
2. Check the intactness and wear conditions of the U-bolts between the wishbone and front crossmember, and, if necessary replace.
3. Check the intactness and wear conditions of the bushes of the U-bolts between the wishbone and front crossmember and, if necessary, replace.
4. Check the intactness and wear conditions of the rubber boots of the ball pin between the wishbone and the wheel upright and, if necessary, replace.



FRONT CROSSMEMBER AND ANTIROLL BAR

REMOVING/REFITTING

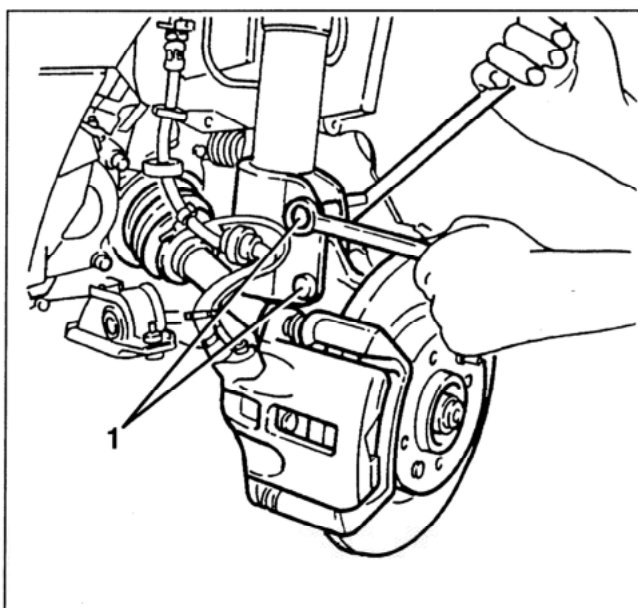
When needing to replace only the antiroll bar or the front crossmember, it is still necessary to remove the whole crossmember proceeding as follows:

- remove the front section of the exhaust pipe (see GROUP 10).

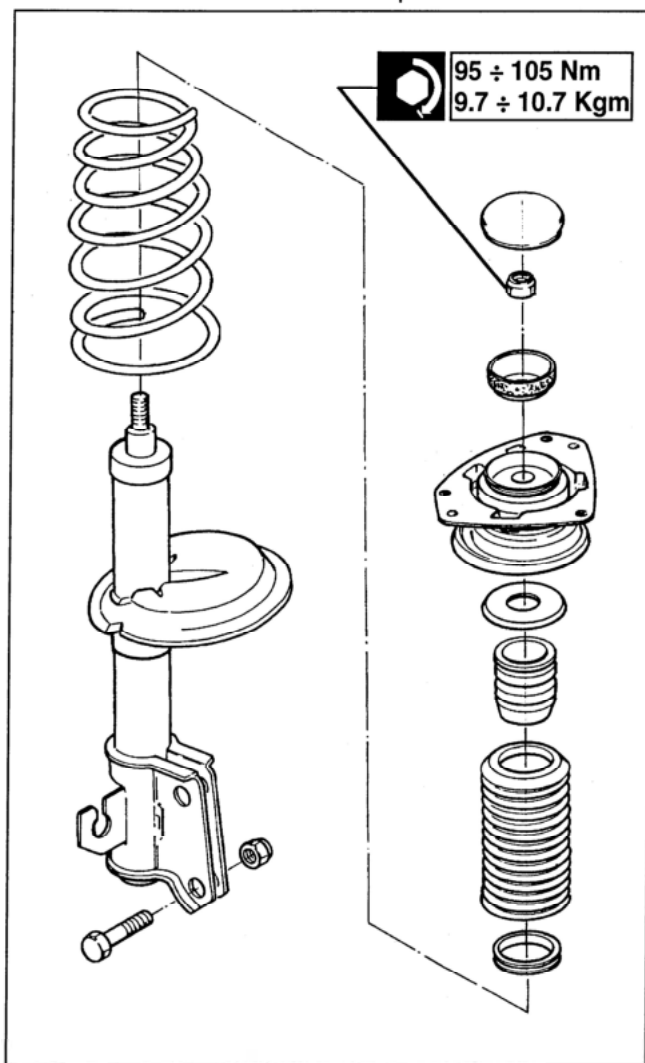
Working from both sides:

- Remove the front wheel.

1. Slacken the bolts fastening the wheel upright to the shock absorber stem.



Decompress the spring-shock absorber assembly and dis-assemble the different parts.



Refit the spring-shock absorber assembly reversing the sequence followed for dis-assembly and tightening the centre nut to the specified torque.

CHECKS AND INSPECTIONS

- Check that the fastening components of the coil spring shock absorber assembly have no abnormalities that might adversely affect operation.
- Check that the shock absorber is functional and for oil leaks, in which case change the whole shock absorber.
- Visually check the springs for cracks, distortion and abnormalities in general, that might adversely affect operation.

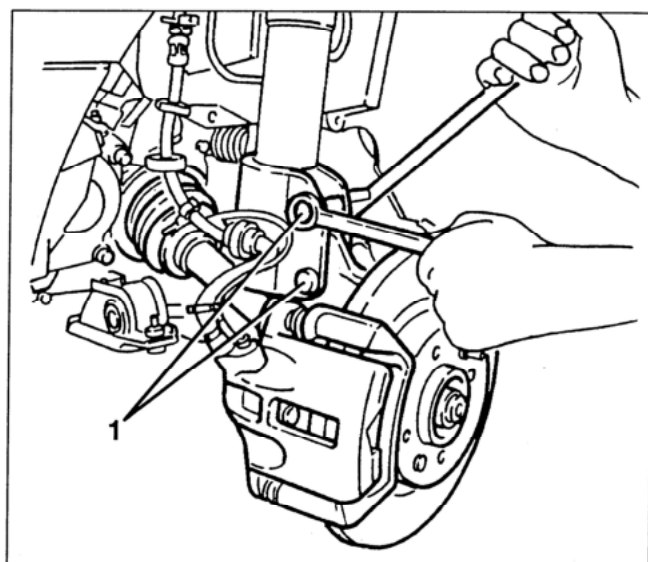
The coil springs are subdivided into classes of rigidity and marked with paint of different colours to simplify their identification. When changing one or both springs, always make sure that the new springs are distinguished by paint of the same colour as the ones replaced.

- Check that the rubber parts are intact, and change them if they are distorted or excessively worn.

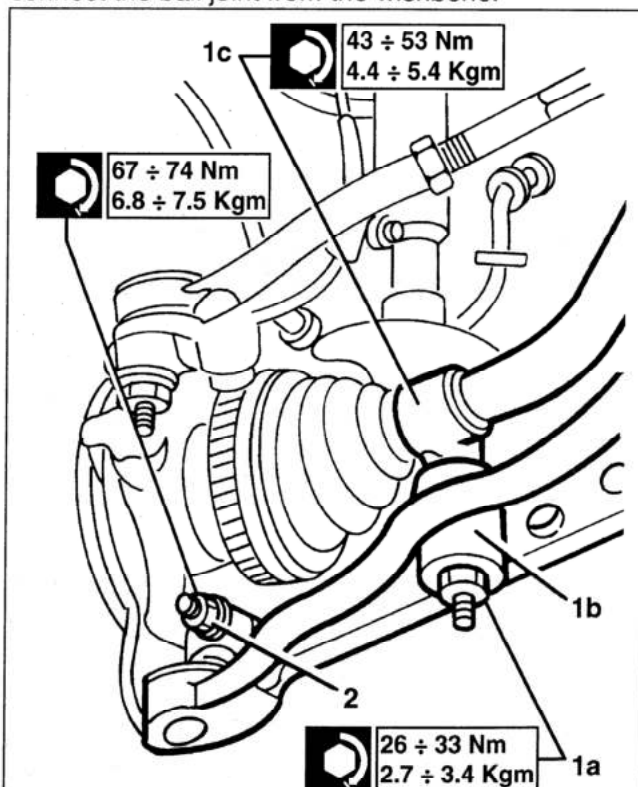
WISHBONE

REMOVING/REFITTING

- Remove the front wheel on the side concerned.
1. Slacken the two bolts fastening the wheel upright to the shock absorber stem.

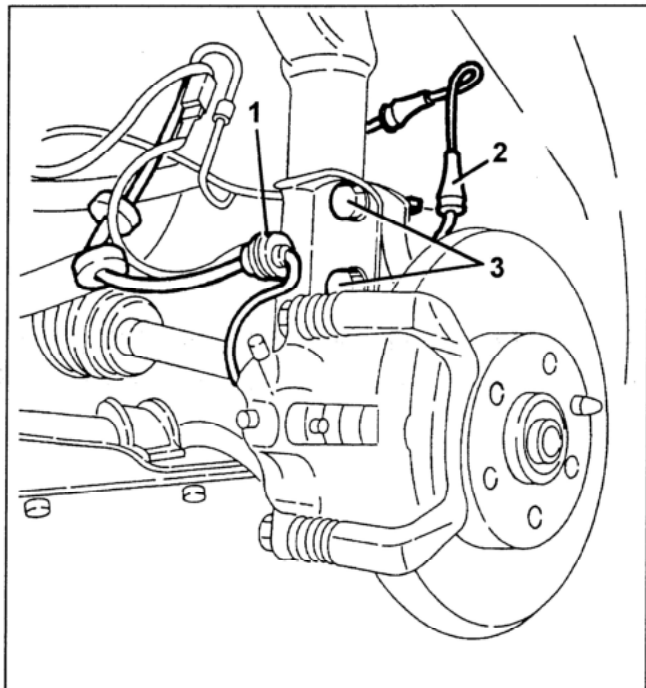


1. Slacken the nut fastening the connecting rod to the wishbone (1a) and remove it together with the rubber pad (1b) then slacken the connecting rod-stabilizer bar fastening nut (1c), and remove it.
2. Slacken the bolt fastening the connection ball pin between the wishbone and wheel upright, then, disconnect the ball joint from the wishbone.

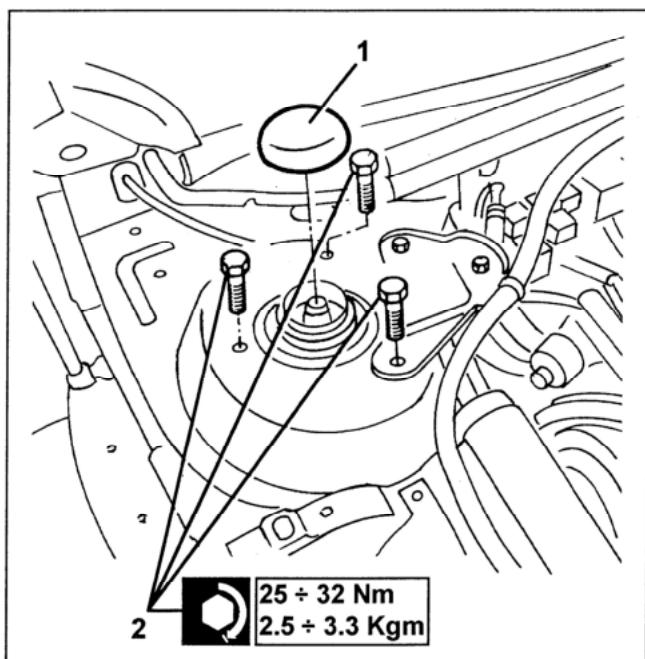


**COIL SPRING AND SHOCK
ABSORBER ASSEMBLY****REMOVING/REFITTING**

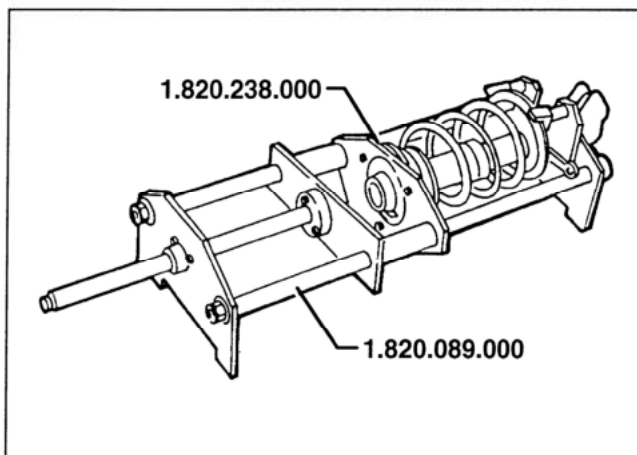
- Remove the front wheel on the side concerned.
- 1. Disconnect, from the vertical guide with shock absorber, the brake pipe retainer grommet.
- 2. Disconnect the ABS inductive sensor from its clamp.
- 3. Slacken the the two bolts fastening the shock absorber guide to the wheel upright.



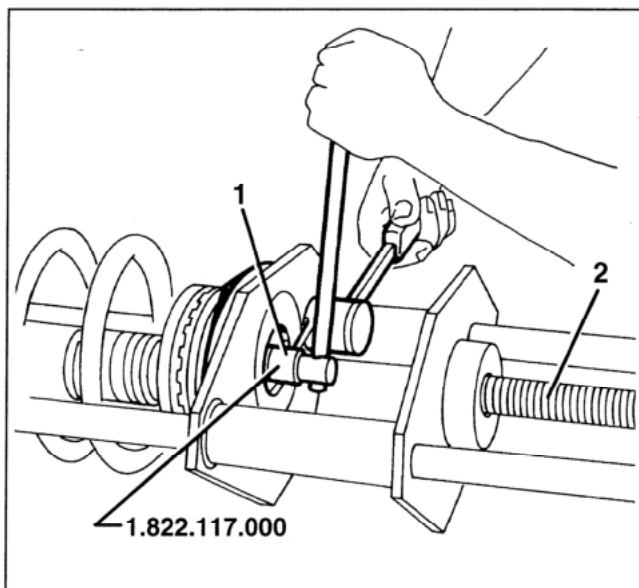
- 1. Remove the protective boot.
- 2. Slacken the three screws fastening the shock absorber to the dome and remove the coil spring and shock absorber assembly.

**DIS-ASSEMBLY/REASSEMBLY**

- 1. Position the coil spring-shock absorber assembly on tool no. 1.820.089.000 fitted with rest plates no. 1.820.238.000 and compress it.



- 1. Insert a 6 mm Allen wrench in the shock absorber stem centre pin.
- 2. Using the extension for wrench no. 1.822.117.000, and levering with the Allen wrench, slacken the spring-shock absorber upper nut.



FRONT SUSPENSION

DESCRIPTION

The front suspension is Mc Pherson type, independent with telescopic struts.

The front suspension can be mainly knocked down into the following components:

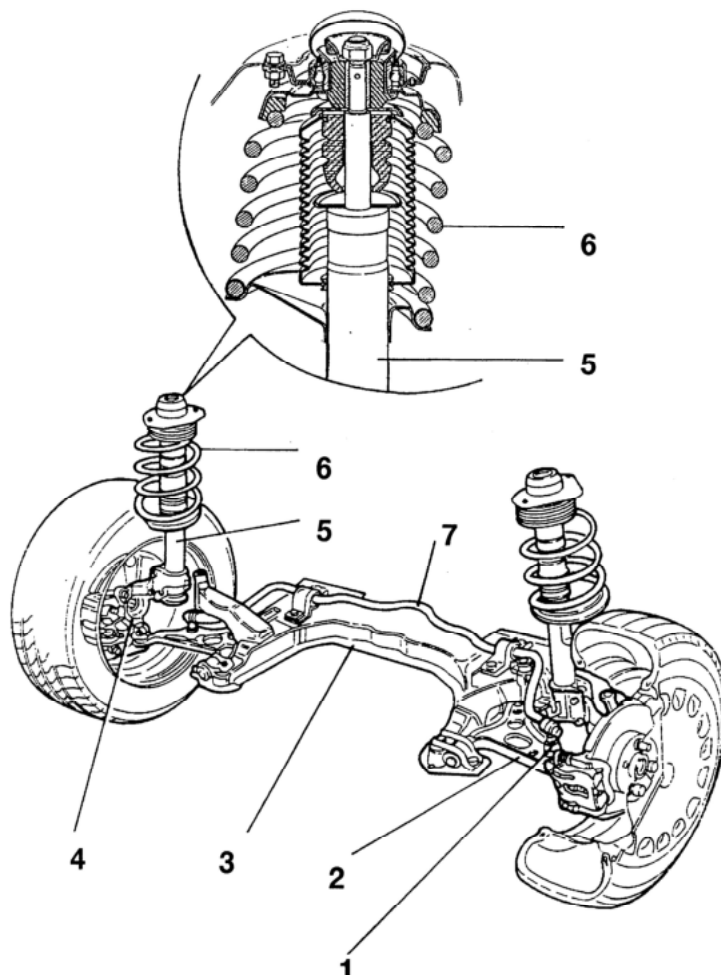
- The front crossmember (3) which is fastened rigidly to the body and, in addition to reinforcing the bearing structure, supports the steering box and cast iron wishbones of the suspension.
- The telescopic struts which comprise the helical springs (6) and the shock absorbers (5). This way, the offset, tapered springs reduce the thrust on the shock absorber stem and simplify steering.

This solution also eliminates any shock absorber noise when the car is travelling, thereby improving comfort.

The pressurised shock absorbers with lamellar disc-type inlet valves with particularly fine tolerances, enable excellent results in terms of comfort and noiselessness on the various types of road surfaces, while maintaining the necessary damping action.

- The cast iron wishbones (2), support the ball joints connecting the wheel upright (4) and the silent-blocks with the sheet metal reinforcement for fastening the wishbones to the crossmember (3).
- The rotation of the wishbones on silent blocks gives the suspension high crosswise rigidity and low longitudinal rigidity, thereby enabling:
 - improved behaviour of the car even under particularly critical roadholding conditions (the former);
 - improved riding comfort (the latter).

The stabilizer bar (7) increases the rigidity of the suspension of one side of the car and lowers it proportionately on the other side. Its purpose is to limit the crosswise lean of the bearing body. This makes it possible to increase the speed limits when cornering as it counters the increase of roll of the car body caused by centrifugal stresses, which occur with the increase of speed.



1. Stabilizer bar - wishbone connecting rod
2. Wishbone
3. Front crossmember
4. Wheel upright
5. Shock absorber
6. Spring
7. Stabilizer bar

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