

LOGAN

3 Chassis

30A GENERAL INFORMATION

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35A WHEELS AND TYRES

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X90

APRIL 2004

Edition Anglaise

"The repair methods given by the manufacturer in this document are based on the technical specifications current when it was prepared.

The methods may be modified as a result of changes introduced by the manufacturer in the production of the various component units and accessories from which his vehicles are constructed."

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L90 - Section 3

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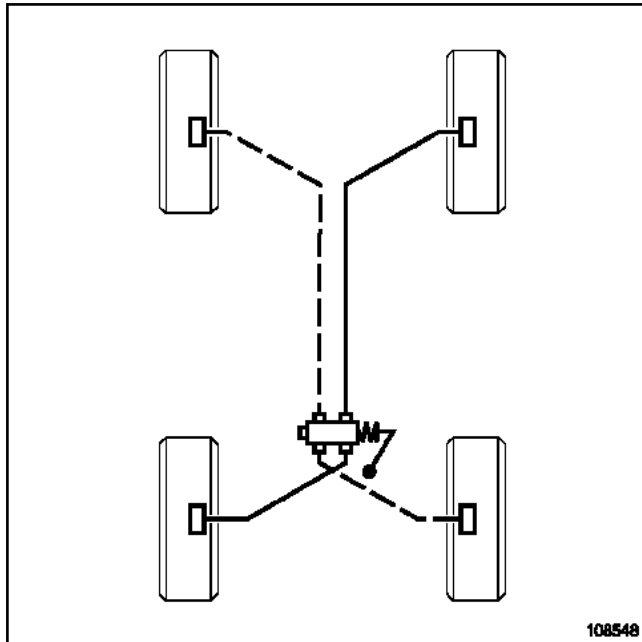
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« X » shaped braking circuit with load sensitive limiter

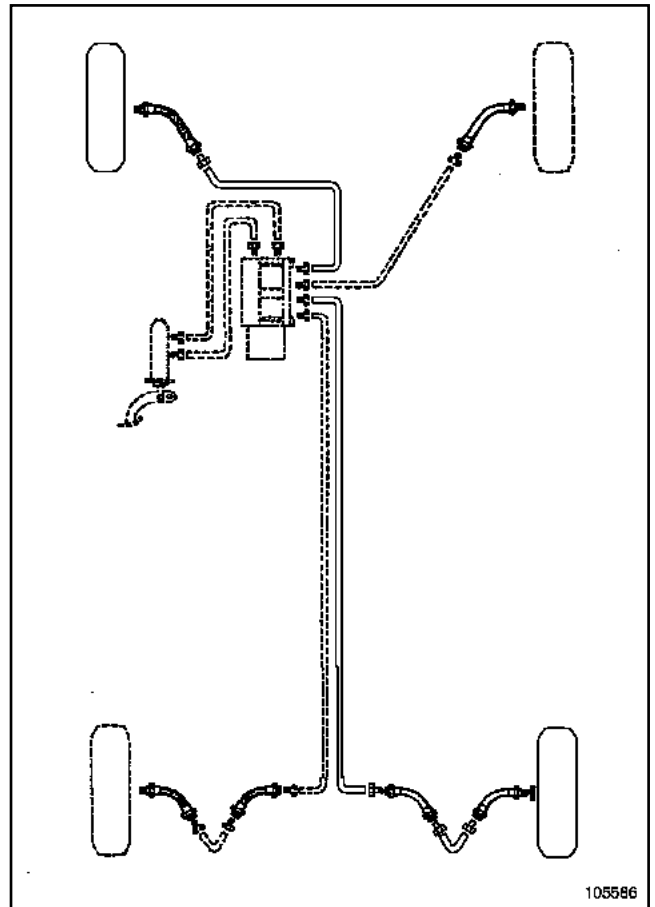


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IMPORTANT

This is a general system diagram, do not use it as a reference for take-off points or circuit allocation. When replacing a vehicle's braking circuit components, always mark the pipes before removing them as they must be reconnected in their original positions.

« X » shaped braking circuit with ABS



105586
105586

IMPORTANT

This is a general system diagram, do not use it as a reference for take-off points or circuit allocation. When replacing a vehicle's braking circuit components, always mark the pipes before removing them as they must be reconnected in their original positions.

GENERAL INFORMATION

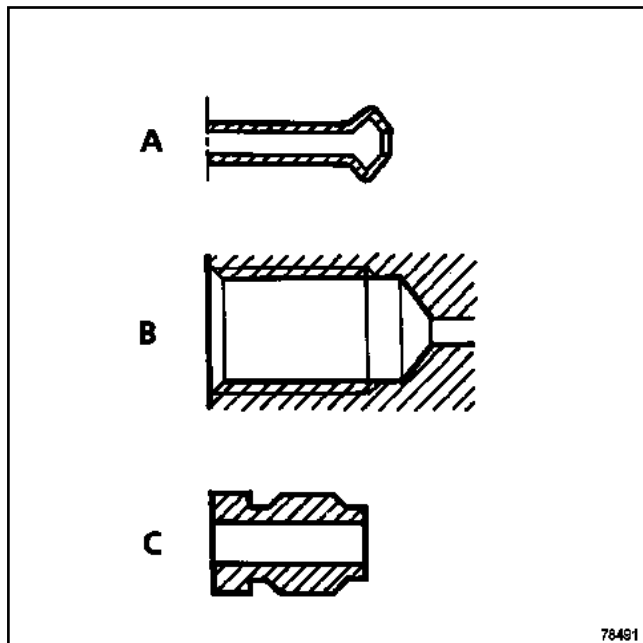
Brake circuit connection and piping

30A

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WARNING

- The pipes between the master cylinder, callipers and the hydraulic assembly are connected using threaded unions with a metric thread.
- Therefore, only parts listed in the Parts Catalogue for this vehicle should be used.



Parts identification:

- shape of steel or copper pipe end piece (A),
- shape of connecting points on components (B),
- shape of unions (C): **11 mm** Allen key.

Brake fluid

BRAKE FLUID REPLACEMENT INTERVAL

Our braking technology, and in particular the disc brakes (hollow pistons which conduct little heat, have a low volume of fluid in the cylinder, sliding callipers avoiding the need for a fluid reserve in the least cooled area of the wheel), has allowed us to prevent the risk of « vapour lock » as far as possible, even with heavy braking (mountainous area). However, current brake fluids are subject to slight deterioration during the first months of use due to slight humidity intake. This is why it is recommended that you change the brake fluid: see **the warranty and servicing book for the vehicle**.

1 - Topping up the level

Wear of the brake pads will result in a gradual drop in the fluid level in the reservoir.

Do not top up the fluid, as the level will rise again when the pads are next changed. The brake fluid level must not fall below the minimum mark.

2 - Approved brake fluid

Mixing two incompatible brake fluids in the braking circuit may cause a serious risk of leaks, mainly due to deterioration of the cups.

To prevent this risk, be sure to only use brake fluids which have been checked and approved by our laboratories and that conform to Standard SAE J 1703-DOT4.

For optimised braking, RENAULT recommends a brake fluid with low viscosity in cold conditions (**750 mm² / s** at **- 40°C** maximum).

Essential equipment

brake circuit bleeding device (approved by Renault)

diagnostic tool

Tightening torques 

bleed screw

6 Nm

Precautions to be taken when bleeding the braking circuit:

- Check the brake fluid levels in the braking circuit and the bleeding device.
- The brake regulation circuit must be free of all hydraulic and electrical faults.

I - BLEEDING THE BRAKING CIRCUIT, EXCLUDING REGULATION SYSTEMS**WARNING**

Special precaution to be taken when bleeding the braking circuit: the ignition should not be switched on so that the hydraulic unit solenoid valves are not activated (if fitted to the vehicle).

This procedure must be applied after one of the following components has been removed or replaced:

- the brake limiter,
- the master cylinder,
- the brake fluid,
- the hydraulic unit (new and pre-filled),
- a rigid pipe,
- a hose,
- the reservoir,
- a calliper,
- the brake servo,
- the slave cylinder.

Mount the vehicle on a two-post lift.

Connect the air bleed device to the brake fluid reservoir (refer to the instructions).

Fit the draining jars to the bleed screws.

Drain the circuit by opening the bleed screw in the following order:

- the rear right-hand circuit,

- the front left-hand circuit,
- the rear left-hand circuit,
- the front right-hand circuit.

Torque tighten the **bleed screw (6 Nm)**.

With the engine switched off, check the pedal travel; if it is not correct, start this bleeding procedure again.

Top up the brake fluid level in the reservoir after disconnecting the bleeding device. Check the sealing of the bleed screws and ensure that the sealing covers are in place.

During a road test, trigger braking regulation to confirm that the brake pedal travel is correct. If the pedal travel becomes incorrect during the road test, apply the braking regulation circuit bleeding procedure.

II - BLEEDING THE BRAKING REGULATION CIRCUIT

This procedure is to be applied after a road test with braking regulation in which the pedal travel becomes incorrect.

Mount the vehicle on a two-post lift.

Referring to the equipment instruction manual, connect:

- tool **brake circuit bleeding device (approved by Renault)** to the vehicle braking circuit,
- the **diagnostic tool**.

Fit the draining jars to the bleed screws.

Bleed the regulation circuit using the **diagnostic tool**.

Run command **SC006 « hydraulic assembly and brake circuits bleed »**.

Follow the instructions on the **diagnostic tool**.

Note:

Depress and release the brake pedal alternately (pumping action) throughout the bleeding procedure.

Disconnect the bleeding device.

Top up the brake fluid level in the reservoir.

Check the sealing of the bleed screws and ensure that the sealing caps are in place.

During a road test, trigger braking regulation to confirm that the brake pedal travel is correct. If the pedal travel becomes incorrect during the road test, follow the braking regulation circuit bleeding procedure.

It is therefore possible to use a larger quantity of brake fluid than the capacity of the circuit.

GENERAL INFORMATION

Brake: Specifications

30A

|

	Engine	
Front brakes (mm)		
Piston diameter	48	52
Disc diameter	238	259
Disc thickness	12	12
Minimum disk thickness (1)	10.6	10.6
Maximum disc run-out	0.07	0.07
Brake lining thickness (including support)	18	18
Minimum brake lining thickness (including support)	6	6
Rear brakes (mm)		
Slave cylinder diameter	19	
Drum diameter	180.25	203,3
Maximum drum diameter for replacement	181.25	204.45
Brake lining thickness (including support)	179.4	202.45
Thickness of primary brake pads	4.6	
Thickness of secondary brake pads	3.3	
Master cylinder (mm)		
Diameter	20.6	
Stroke	32	

(1) Brake discs cannot be reground. In case of excessive scoring or wear they must be replaced.

GENERAL INFORMATION
Anti-roll bars: Specifications

30A

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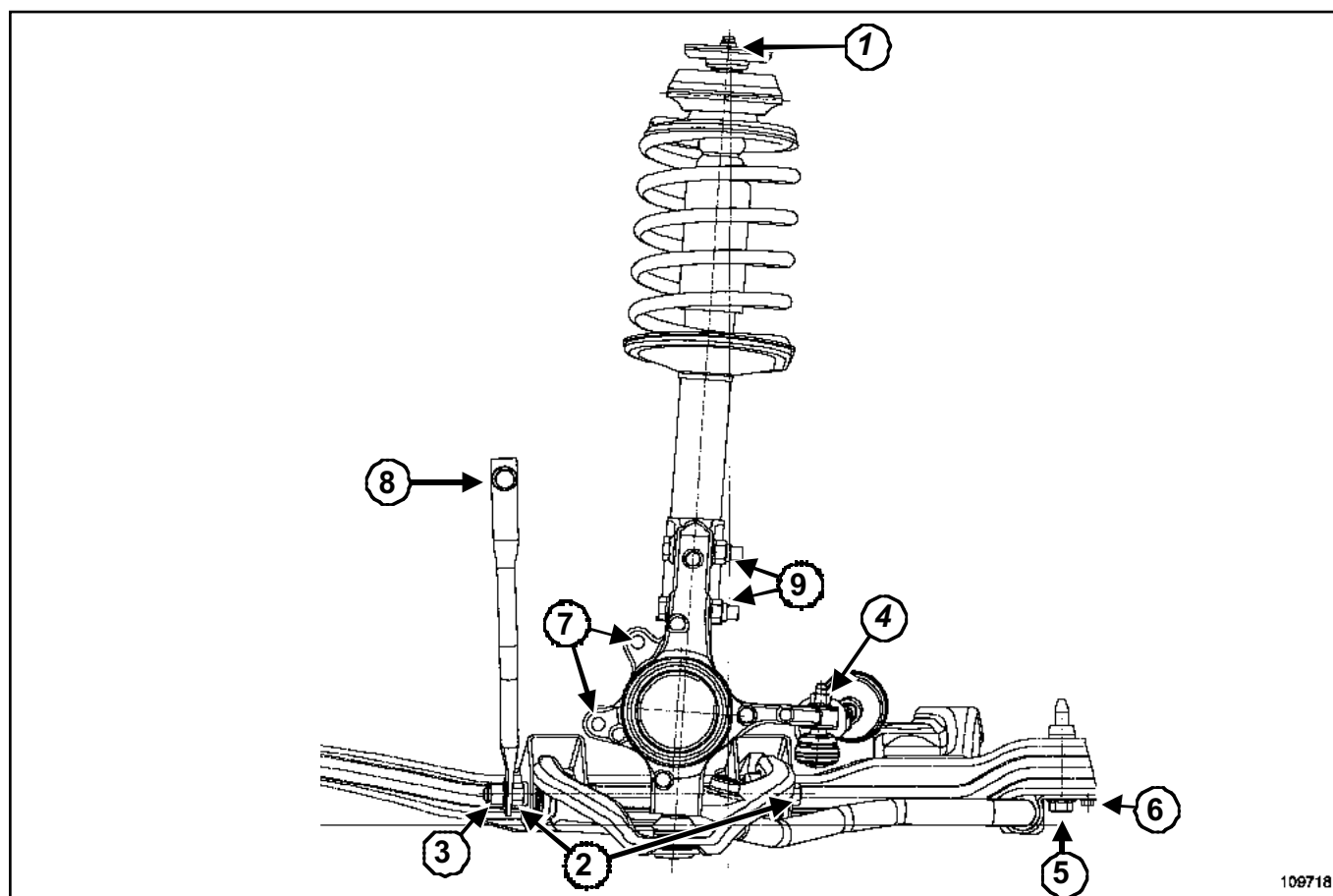
Front anti-roll bar diameter: **24.5 mm.**

|

GENERAL INFORMATION

Front axle tightening torque

30A



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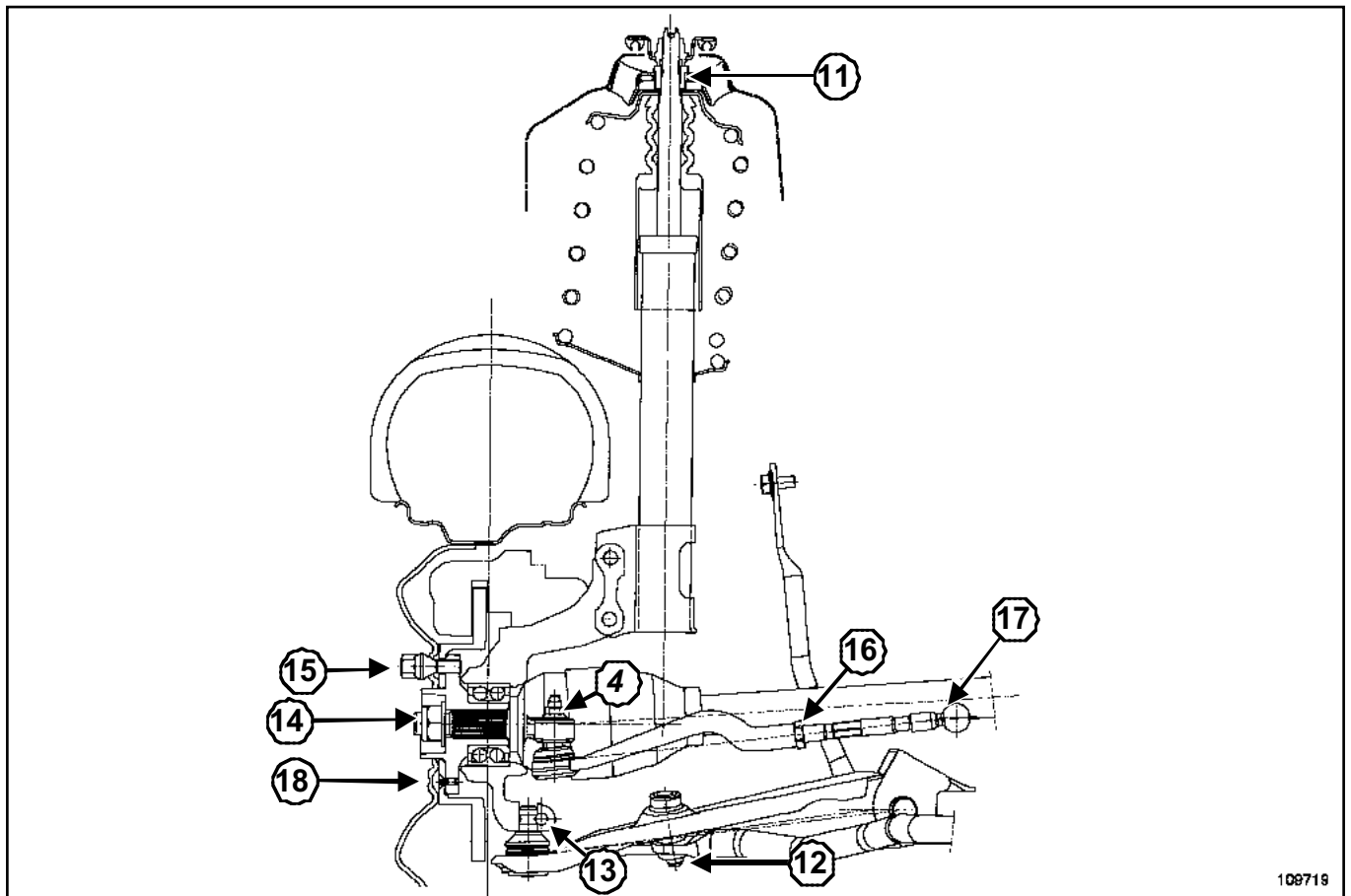
109718

Reference	Description	Tightening torque (Nm)
(1)	Mounting nut attaching « spring and shock absorber » assembly to body	44
(2)	Lower arm bolt	105
(3)	Sub-frame tie-rod lower mounting bolt	62
(4)	Track rod end nut	37
(5)	Anti-roll bar and sub-frame bearing mounting bolt	105
(6)	Anti-roll bar bearing mounting nut	8
(7)	Calliper support bolt	105
(8)	Sub-frame tie-rod mounting bolt on the side member	21
(9)	Hub holder shock absorber mounting bolt	105
	front sub-frame bolt	105
	Steering rack - sub-frame mounting bolt	105

GENERAL INFORMATION

Front axle tightening torque

30A



109719

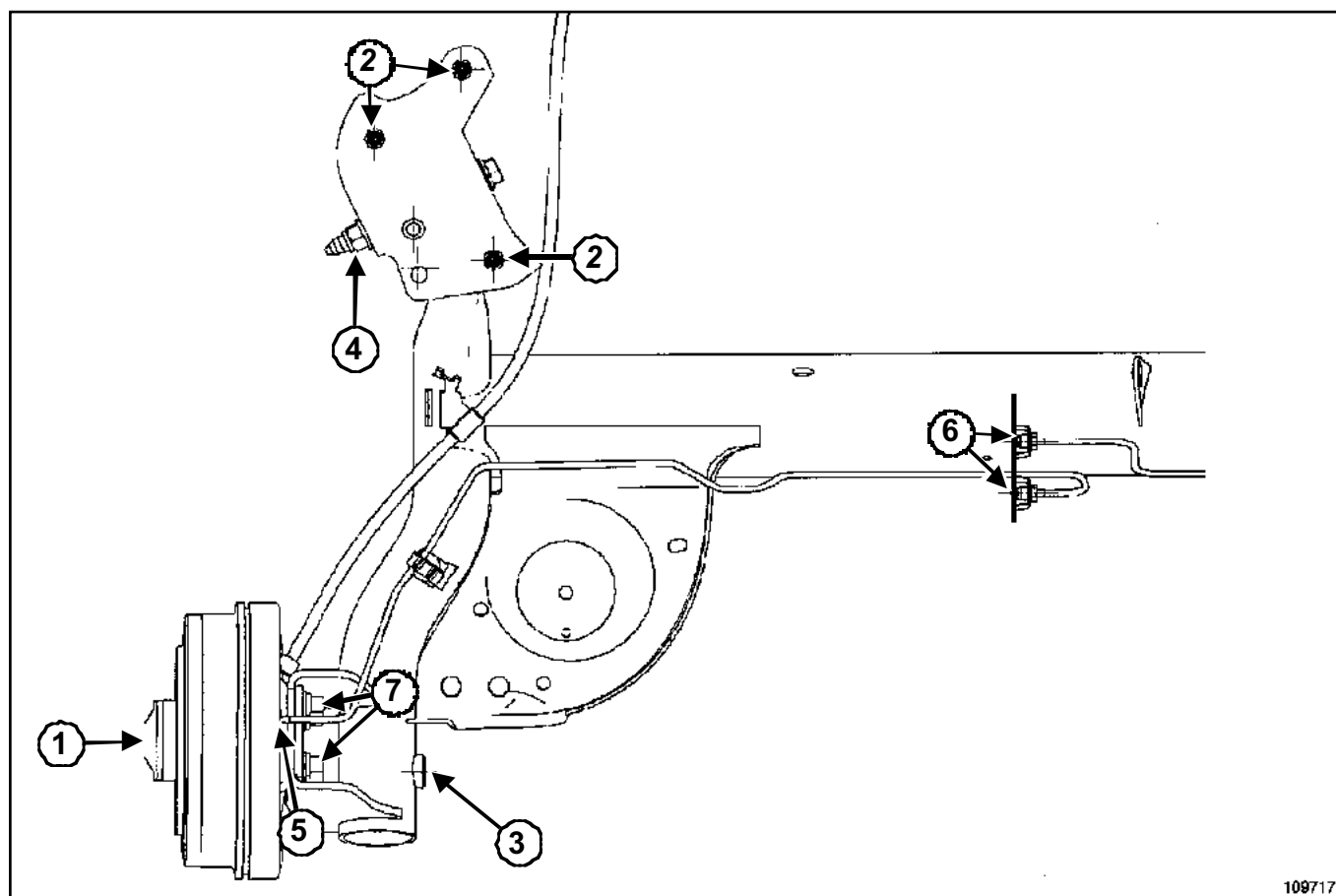
109719

Reference	Description	Tightening torque (Nm)
(11)	Shock absorber nut for spring cup	62
(12)	Anti-roll bar tie rod ball joint nut	14
(13)	Lower arm ball joint bolt	62
(14)	Driveshaft nut	280
(15)	Wheel bolts	105
(16)	Wheel alignment lock nut	50
(17)	Axial ball joint mounting on the steering rack	34
(18)	Brake disc mounting bolt	14

GENERAL INFORMATION

Rear axle tightening torque

30A



109717

109717

I

Reference	Description	Tightening torque (Nm)
(1)	Drum nut	175
(2)	Bearing mounting bolt	62
(3)	Shock absorber lower mounting bolt	105
(4)	Rubber bush mounting nut	125
(5)	Rigid brake pipe on brake cylinder	14
(6)	Rigid pipe union on flexible pipe	14
(7)	Mounting bolts of the brake backing plate on the rear axle	80

GENERAL INFORMATION

Brake system tightening torque

30A

I -FRONT AND REAR BRAKES

Description	Tightening torque (Nm)
Front calliper bleed screw	6
Rear cylinder bleed screw	6
Front calliper inlet brake hose	17
Rear cylinder entry brake pipe	14
Brake hose on brake pipe	14
Front brake guide pin bolt	34
Calliper support bolt	105
Brake pipe on compensator	14
Brake pipe on master cylinder	14
Brake pipe on hose	14
Brake disc mounting bolt	14
cylinder mounting bolt on flange	14

II - BRAKE CONTROL

Description	Tightening torque (Nm)
Brake servo mounting nut	21
Master cylinder mounting nuts	21
Master cylinder outlet pipe	14
Mounting bolt securing the hydraulic unit to its support	8
Hydraulic unit pipe unions	14
Parking brake control mounting nuts	21
Hydraulic unit support - vehicle body mounting bolts	21
Compensator mounting bolt	12

GENERAL INFORMATION

Steering tightening torque

30A

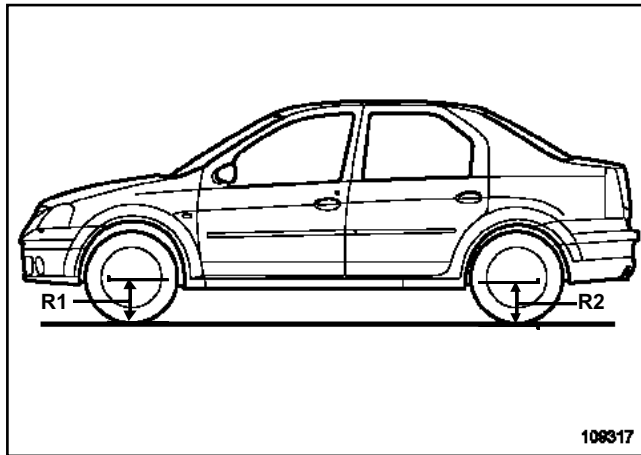
Description	Tightening torque (Nm)
Securing nuts for steering column	21
Universal joint bolt	21
Wheel alignment adjusting lock nut	50

Description	Tightening torque (Nm)
Steering rack bolt	105
Track rod end nut	37
Axial ball joint	34

DIRECTION ASSISTEE

Description	Tightening torque (Nm)
Pressure switch on high pressure pipe	12
High and low pressure pipe union on steering rack	21
High pressure pipe union on the steering pump	21
Power assisted steering pump mounting bolts on support	21

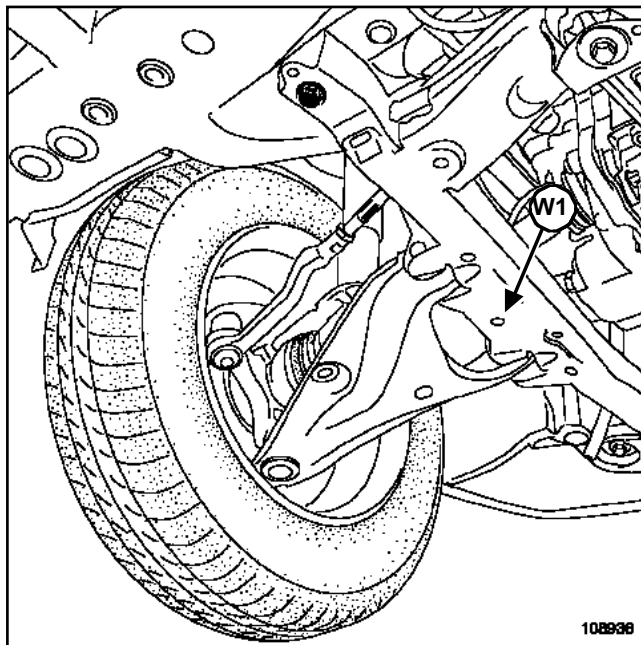
MEASURING POINTS



109317

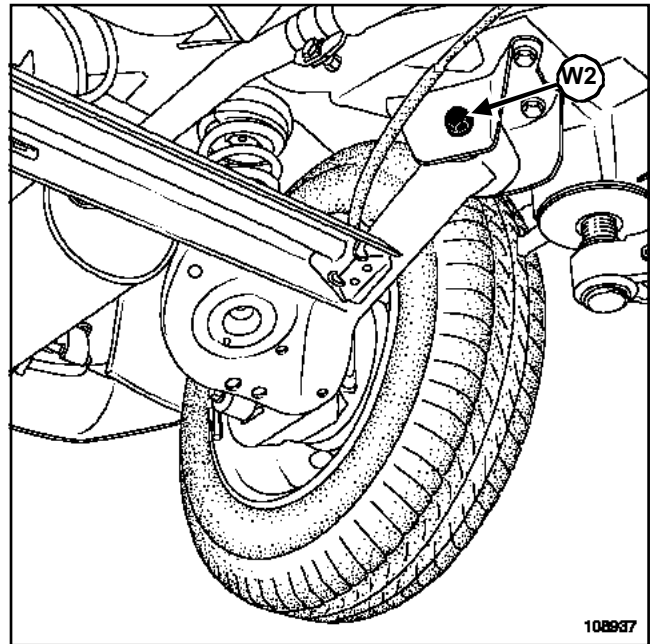
Measurement (**R1**) is taken between the ground and the front wheel axis.

(**R2**) is taken between the ground and the rear wheel axis.



108936

Measurement (**W1**) is taken at the front between the ground and the underside of the sub-frame at the hole in the centre of the lower arm.



108937

Measurement (**W2**) is taken at the rear, between the ground and the rubber bushing mounting shaft on the bearing.

Values and adjustments for the front axle assemblies

Before taking axles to the test bench, you must check the inflation pressure of the tyres (see **35A, Wheels and tyres, Tyre inflation pressure**).

WARNING

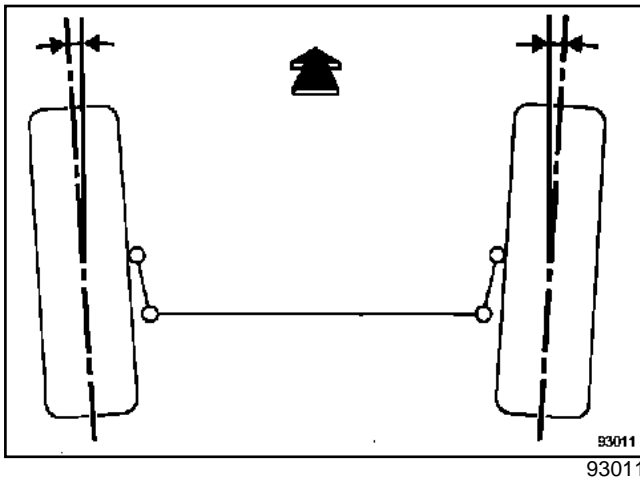
When checking the axle values, the vehicle must be unloaded (no luggage, persons in the vehicle) with half a tank of fuel.

Take care to position the steering wheel straight ahead during wheel alignment adjustment, in such a way as not to offset the angular position of the front wheels with the straight-ahead position. The steering wheel being offset in relation to the position of the wheels is cause for the vehicle to be returned by the customer.

Adjust the vehicle level in accordance with the specifications before checking the geometry of the wheels. If the vehicle level is not in accordance with the specifications, try to adjust it by lowering or raising the bodywork.

I - SIGNS CONVENTION

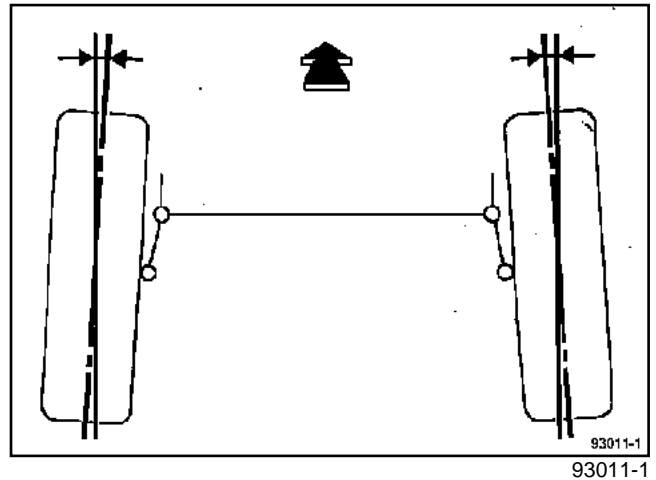
1 - Opening



WARNING

Signs convention in use above, - = toe-out.

2 - Close (or toe-in)

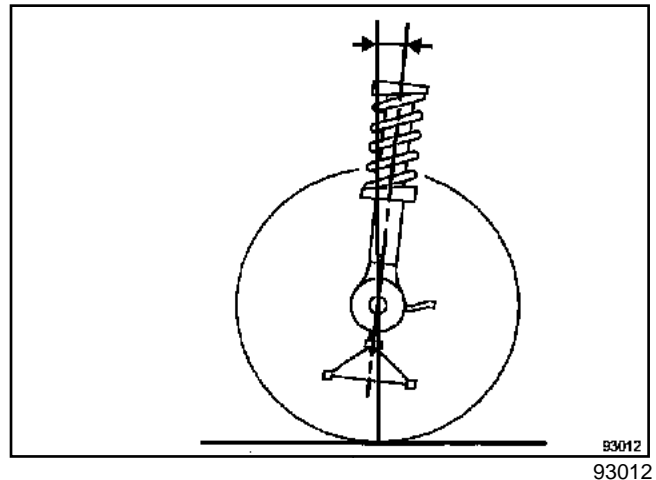


WARNING

Signs convention in use above, + = close (or toe-in).

II - CASTOR ANGLE

Not adjustable.

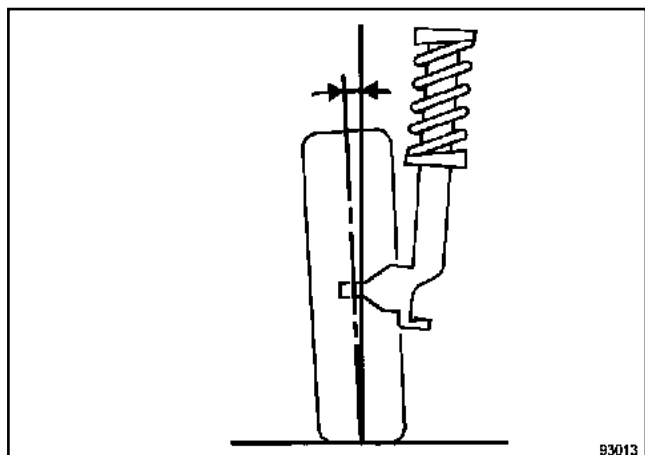


Value	Position of front axle (mm)
$2^{\circ} 42' \pm 30'$	W1 = 188.38 ± 10.5 (Wheel rim 14")
Maximum left / right difference = 1°	W1 = 192.5 ± 10.5 (Wheel rim 15")

III - CAMBER

Not adjustable.

Values and adjustments for the front axle assemblies

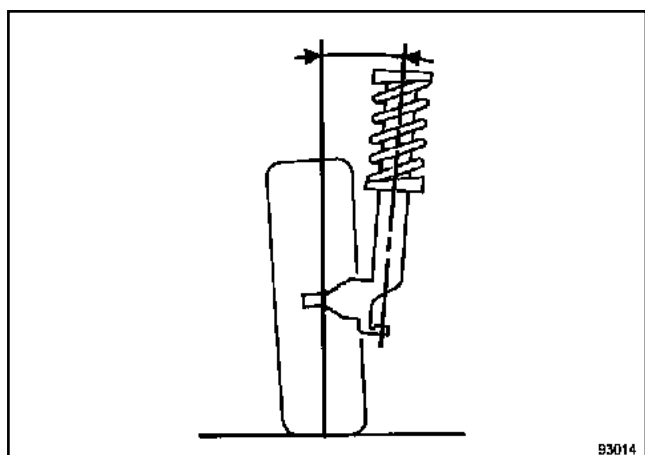


93013

Value	Position of front axle (mm)
- 0° 10' ± 30' Maximum left / right difference = 1°	W1 = 188.38 ± 10.5 (Wheel rim 14") W1 = 192.5 ± 10.5 (Wheel rim 15")

IV - PIVOT

Not adjustable.

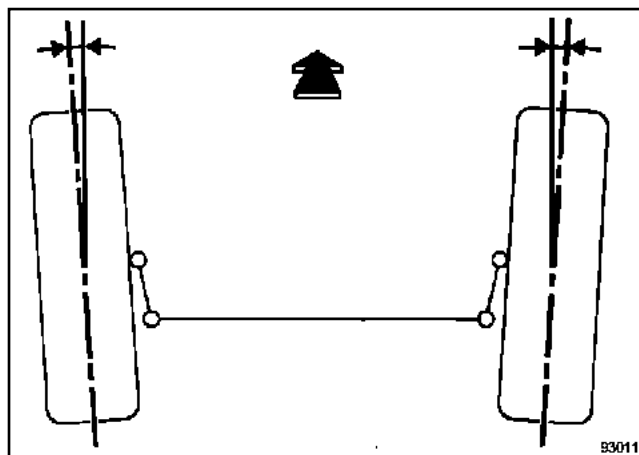


93014

Value	Position of front axle (mm)
10° 17' ± 30' Maximum left / right difference = 1°	W1 = 188.38 ± 10.5 (Wheel rim 14") W1 = 192.5 ± 10.5 (Wheel rim 15")

V - WHEEL ALIGNMENT

Adjustable by rotating the track rod sleeves.



93011

Value	Position of front axle (mm)
(For two wheels) Toe-out - 0° 10' ± 10' wheel rims 14": 1.034 mm ± 1.034 mm wheel rims 15": 1.108 mm ± 1.108 mm	W1 = 188.38 ± 10.5 (Wheel rim 14") W1 = 192.5 ± 10.5 (Wheel rim 15")

VI - POSITION FOR TIGHTENING RUBBER BUSHES

See 31A, Front carrying components, lower arm.

Values and adjustments for the rear axle assemblies

Before taking axles to the test bench, you must check the inflation pressure of the tyres (see **35A, Wheels and tyres, Tyre inflation pressure**).

WARNING

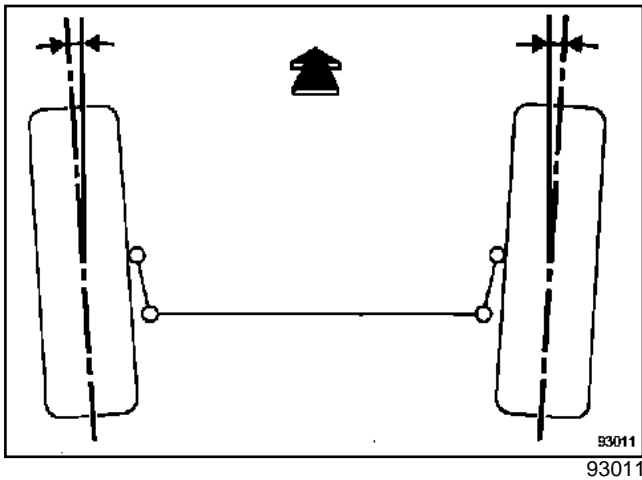
When checking the axle values, the vehicle must be unloaded (no luggage, persons in the vehicle) with half a tank of fuel.

Take care to position the steering wheel straight ahead during wheel alignment adjustment, in such a way as not to offset the angular position of the front wheels with the straight-ahead position. The steering wheel being offset in relation to the position of the wheels is cause for the vehicle to be returned by the customer.

Adjust the vehicle level in accordance with the specifications before checking the geometry of the wheels. If the vehicle level is not in accordance with the specifications, try to adjust it by lowering or raising the bodywork.

I - SIGNS CONVENTION

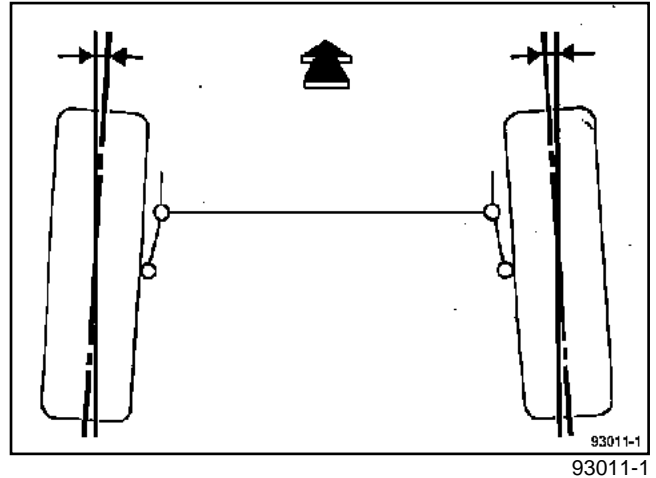
1 - Opening



WARNING

Signs convention in use above, - = toe-out.

2 - Close (or toe-in)

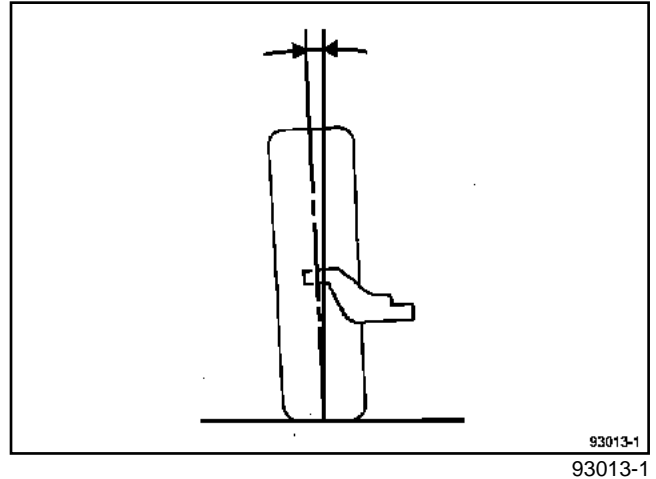


WARNING

Signs convention in use above, + = close (or toe-in).

II - CAMBER

Not adjustable.

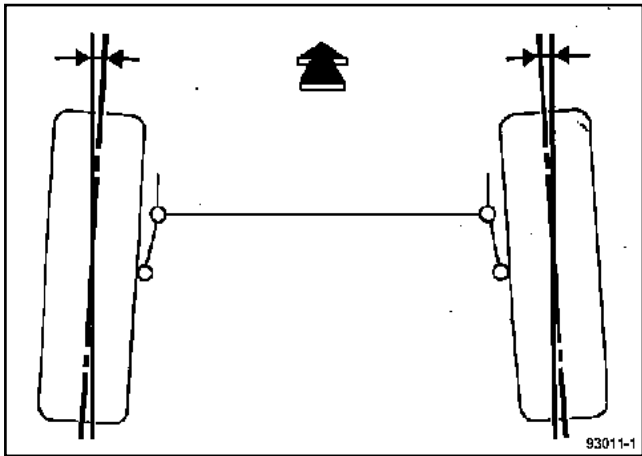


Value	Position of rear axle
$-0^{\circ} 51' \pm 15'$	W2 = 291.6 ± 10.5 (wheel rim 14") W2 = 293.96 ± 10.5 (wheel rim 15")

III - WHEEL ALIGNMENT

Not adjustable.

Values and adjustments for the rear axle assemblies



93011-1

Value	Position of rear rear
(For two wheels) Toe-in + 0° 44' ± 15'	W2 = 291.6 ± 10.5 (wheel rim 14") W2 = 293.96 ± 10.5 (wheel rim 15")

IV - POSITION FOR TIGHTENING RUBBER BUSHES

See 33A, Rear carrier components, Tightening the axle in position.

GENERAL INFORMATION

Vehicle handling: Fault finding

30A

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Shimmy*: steering wheel vibration between 62.5 and 75 mph (100 and 120 km/hour).

I - BRAKING

Cause / symptom	Brake pad wear	Irregular brake pad wear	Brake disc fogging	Brake disc wear	Brake calliper piston seizing	Brake disc corrosion	Irregular brake disc wear	Brake servo failure	Air in the braking circuit	Braking circuit internal leakage	Braking circuit external leakage
Noise when braking	x	x		x		x					
Permanent noise	x	x			x						
Brake chatter			x	x			x				
Pedal vibrations			x	x		x					
Hard pedal					x			x			
Soft pedal				x					x	x	x
Spongy pedal				x					x		x
Pedal to the floor									x	x	x
Permanent braking					x			x			

GENERAL INFORMATION

Vehicle handling: Fault finding

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II - STEERING

Cause/ symptom	Insufficient power assisted steering oil level	Air in the power assisted steering circuit	Play in the steering	Pressure fault on pump outlet	Drive belt tension fault	Steering column deterioration	Steering column assembly fault	Front axle angle fault (caster angle)	Assistance electronic management fault	Brake slave cylinder seizing (piston or cylinder)	Tyre fault
Noise	x	x	x		x						
Vibrations			x			x	x				
Juddering			x			x	x				
Poor return to steering wheel centre						x	x	x			
Hydraulic variable power assisted steering low speed assistance fault	x	x							x		

GENERAL INFORMATION

Vehicle handling: Fault finding

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Cause/ symptom	Insufficient power assisted steering oil level	Air in the power assisted steering circuit	Play in the steering	Pressure fault on pump outlet	Drive belt tension fault	Steering column deterioration	Steering column assembly fault	Front axle angle fault (caster angle)	Assistance electronic management fault	Brake slave cylinder seizing (piston or cylinder)	Tyre fault
Hydraulic or electric high speed variable power assisted steering excessive assistance									x		
Hydraulic or electric variable power assisted steering assistance fault				x	x						
Stabilised speed pull							x				x
Braking pull						x	x			x	

GENERAL INFORMATION

Vehicle handling: Fault finding

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III - WHEELS AND TYRES

Cause/ symptom	Incor- rect tyre balan- cing	Tyre infla- tion pres- sure fault	Defor- mation or wear on wheels and tyres	Tyre tread fault	Non confor- mity of tyre size	Wheel align- ment fault	Front axle and suspen- sion (see table for « Front axle and suspen- sion »	Bra- king (see table for « Braki ng »	Stee- ring (see table for « Steeri ng »
Vibra- tions	x		x	x			x		x
Shimmy *	x		x	x			x	x	x
Poor roadhol- ding		x	x		x		x		
Prema- ture tyre wear						x	x	x	x
Irregu- lar tyre wear		x	x	x		x		x	x

GENERAL INFORMATION

Vehicle handling: Fault finding

30A

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IV - AXLES AND SUSPENSION

Sub-frame - front axle and suspension

Cause/ symptom	Shock absorber deformation	Deterioration of spring and shock absorber assembly mountings on the body	Contact with surrounding parts	Suspension shock absorber wear	Suspension spring state	Wear in anti-roll bar or bearings	Alignment fault in front or rear axles	Fault in assembly or tightening of sub-frame or front axle parts	Hub-carrier bearing deterioration	Imbalance between right and left suspension	Axle assembly angle faults	Braking (see table for « Braking »)
Noise		x	x	x	x	x		x	x			
Vibrations			x	x				x	x			
Shimmy*							x		x			x
Poor road-holding	x				x		x			x		

GENERAL INFORMATION

Vehicle handling: Fault finding

30A

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Rear axle and suspension

Cause/ symptom	Shock absorber deformation	Deterioration of spring and shock absorber assembly mountings on the body	Contact with surrounding parts	Suspension shock absorber wear	Suspension spring state	Wear in anti-roll bar or bearings	Wheel alignment fault	Fault in assembly or tightening of sub-frame or front axle parts	Hub-carrier bearing deterioration	Imbalance between right and left suspension	Axle assembly angle faults	Braking (see table for « Braking »)
Noise		x	x	x	x	x		x	x			
Vibration			x	x				x	x			
Shimmy*							x		x			x
Poor road-holding	x				x		x			x		

Front axle geometry

Faults	Possible causes
Incorrect castor	-Bent arm -Bent side member
Camber plus pivot sound but: Incorrect camber Incorrect pivot	-Bent arm -Bent side member
Camber is sound but: Incorrect pivot	Bent stub axle carrier
Pivot is sound but: Incorrect camber	Bent stub axle carrier
Wheel alignment variation faults	See incorrect castor
Wheel alignment is out by more than 6mm	Right or left stub axle carrier twisted

Brake pads

Tightening torques 

guide pin bolt	34 Nm
wheel bolts	105 Nm

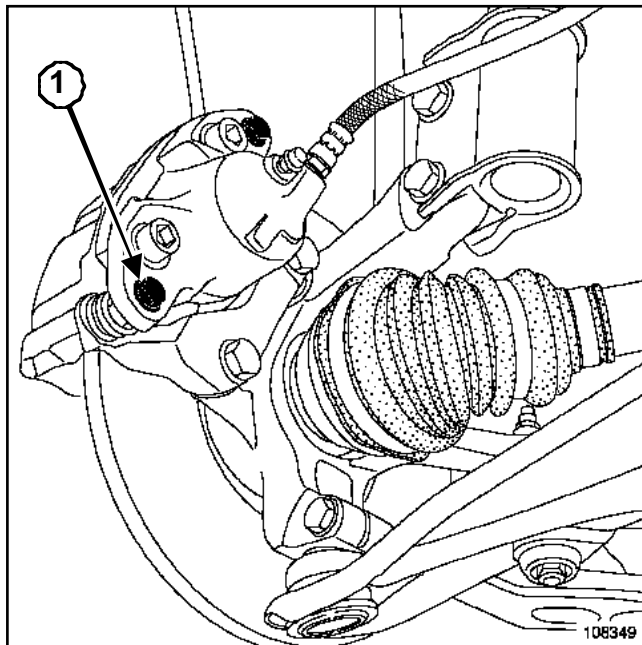
When replacing the brake pads, it is essential to replace the brake pads on the opposite side

REMOVAL

Mount the vehicle on a two-post lift.

Unlock the steering wheel.

Remove the front wheels.



Remove the lower guide pin bolt (1).

Rotate the calliper upwards.

Remove the pads.

Check the condition of the braking components.

Replace any faulty parts.

Clean the calliper mountings and callipers.

REFITTING

Bush the piston back until it is at the end of its bore.

Fit the new pads, starting with the interior.

WARNING

- Attach the wheel sensor wiring, if they have become unclipped (if the vehicle is fitted with wheel sensors).
- Do not damage the brake hose.
- Do not twist the brake hose.

Proceed in the reverse order to removal.

Torque tighten:

- the **guide pin bolt (34 Nm)**,
- the **wheel bolts (105 Nm)**.

IMPORTANT

Depress the brake pedal several times to bring the pistons, the brake pads and discs into contact.

Note:

The brake fluid level must be between the « MIN » and « MAX » markings on the reservoir.

Essential equipment

pedal press

Tightening torques

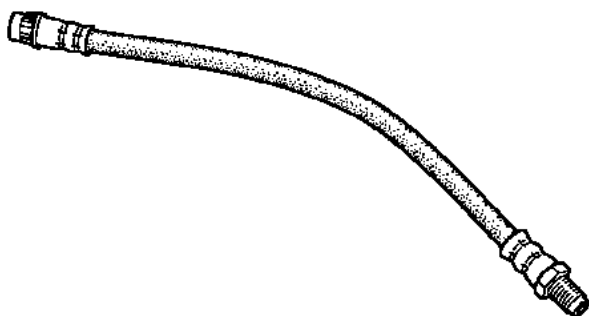
brake hose onto the caliper **17 Nm**

brake hose onto the union **14 Nm**

bleed screw **6 Nm**

IMPORTANT

Be sure to follow the order of operations for the procedure described below.



108919

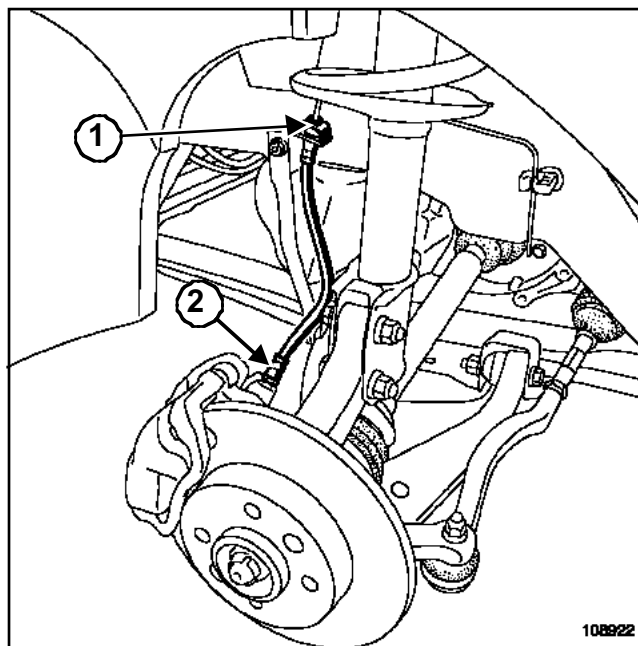
108919

REMOVAL

Fit the **pedal press** tool to the brake pedal to restrict the outflow of brake fluid.

WARNING

Prepare for brake fluid outflow, to prevent damage to the mechanical parts and bodywork around the braking system.



108922

108922

Unscrew:

- the pipe union (1), which frees the hose from the splines,
- the calliper hose (2).

WARNING

Check condition of brake pipe. Replace if necessary.

REFITTING

Refit the brake hose at the calliper end.

WARNING

Do not twist the brake hose, and straighten the wheels as steering lock makes it easier for the unit to become twisted.

Make sure that there is no contact between the brake hose and the surrounding components.

Note:

The hoses supplied as spare parts are encased in a spring to prevent them from being twisted during fitting.

Torque tighten:

- the **brake hose onto the calliper (17 Nm)**,
- the **brake hose onto the union (14 Nm)**,

The brake pipe

Position the female end of the brake hose on the retaining bracket without straining it by twisting.

Make sure that the end piece engages freely into the bracket splines.

Mount:

- the spring,
- the rigid pipe on the brake hose, making sure that the hose is not twisted when the rigid pipe is screwed on.

Bleeding the circuit (see **30A, General Vehicle Information, Braking circuit bleed**).

Torque tighten the **bleed screw (6 Nm)**.

Essential equipment

pedal press

Tightening torques 

guide pin bolts	34 Nm
brake pipe	17 Nm
bleed screw	6 Nm
wheel bolts	105 Nm

When replacing a disc, it is essential to replace the brake pads and disc on the opposite side.

Note:

The callipers supplied as replacement parts are pre-filled.

REMOVAL

Mount the vehicle on a two-post lift.

WARNING

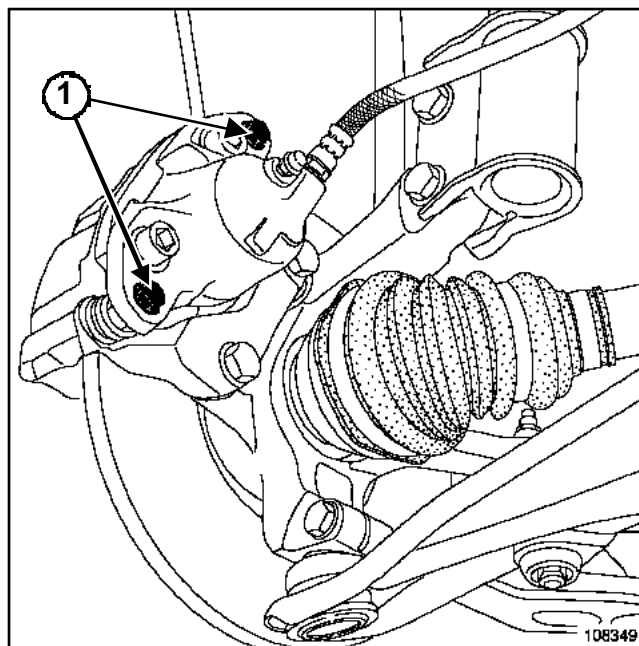
Take precautions for brake fluid outflow, to prevent damage to the mechanical parts and bodywork around the braking system.

Unlock the steering column.

Fit tool **pedal press** to the brake pedal to restrict the outflow of brake fluid.

Remove the front wheels.

Release the brake hose from the brake calliper.



Remove:

- the guide pin bolts (1),
- the brake calliper,
- the brake pads,

Check the condition of the braking components (replace faulty parts).

Clean the calliper mountings and callipers.

REFITTING

Bush the piston back until it is at the end of its bore.

Fit the pads, starting with the interior.

Refit:

- the calliper,
- the guide pin bolt.

Torque tighten:

- the **guide pin bolts (34 Nm)**,
- the **brake pipe (17 Nm)**.

WARNING

- Attach the wheel sensor wiring, if it has become unclipped (if the vehicle is fitted with them).
- Do not twist the brake pipe.

Refit the wheels.

Torque tighten:

- the **bleed screw (6 Nm)**,

- the **wheel bolts** (105 Nm).

Bleed the brake circuit partially if the limiter reservoir is not completely emptied during the procedure. Otherwise bleed the circuit completely (see **30A, General information, Bleeding the braking circuit**).

IMPORTANT

Depress the brake pedal several times to bring the pistons, the brake pads and discs into contact.

Note:

The brake fluid level must be between the « MIN » and « MAX » markings on the reservoir.

Tightening torques 

calliper mounting bolt	105 Nm
guide pin bolts	34 Nm
wheel bolts	105 Nm

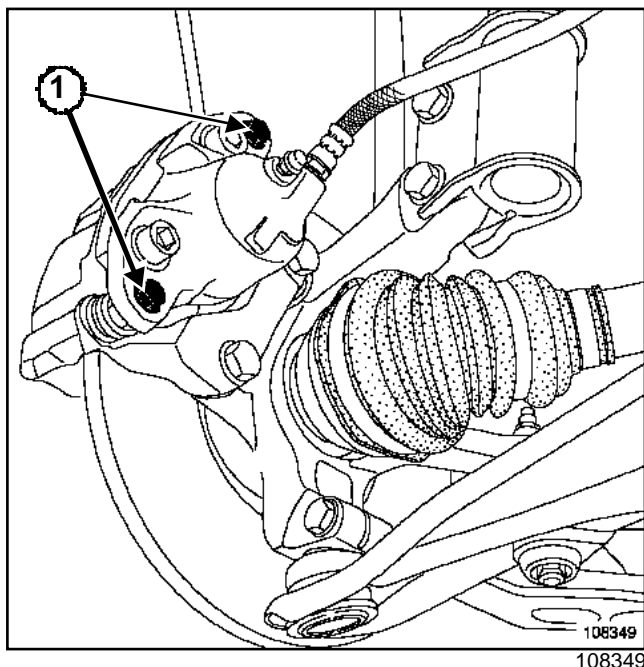
When replacing a disc, it is essential to replace the brake pads and disc on the opposite side.

REMOVAL

Mount the vehicle on a two-post lift.

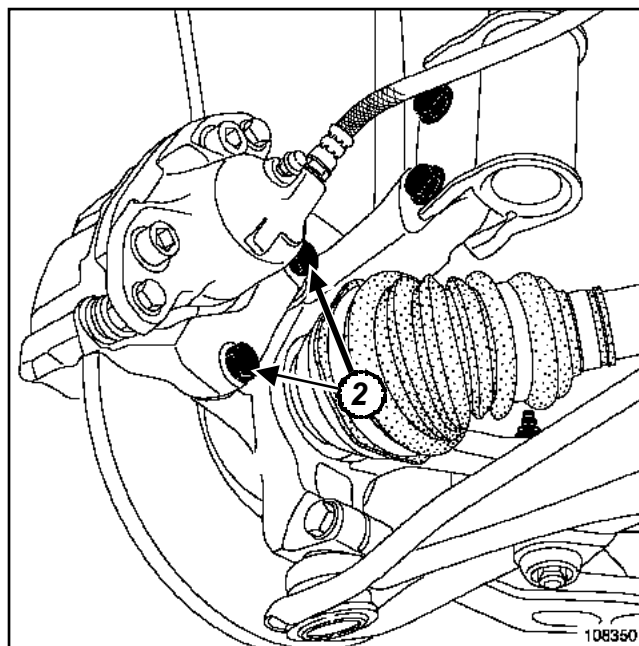
Unlock the steering column.

Remove the front wheels.



Remove the guide pin bolts (1).

Suspend the brake calliper from the suspension spring.



Remove:

- the brake pads,
- the calliper mounting bolts, (2)
- the calliper mounting.

Check the condition of the braking components (replace faulty parts).

Clean the calliper mountings and callipers.

REFITTING

Push the piston so that it is at the bottom of its housing.

Coat the calliper mounting with a **LOCTITE FREN-BLOC** type product before fitting.

Refit:

- the calliper mounting,
- the calliper mounting bolts.

Torque tighten **calliper mounting bolt (105 Nm)**.

Fit the pads, starting with the interior.

Refit:

- the calliper,
- the guide pin bolts.

WARNING

- Attach the brake hose and wheel speed sensor wiring if they have been unclipped.
- Do not damage the brake hose.
- Do not twist the brake hose.

Torque tighten the **guide pin bolts (34 Nm)**.

Refit the wheels.

Torque tighten **wheel bolts (105 Nm)**.

IMPORTANT

Depress the brake pedal several times to bring the pistons, the brake pads and discs into contact.

Note:

The brake fluid level must be between the « MIN » and « MAX » markings on the reservoir.

Tightening torques 

disc mounting bolts	14 Nm
calliper mounting bolts	105 Nm
wheel bolts	105 Nm

Brake discs are not regrindable. If there is excessive scoring or wear, they will need to be replaced.

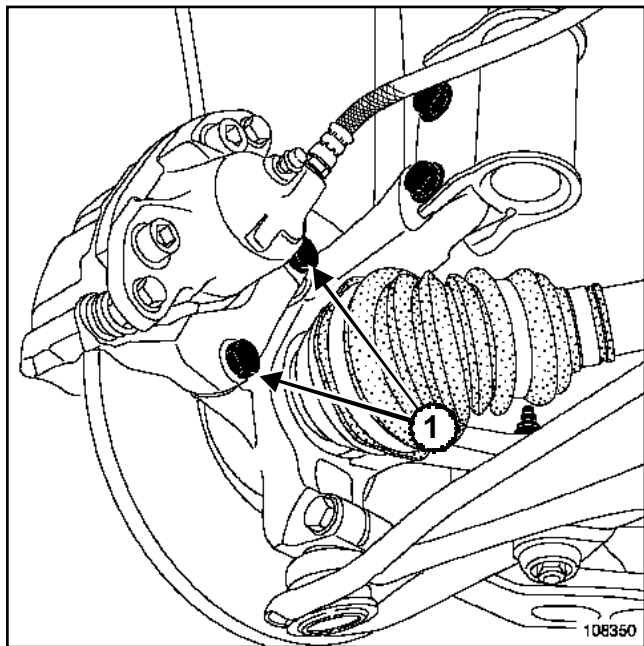
When replacing a brake disc, it is essential to replace the pads and disc on the opposite side as well.

REMOVAL

Mount the vehicle on a two-post lift.

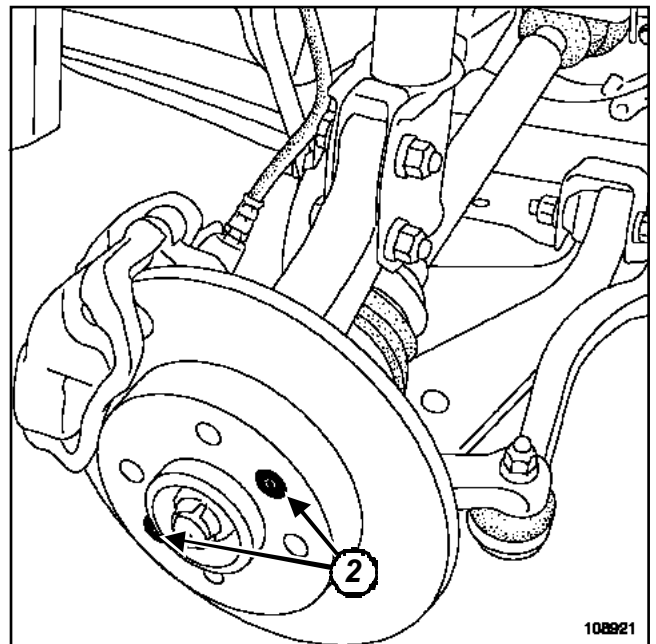
Unlock the steering column.

Remove the front wheels.



Remove both calliper mounting bolts (1)

Suspend the calliper / calliper mounting assembly.



108921
108921

Remove

- the calliper mounting,
- the disc mounting bolts, (2)
- the disc.

Clean the calliper mountings and callipers.

REFITTING

Proceed in the reverse order to removal.

WARNING

- Attach the wheel sensor wiring, if it has become unclipped (if the vehicle is fitted with wheel sensors).
- Do not damage the brake pipe.
- Do not twist the brake pipe.

Torque tighten:

- the **disc mounting bolts (14 Nm)**,
- the **calliper mounting bolts (105 Nm)**.

Coat the calliper mounting with a **LOCTITE FREN-BLOC** type product before fitting.

Refit the wheels.

Torque tighten **wheel bolts (105 Nm)**.

IMPORTANT

Depress the brake pedal several times to bring the pistons, the brake pads and discs into contact.

Note:

The brake fluid level must be between the « MIN » and « MAX » markings on the reservoir.

Essential special tooling

Rou. 604-01	Hub locking tool
Tav. 476	Ball joint extractor
Tav. 1050-04	Universal driveshaft pusher tool (back-plate and claws, without jack).
Tav. 1420-01	Spare hydraulic screw for Tav.1420, Tav1050-02, Tav.1050-04 and Tav.1454.

Tightening torques

shock absorber base bolts	105 Nm
lower ball joint bolt	62 Nm
track rod end nut	37 Nm
brake disk mounting bolts	14 Nm
hub nut	280 Nm
brake calliper support mounting bolts	105 Nm
wheel mounting bolts	105 Nm

REMOVAL

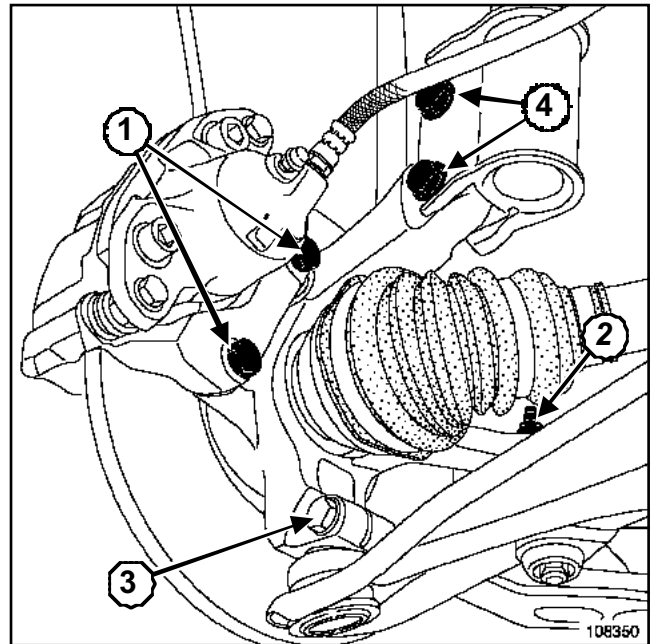
Mount the vehicle on a two-post lift.

Unlock the steering wheel.

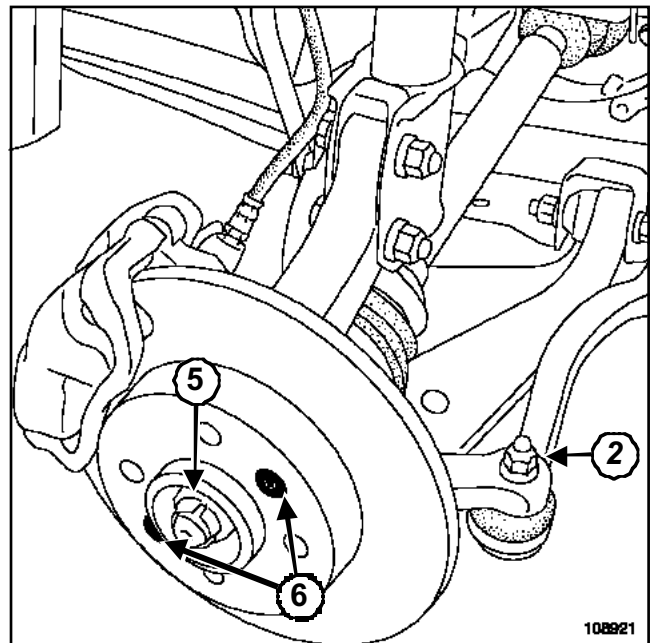
Remove the front wheel on the side concerned.

Unscrew the mounting bracket of the speed sensor cable (if fitted).

Unclip the wheel speed sensor (if fitted on the vehicle).



108350
108350



108921
108921

Remove the front brake calliper support bolts (1).

Hang the « calliper - front brake calliper support » assembly on the suspension spring.

Remove:

- the hub nut (5) using tool (Rou. 604-01),
- the mounting (6) bolts of the disk,
- the disc,
- the nut (2) of the track rod end,
- the bolt (3) of the lower ball joint,
- the lower mounting (4) bolts of the shock absorber.

Hub carrier

Extract the ball joints using tool (Tav. 476).

Remove the stub axle carrier of the front driveshaft, by pivoting it towards the vehicle interior or using tools (Tav. 1050-04) and (Tav. 1420-01) if necessary.

IMPORTANT

Take care to avoid injury from the base of the shock absorber when it comes out of the stub axle carrier.

REFITTING

Proceed in the reverse order to removal.

Note:

Smear the calliper support bolts with **LOCTITE FRENBLOC** or similar type product before fitting.

Torque tighten:


- the **shock absorber base bolts (105 Nm)**,
- the **lower ball joint bolt (62 Nm)**,
- the **track rod end nut (37 Nm)**,
- the **brake disk mounting bolts (14 Nm)**,
- the **hub nut (280 Nm)**,
- the **brake calliper support mounting bolts (105 Nm)**,
- the **wheel mounting bolts (105 Nm)**.

IMPORTANT

Depress the brake pedal several times to bring the pistons, the brake pads and discs into contact.

Adjust the axles (see **30A, General Vehicle Information, Value and adjustment of the front axle**).

Essential special tooling	
Tav. 1050-04	Universal driveshaft pusher tool (back-plate and claws, without jack).
Tav. 1420-01	Spare hydraulic screw for Tav.1420, Tav1050-02, Tav.1050-04 and Tav.1454.
Rou. 604-01	Hub locking tool
Tav. 476	Ball joint extractor

Tightening torques 	
lower ball joint bolt	62 Nm
track rod end nut	37 Nm
driveshaft nut	280 Nm
shock absorber base bolts	105 Nm
disk mounting bolts	14 Nm
calliper support bolt	105 Nm
wheel mounting bolt	105 Nm

The following tools are required for this procedure:

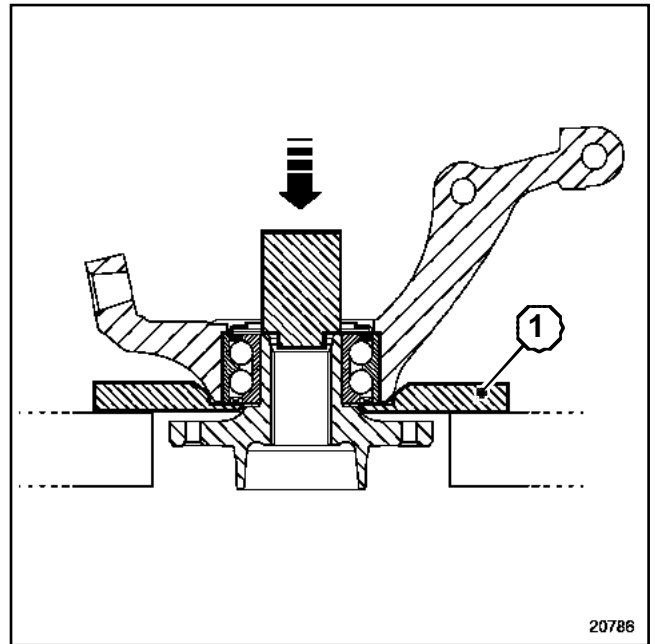
- tool (Tav. 1050-04),
- tool (Tav. 1420-01),
- tool (Rou. 604-01),
- tool (Tav. 476),
- general purpose puller.

WARNING

The bearing is instrumented. Take care not to make the wheel speed sensor target whilst refitting (if fitted on vehicle).

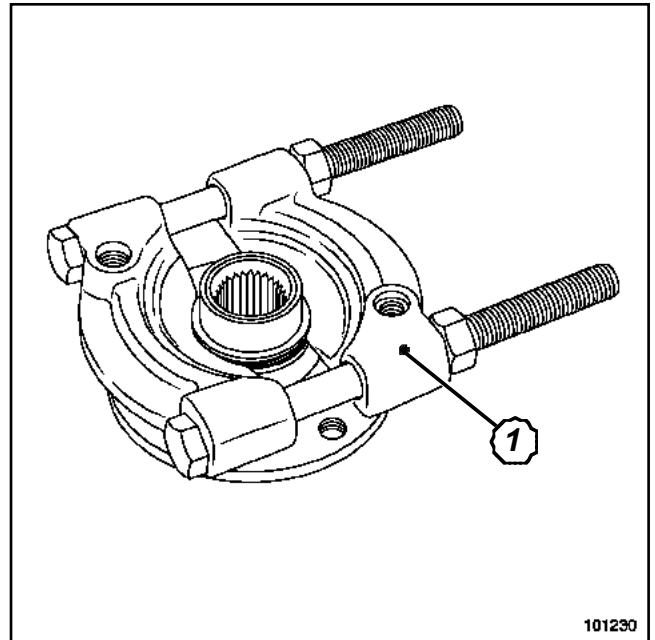
REMOVAL

Remove the hub carrier (see **31A, Front carrier components, Hub carrier**).



20786

Remove the hub, on the press, by working on the hub with a **36.5 mm** outside diameter tube using a general purpose puller (1).

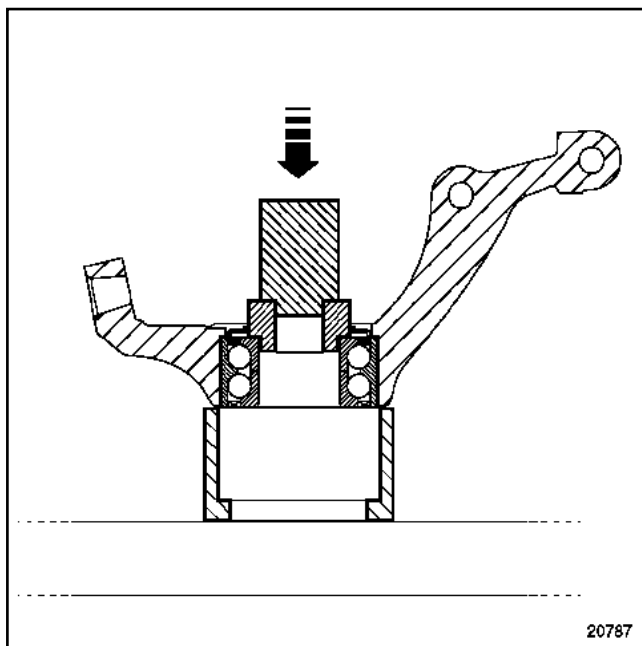


101230

Extract the lower bush from the hub using a jaw extractor (1).

Place the jaws of the extractor into the throat of the internal bush of the hub to pull it out.

Remove the bearing retaining circlip.



20787
20787

Remove the bearing by pressing on the internal bush with a tube with external diameter of **65 mm**.

WARNING

Do not press on the sensor carrier (if fitted on the vehicle).

REFITTING

WARNING

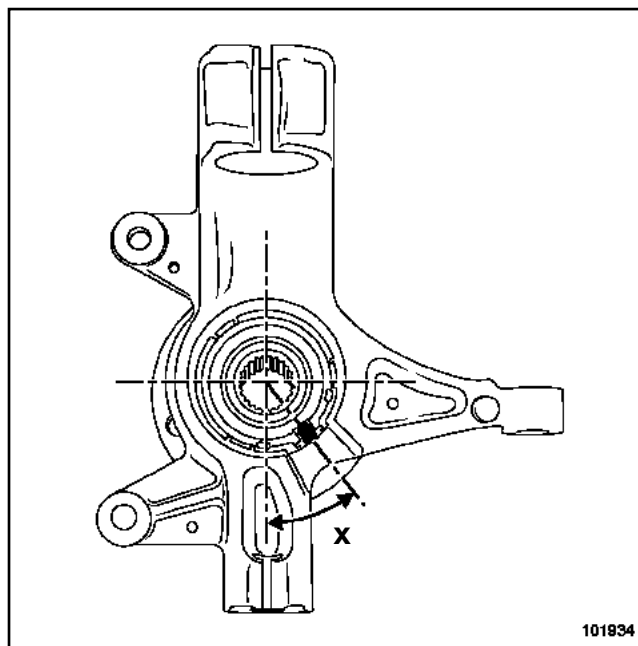
Do not move the vehicle without its driveshafts torque tightened on the hub, as to do so could destroy the wheel bearings and damage the ABS target.

WARNING

- Be sure to check the condition of the hub surface and the hub carrier bore before refitting the bearing. Replace the hub carrier if it is defective.

Clean:

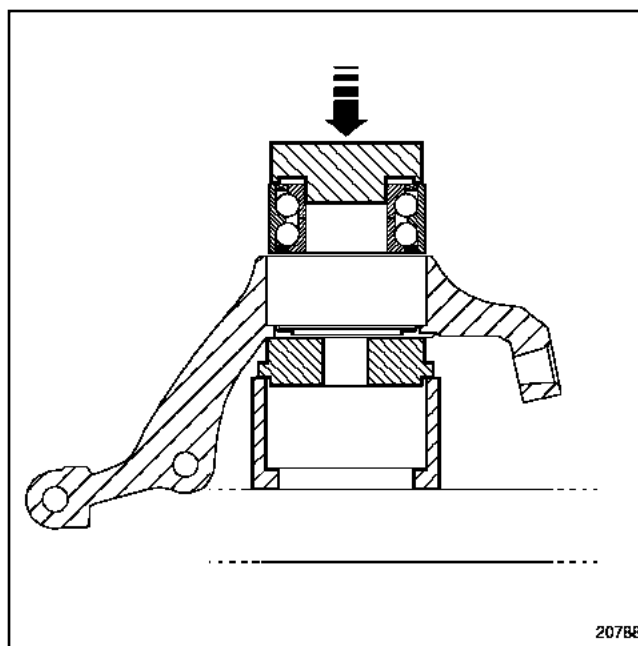
- the inner and outer surfaces of the new bearing in contact with the stub axle carrier and the hub,
- the stub axle carrier surfaces in contact with the new bearing,
- the hub surfaces in contact with the new bearing.



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Refit the sensor carrier (if fitted).

Position the sensor carrier at **(X)** or $35^\circ \pm 5$ from the vertical axle of the hub carrier, as this position corresponds with the centre of the housing (if fitted).



20788
20788

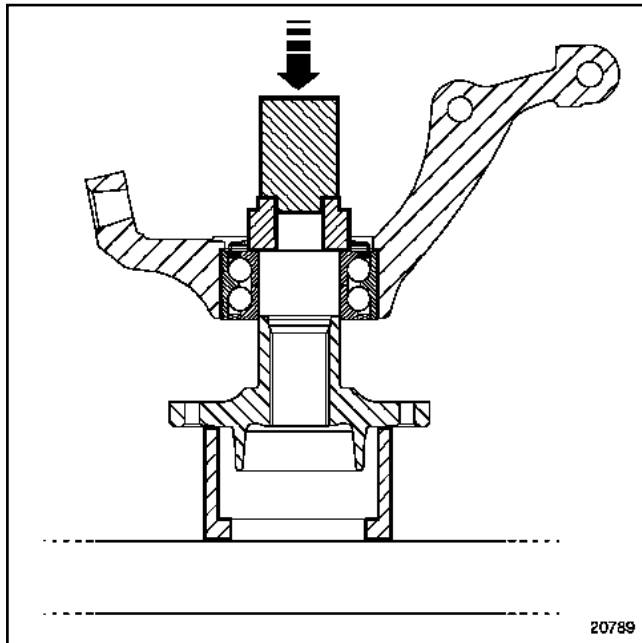
Press on the external bearing bush with a tube of an external diameter of **70 mm**.

WARNING

Do not grip the inner bearing bush, to avoid damaging the bearing (significant force is required for fitting).

Hub-carrier bearing

Refit the bearing retaining circlip.



20789

Press on the inner bearing bush with a tube of an external diameter of **50 mm**.

Refit the "hub carrier - bearing - hub" assembly on the vehicle (see **31A, Front carrier components, Hub carrier**).

Torque tighten:

- the **lower ball joint bolt (62 Nm)**,
- the **track rod end nut (37 Nm)**,
- the **driveshaft nut (280 Nm)**,
- the **shock absorber base bolts (105 Nm)**,
- the **disk mounting bolts (14 Nm)**,
- the **calliper support bolt (105 Nm)**,
- the **wheel mounting bolt (105 Nm)**.

FRONT AXLE ASSEMBLIES

Spring and shock absorber assembly

31A

Essential equipment

spring compressor

Tightening torques

shock absorber nut for spring cups	62 Nm
------------------------------------	-------

shock absorber nut on the body	44 Nm
--------------------------------	-------

shock absorber base bolts	105 Nm
---------------------------	--------

wheel mounting bolts	105 Nm
----------------------	--------

REMOVAL

Mount the vehicle on a two-post lift.

WARNING

Make sure the colours of the springs and shock absorbers are identical with the spare parts.

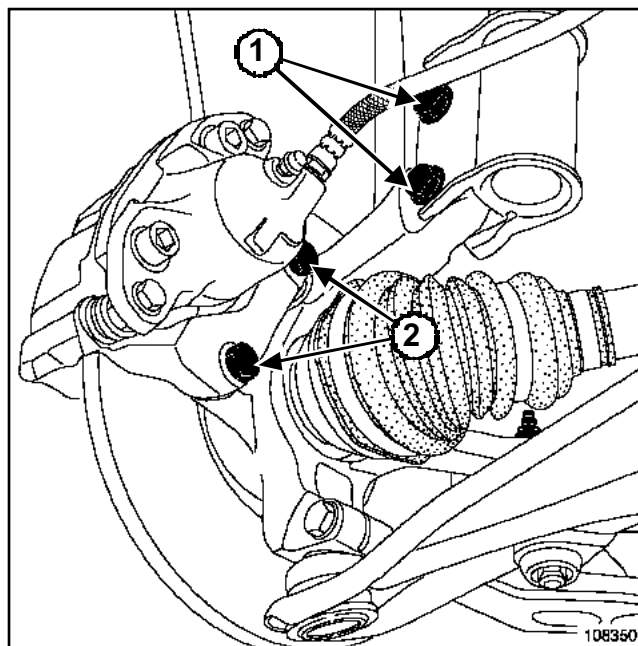
Unlock the steering wheel.

Disconnect the battery, starting with the negative terminal.

Remove the front wheels.

Unscrew the mounting bracket of the speed sensor cable (if fitted).

Unclip the wheel speed sensors (if fitted on the vehicle).



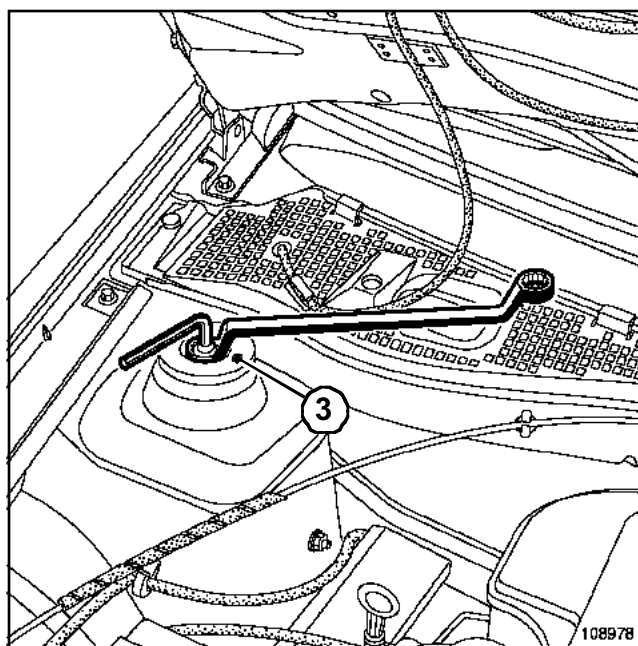
108350

Remove the mounting (2) bolts of the calliper support, hang them up.

Remove the bolts (1) of the shock absorber base.

Remove the shock absorber base from the stub axle carrier, pushing on the stub axle carrier.

Hang up the stub axle carrier.



108978

Remove:

- the shock absorber cage with a male Allen key and a ring spanner,
- the cage (3),
- the « spring and shock absorber » assembly.

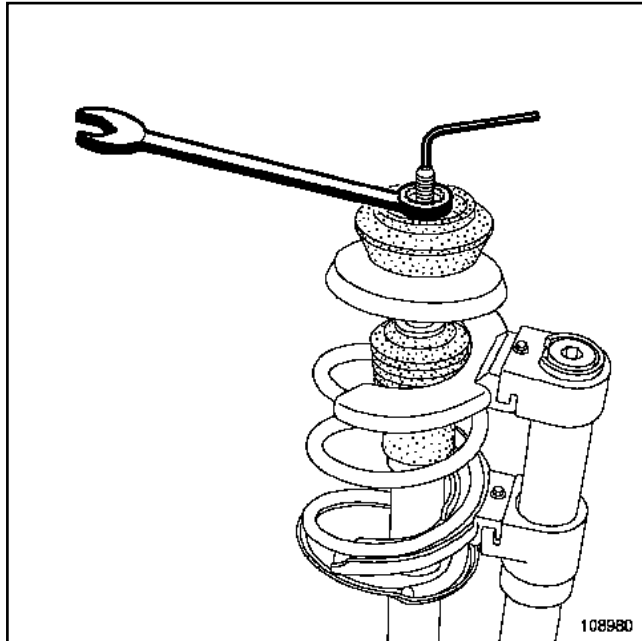
FRONT AXLE ASSEMBLIES

Spring and shock absorber assembly

31A

Mount the appropriate cups on the **spring compressor** and position the assembly on the spring.

Detach the spring from the cups by compressing the spring.



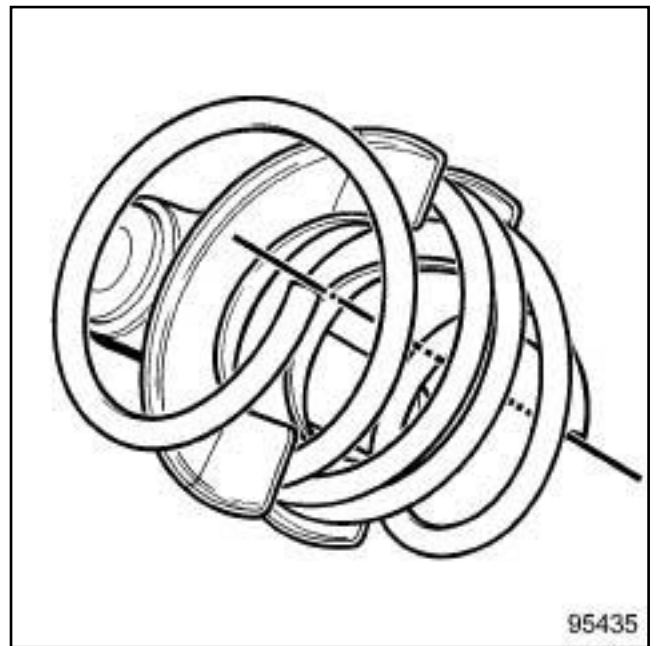
108980

Remove the shock absorber rod with a male Allen key and a ring spanner.

Separate the various components of the "spring and shock absorber" assembly.

REFITTING

Put the **spring compressor** in a vice.



95435

Note:

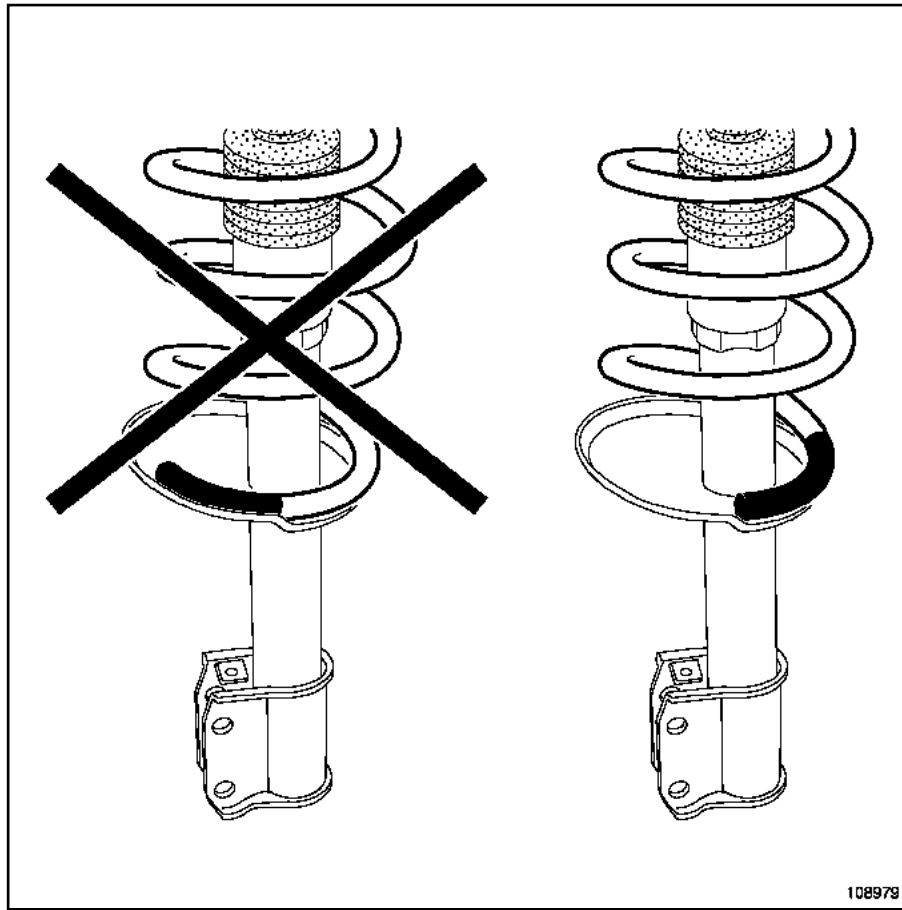
When replacing the spring, ensure the positioning and orientation of the spring and the tool cups are correct to facilitate refitting.

Apply grease between the ends of the spring and its stops.

FRONT AXLE ASSEMBLIES

Spring and shock absorber assembly

31A



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108979

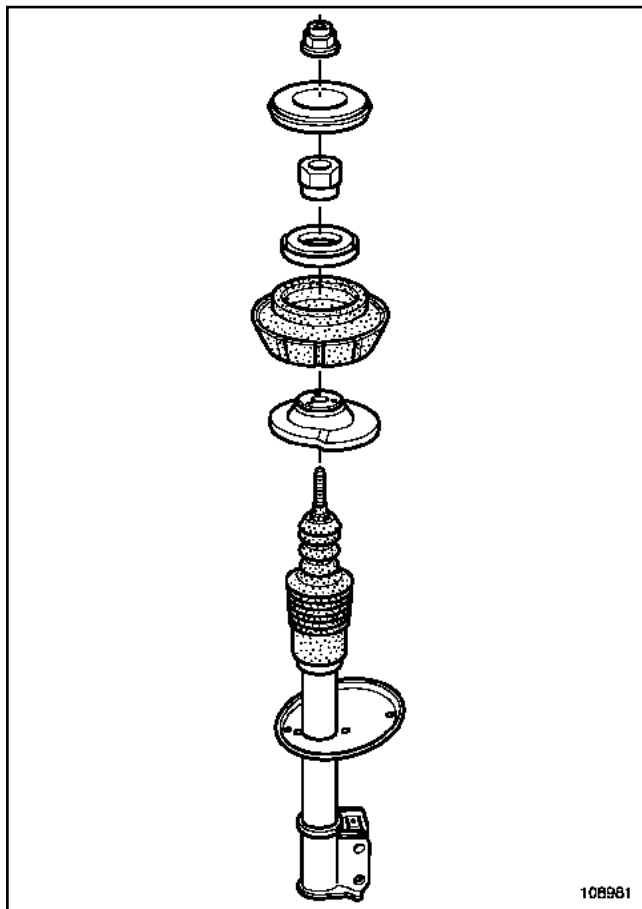
Insert the spring in the groove of the cup.

|

FRONT AXLE ASSEMBLIES

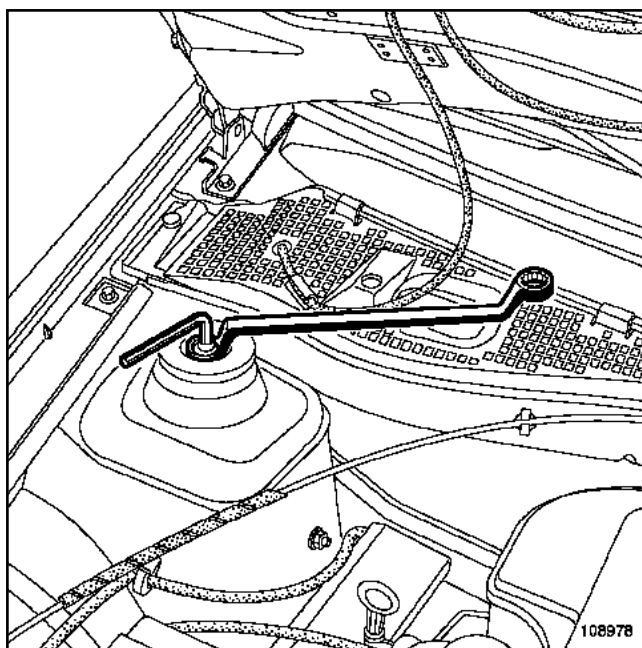
Spring and shock absorber assembly

31A



108981

Be sure to fit the constituent parts in the correct order and direction.



108978

Be sure to replace the shock absorber rod nut.

Torque tighten the **shock absorber nut for spring cups (62 Nm)**.

Decompress the spring.

Remove the **spring compressor**.

Proceed in the reverse order to removal.

WARNING

- Fix the wheel speed sensor wiring, if it has come undone (if fitted on vehicle).
- Do not twist the brake hose.

Torque tighten:


- the **shock absorber nut on the body (44 Nm)**,
- the **shock absorber base bolts (105 Nm)**,
- the **wheel mounting bolts (105 Nm)**.

WARNING

Connect the battery starting with the positive terminal ; perform the necessary programming (see **80A, Battery: removal - refit**).

Essential special tooling	
Tav. 476	Ball joint extractor
Sus. 1413	Rubber mounting compressor for fitting anti-roll bars. (wheel side)

Essential equipment	
jack	

Tightening torques 	
rear and front lower arm mounting bolts on the sub-frame	105 Nm
lower sub-frame tie-rod mounting nut	62 Nm
sub-frame tie-rod upper bolt	21 Nm
anti-roll bar reduction linkage ball joint nuts	35 Nm
lower ball joint nut	62 Nm
front wheel bolts	105 Nm

WARNING

Do not grip lower arm with a lifting system.

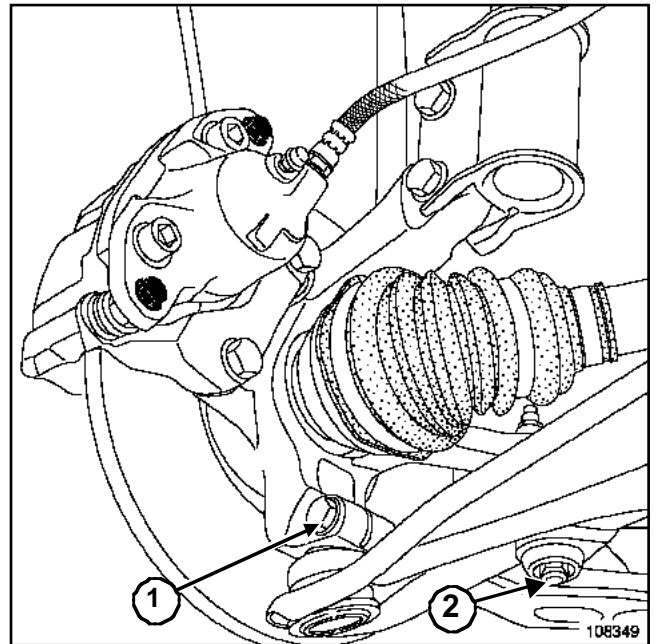
REMOVAL

Mount the vehicle on a two-post lift.

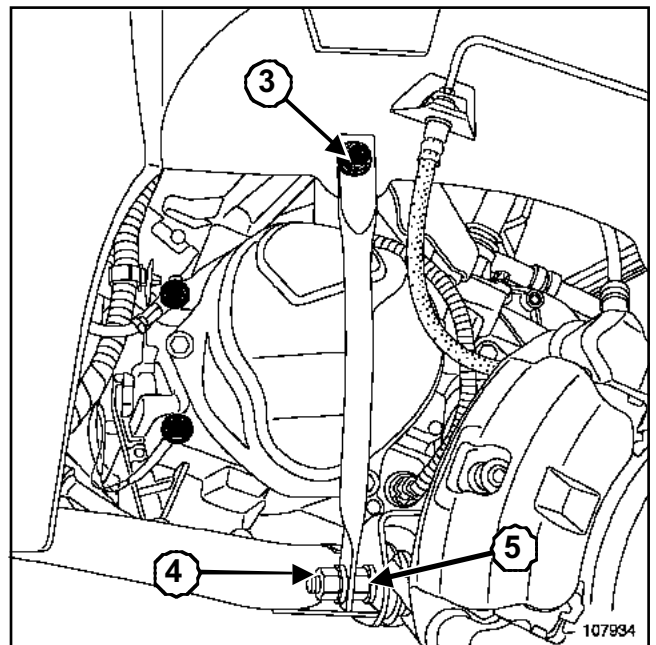
Unlock the steering wheel.

Remove:

- the front wheel,
- the side wheel arch liner.



108349
108349



107934
107934

Remove:

- the lower ball joint bolt (1),
- the stabiliser bar tie-rod lower nut (2).

Extract the ball joint using tool (Tav. 476).

Untighten the sub-frame tie-rod upper bolt (3).

Remove:

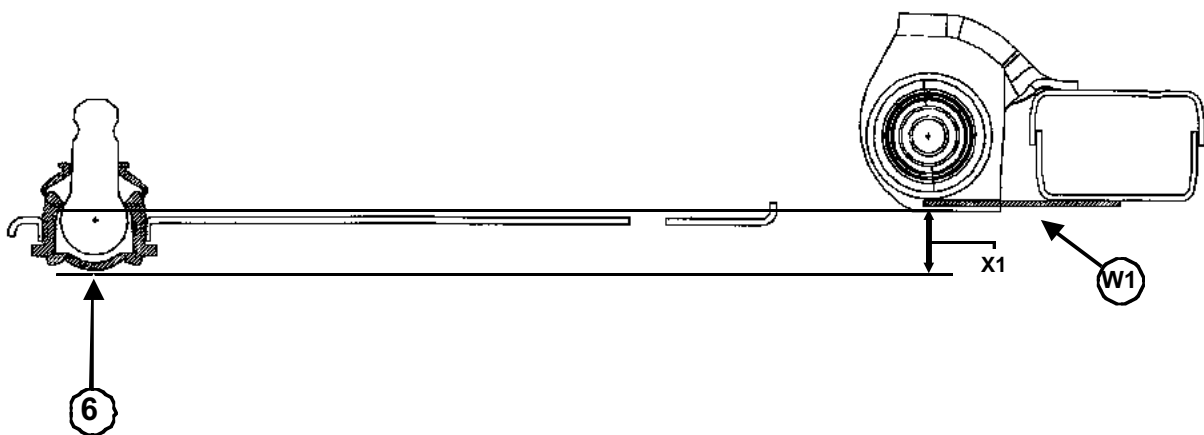
- the sub-frame tie-rod lower mounting bolt (4).
- the rear and front lower arm mounting bolts (5),
- the lower arm.

REFITTING

Proceed in the reverse order to removal.

WARNING

The arms bolts must be replaced.



109835

109835

WARNING

When refitting, position the lower arm to obtain a centre-to-centre distance measurement (**X1**) = **24 mm** between the bottom of the ball joint (**6**) of the lower arm and the above of the sub-frame at the level of the hole at the lower arm centre (**W1**), for tightening the rubber bushes without forcing.

Bring **jack** into contact on the above of the sub-frame at the level of the hole at the centre of the lower arm (**W1**).

Lower the **jack** by (**X1**) = **24 mm**.

Fit the bottom of the ball joint (**6**) of the lower arm on the **jack** without altering the adjustment.

Torque tighten the **rear and front lower arm mounting bolts on the sub-frame (105 Nm)** in this position.

Remove the **jack**.

Refit the lower ball joint into the stub axle carrier.

Refit and torque tighten:

- the **lower sub-frame tie-rod mounting nut (62 Nm)**,
- the **sub-frame tie-rod upper bolt (21 Nm)**,
- the **anti-roll bar reduction linkage ball joint nuts (35 Nm)**,
- the **lower ball joint nut (62 Nm)**,
- the front wheels and the **front wheel bolts (105 Nm)**.

Note:

Fit the anti-roll bar linkage with tool (Sus. 1413) and the adapter (Sus.1734).

WARNING

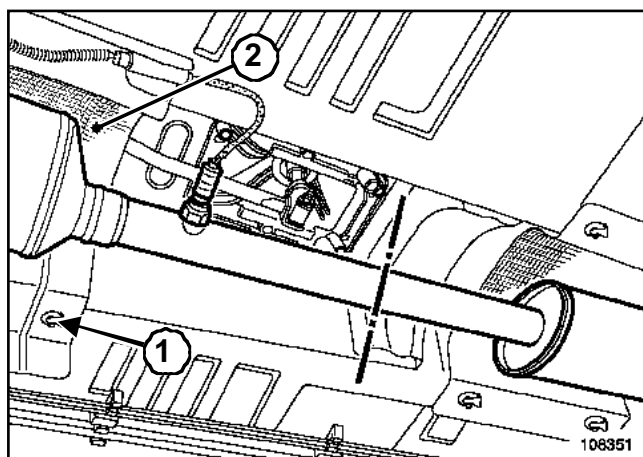
Adjust the axles (see **30A, General Vehicle Information, Value and adjustment of the front axle**).

Essential special tooling**Sus. 1413**

Rubber mounting compressor for fitting anti-roll bars. (wheel side)

Essential equipment

jack

Tightening torques stabiliser bar tie rod nuts **14 Nm**stabiliser bar central bearing bolts **105 Nm****REMOVAL**

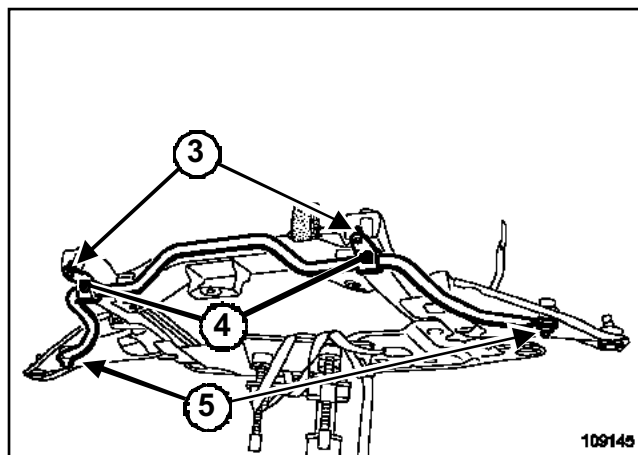
108351

Remove the special mounting (1) bolts of the heat shield.

Move the heat shield slightly to one side (2) to be able to unscrew the anti-roll bar right-hand bearing nut.

WARNING

All damaged heat shields must be replaced.



109145

109145

Remove:

- the nuts (3) of the anti-roll bar central bearings,
- the bolts (4) of the anti-roll bar central bearings (rear mounting bolt of the sub-frame),
- the lower nuts (5) of the stabiliser bar tie rod,
- the anti-roll bar.

Check the condition of the central bearings and the tie rods, replacing them if necessary.

REFITTING

Proceed in the reverse order to removal.

WARNING

The sub-frame bolts must be replaced.

WARNING

Firstly position the central bearings with their bolts.

Lift the lower arm with a **jack**.

Fit the anti-roll bar linkage with tool (Sus. 1413) and the tool (Sus. 1734).

Torque tighten:


- the **stabiliser bar tie rod nuts (14 Nm)**,
- the **stabiliser bar central bearing bolts (105 Nm)**.

WARNING

The tightening order of the anti-roll bar must be followed.

Essential special tooling	
Mot. 1199-01	Exhaust pipe cutter
Tav. 476	Ball joint extractor

Essential equipment	
safety belt	
steering wheel lock	
jack	

Tightening torques 		
sub-frame mounting bolts		105 Nm
sub-frame tie-rod upper bolts		21 Nm
steering ball-joint nuts		37 Nm
lower ball joint bolts		62 Nm
engine tie-bar bolts on the sub-frame		65 Nm
engine tie-bar bolts on the gearbox		35 Nm
steering column universal joint bolts		21 Nm
wheel mounting bolts		105 Nm

WARNING

Do not grip lower arm with a lifting system.

REMOVAL

Mount the vehicle on a two-post lift.

IMPORTANT

- During this operation, secure the vehicle to the lift with a strap **safety belt**, to prevent it from becoming unbalanced.
- For the fitting procedure of the **safety belt**, see **02A, Lifting equipment, Underbody lift: safety**.

Straighten the wheels.

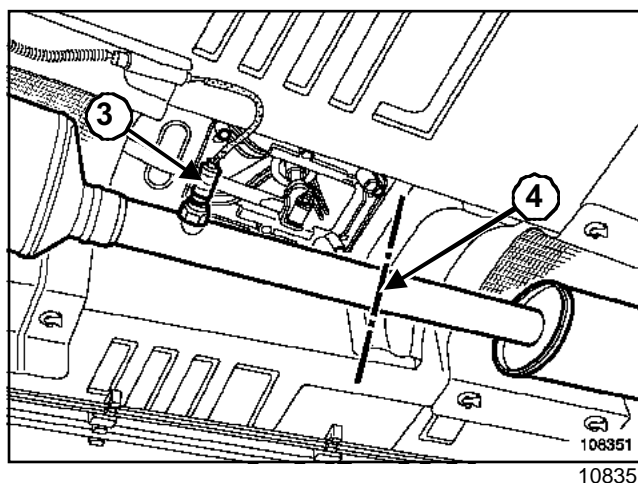
Fit the **steering wheel lock**.

In the passenger compartment, remove the steering column universal joint bolt and nut.

Strap the radiator to the front upper cross member.

Remove

- the wheels,
- the two side wheel arch liners.

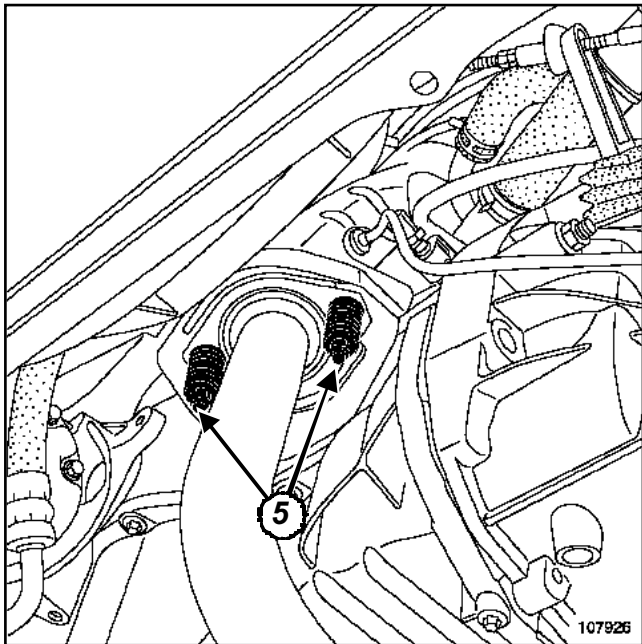


Unclip and disconnect the lambda sensor (3).

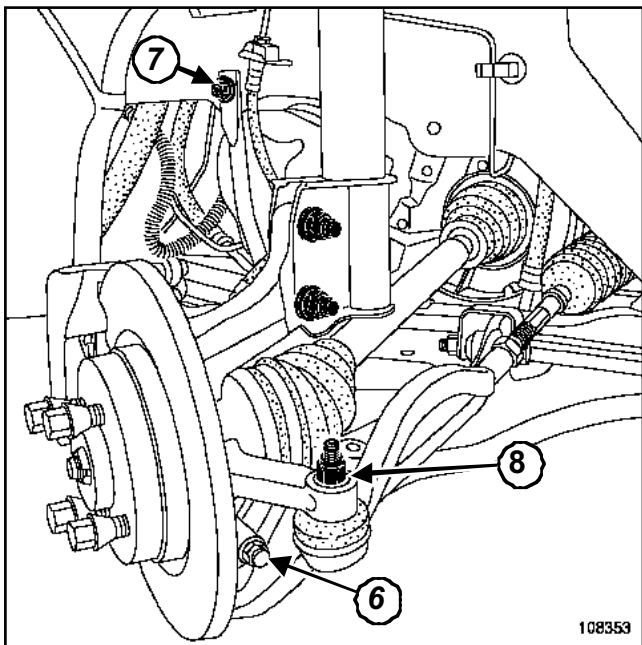
Cut the exhaust pipe (4) at **130 cm** from the exhaust manifold using tool (Mot. 1199-01).

IMPORTANT

Catalytic converters contain ceramic fibres; these are contained within a closed unit, and cannot be dispersed. Cutting or drilling catalytic converters is prohibited.



107926
107926



108353
108353

Remove:

- the sub-frame tie-rod upper bolts (7),
- the exhaust pipe nuts at the level of the exhaust manifold (5),
- the exhaust pipe rubber mounting at the catalytic converter level,
- the exhaust pipe from the manifold to the cut,
- the steering ball joint nuts (8),
- the lower ball joint bolts (6).

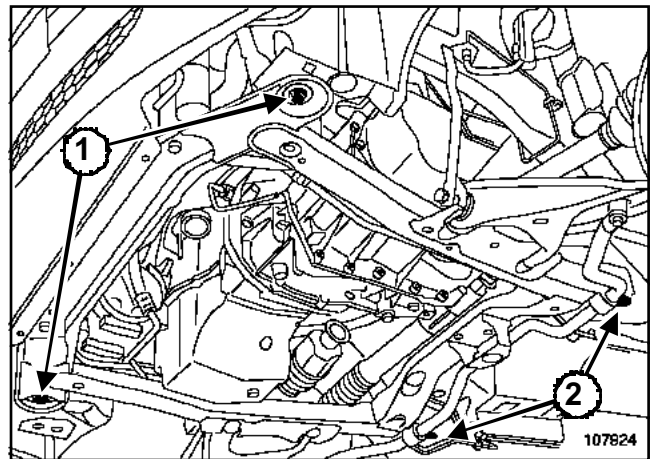
Extract the four ball joints using tool (Tav. 476).

DIRECTION ASSISTEE

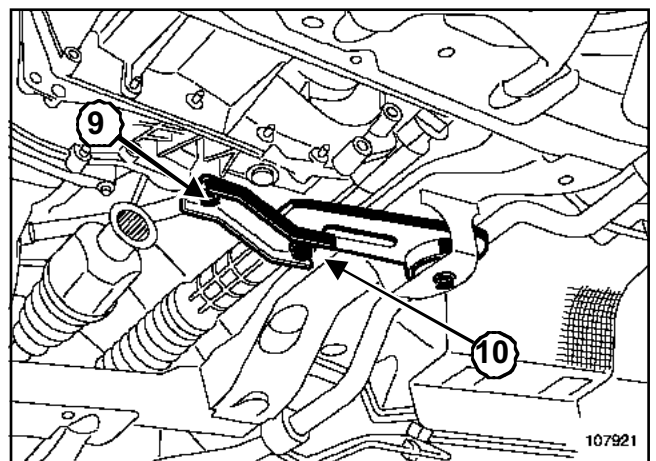
Fit a hose clamp on the low pressure pipe to restrict the flow of power assisted steering fluid.

Unscrew:

- the low pressure pipe mounting bolt on the sub-frame,
- the high pressure pipe union on the rotation valve,
- the low pressure pipe union on the rotation valve.



107824
107924



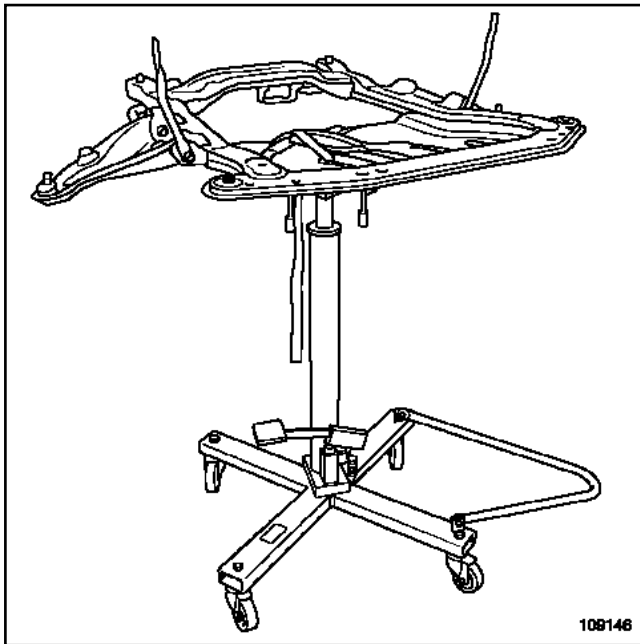
107921
107921

Remove the mounting (9) and (10) bolt of the engine tie-bar on the engine.

Put a **jack** on the fixed engine guard using a **safety belt**.

Remove:

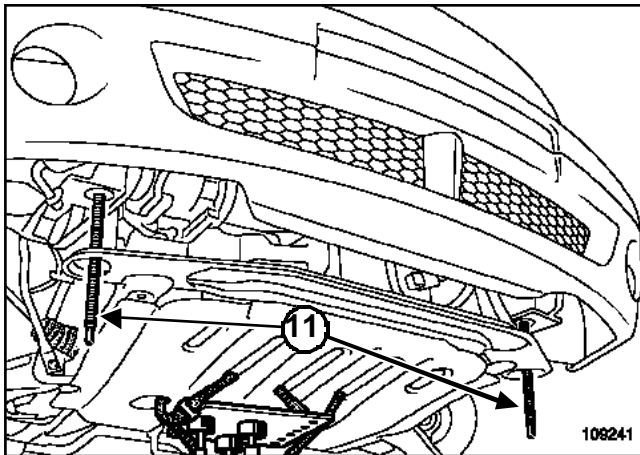
- the sub-frame mounting bolts on the body (2) and (1),
- the sub-frame.



109146

Remove the equipment from the sub-frame.

REFITTING



109241

Put two M12 threaded rods (11) of the tool (Tav. 1747) in the position of the sub-frame front mounting bolts, to guide the sub-frame when it is refitted.

WARNING

- Check the position of the radiator on the lower cross member.
- Straighten the wheels.
- You must replace the sub-frame bolts, and the nut and bolt of the steering column universal joint.

Proceed in the reverse order to removal.

Torque tighten in order:

- the **sub-frame mounting bolts (105 Nm)**,
- the **sub-frame tie-rod upper bolts (21 Nm)**,

WARNING

Be sure to follow the sub-frame tightening order.

Fit the sleeve part number **77 03 083 443** with "mastic pour sealing the union on exhaust pipes" on the exhaust pipe cut.

Torque tighten:

- the **steering ball-joint nuts (37 Nm)**,
- the **lower ball joint bolts (62 Nm)**,
- the **engine tie-bar bolts on the sub-frame (65 Nm)**,
- the **engine tie-bar bolts on the gearbox (35 Nm)**,
- the **steering column universal joint bolts (21 Nm)**,
- the **wheel mounting bolts (105 Nm)**.

WARNING

Adjust the axles (see **30A, General Vehicle Information, Value and adjustment of the front axle**).

DIRECTION ASSISTEE

Fill up the power assisted steering oil circuit (type: **ELFRENAULTMATIC D2**).

Bleed the circuit by turning the steering wheel from lock to lock with the engine switched off in the first instance.

Bleed the circuit by turning the steering wheel from lock to lock with the engine running.

Top up the level of oil in the reservoir.

Check that there are no leaks.

Essential equipment

pedal press

Tightening torques

rigid brake pipe union on the rear axle **14 Nm**

rigid brake pipe union at the cylinder **14 Nm**

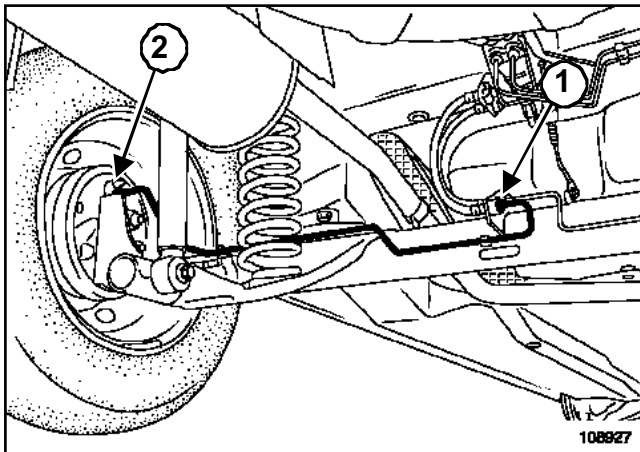
The pipes have a rigid and a flexible section.

REMOVAL

Mount the vehicle on a two-post lift.

Fit the **pedal press** tool to the brake pedal to restrict the outflow of brake fluid.

I - REAR LEFT-HAND RIGID BRAKE PIPE



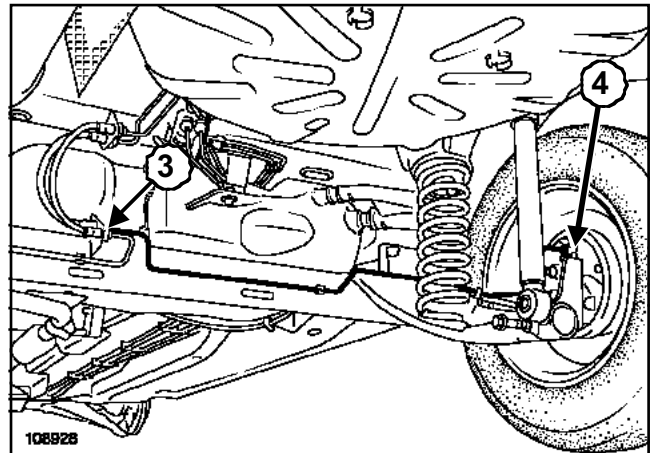
Unscrew:

- the rigid brake pipe from the rear axle (1),
- the rigid brake pipe at the brake cylinder (2)

Unclip the rear axle rigid brake pipe.

Remove the rigid brake pipe.

II - REAR RIGHT-HAND RIGID BRAKE PIPE



Unscrew:

- the rigid brake pipe at the rear axle (3),
- the rigid brake pipe at the brake cylinder (4)

Unclip the rear axle rigid brake pipe.

Remove the rigid brake pipe.

REFITTING

Proceed in the reverse order to removal.

Torque tighten:

- the **rigid brake pipe union on the rear axle (14 Nm)**,
- the **rigid brake pipe union at the cylinder (14 Nm)**,

WARNING

Do not twist the brake hose.

Make sure that there is no contact between the brake hose and the surrounding components.

It is essential to replace the rigid pipe mounting clips.

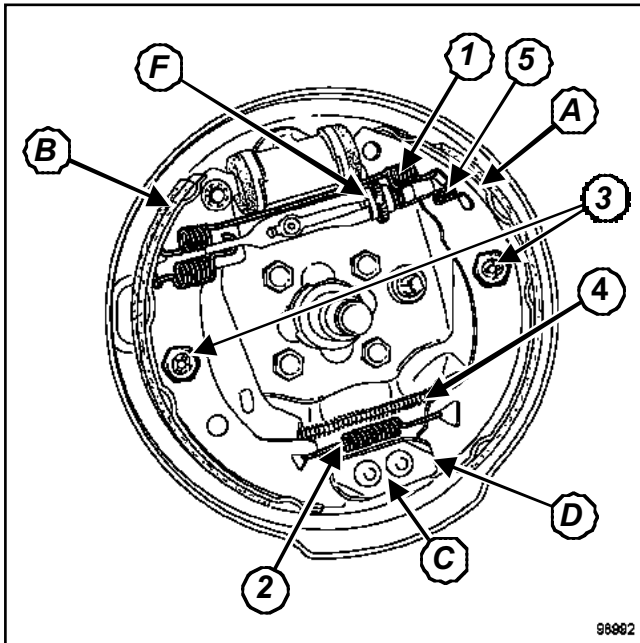
Bleeding the circuit (see **30A, General Vehicle Information, Braking circuit bleed**).

DIRECTION MANUELLE, and BASIC HEATING

Tightening torques

rear hub nut	175 Nm
wheel bolts	105 Nm

Composition of brake (automatic incremented compensation).



98992
98992

- (A) Leading shoe
- (B) Trailing shoe
- (C) Fixed point
- (D) Base of brake shoe
- (E) Self-adjusting compensator
- (F) Upper return spring
- (1) Lower return spring (for base)
- (2) Side retainer
- (3) Handbrake lever return spring
- (4) Incremented compensator system spring
- (5) Side retainer

IMPORTANT

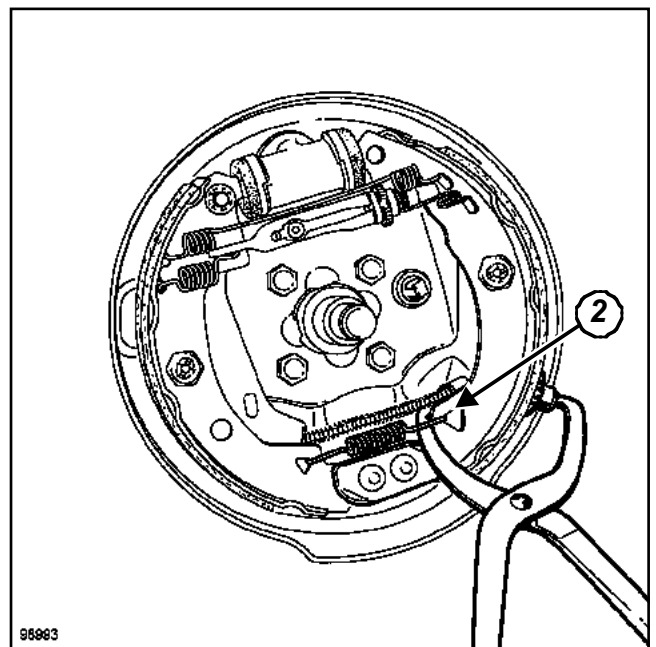
Brake shoes must be replaced by complete axle - never fit shoes of differing makes or grades.

REMOVAL

Mount the vehicle on a two-post lift.

Slacken the handbrake cables as much as possible.

Remove the brake drum (see 33A, Rear axle components, Brake drum).



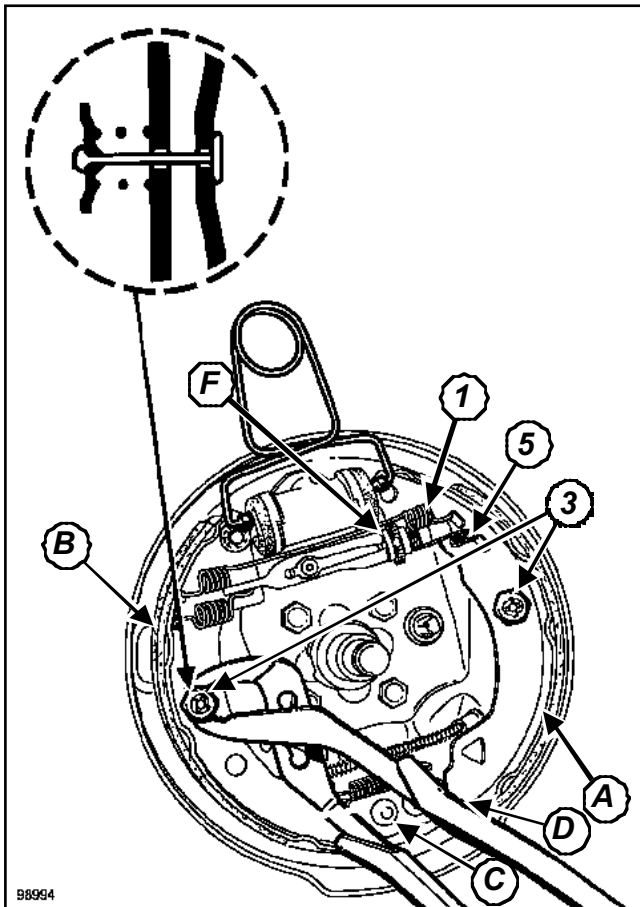
98993

98993

Remove the lower spring (2) with brake shoe pliers.

Place the pliers on the slave cylinder pistons.

DIRECTION MANUELLE, and BASIC HEATING



98994

Remove:

- the upper retaining spring (1) removing the rear brake lining first with brake shoe pliers,
- the incremented compensator system spring (5),
- the side retainers (3) holding the connecting rod against the brake backing plate,
- the incremented play compensation lever (F),

Remove each brake shoe base (D) alternately from fixed point (C).

Unclip the parking brake cable from the brake lining.

Remove the linings (B) and (A).

Remove any dust from the drums and flanges using a brake cleaner.

REFITTING

Lightly grease the support linkage lever thread (F).

Proceed in the reverse order to removal.

WARNING

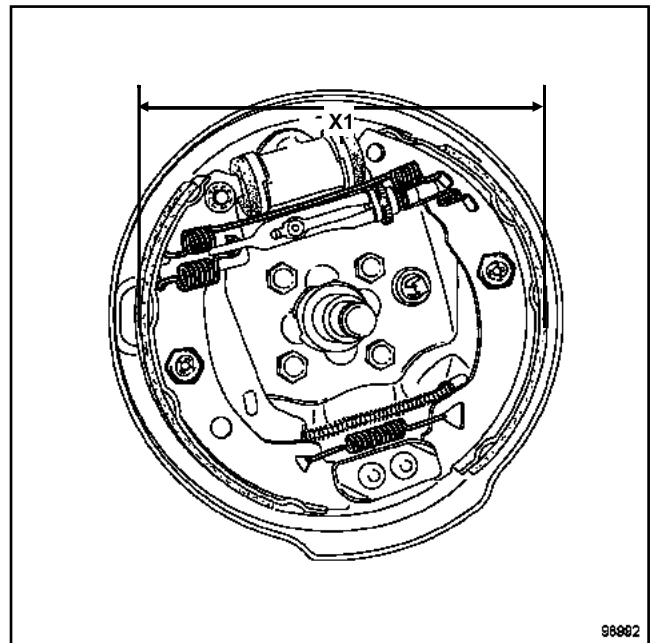
The brake mechanism components are different on the left and right-hand sides, so it is important not to mix them.

Note:

On the left-hand brake: the bolt thread has a right pitch.

On the right-hand brake: the bolt thread has a left pitch.

ADJUSTMENT

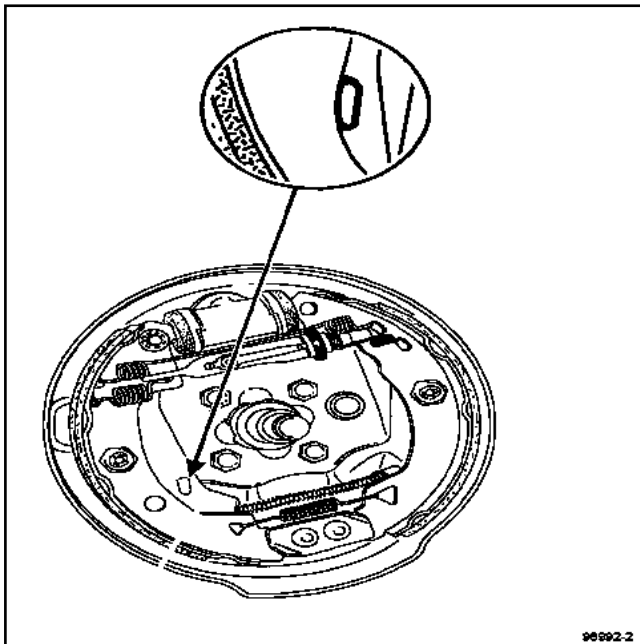


98992

With the help of a screwdriver, adjust the brake shoe diametric setting using the linkage to a diameter (X1) of $179.4 \text{ mm} \pm 0.25$.

Carry out the same adjustment on the other side.

DIRECTION MANUELLE, and BASIC HEATING



98992-2

Adjust the handbrake if the lever remains between the first and second parking brake travel position (see **37A, Mechanical component controls, Parking brake cables**).

Refit the drum.

Adjust the brake shoes by repeatedly depressing the brake pedal.

Make sure that the incremented compensator system is working properly (you should hear the drums click).

Torque tighten:

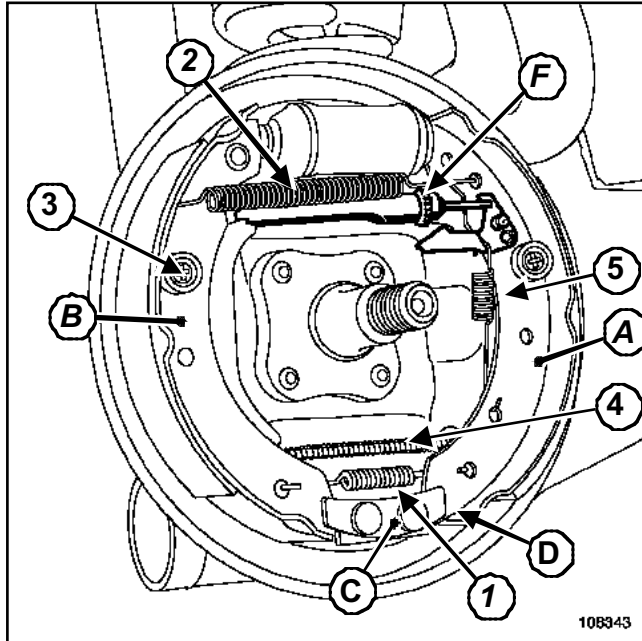
- the rear hub nut (175 Nm),
- the wheel bolts (105 Nm).

DIRECTION ASSISTEE, and AIR CONDITIONING

Tightening torques

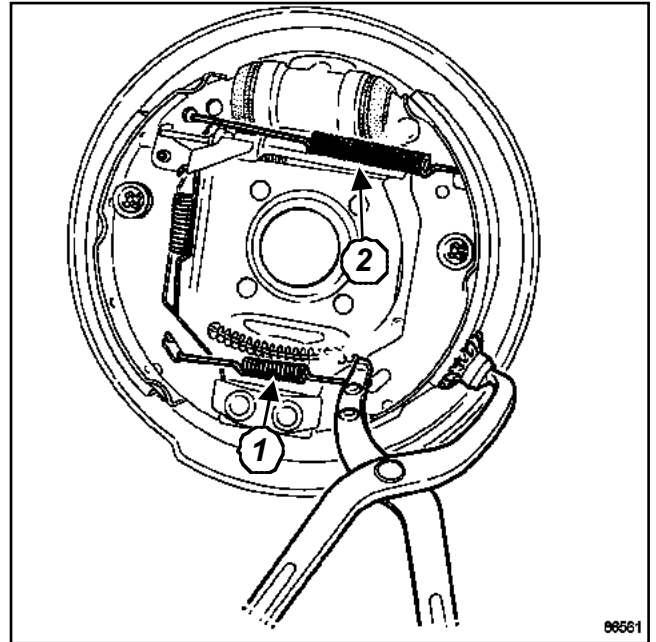
rear hub nut	175 Nm
wheel bolts	105 Nm

Composition of brake (self-adjusting compensator).



- (A) Leading shoe
- (B) Trailing shoe
- (C) Fixed point
- (D) Base of brake shoe
- (F) Self-adjusting compensator
- (1) Lower return spring (for base)
- (2) Upper return spring
- (3) Side retainer
- (4) Handbrake lever return spring
- (5) Incremented compensator system spring

REMOVAL



Slacken the handbrake cables as much as possible.

Remove:

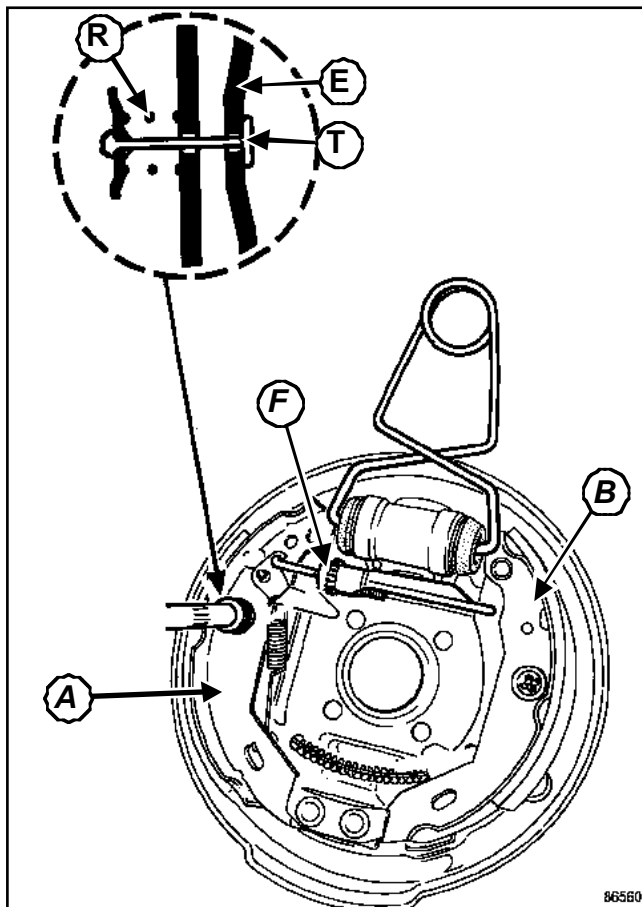
- the brake drum (see 33A, Rear axle components, Brake drum).
- the lower spring (1), then the upper spring (2) with brake shoe pliers.

IMPORTANT

Brake shoes must be replaced by complete axle - never fit shoes of differing makes or grades.

Place the pliers on the slave cylinder pistons.

DIRECTION ASSISTEE, and AIR CONDITIONING

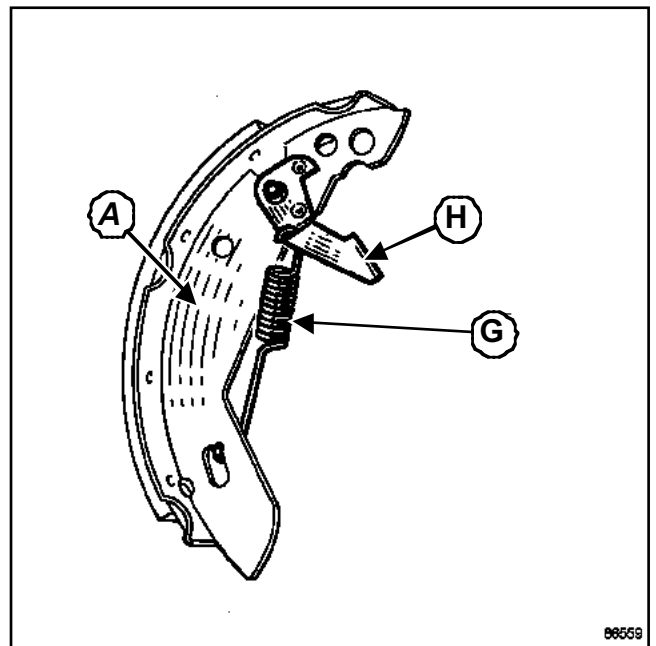


86560
86560

Remove:

- the side retainer springs (R) holding the connecting rod (T) against the brake backing plate (E),
- the leading shoe (A),
- the linkage (F),
- the trailing shoe (B).

Uncouple the handbrake cable from the handbrake lever.



86559
86559

Remove the leading shoe:

- the spring (G),
- the adjustment lever (H).

Remove any dust from the drums and the flanges using a brake cleaner.

REFITTING

Lightly grease the support linkage thread.

WARNING

The brake mechanism components are different on the left and right-hand sides, so it is important not to mix them.

Note:

On the left-hand brake: the bolt thread has a right pitch.

On the right-hand brake: the bolt thread has a left pitch.

Refit the leading shoe:

- the adjustment lever,
- the spring.

Reattach the handbrake cable to the trailing shoe.

Mount:

- the trailing shoe and secure it,

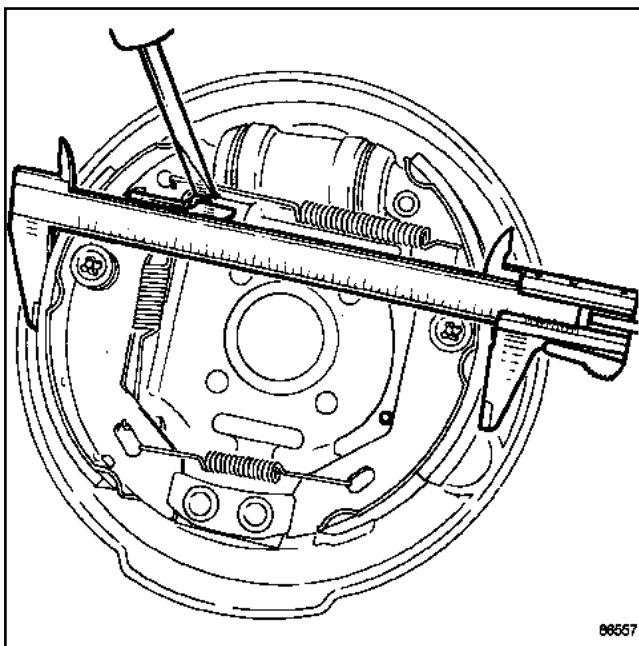
DIRECTION ASSISTEE, and AIR CONDITIONING

- the support control lever directing the threaded pushrod hollow section on the adjustment lever side,
- the leading shoe and secure it.

Remove the pliers from the slave cylinder pushrods, the refit:

- the upper spring,
- the lower spring.

ADJUSTMENT



86557

With the help of a screwdriver, adjust the diametric setting of the brake shoes using the rod, to a diameter of **202.45 mm ± 0.25**

Carry out the same adjustment on the other side.

Adjust the handbrake if the lever remains between the first and second position of the parking brake travel (see **37A, Mechanical component controls, Parking brake cables**).


Refit the drum.

Adjust the brake shoes by repeatedly depressing the brake pedal.

Make sure that the self-adjusting compensator system is working properly (you should hear the drums click).

Torque tighten:

- the rear hub nut (**175 Nm**),
- the wheel bolts (**105 Nm**).

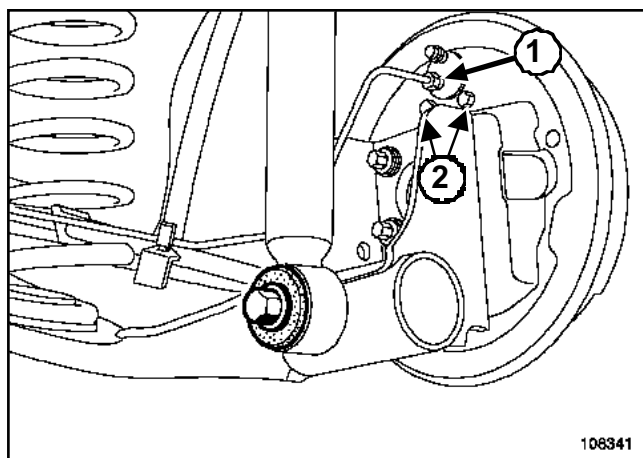
Tightening torques 	
cylinder on the brake back plate mounting bolts	14 Nm
rigid pipe union on the slave cylinder	14 Nm
bleed screw	6 Nm
drum nut	175 Nm
wheel bolts	105 Nm

REMOVAL

Remove:

- the brake drum (see **33A, Rear axle components, Brake drum**).
- the upper return spring using brake shoe pliers (see **33A, Rear axle components, Rear brake linings**).

Separate the shoes.



108341
108341

Unscrew:

- the rigid pipe union (1) on the slave cylinder (take precautions for brake fluid outflow),
- the cylinder mounting bolts on the (2) brake backing plate.

Remove the brake cylinder.

REFITTING

Remove any dust from the drums, the brake linings and the brake back plates using brake cleaner.

Proceed in the reverse order to removal.

Torque tighten:

- the cylinder on the brake back plate mounting bolts (14 Nm),
- the rigid pipe union on the slave cylinder (14 Nm),
- the bleed screw (6 Nm),
- the drum nut (175 Nm),
- the wheel bolts (105 Nm).

Bleeding the circuit (see **30A, General Vehicle Information, Braking circuit bleed**).

Adjust the brake shoes by repeatedly depressing the brake pedal.

Check the cut-out pressure (see **37A, Mechanical component controls, Brake limiter**).

Essential special tooling

Tav. 1050-04	Universal driveshaft pusher tool (back-plate and claws, without jack).
Tav. 1420-01	Spare hydraulic screw for Tav.1420, Tav1050-02, Tav.1050-04 and Tav.1454.

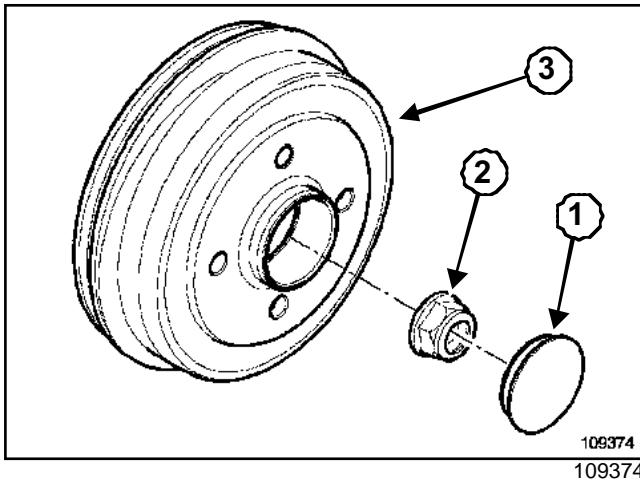
Tightening torques

hub nut	17.5 daNm
wheel bolts	10.5 daNm

REMOVAL

Position the vehicle on a two-post lift.

Release the parking brake lever.



Remove:

- the wheel concerned,
- the hub cover (1) using a chisel and a hammer,
- the hub nut (2),
- the drum (3) using tools(Tav. 1050-04) and (Tav. 1420-01), if necessary.

REFITTING

Remove any dust from the drums, the shoes and the flanges using a brake cleaner.

Adjust the handbrake if the lever remains between the first and second position of the parking brake travel (see **37A, Mechanical component controls, Parking brake cables**).

Fit:

- the drum,
- the nut.

Torque tighten the **hub nut (17.5 daNm)**.

Fit the hub cover plug.

Adjust the brake shoes by repeatedly depressing the brake pedal.

IMPORTANT

The two brake drums must be of the same diameter, if one is reground, the other must also be reground. The maximum diameter is etched on the drum.

Refit the wheel and torque tighten the **wheel bolts (10.5 daNm)**.

Tightening torques

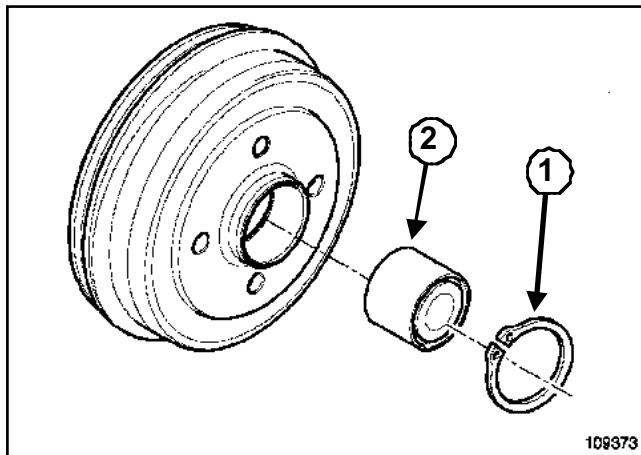
hub nut	17.5 daNm
wheel mounting bolts	10.5 daNm

CHECKING

Use a dial gauge fixed on the drum to check that the end float is **0** to **0.03 mm** max.

REMOVAL

Remove the drum (see 33A, **Rear carrier elements, Brake drum**).



Extract the hub:

- the bearing retaining clips (1),
- the bearing (2) using a tube of an external diameter of **49 mm** and a press.

Note:

Check that the tube is properly pressing against the external bearing ring.

REFITTING

Lift the bearing until it presses onto the shoulder using a tube of an external diameter of **50 mm** and a press.

Fit:

- a new clip,
- the drum on the previously oiled stub-axle (see 33A, **Rear carrier components, Brake drum**).

Torque tighten:

- the hub nut (**17.5 daNm**),
- the wheel mounting bolts (**10.5 daNm**).

Essential equipment

jack

Tightening torques

shock absorber lower mounting bolt	105 Nm
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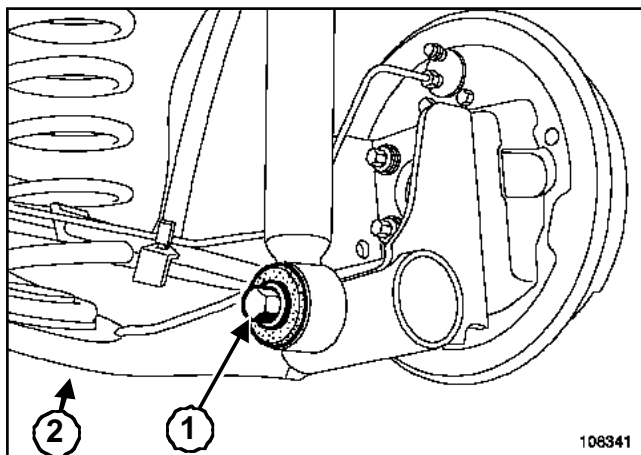
wheel bolts	105 Nm
-------------	--------

During removal, note the colours of the shock absorbers and springs, to ensure the parts match when refitting.

REMOVAL

Mount the vehicle on a two-post lift.

Remove the rear wheels.

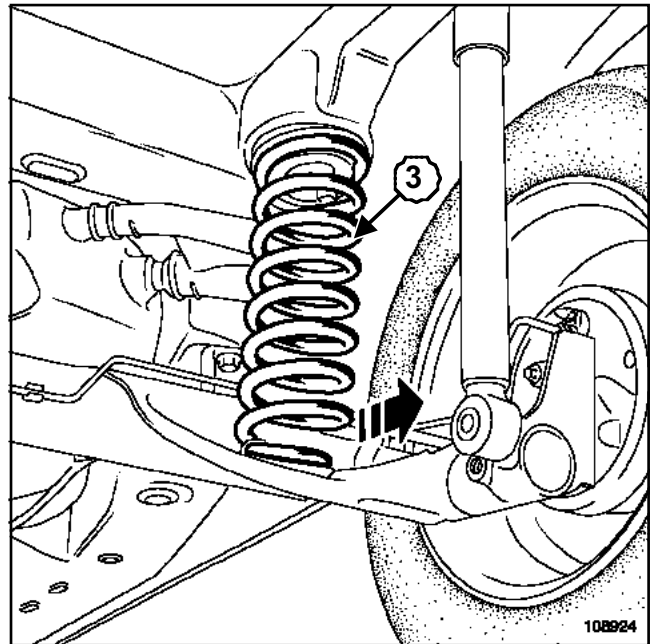


Position tool **jack**(2) in contact, with a shim, under the spring collar, without restricting its movement.

Mark the position where the spring is fitted.

Remove the shock absorber lower mounting bolt (1).

Remove tool **jack**.



108924

Remove spring (3) and its lower mounting.

WARNING

If the upper mounting is unclipped, replace it.

WARNING

Take a measurement at the same time.

REFITTING

Refit:

- the lower mounting on the rear axle (positioning the guide correctly),
- the spring with its upper mounting in the marked location, starting at the top.

Set up the **jack** tool, with a shim, under the spring cup.

Compress the rear axle so that the lower shock absorber mounting can be pretightened.

WARNING


The shock absorber mountings are only to be tightened with the vehicle wheels on the ground.

Remove tool **jack**.

Refit the rear wheel.

Lower the lift until the wheels touch the ground.

Torque tighten the **shock absorber lower mounting bolt (105 Nm)** and the **wheel bolts (105 Nm)**.

Tightening torques 	
shock absorber upper mounting nuts	14 Nm
shock absorber lower mounting nuts	105 Nm
wheel bolts	105 Nm

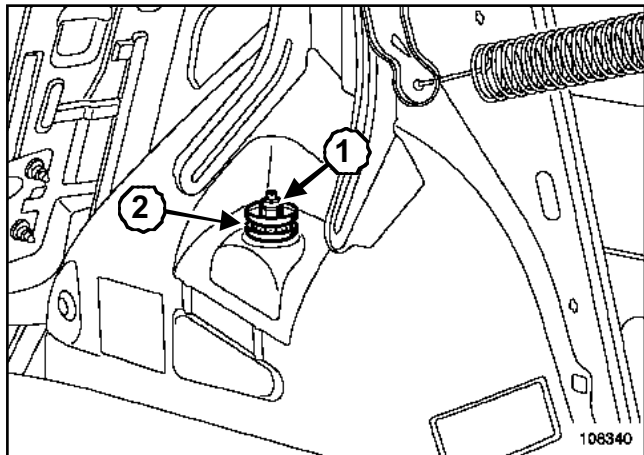
During removal, note the colours of the shock absorbers and springs, to ensure the parts match when refitting.

WARNING

- Never grip the rear axle with a lifting system.
- If replacing a shock absorber, the shock absorber on the opposite side must be replaced.

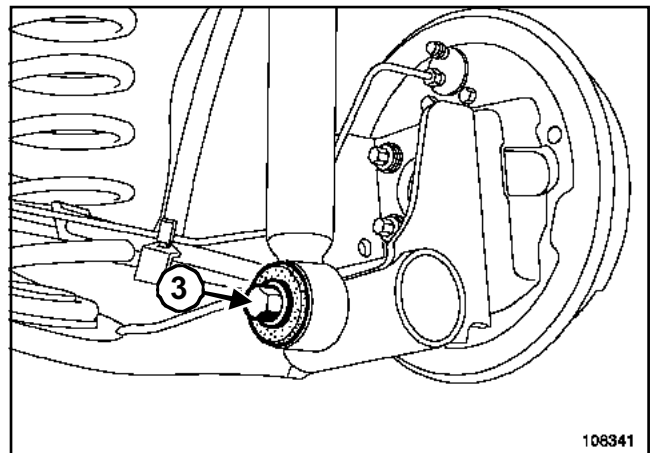
REMOVAL

Mount the vehicle on a two-post lift.



Put the vehicle down on its wheels and in the luggage compartment, remove:

- the wheel arch trim,
- nut (1) and rubber bush (2).



108341

Raise the vehicle and remove the shock absorber lower bolt (3).

Remove the shock absorber.

WARNING

Take a measurement at the same time.

REFITTING

Proceed in the reverse order to removal

Pretighten the shock absorber lower mounting.

WARNING

The shock absorber mountings are only to be tightened with the vehicle wheels on the ground.

Position the shock absorber head in its housing.

Lower the lift until the wheels touch the ground.

Align the shock absorber head with the drill hole in the boot.

Refit the shock absorber upper mounting nut.

Pretighten the shock absorber upper mounting nut.

Repeat the operation on the opposite side.

Torque tighten:

- the **shock absorber upper mounting nuts (14 Nm)** while holding the bolt head,
- the **shock absorber lower mounting nuts (105 Nm)**,
- the **wheel bolts (105 Nm)**.

Refit the wheel arch liner.

L90, and K7J or K7M

Essential equipment

safety belt
pedal press
jack

Tightening torques

bearing mounting bolts	62 Nm
brake backing plate mounting bolts	80 Nm
rigid pipe unions on the brake cylinders	14 Nm
rigid pipe unions of the brake on the flexible pipes	14 Nm
drum nuts	175 Nm
shock absorber lower mounting	105 Nm
wheel mounting bolts	105 Nm

REMOVAL

Release the parking brake.

Mount the vehicle on a two-post lift.

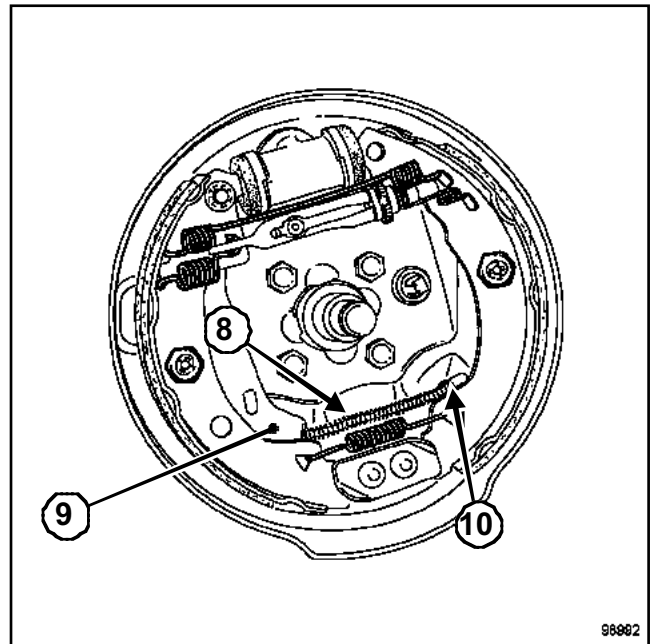
IMPORTANT

- During this operation, secure the vehicle to the lift with a strap **safety belt**, to prevent it from becoming unbalanced.
- For the fitting procedure of the **safety belt**, see **02A, Lifting equipment, Underbody lift: safety**.

Remove:

- the rear wheels,
- the brake drums (see **33A, Rear carrier elements, Brake drum**).

Fit the **pedal press** tool to the brake pedal to restrict the outflow of brake fluid.

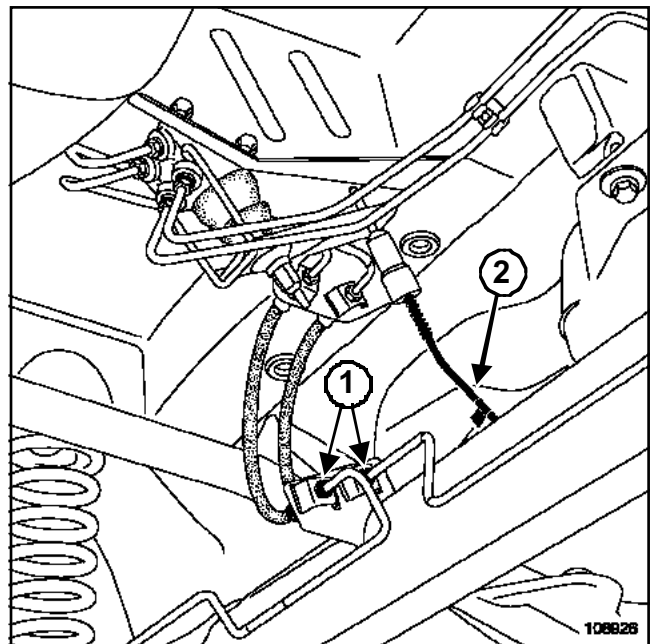


Remove the parking brake cables (8) by pushing the lever (9) using a pair of pliers and a screwdriver.

Unclip the parking brake cables (10).

Unscrew the wheel speed sensors (if fitted on the vehicle).

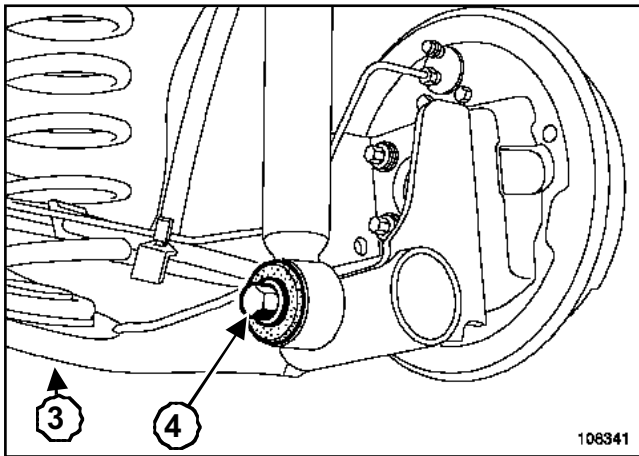
Unclip the rear axle wheel speed cables (if fitted on the vehicle).



Unscrew the unions of the rigid pipes on the flexible brake pipes (1).

Detach the compensator rod (2) of the rear axle (if fitted on vehicle).

L90, and K7J or K7M



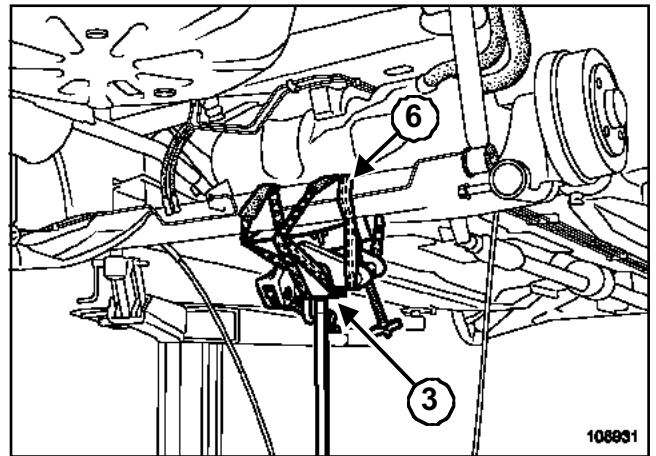
108341
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Bring tool **jack(3)** into contact with a shim, under the right-hand spring cup, without forcing it.

Mark the position where the spring is fitted.

Remove the shock absorber lower mounting bolt (4) with a long dowel.

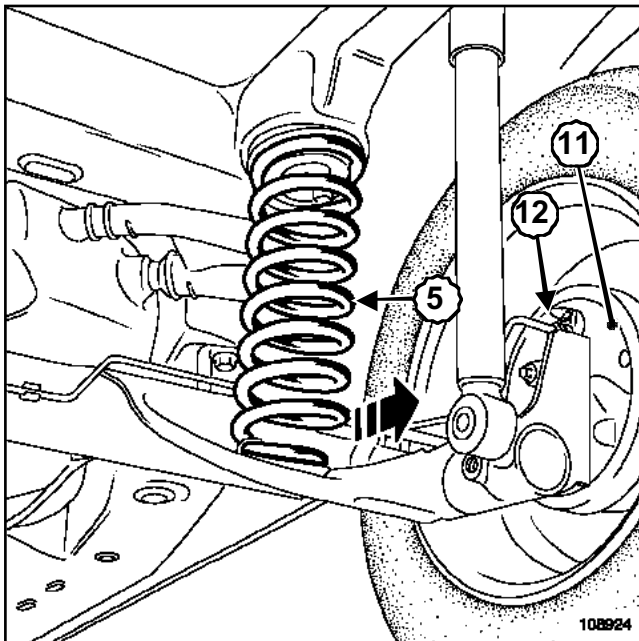
Remove the **jack** tool.



108931
108931

Fit the **jack(3)** tool at the centre of the rear axle.

Trim the rear axle at **jack** with a **safety belt(6)**.



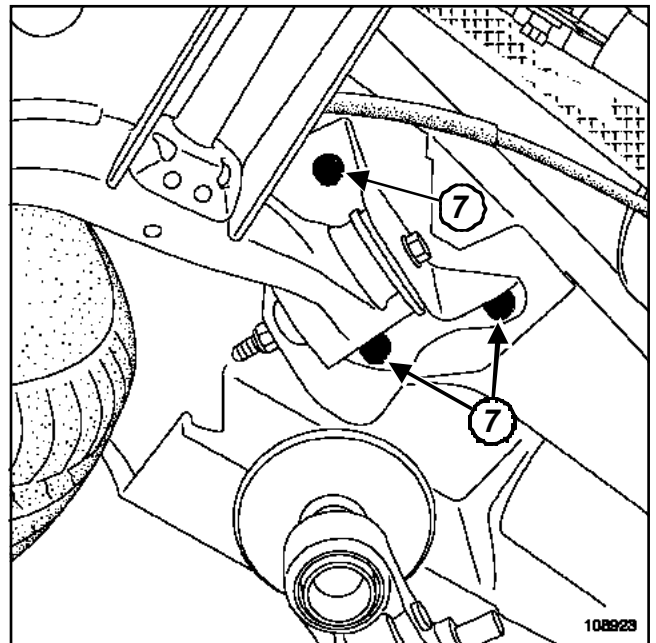
108924
108924

Remove the spring (5) with its lower support.

Loosen the rigid brake pipe unions (12) on the brake cylinders.

Remove the brake backing plate (11).

Proceed in the same way for the other side.



108923
108923

Loosen the bearing bolts (7).

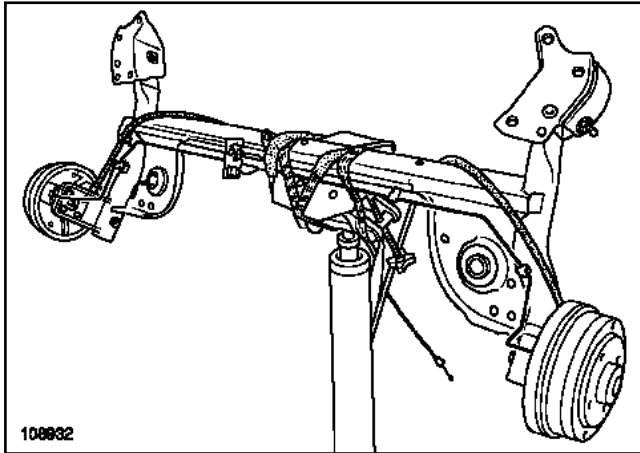
Lower the rear axle with the **jack**.

WARNING

If the upper support is unclipped, replace it.

L90, and K7J or K7M

REFITTING



108932

Strap the rear axle onto tool **jack**.

Position the axle underneath the vehicle.

Position the bearing locators opposite the centring holes.

Refit the mounting bolts starting with the left-hand bearing.

Insert the brake pipes into their housing.

Remove the **safety belt** and the **jack**.

Refit the brake backing plate.

Torque tighten:

- the **bearing mounting bolts (62 Nm)**,
- the **brake backing plate mounting bolts (80 Nm)**,
- the **rigid pipe unions on the brake cylinders (14 Nm)**,
- the **rigid pipe unions of the brake on the flexible pipes (14 Nm)**,

Refit the parking brake cables.

Check that the parking brake cable stops are properly engaged in their housing.

Refit:

- the drums,
- the supports on the springs,
- the springs in their housing.

Refit the cables and the wheel speed sensors.

Reconnect the parking brake control unit cables to the lever.

Place the tool **component jack** in contact with a shim under the spring cup.

Compress the rear axle.

Refit the shock absorber lower mountings.

WARNING

Do one side at a time.

WARNING

The shock absorber mountings are only to be tightened with the vehicle wheels on the ground.

Refit the rear wheels.

Lower the lift.

Torque tighten:

- the **drum nuts (175 Nm)**,
- the **shock absorber lower mounting (105 Nm)**,
- the **wheel mounting bolts (105 Nm)**.

REAR AXLE ASSEMBLIES

Locking the axle in position

33A

Essential equipment

safety belt

jack

Tightening torques

the bush mounting bolts

125 Nm

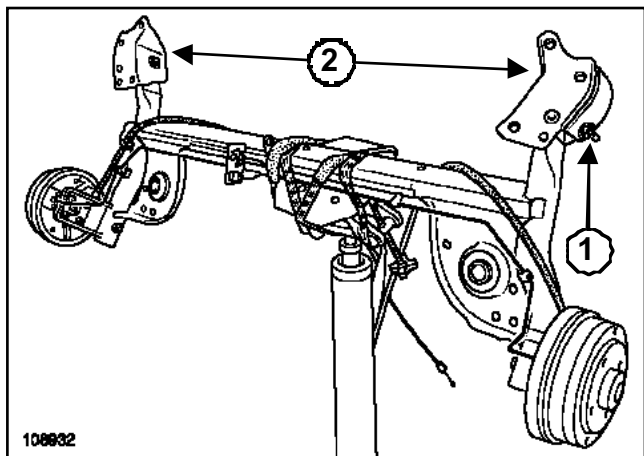
REMOVAL

Release the rubber bush nut.

Remove the rear axle assembly (see 33A, **Rear carrier components, Rear axle assembly**).

IMPORTANT

- During this operation, secure the vehicle to the lift with a strap **safety belt**, to prevent it from becoming unbalanced.
- For the fitting procedure of the **safety belt**, see **02A, Lifting equipment, Underbody lift: safety**.



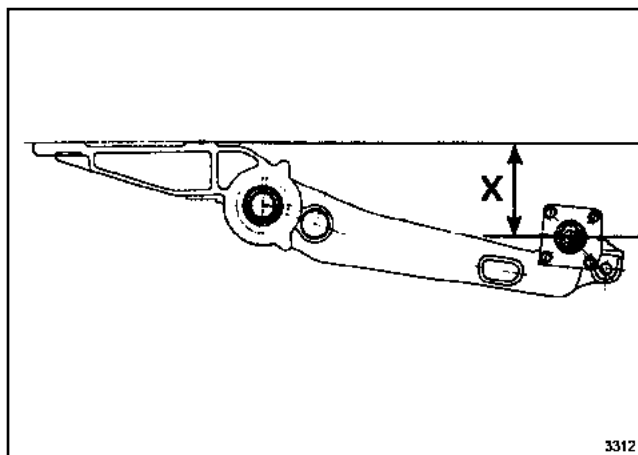
Remove:

- the mounting nuts (1),
- the bearings (2).

REFITTING

Proceed in the reverse order to removal

The operation is carried out with the shock absorber lower mounting removed.



3312

3312

Position the rear axle using tool **jack**, to obtain a measurement between the centre of the rear hub and the rear side member corresponding with a length of **8.2 mm ± 3**.

Torque tighten **the bush mounting bolts (125 Nm)**.

I -INFLATION

Cold inflation pressure (bar).

WARNING

If checking the pressure when warm, assume a pressure increase of **0.2 to 0.3 bar** and never deflate the tyres.

Wheel rim	Tyre	Inflation pressure in normal use (bar)	
		Front	Rear
5.5 J 14	165/80 R14	2	2
6 J 15	185/65 R15	1.9	2.1
6 J 15*	185/65 R15	1.9	2.1

* Alloy wheel rim

II - CONFORMITY CHECK AND CORRECTION

Tightening torque for **wheel bolts (10.5 daNm)**

Maximum wheel rim run-out checked on the external diameter of the rim:

- steel wheel rim: **0.8 mm**,
- alloy wheel rim: **0.3 mm**.

Maximum run-out checked on the surface of the wheel rim: **0.7 mm**.

Wheel offset:

- steel wheels: **44 mm**,
- alloy wheels: **47 mm**.

For fitting chains, see **Driver's handbook**.

WHEELS AND TYRES

Wheel rim: Identification

35A

The wheel rims are marked in one of two ways:

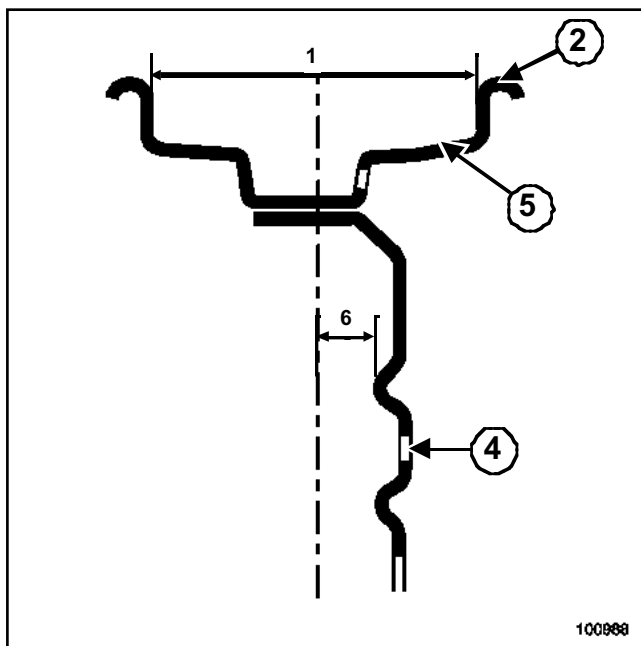
- etched marking for steel wheel rims,
- cast marking for alloy wheel rims.

The marking gives the main dimensional specifications of the wheel rim.

This marking may be:

- complete, for example **5 1/2 J 144 CH 36**;
- simplified, for example **5 1/2 J14**.

	Type of wheel	5.5 J 14
1	Width (in inches)	5.5
2	Rim edge profile	J
3	Nominal diameter (in inches)	14
4	Number of holes	4
5	Tyre bead profile	CH
6	Offset (in mm)	36



100988

The wheel bolts are positioned in a circle with a diameter of **100 mm** (four mounting bolts).

The bolts fixing aluminium wheels cannot be used for fixing steel wheels.

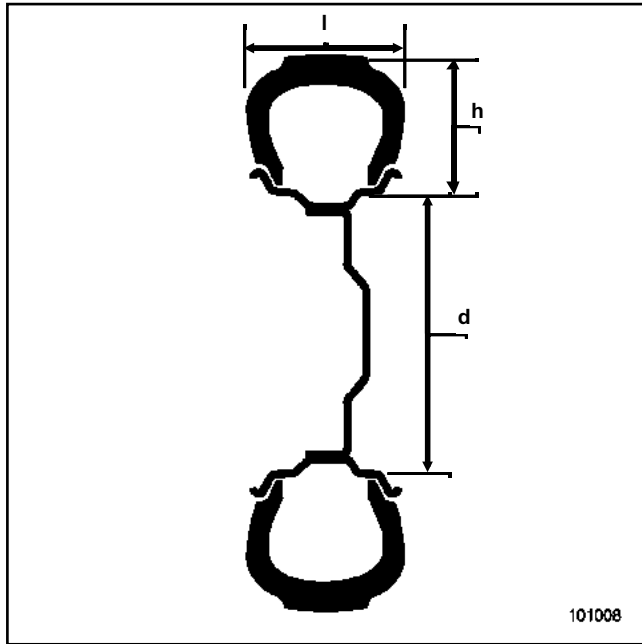
The maximum run-out is measured at the rim edge .

WHEELS AND TYRES

Identification of tyres

35A

Example of tyre identification marking: 205/55 R 16 91 V.



205	Tyre width in mm (l)
55	Height/width ratio (h/l)
R	Radial structure
16	Internal diameter in inches (d)
91	Load index
V	Speed code

Speed index table:

Maximum speed	mph (km/h)
R	106 (170)
S	112 (180)
T	118 (190)
U	124 (200)
H	130 (210)
V	149 (240)
ZR	above 149 (240)

I - PREREQUISITES FOR WHEEL BALANCING

Wheel balancing is a measurement operation.

Several conditions must be met to achieve a reliable result in a single operation.

The wheel balancer must be installed in accordance with the manufacturer's instructions.

Never grease the threaded shaft.

Check the condition of the supports, centring components and mountings.

Replace any faulty parts (see manufacturer's instructions).

The wheel and the wheel balancer must be clean.

1 - Wheel

Clean the bearing and centring faces.

Remove any gravel trapped in the tyre treads.

Clean the wheels.

2 - Wheel balancer

Be careful to keep the contact surface of the wheel balancing machine and all the alignment accessories (bush, thrust plate, etc.) clean.

II - WHEEL REMOVAL AND WHEEL BALANCING

1 - Driver's observation

If the wheels are not correctly balanced this causes the steering wheel and/or the vehicle floor to vibrate.

The vibrations occur at between **56 mph (90 km/h)** and **93 mph (150 km/h)**.

WARNING

Perform a road test of at least **1.25 miles (2 km)** before the wheel balancing operation to prevent a flat spot forming on the tread when the vehicle is stationary.

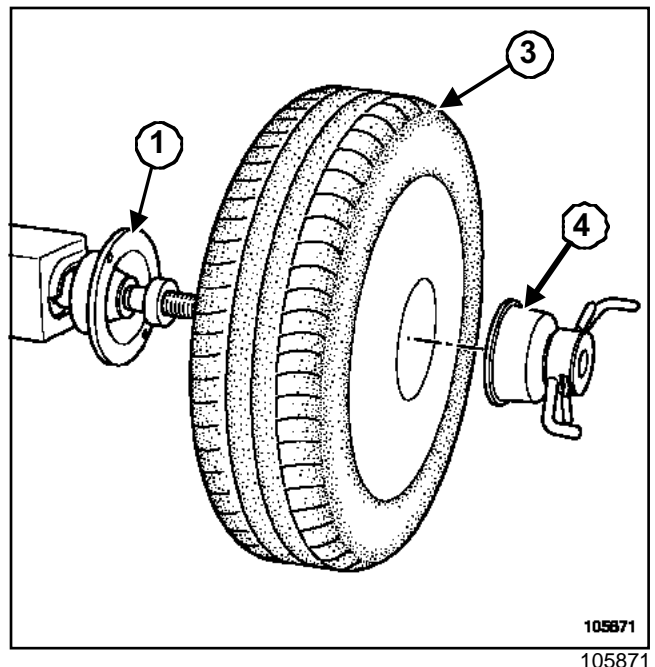
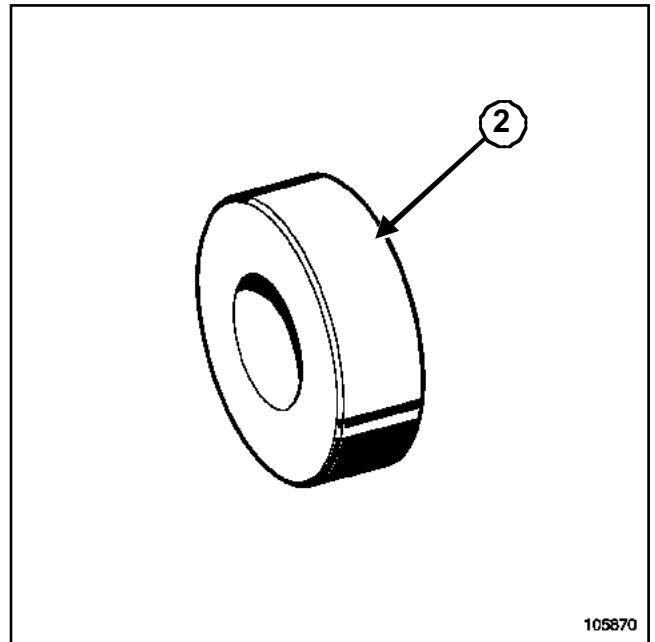
After the road test:

- lift the vehicle immediately,
- leave the four wheels suspended,
- release the parking brake.

Remove the wheels, positioning the valves upwards.

Be sure to clean the wheel, disc, and hub bearing surfaces.

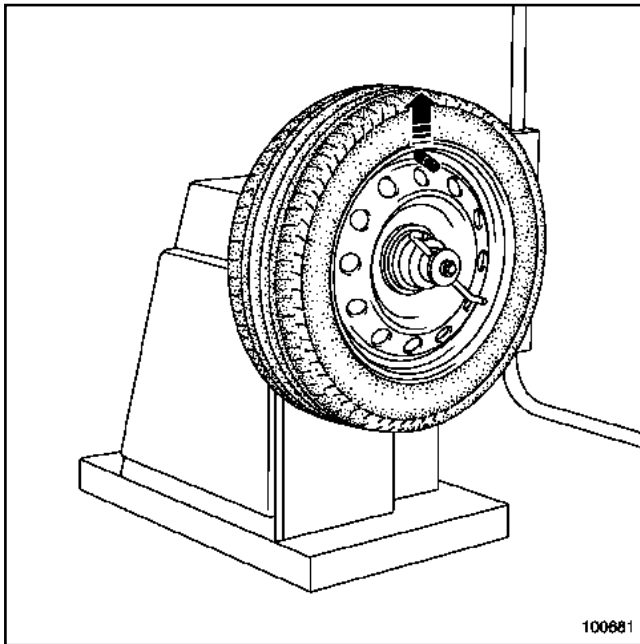
To reproduce the exact vehicle wheel assembly, it is essential to fit a **60 mm** diameter cylindrical centring device on the wheel balancer.



The wheel is fitted on the wheel balancer as follows:

- (1) wheel balancer back-plate,
- (2) ring, diameter **60 mm**,
- (3) wheel,
- (4) wheel locking tool.

After switching on the wheel balancer and entering the specific wheel parameters, select the « end » balancing mode.



100681

Place the wheel on the wheel balancer, with the valve at the top, then lock the wheel in place.

Check that the wheel is not deformed because of accidental impact. If it is, replace the deformed components.

Remove any grit which may be jammed in the tyre treads.

Start the wheel balancer and check that the wheel balance is below **5 g** (dynamic) and **10 g** (static).

Otherwise, remove the old balancing weights and repeat the wheel balancing procedure to obtain a value below **5 g** on each wheel surface and a value below **10 g** when static.

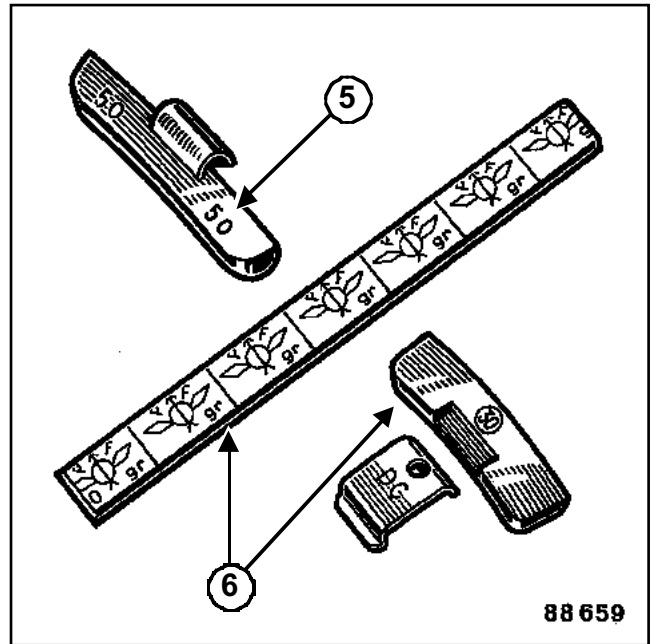
Repeat this operation on the other vehicle wheels.

2 - Balance weights

In some countries, the use of lead weights is prohibited. When replacing them it is recommended to use weights made of **ZAMAC**.

Only use spare parts weights:

- secured by hooks to steel wheel rims (hooks incorporated in the weight),
- secured using (flat) hooks, or self-adhesive weights, for alloy wheel rims.



88659

- (5) Steel wheel rim
- (6) Alloy wheel rim

DIRECTION MANUELLE

Essential special tooling

Tav. 476 Ball joint extractor

Essential equipment

jack

Tightening torques

axle assembly sub-frame bolts **105 Nm**

torque reaction support bolts on the gearbox **105 Nm**

steering rack bolts **105 Nm**

track rod end nut **(37 Nm)**

steering column universal joint bolt **21 Nm**

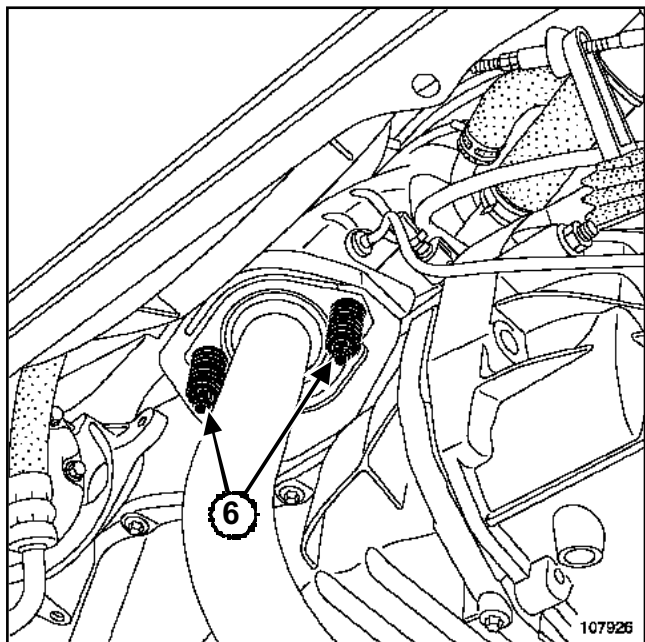
wheel mounting bolts **105 Nm**

REMOVAL

Mount the vehicle on a two post lift.

Straighten the wheels.

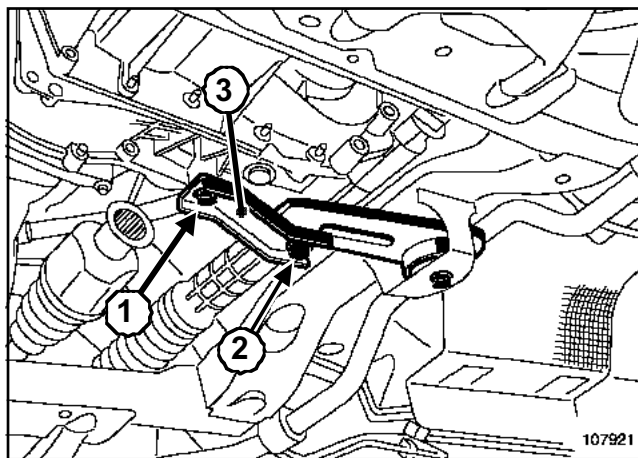
Remove the steering column universal joint bolt (to the side of the pedals).



Remove:

- the engine undertray,

- the front wheels,
- the lateral wheel arch liners,
- the nuts (6) from where the exhaust pipe goes down from the exhaust manifold,
- the track rod ends using tool (Tav. 476).
- the steering rack mounting bolts.

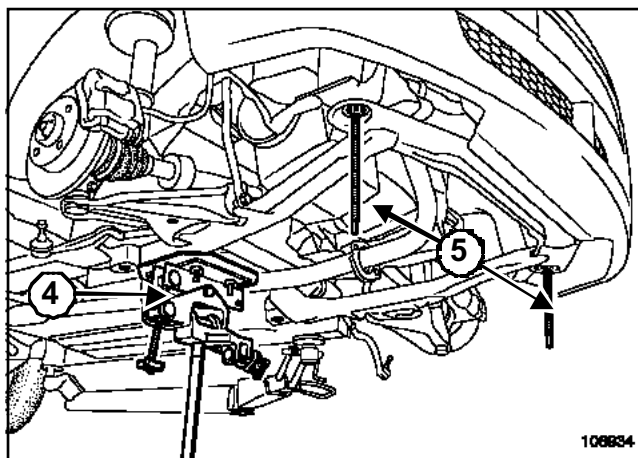


107921

Loosen the support (1) mounting bolts.

Remove the mounting (2) bolt of the torque reaction on the gearbox.

Pivot the support (3).

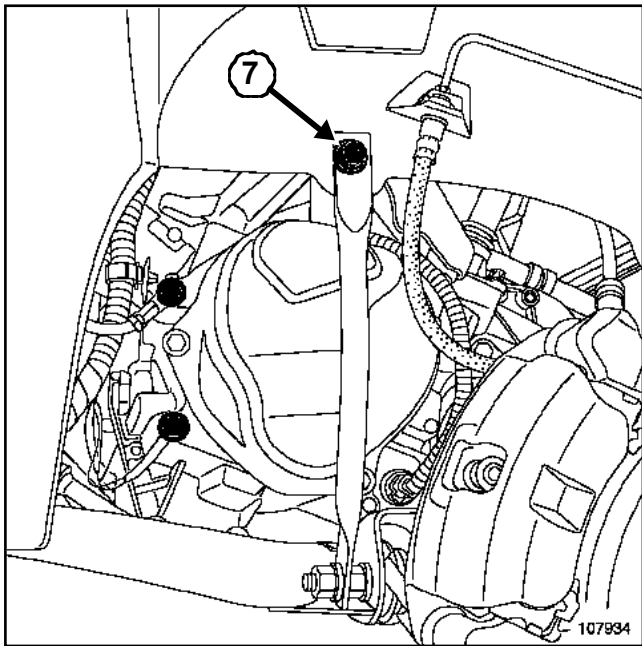


108934

Fit a **jack(4)** to support the axle assembly sub-frame rear.

Replace the two front mounting bolts of the axle assembly sub-frame by two rods of tool (TAV. 1747) (5) to lower the front of the axle assembly sub-frame slightly.

DIRECTION MANUELLE



107934

Remove:

- the upper mounting (7) bolts of the axle assembly sub-frame tie-rod,
- the rear axle assembly sub-frame mounting bolts.

Lower the axle assembly sub-frame with the **jack**.

Remove the steering rack to the left.

REFITTING

Proceed in the reverse order to removal.

WARNING

Check that the radiator bottom slots onto the front cross member of the axle assembly sub-frame when it is refitted.

Torque tighten:

- the axle assembly sub-frame bolts (105 Nm),
- the torque reaction support bolts on the gear-box (105 Nm),
- the steering rack bolts (105 Nm),
- the track rod end nut ((37 Nm)),
- the steering column universal joint bolt (21 Nm),
- the wheel mounting bolts (105 Nm).

WARNING

You must check the front axle assembly angles (adjust if necessary) (see 30A, **General Vehicle Information, Front axle assembly values and adjustments**).

STEERING ASSEMBLY

Axial ball joint linkage

36A

Essential special tooling

Tav. 476	Ball joint extractor
Dir. 1306-01	Tool for locking steering rack (TRW)
Dir. 1305-01	Axial ball joint removal and refitting tool

Tightening torques

axial ball joint	34 Nm
wheel alignment adjustment lock nut	50 Nm
track rod end nut	(37 Nm)
wheel mounting bolts	105 Nm

REMOVAL

Mount the vehicle on a two post lift.

Note:

During this operation, the steering rack must be in place on the vehicle.

Unlock the steering wheel.

Remove the front wheel.

Mark the lock nut position with a marker.

Loosen the wheel alignment adjusting lock nut.

Extract the track rod end using tool (Tav. 476).

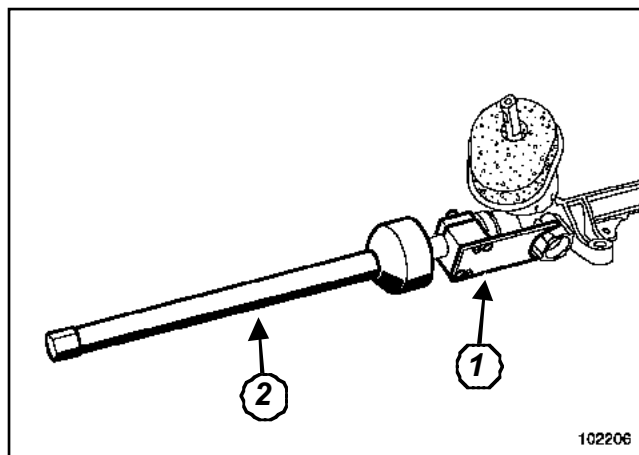
Note the number of thread turns captured in order to pre-adjust the wheel alignment during refitting.

Remove:

- the ball joint housing,
- the lock nut,
- the gaiter retaining clips,
- the gaiter.

WARNING

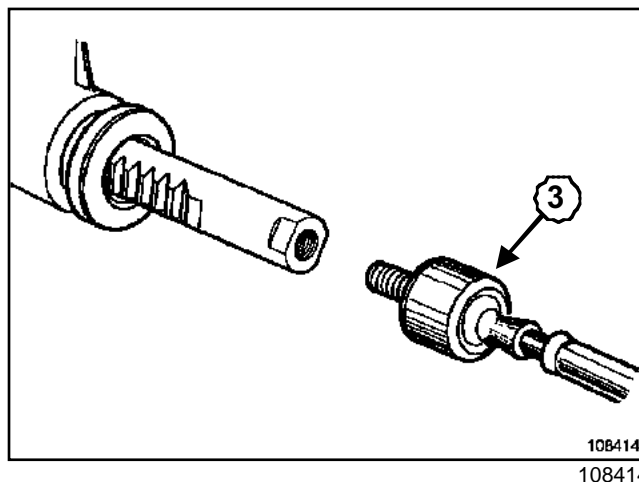
Take care not to deform the gaiters: they could be irreparably damaged.



Set up tool (Dir. 1306-01)(1) on the steering rack, at the pinion end.

Unlock the axial ball joint using tool (Dir. 1305-01).(2)

REFITTING



Put **LOCTITE FRENBLOC** on the axial ball joint threading.

Refit the axial ball joint (3).

Torque tighten the **axial ball joint (34 Nm)** using tool (Dir. 1305-01).

Coat the following parts with lithium grease:

- the gaiter,
- the steering rack,
- the axial ball joint.

Refit:

- the gaiter,
- the new retaining clips for the gaiter,
- the lock nut,
- the ball joint housing.

Retighten the ball joint housing by the number of rotations noted during removal.

Refit the track rod end.

Torque tighten:

- the **wheel alignment adjustment lock nut (50 Nm)**,
- the **track rod end nut ((37 Nm))**,
- the **wheel mounting bolts (105 Nm)**.

Adjust the front axle assembly (see **07B, General Vehicle Information, Axle assembly values and adjustment**).

Essential equipment

diagnostic tool

Tightening torques

steering column mounting nuts	21 Nm
-------------------------------	-------

steering column universal joint bolt	21 Nm
--------------------------------------	-------

IMPORTANT

Before working on a safety system component or near one, you must lock the air bag computer with **diagnostic tool** (see **88C, Air bag and pretensioners, Air bag computer locking procedure**). When this function is activated, all the trigger lines are inhibited and the air bag warning light on the instrument panel lights up continuously (ignition on).

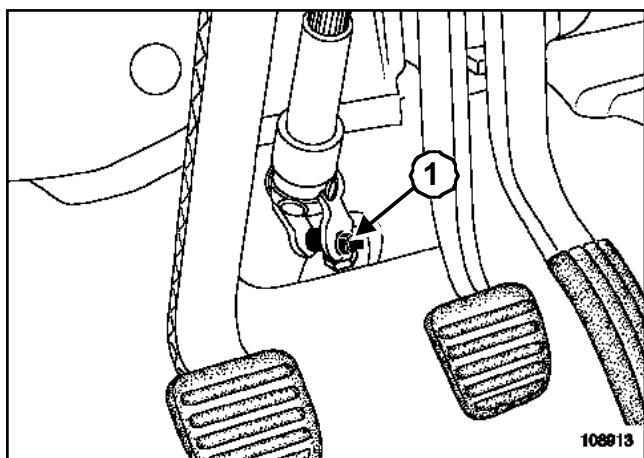
No lift is required for this operation.

REMOVAL

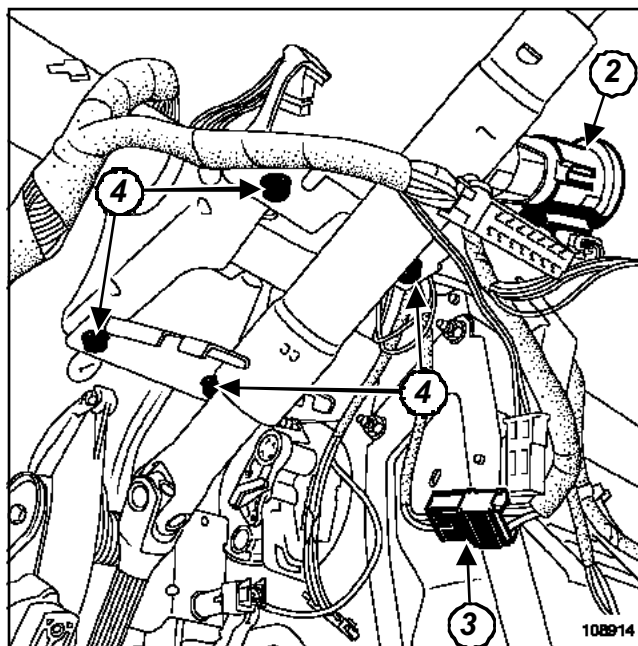
Set the vehicle wheels straight.

Disconnect the battery, starting with the negative terminal.

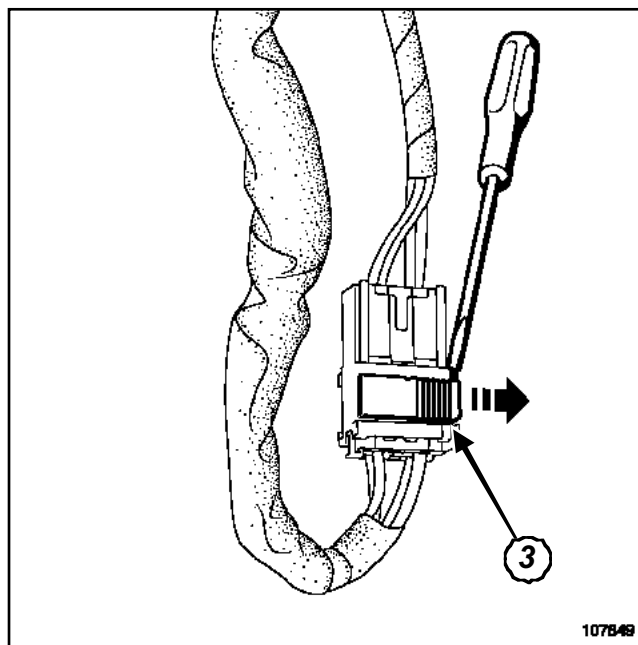
Remove the dashboard, the shell and the steering wheel (see **57A, Interior equipment, Dashboard**).



Remove the steering column universal joint bolt (1).



108914



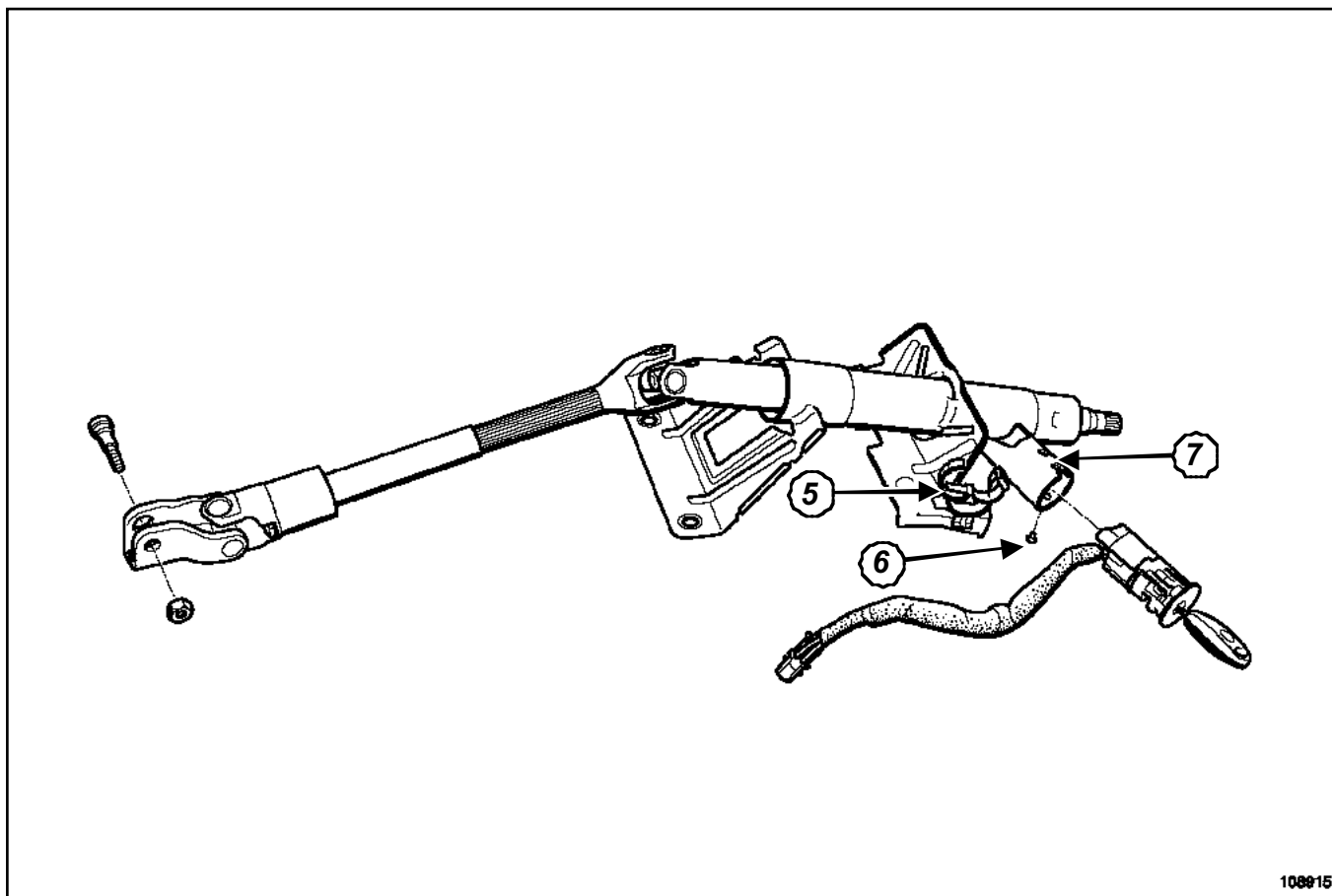
107849

Unclip the engine immobiliser (2) with a flathead screwdriver.

Disconnect the connector (3) of the starter switch with a flathead screwdriver.

Remove:

- the mounting (4) bolts of the steering column,
- the steering column.

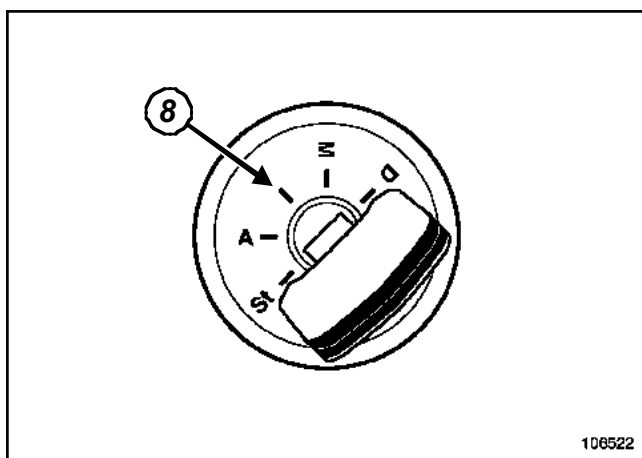


108915

108915

Open the ignition switch wiring retaining clip.

Remove the ignition switch bolt .



106522

106522

Insert the key into the ignition switch and turn it a quarter turn (8).

Remove the ignition switch by pressing on the lock (7).

REFITTING

Proceed in the reverse order to removal.

WARNING

- The steering wheel should enter the splines freely (the splines have foolproofing devices).
- Do not damage the foolproofing splines.
- The steering wheel bolt must be replaced each time it is removed.

Note:

- Be sure to replace the steering column universal joint bolt and eccentric nut each time they are removed.
- On a new steering column, the steering column universal joint cam nut is pre-fitted.

Ensure that the steering column universal joint cam nut and bolt are fitted the right way round.

Finger tighten the cam nut and the fork bolt.

Lock the cam nut in its housing (aperture on the steering column universal joint).

Torque tighten:

- the **steering column mounting nuts (21 Nm)**,
- the **steering column universal joint bolt (21 Nm)**.

WARNING

Connect the battery, starting with the positive terminal.

- Carry out the necessary programming (see **88C, Air bag and pretensioners, Air bag computer locking procedure**).
- Carry out a complete check using the **diagnostic tool**.
- Clear the fault generated using the **diagnostic tool**.

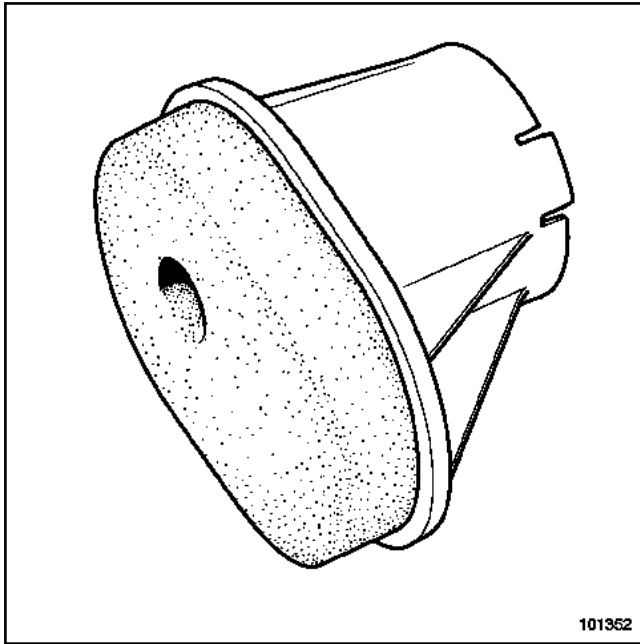
STEERING ASSEMBLY

Bulkhead seal

36A

REMOVAL

Remove the front axle sub-frame (see **31A, Front carrier components, Axle assembly sub-frame**).



101352

101352

Unclip the bulkhead seal using a screwdriver.

REFITTING

Proceed in the reverse order to removal.

POWER ASSISTED STEERING

Power assisted steering rack

36B

DIRECTION ASSISTEE

Essential special tooling

Tav. 476 Ball joint extractor

Essential equipment

jack

Tightening torques

axle assembly sub-frame bolts	105 Nm
torque reaction support bolts on the gearbox	35 Nm
steering rack bolts	105 Nm
track rod end nut	(37 Nm)
steering column universal joint bolt	21 Nm
high pressure union on the rack	21 Nm
low pressure union on the rack	21 Nm
wheel mounting bolts	105 Nm

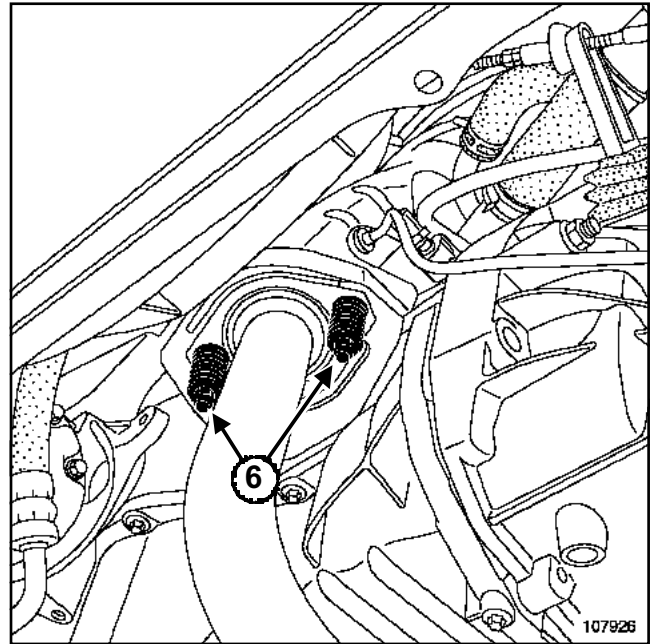
REMOVAL

Mount the vehicle on a two post lift.

Straighten the wheels.

Remove the steering column universal joint bolt (to the side of the pedals).

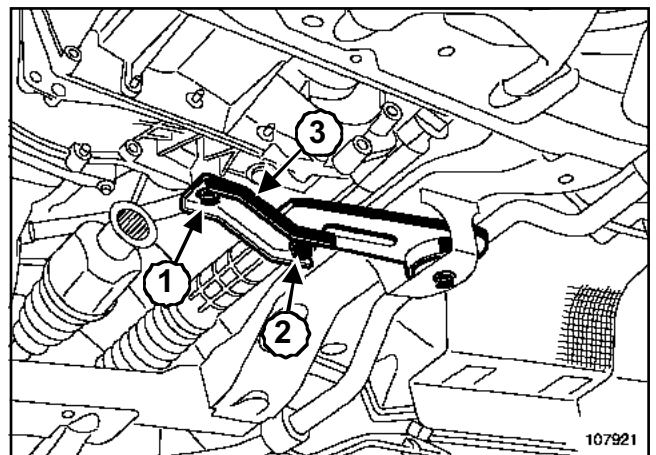
Fit a hose clamp on the low pressure pipe to restrict the flow of power assisted steering fluid.



107926

Remove:

- the engine undertray,
- the front wheels,
- the side wheel arch liners,
- the nuts (6) from where the exhaust pipe goes down from the exhaust manifold,
- the high pressure union on the steering rack,
- the low pressure union on the steering rack,
- the track rod ends using tool (Tav. 476).
- the steering rack mounting bolts.



107921

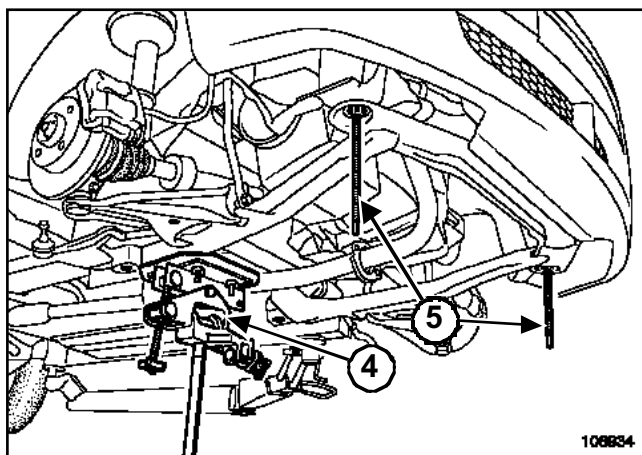
107921

Loosen the support (1) mounting bolts.

Remove the mounting (2) bolt of the torque reaction on the gearbox.

Pivot the support (3).

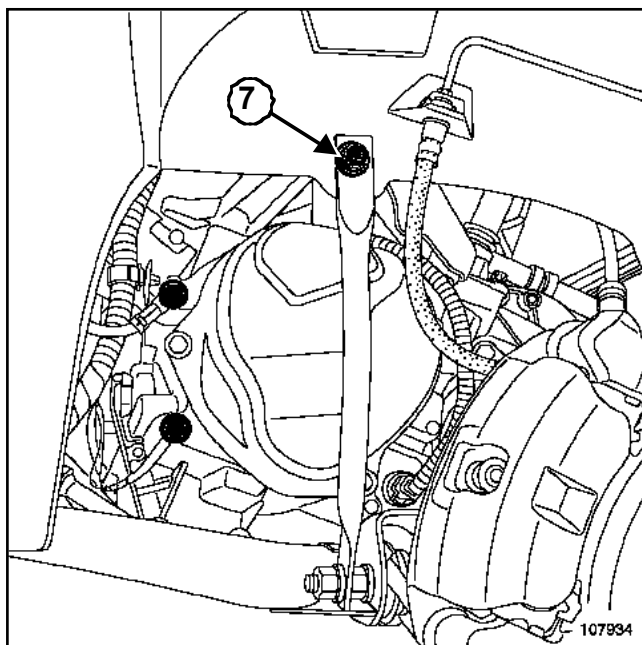
DIRECTION ASSISTEE



108934

Fit a **jack**(4) to support the axle assembly sub-frame rear.

Replace the two front mounting bolts of the axle assembly sub-frame by two rods of tool (Tav. 1747) (5) to lower the front of the axle assembly sub-frame slightly.



107934

Remove:

- the upper mounting (7) bolts of the axle assembly sub-frame tie-rod,
- the rear axle assembly sub-frame mounting bolts.

Lower the axle assembly sub-frame with the **jack**.

Remove the steering rack to the left.

REFITTING

Proceed in the reverse order to removal.

WARNING

Check that the radiator bottom slots onto the front cross member of the axle assembly sub-frame when it is refitted.

Torque tighten:

- the axle assembly sub-frame bolts (105 Nm),
- the torque reaction support bolts on the gearbox (35 Nm),
- the steering rack bolts (105 Nm),
- the track rod end nut ((37 Nm)),
- the steering column universal joint bolt (21 Nm),
- the high pressure union on the rack (21 Nm),
- the low pressure union on the rack (21 Nm),
- the wheel mounting bolts (105 Nm).

WARNING

You must check the front axle assembly angles (adjust if necessary) (see 30A, **General Vehicle Information, Front axle assembly values and adjustments**).

Remove the hose clamp.

Fill up the power assisted steering oil circuit (type: **ELFRENAULTMATIC D2**).

Bleed the circuit by turning the steering wheel from lock to lock with the engine switched off in the first instance.

Bleed the circuit by turning the steering wheel from lock to lock with the engine running.

Top up the level of oil in the reservoir.

Check that there are no leaks.

Essential equipment

diagnostic tool

Tightening torques

steering column mounting nuts	21 Nm
-------------------------------	-------

steering column universal joint bolt	21 Nm
--------------------------------------	-------

IMPORTANT

Before working on a safety system component or near one, you must lock the air bag computer with **diagnostic tool** (see **88C, Air bag and pretensioners, Air bag computer locking procedure**). When this function is activated, all the trigger lines are inhibited and the air bag warning light on the instrument panel lights up continuously (ignition on).

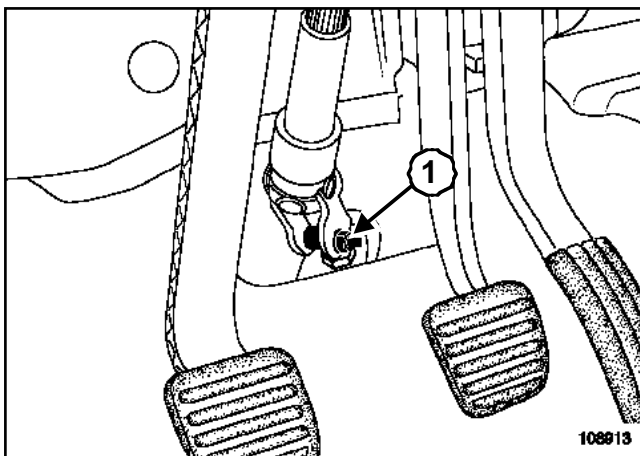
No lift is required for this operation.

REMOVAL

Set the vehicle wheels straight.

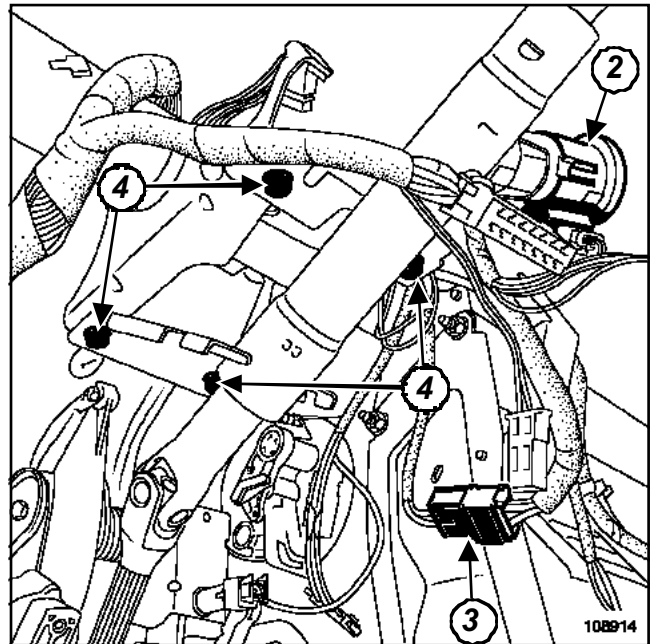
Disconnect the battery, starting with the negative terminal.

Remove the dashboard, the shell and the steering wheel (see **57A, Interior equipment, Dashboard**).

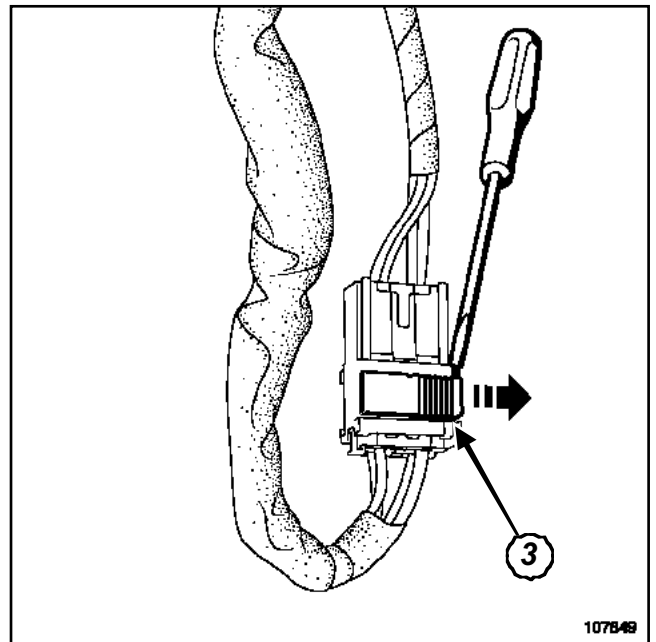


108913
108913

Remove the steering column universal joint bolt (1).



108914
108914



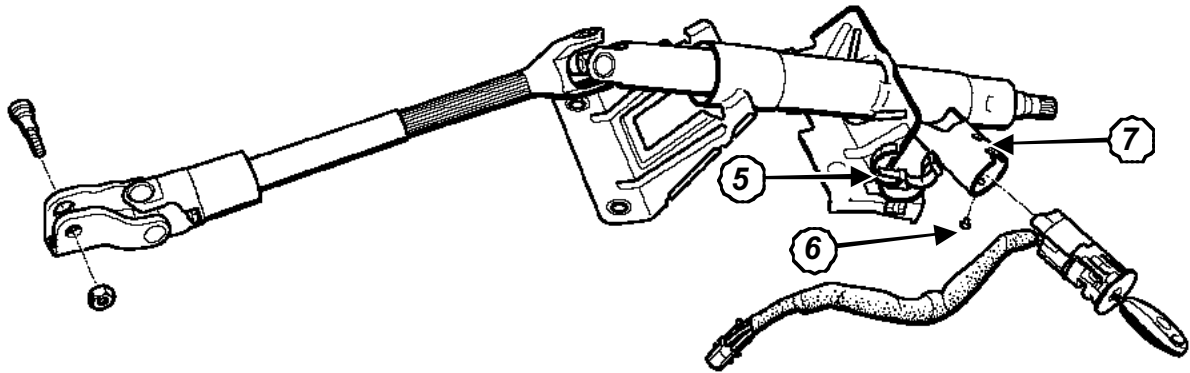
107849
107849

Unclip the engine immobiliser (2) with a flathead screwdriver.

Disconnect the connector (3) of the starter switch with a flathead screwdriver.

Remove:

- the mounting (4) bolts of the steering column,
- the steering column.

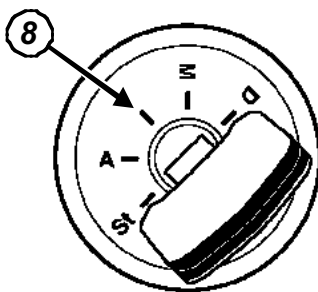


108915

108915

Open the ignition switch wiring retaining clip.

Remove the ignition switch bolt .



106522

106522

Insert the key into the ignition switch and turn it a quarter turn (8).

Remove the ignition switch by pressing on the lock (7).

REFITTING

Proceed in the reverse order to removal.

WARNING

- The steering wheel should enter the splines freely (the splines have foolproofing devices).
- Do not damage the foolproofing splines.
- The steering wheel bolt must be replaced each time it is removed.

Note:

- Be sure to replace the steering column universal joint bolt and eccentric nut each time they are removed.
- On a new steering column, the steering column universal joint cam nut is pre-fitted.

Ensure that the steering column universal joint cam nut and bolt are fitted the right way round.

Finger tighten the cam nut and the fork bolt.

Lock the cam nut in its housing (aperture on the steering column universal joint).

Torque tighten:

- the **steering column mounting nuts (21 Nm)**,
- the **steering column universal joint bolt (21 Nm)**.

WARNING

Connect the battery, starting with the positive terminal.


- Carry out the necessary programming (see **88C, Air bag and pretensioners, Air bag computer locking procedure**).
- Carry out a complete check using the **diagnostic tool**.
- Clear the fault generated using the **diagnostic tool**.

POWER ASSISTED STEERING

Power assisted steering pump

36B

AIR CONDITIONING

Tightening torques 	
power assisted steering pump mounting bolts	21 Nm
high pressure union on the power assisted steering	21 Nm

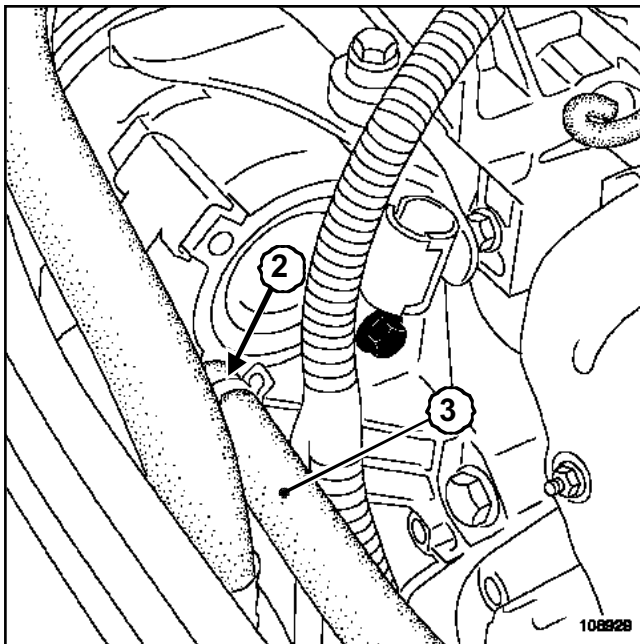
REMOVAL

Mount the vehicle on a two post lift.

Remove:

- the engine undertray,
- the front right wheel,
- the accessories belt (see 11A, **Top and front of engine, Accessories belt**).

Install the set of 2 hose clamps on the hydraulic inlet and outlet of the power assisted steering pump.



108929

Remove the clip (2) from the hydraulic inlet hose on the pump.

Disconnect the inlet hose (3).

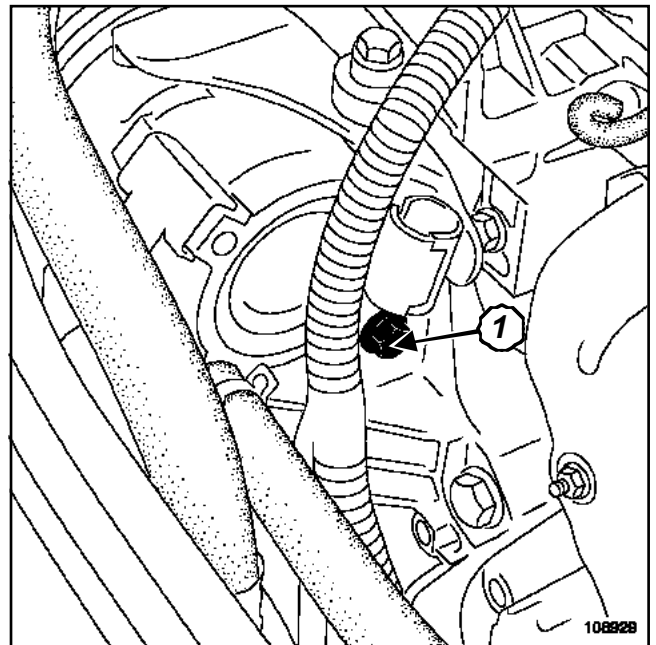
Loosen the high pressure pipe union from the pump.

Remove the high pressure pipe from the pump.

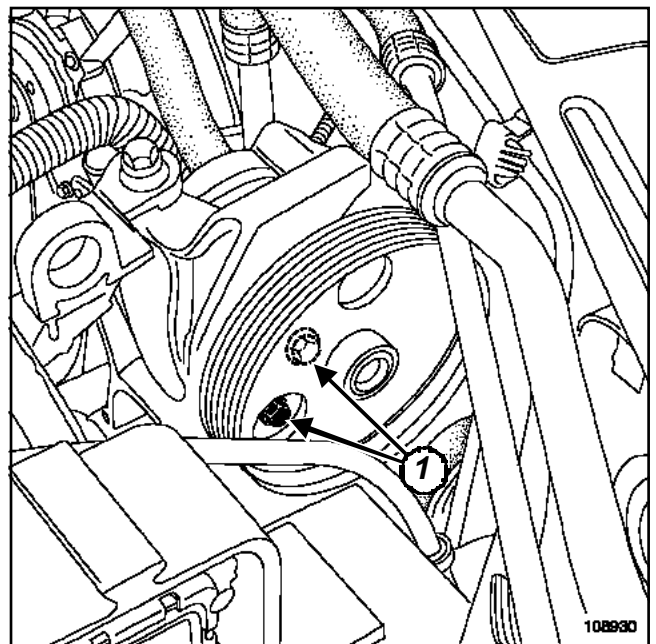
Fit caps to the pipe and power assisted steering pump openings to avoid impurities getting into them.

WARNING

Protect the alternator from power assisted steering oil outflow.



108929



108930

Remove:

- the three mounting (1) bolts on the alternator support - power assisted steering pump - compressor,
- the power assisted steering pump.

REFITTING

Proceed in the reverse order to removal.

Torque tighten:

- the **power assisted steering pump mounting bolts (21 Nm)**,
- the **high pressure union on the power assisted steering (21 Nm)**,

WARNING

Torque tighten first the two bolts on the accessories belt side, then the bolts on the other side.

WARNING

Replace any belt that has been removed.

When replacing the belt, be sure to replace the tension wheels and idler pulleys.

Fill up the power assisted steering oil circuit (type: **ELFRENAULTMATIC D2**).

Bleed the circuit by turning the steering wheel from lock to lock with the engine switched off in the first instance.

Bleed the circuit by turning the steering wheel from lock to lock with the engine running.

Top up the level of oil in the reservoir.

Check that there are no leaks.


Refit the engine undertray.

POWER ASSISTED STEERING

Power assisted steering pump

36B

BASIC HEATING

Tightening torques 	
power assisted steering pump mounting bolts	21 Nm
high pressure union on the power assisted steering	21 Nm

REMOVAL

Mount the vehicle on a two post lift.

Remove:

- the engine undertray,
- the accessories belt (see **11A, Top and front of engine, Accessories belt**),
- the front bumper (see **55A, External protection, Front bumper**).

Install the set of 2 hose clamps on the hydraulic inlet and outlet of the power assisted steering pump.

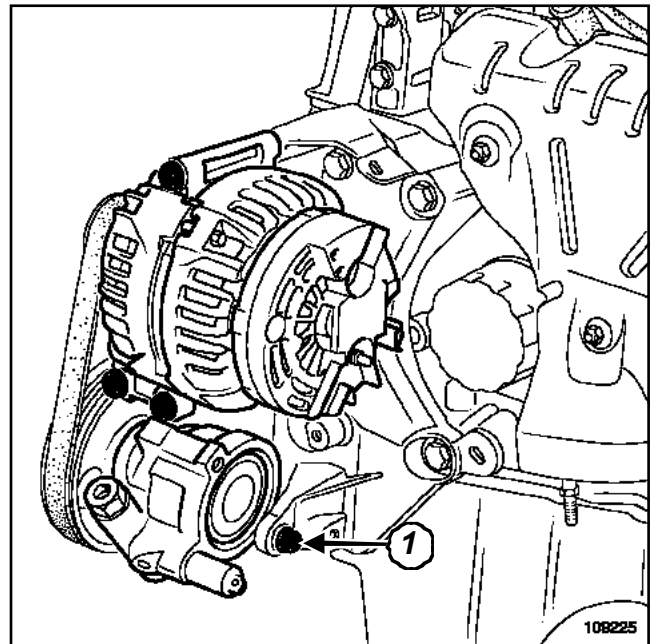
Remove the clip from the hydraulic inlet hose on the pump.

Disconnect the inlet hose.

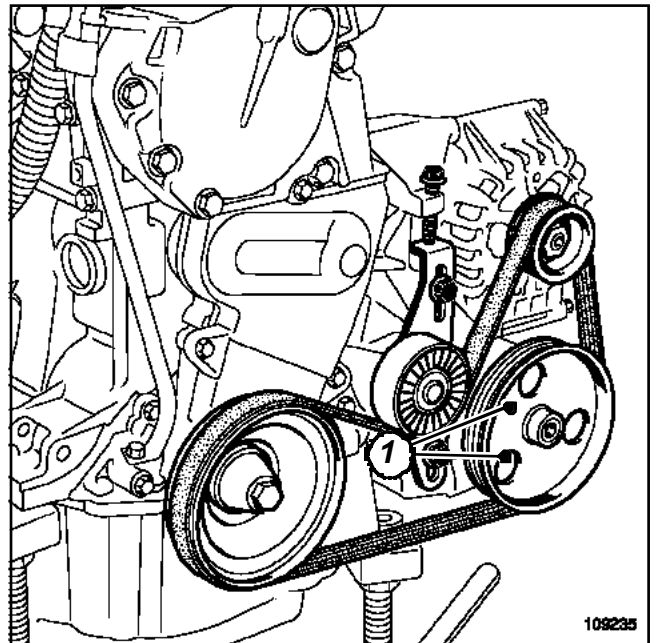
Loosen the high pressure pipe union from the pump.

Remove the high pressure pipe from the pump.

Fit caps to the pipe and power assisted steering pump openings to avoid impurities getting into them.



109225



109235

Remove:

- the mounting (1) bolts on the alternator support - power assisted steering pump - compressor,
- the power assisted steering pump.

REFITTING

Proceed in the reverse order to removal.

POWER ASSISTED STEERING

Power assisted steering pump

36B

BASIC HEATING

Torque tighten:

- the **power assisted steering pump mounting bolts (21 Nm)**,
- the **high pressure union on the power assisted steering (21 Nm)**.

WARNING

Torque tighten first the two bolts on the accessories belt side, then the bolts on the other side.

WARNING

Replace any belt that has been removed.

When replacing the belt, be sure to replace the tension wheels and idler pulleys.

Fill up the power assisted steering oil circuit (type: **ELFRENAULTMATIC D2**).

Bleed the circuit by turning the steering wheel from lock to lock with the engine switched off in the first instance.

Bleed the circuit by turning the steering wheel from lock to lock with the engine running.

Top up the level of oil in the reservoir.

Check that there are no leaks.

Refit the engine undertray.

POWER ASSISTED STEERING

Power assisted steering pump pulley

36B

L90, and K7J or K7M

Essential special tooling

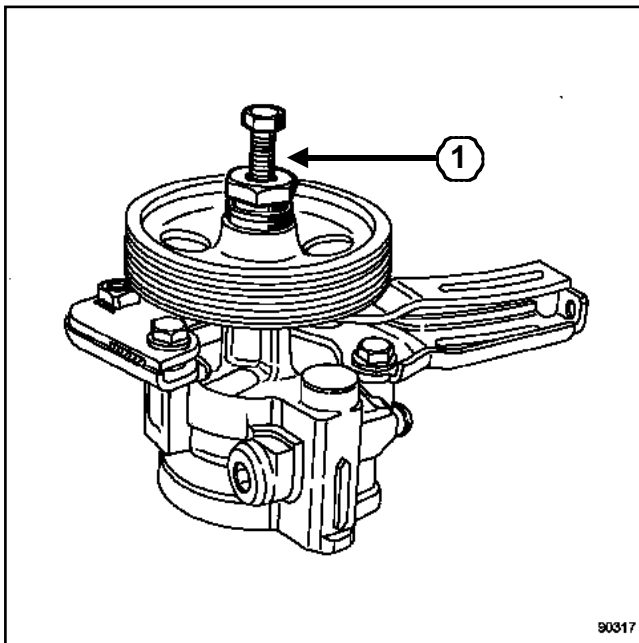
Dir. 1083-01	PAS pump pulley fitting tool
--------------	------------------------------

REMOVAL

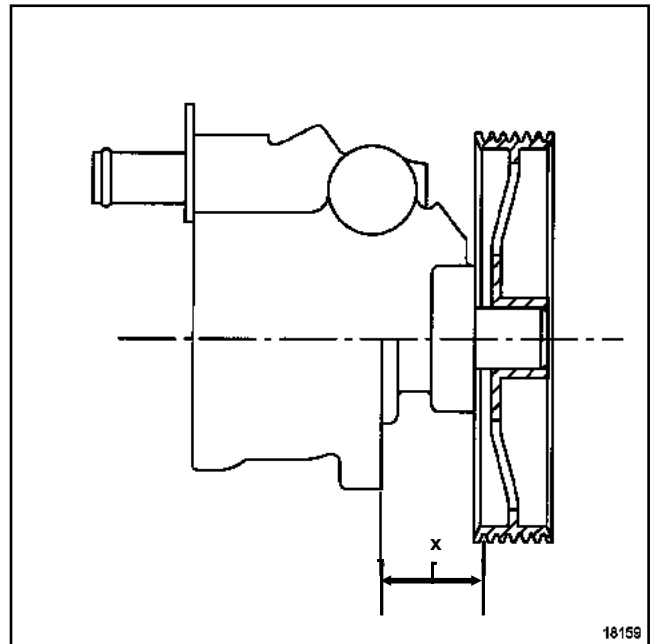
Remove the power assisted steering pump (see 36B, Power assisted steering, Power assisted steering pump).

Use the press with a jaw extractor.

REFITTING



Fit the pulley with tool (Dir. 1083-01)(1) until you reach the measured fitting dimension (smear plenty of grease onto the threading and the point on the pulley).



Follow the pulley fitting dimension measurement, $X = 25.4 \text{ mm} \pm 0.4$.

POWER ASSISTED STEERING

Power assisted steering pump: Checking

36B

Essential special tooling

Dir. 1204 Union for measuring pressure in power assisted steering high pressure pipes.

Fre. 244-03 Braking circuit checking pressure gauge: from 0 to 160 bar. Replaces Fre.1085

Tightening torques

pressure switch **1.2 daNm**

Mount the vehicle on a two post lift.

Remove the engine undertray.

Fit a hose clamp on the power assisted steering pump oil inlet pipe to restrict the flow.

BASIC HEATING

Note:

If the vehicle is not fitted with air conditioning, the power assisted steering pump is located below the alternator, but the procedure remains the same.

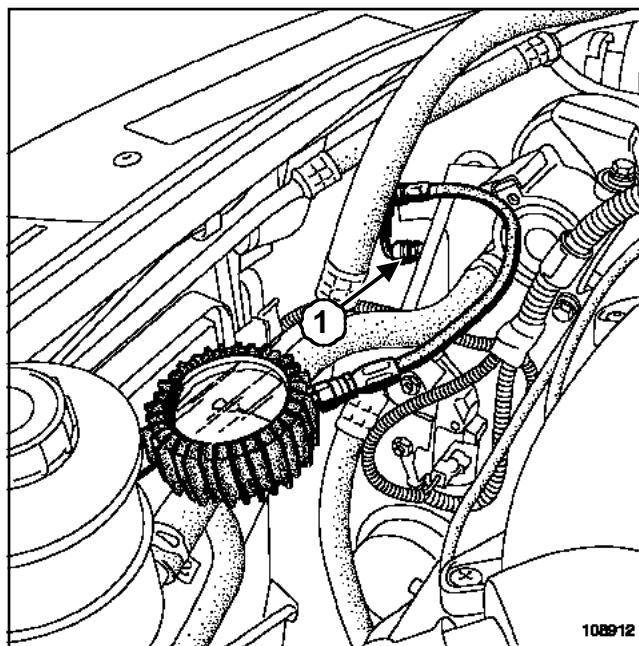
Disconnect the pressure switch connector.

AIR CONDITIONING

WARNING

Protect the alternator from power assisted steering oil outflow.

Remove the pressostat.



108912

Fit the tool (Dir. 1204) in the place of the pressure switch (1).

Connect tool (Fre. 244-03) onto tool (Dir. 1204).

POWER ASSISTED STEERING

Power assisted steering pump: Checking

36B

Remove the hose clamp.

Lower the vehicle.

Fill up the power assisted steering oil circuit (type: **ELFRENAULTMATIC D2**).

Bleed the circuit by turning the steering wheel from lock to lock with the engine switched off in the first instance.

Bleed the circuit by turning the steering wheel from lock to lock with the engine running.

Top up the level of oil in the reservoir.

Check the power assisted steering pump pressure with the steering wheel straight and not being used; the value should not exceed **5 to 7 bar**.

Check the power assisted steering pump pressure with the steering wheel turned as far as it will go; the value should be **79 to 86 bar**.

Turn the engine off.

Raise the vehicle.

Fit a hose clamp on the power assisted steering pump oil inlet pipe to restrict the flow.

Remove tool (Fre. 244-03) then its adapter (Dir. 1204).

WARNING

Be sure to replace the O-rings removed from the power assisted steering unions.

Refit the pressure switch.

Torque tighten the **pressure switch (1.2 daNm)**.

Reconnect its connector.

Remove the hose clamp.

Fill up the power assisted steering oil circuit (type: **ELFRENAULTMATIC D2**).

Bleed the circuit by turning the steering wheel from lock to lock with the engine switched off in the first instance.

Bleed the circuit by turning the steering wheel from lock to lock with the engine running.

Top up the level of oil in the reservoir.

Check that there are no leaks.

Refit the engine undertray.

Tightening torques

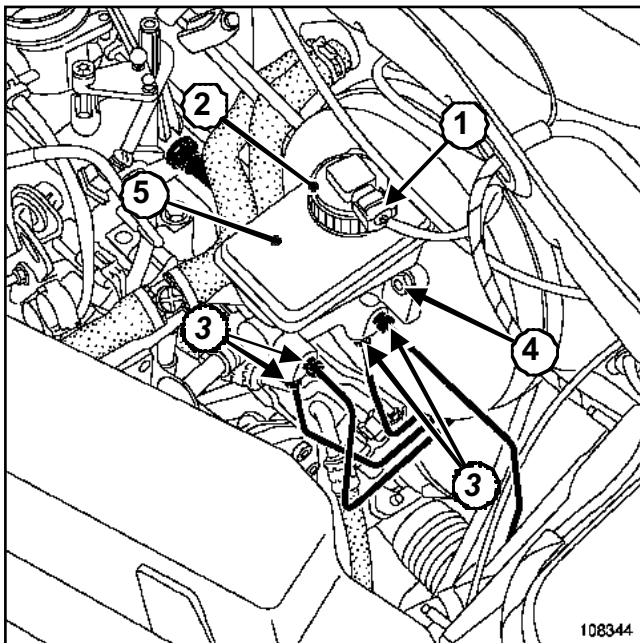
master cylinder pipe unions	14 Nm
brake servo mounting nuts	21 Nm

WARNING

Take precautions for brake fluid outflow, to prevent damage to the mechanical parts and bodywork around the braking system.

REMOVAL

Mount the vehicle on a two-post lift.



Disconnect the brake fluid level sensor connector (1).

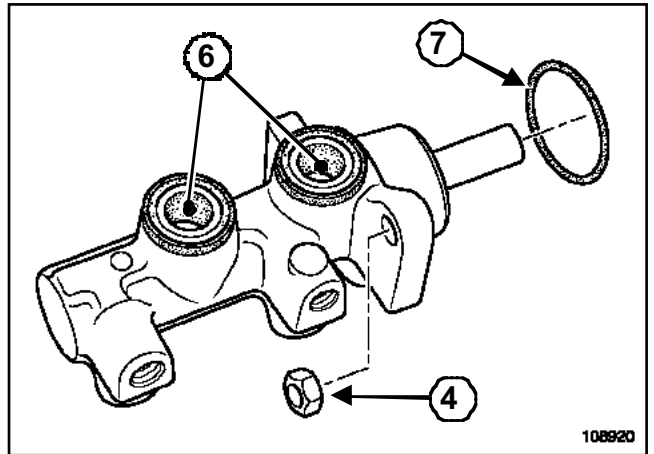
Remove the brake fluid filler cap (2).

Drain the brake fluid reservoir with a syringe.

Remove:

- the brake fluid reservoir (5)
- the master cylinder pipe unions (3) and mark their positions,
- the brake servo mounting nuts (4)
- the brake master cylinder.

REFITTING



Clip the brake fluid reservoir onto the master cylinder correctly.(6)

WARNING

Be sure to replace the master cylinder seal (7).

Line up the master cylinder with the brake servo so that the pushrod goes into the master cylinder housing.

Proceed in the reverse order to removal.

Torque tighten:

- the **master cylinder pipe unions (14 Nm)**,
- the **brake servo mounting nuts (21 Nm)**.

Fill up the brake fluid reservoir.

Drain the brake circuit (see 30A, **General information, Draining the braking circuit**).

Brake compensator

Essential special tooling

Fre. 1085-01	Brake pressure gauge 0 -250 bar. Replaces Fre.1085
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Tightening torques 

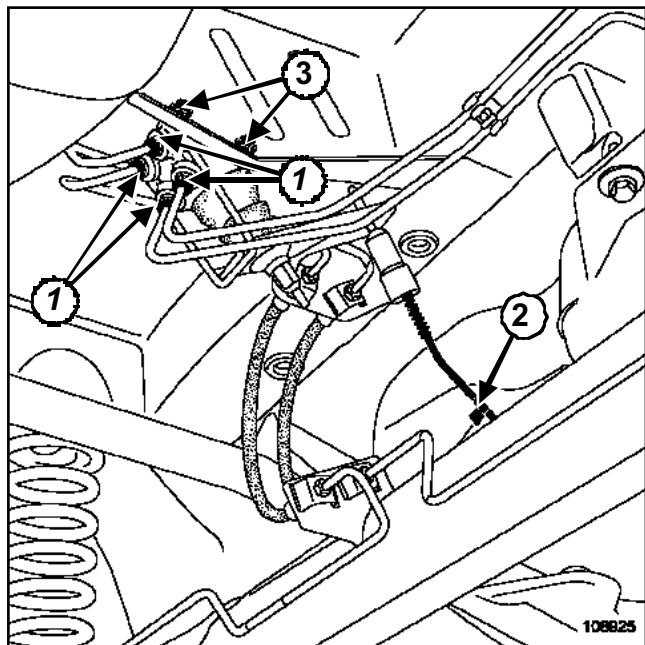
brake limiter piping unions	14 Nm
brake limiter mounting bolts	12 Nm

Vehicles fitted with ABS do not have a brake limiter.

Block the pedal to limit the flow.

REMOVAL

Mount the vehicle on a two-post lift.



108925

Disconnect the four brake pipes (1).

Remove the rod (2) from the rear axle brake limiter.

Remove the brake limiter mounting bolts. (3)

REFITTING

Proceed in the reverse order to removal.

Drain the brake circuit (see **30A, General information, Draining the braking circuit**).

Torque tighten:

- the **brake limiter piping unions (14 Nm)**,

- the **brake limiter mounting bolts (12 Nm)**.

Check the brake limiter.

CHECKING

I-CHECKING PRINCIPLE

The pressure is read in an **X** pattern by comparing the rear and front wheel pressure.

Note:

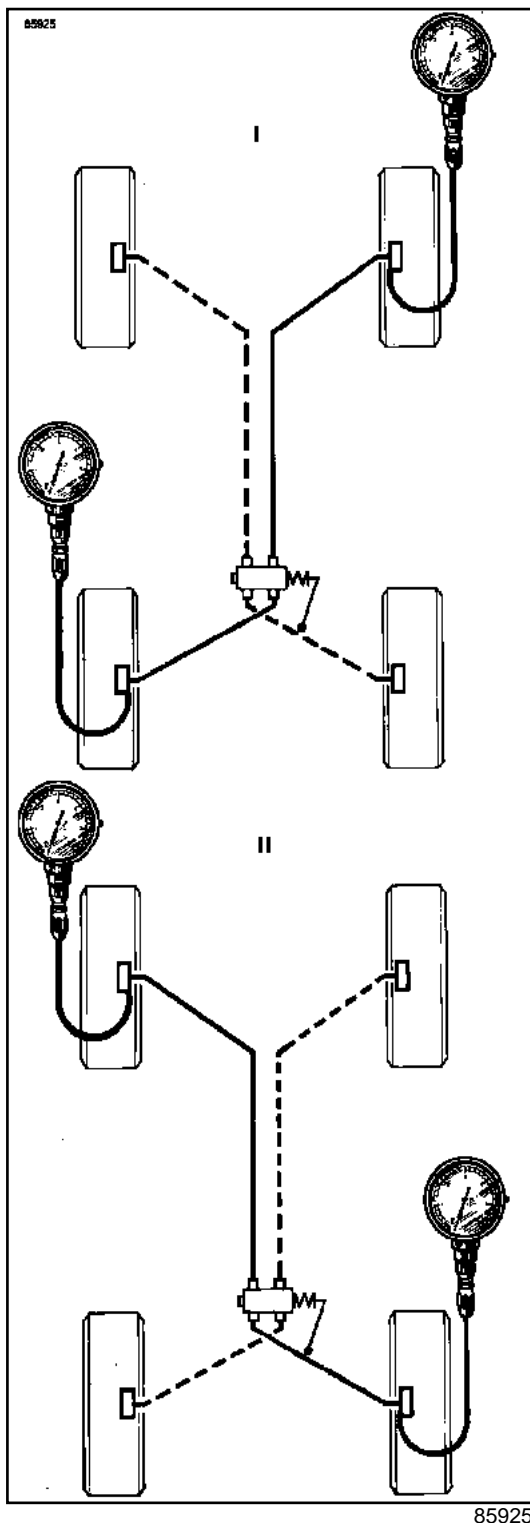
It is essential to check both circuits.

Front right/rear left and front left/rear right.

The setting enables the rear pressure to be adjusted according to the front pressure.

The adjustment is made simultaneously in on circuits.

If the pressure is incorrect for one of the two circuits, replace the limiter.



Checking the brake limiter adjustment must be carried out with the vehicle on the ground and one person inside the vehicle.

II - CHECK

Connect two pressure gauges to tool (Fre. 1085-01) (diagram 1):

- one at the front right-hand side,
- one at the rear left-hand side.

Drain the brake circuit using the pressure gauge bleed screw.

Start the engine.

Gradually depress the brake pedal until the pressure at the front wheels reaches 100 bar

Then read the pressure on the rear wheels (see checking value); Correct if necessary.

Carry out the same operation on the other circuit (diagram 2).

If there is a major difference (values outside tolerances), replace the limiter as no operations are permitted.

Note:

The pressure difference between the two rear wheels should be lower than **4 bar**, regardless of the load on the rear axle.

Drain the brake circuit (see **30A, General information, Draining the braking circuit**).

III - CHECKING VALUES

1 - No balance:

For the E0 equipment level, the rear pressure should be between **27 and 38 bar** with a **100 bar** pressure at the front.

For the E1 equipment level, the rear pressure should be between **32 and 43.8 bar** with a **100 bar** pressure at the front.

For the E2 equipment level, the rear pressure should be between **33.8 and 46 bar** with a **100 bar** pressure at the front.

WARNING

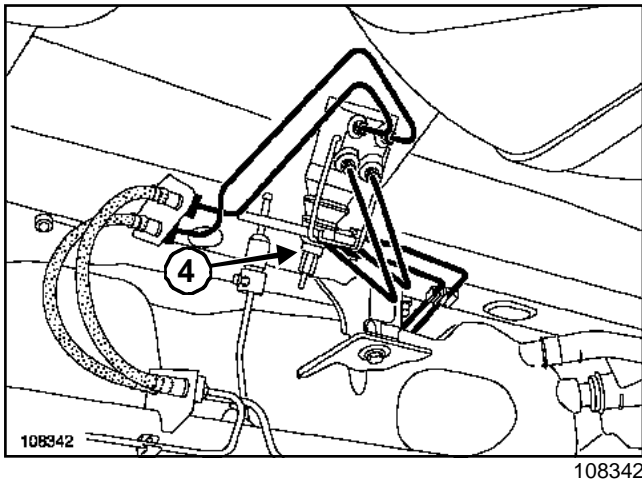
The fuel tank needs to be full if carrying out his procedure.

Brake compensator

2 - With balance:

Perform the pressure checks using the following two loads:

- For a rear axle load of **425 kg** and a pressure of **100 bar** at the front, a pressure of between **27.7 and 39.6 bar** is required,
- For a rear axle load of **550 kg** and a pressure of **100 bar** at the front, a pressure of between **45.4 and 57.3 bar** is required,

ADJUSTMENT

Turn nut (4) until the correct value is obtained.

Brake servo

Tightening torques

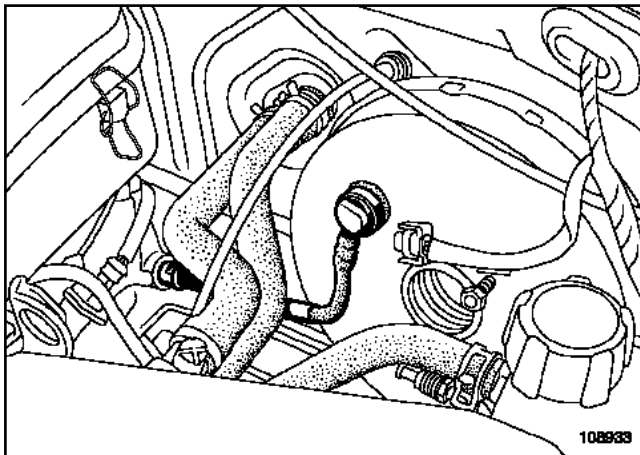
brake servo mounting nuts	21 Nm
master cylinder nuts	21 Nm
master cylinder pipe unions	14 Nm

WARNING

Prepare for brake fluid outflow, to prevent damage to the mechanical parts and bodywork around the braking system.

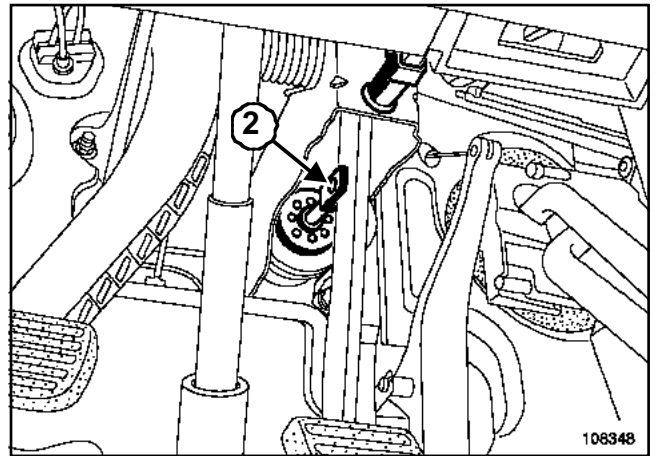
REMOVAL

Remove the master cylinder (see 37A, **Mechanical component controls, Master cylinder**).



108933

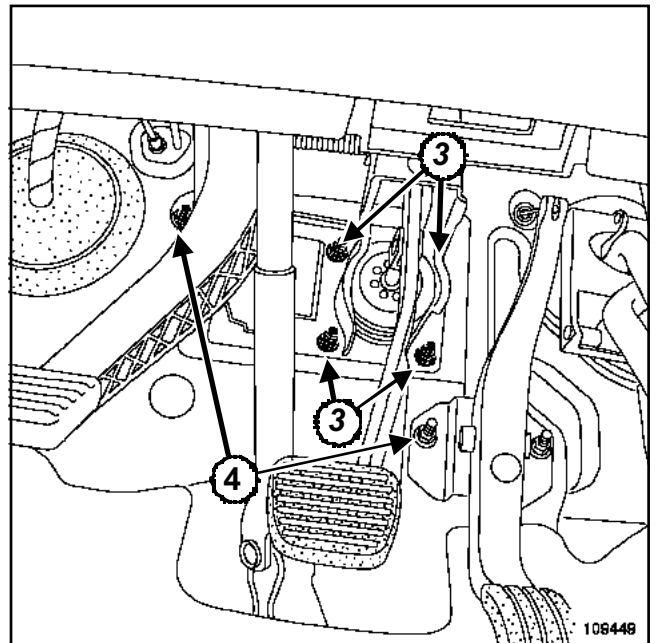
Remove the brake servo anti-return valve. (1)



108348

108348

Remove, on the passenger side, the dual safety shaft (2) between the brake servo pushrod and the brake pedal.



109449

109449

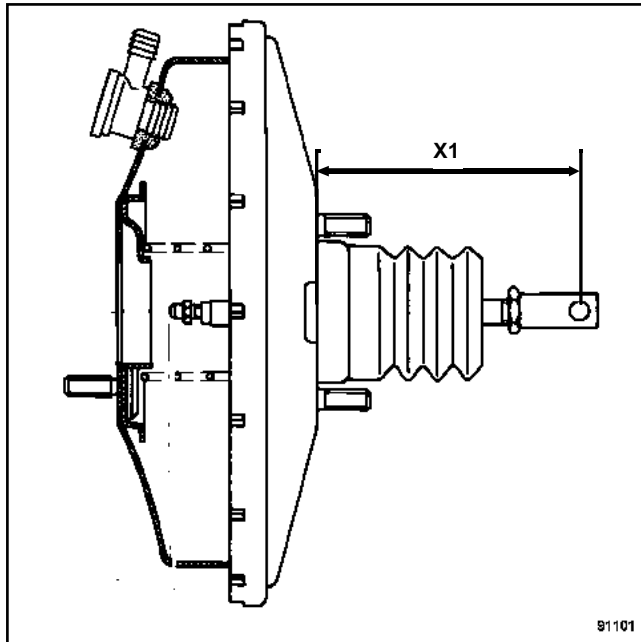
Remove insulating foam special nuts. (4)

Gently move the insulating foam aside.

Remove:

- the brake servo mounting nuts (3) on the passenger side (nuts securing the pedal assembly to the brake servo),
- the brake servo.

REFITTING



91101

Check the following dimension before refitting:

- (X1) = 145.8 mm ± 0.5.

Proceed in the reverse order to removal.

WARNING

Replace the dual safety brake pedal/master connecting shaft during every operation. It has a plastic spring ring which can only be released once.

Grease the dual safety shaft before fitting.

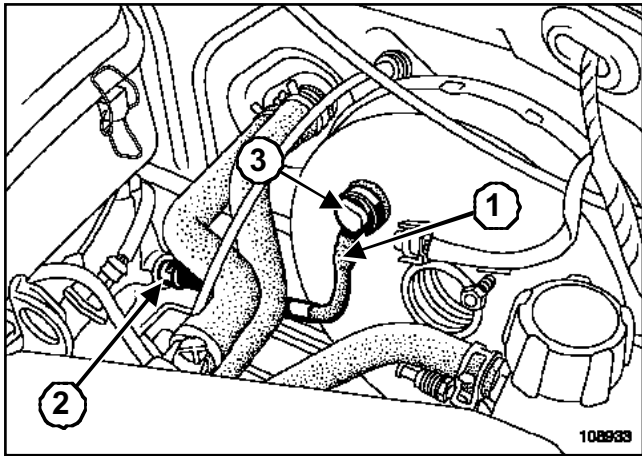
Insert the dual safety shaft from left to right.

Clip the dual safety shaft to the brake servo pushrod by tilting it upwards from the bottom.

Torque tighten:

- the **brake servo mounting nuts (21 Nm)**.
- the **master cylinder nuts (21 Nm)**,
- the **master cylinder pipe unions (14 Nm)**,

Drain the brake circuit (see **30A, General information, Draining the braking circuit**).

REMOVAL

Disconnect the vacuum pipe at the brake servo end (1).

Pull and turn the non-return valve (3) to extract it from the rubber sealing washer.

Unclip the vacuum pipe at the inlet manifold end (2).

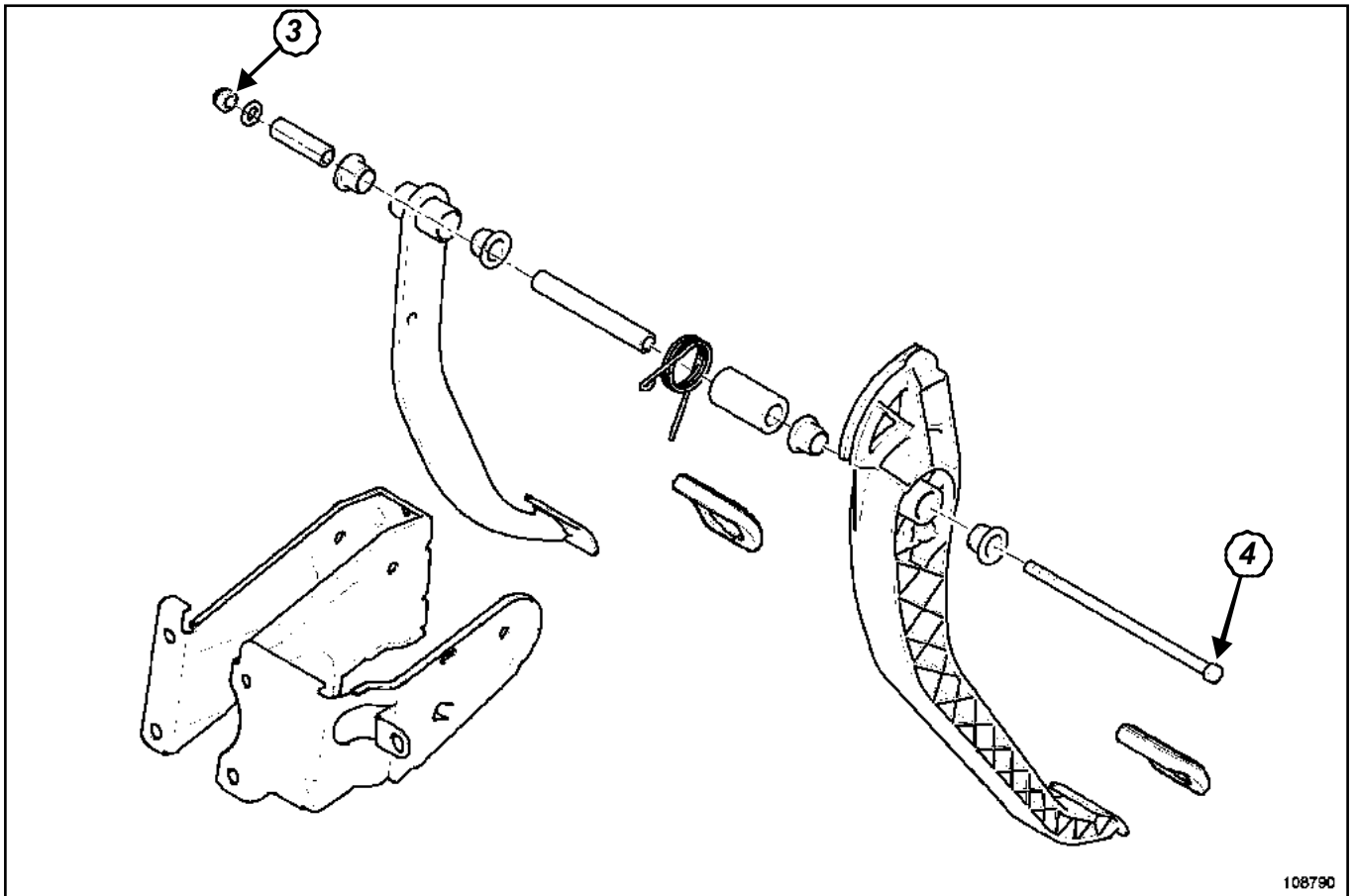
REFITTING

Check the condition of the rubber sealing washer and the non-return valve.

Replace any faulty parts.

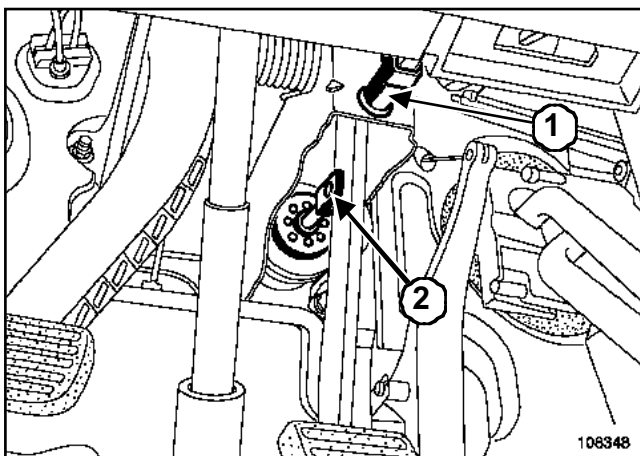
Proceed in the reverse order to removal.

L90, and K7J or K7M



108790

108790

REMOVAL

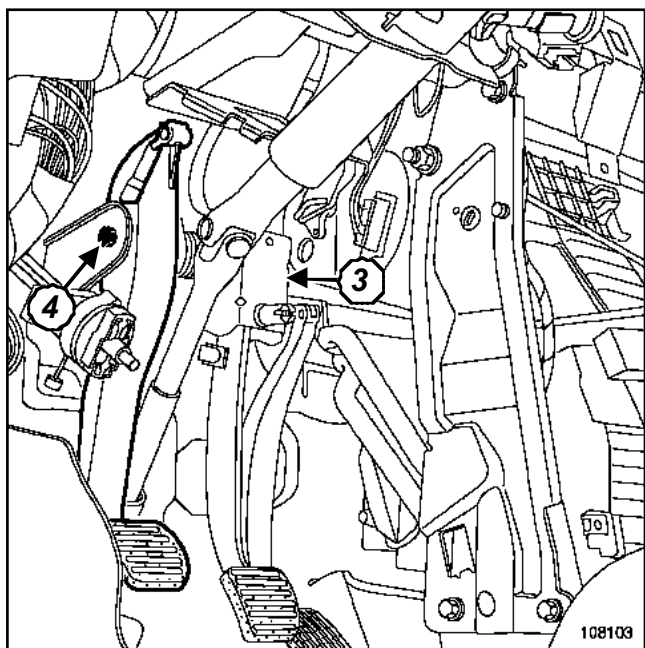
108348

108348

Unclip the stop light switch (1) from the brake pedal by turning it anticlockwise a quarter of a turn.

Remove the safety clevis pin (2) linking the brake pedal to the master cylinder.

L90, and K7J or K7M



108103

- Remove the nut (3) from the pedal assembly shaft.
- Move the pedal assembly pivot (4) to the left until the brake pedal can come out.
- Remove the brake pedal .

REFITTING

- Coat the shaft with grease.
- Proceed in the reverse order to removal.

Note:

Do not hit the pedal assembly shaft with a hammer to get it to go back into place.

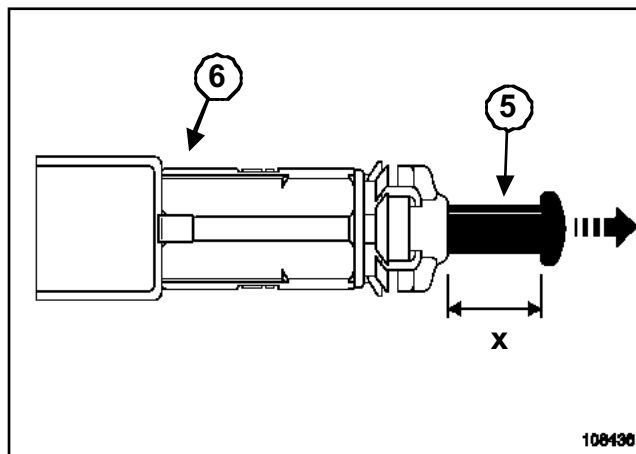
WARNING

Change the safety clevis pin linking the brake pedal and the master cylinder every time work is carried out on it. It has a plastic spring ring that can only be used once.

Grease the safety clevis pin before fitting it.

Insert the safety clevis pin from left to right.

Clip the safety clevis pin to the servo unit pushrod by folding it upwards.

REFITTING THE SENSOR

108436

108436

It is essential to pull carefully on the end of the switch so that measurement (X) is between **13 mm** minimum and **14 mm** maximum.

WARNING

- The switch must be replaced if the piston (5) for the brake pedal position switch (6) is extracted completely.
- The switch must be replaced if the work on the piston involves three adjustments.

Depress the brake pedal.

Position the switch on the pedal assembly.

Turn the brake pedal switch a quarter turn clockwise.

Support the brake pedal as it returns.

Connect the connector.

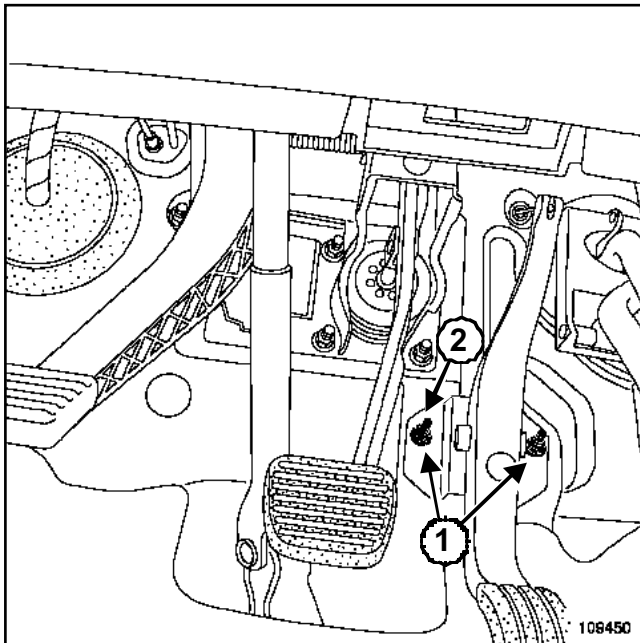
Check that the assembly works correctly.

L90, and K7J or K7M

Tightening torques 

pedal mounting bracket nuts	21 Nm
-----------------------------	-------

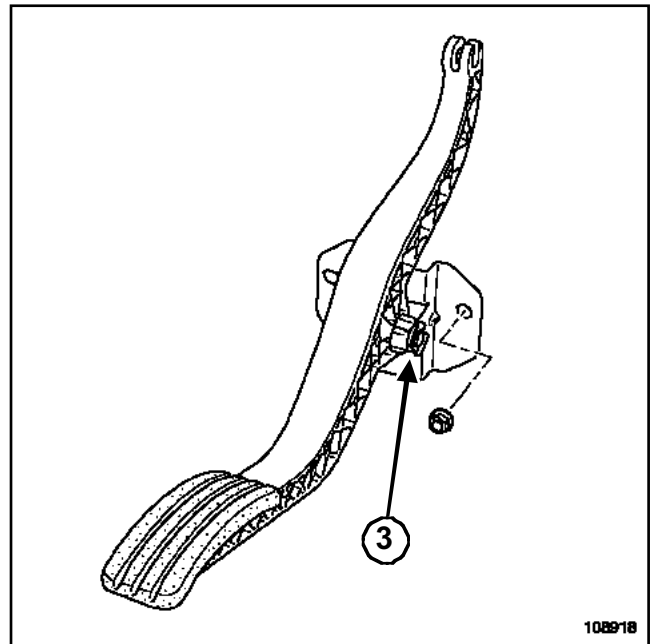
REMOVAL



Unscrew the special nut (2) from the insulating foam around the left-hand accelerator pedal mounting nut.

Remove:

- the accelerator pedal mounting nuts(1),
- the pedal,
- the accelerator cable at the pedal end by moving it upwards and sliding the cable end-piece towards the central console.



Remove:

- the circlip (3) using a screwdriver,
- the pedal shaft.

Note:

Memorise which way round the mounting goes in relation to the pedal and the position of the washers.

REFITTING

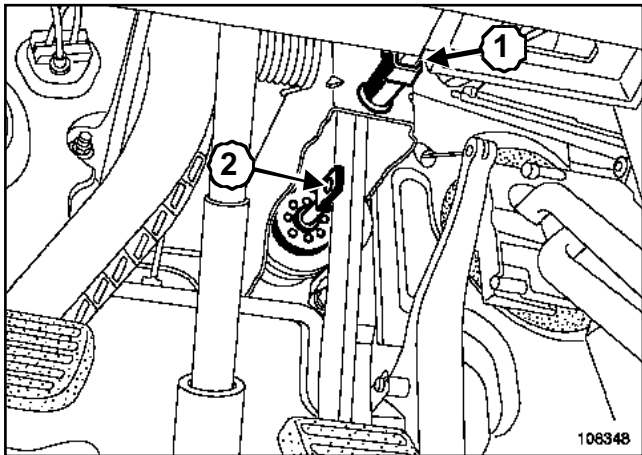
Proceed in the reverse order to removal.

Torque tighten the **pedal mounting bracket nuts (21 Nm)**.

Tightening torques

pedal assembly mounting bracket nuts	21 Nm
steering column universal joint bolt	21 Nm

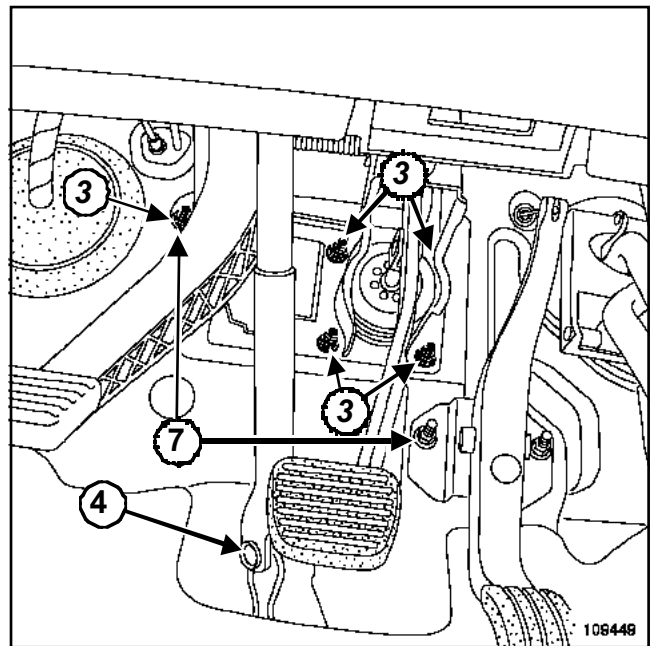
REMOVAL



Disconnect the brake pedal light switch connector (1).

Remove:

- the safety clevis pin linking the brake pedal to the master cylinder (2),
- the clutch cable from its slot on the pedal, lifting the pedal and bringing the cable up at right-angles to the pedal.



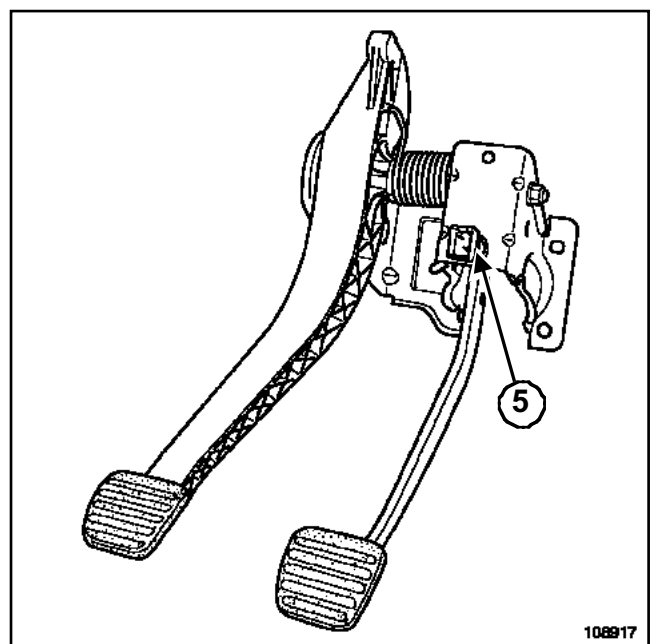
Remove the special insulating foam nuts (7).

Move the insulating foam slightly to one side.

Remove:

- the steering column universal joint bolt(4),
- the pedal assembly bracket mounting bolts (3),
- the pedal assembly.

If necessary, cut the insulating foam to withdraw it.



Unclip the brake light switch (5) if necessary.

MECHANICAL ELEMENT CONTROLS

Clutch/brake pedal assembly

37A

REFITTING

Replace the insulating foam.

Refit

- the insulating foam through the slot,
- the brake light switch (see **37A, Mechanical component controls, brake light switch**).

Proceed in the reverse order to removal.

WARNING

Change the safety clevis pin linking the brake pedal and the master cylinder every time work is carried out on it. It has a plastic spring ring that can only be used once.

Grease the safety clevis pin before fitting it.

Insert the safety clevis pin from left to right.

Clip the safety clevis pin to the servo unit pushrod by folding it upwards.

Torque tighten:

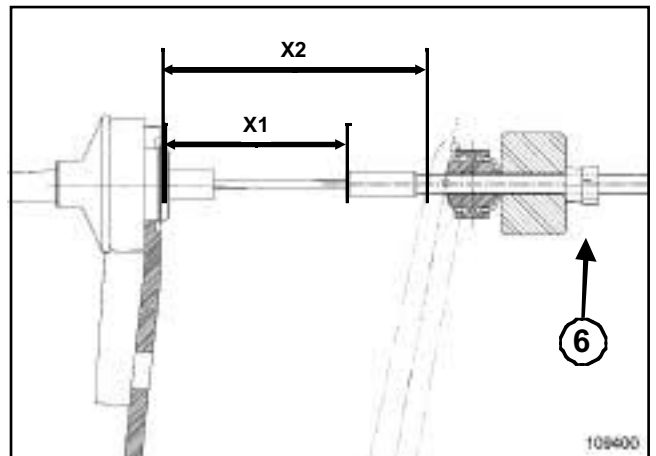
- the **pedal assembly mounting bracket nuts (21 Nm)**,
- the **steering column universal joint bolt (21 Nm)**.

Check that the clutch cable fits perfectly in the groove provided for it on the pedal.

Check that the wipers operate correctly.

With the pedal at rest, clutch engaged position, pull on the cable at the clutch fork on the gearbox.

The cable must have at least **2 cm** of slack.



The adjustment of the slack in the clutch control cable is carried out at the gearbox end, using the nut (6).

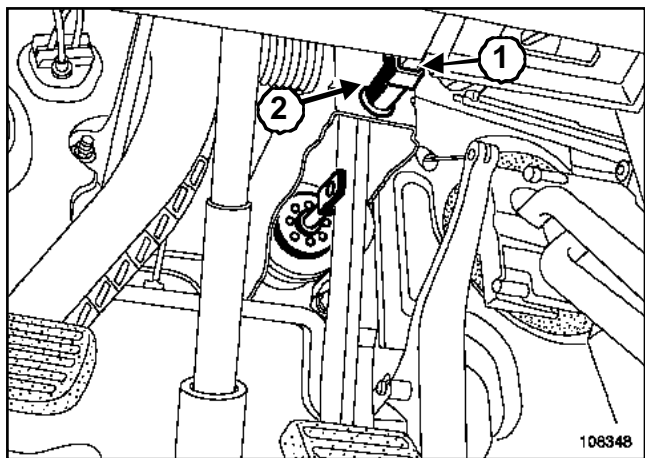
Clutch pedal at rest.

The amount of slack can be measured with a ruler in two places:

- Between the sleeve stop and the end of the clutch control cable = **(X1) 60 mm ± 5**.
- Between the sleeve stop and the end of the clutch fork = **(X2) 86 mm ± 5**.

Brake light switch

REMOVAL



Disconnect the brake pedal position sensor connector (1).

Turn the brake pedal position sensor (2) anticlockwise a quarter of a turn.

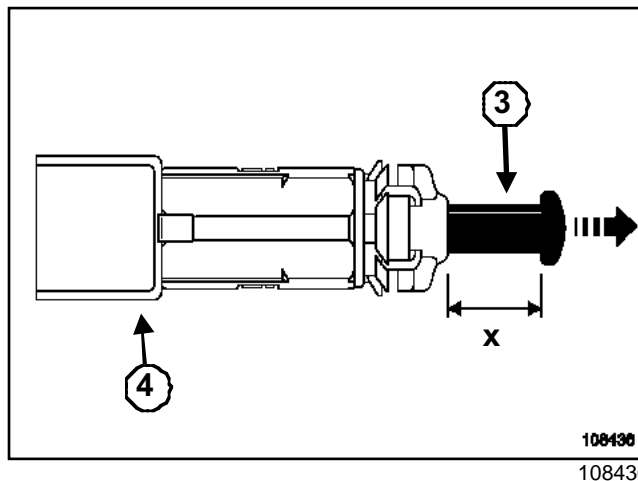
Remove the brake pedal position sensor.

REFITTING

Note:

The brake pedal switch has an automatic adjustment feature, adapting to the pedal position.

I -WHEN REMOVING AND REFITTING THE SENSOR



It is essential to pull carefully on the end of the switch so that measurement (X) is between **13 mm** minimum and **14 mm** maximum.

WARNING

- The switch must be replaced if the piston (4) for the brake pedal position switch (3) is extracted completely.
- The switch must be replaced if the work on the piston involves three adjustments.

Depress the brake pedal.

Position the switch on the pedal assembly.

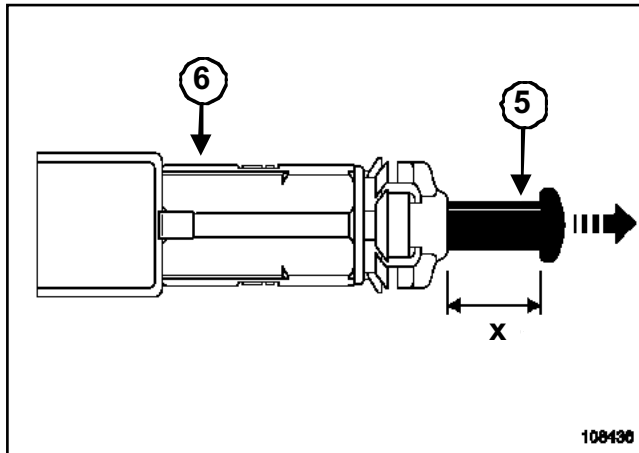
Turn the brake pedal switch a quarter turn clockwise.

Support the brake pedal as it returns.

Connect the connector.

Brake light switch

II - WHEN FITTING A NEW SENSOR



108436

Make sure that measurement (**X**) is at least **13 mm**.

If (**X**) is of another value, apply the procedure for the switch removed.

WARNING

- The switch must be replaced if the piston (5) for the brake pedal position switch (6) is extracted completely.
- The switch must be replaced if the work on the piston involves three adjustments.

Depress the brake pedal.

Position the switch on the pedal assembly.

Turn the brake pedal switch a quarter turn clockwise.

Support the brake pedal as it returns.

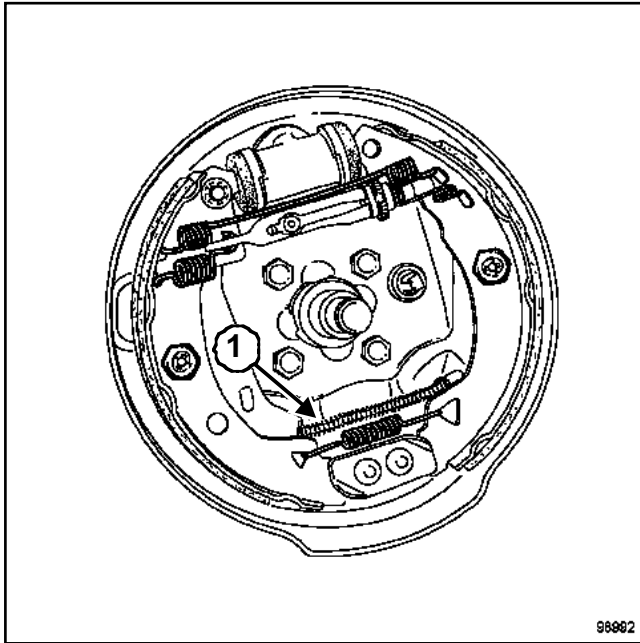
Connect the connector.

Tightening torques 

drum nuts	175 Nm
wheel mounting bolts	105 Nm

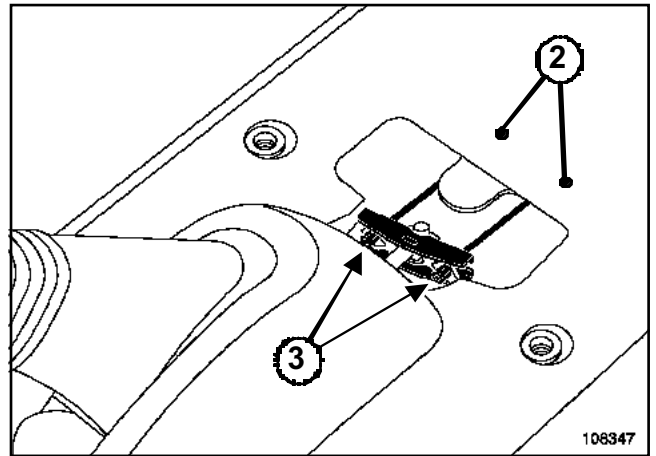
REMOVAL

Mount the vehicle on a two post lift.



Remove:

- the wheel in question,
- the drum cap,
- the drum nut,
- the brake drum,
- the brake cable (1) using a pair of pliers and a screwdriver,
- the centre console (see 57A, **Mechanisms and accessories, interior equipment**) or the cover (depending on the equipment).



Unclip:

- the cable (3) from its housing,
- the sheath from its stop on the body (2) using a pair of pliers,
- the wheel hub flange sheath.

Remove the cable from the retaining clips.

Remove the parking brake cable.

REFITTING

Proceed in the reverse order to removal.

Apply the parking brake lever five times to condition the cables for normal use.

ADJUSTMENT

A badly adjusted parking brake:

- prevents the correct operation of the automatic compensation system for the brake shoes,
- and causes long brake pedal travel.

WARNING

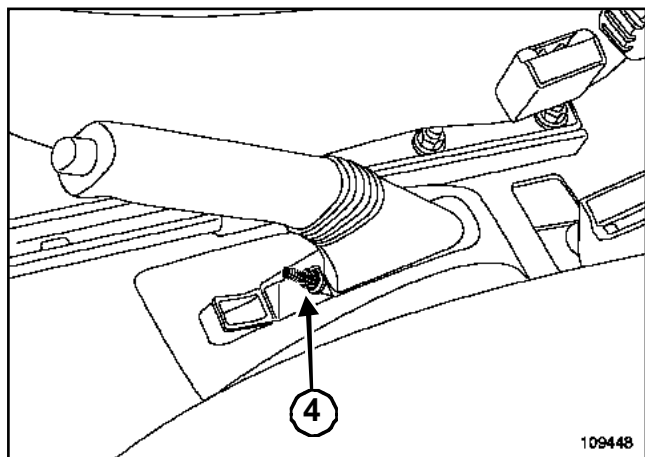
The brake cables should not be re-tensioned to correct this fault since it will quickly recur.

The parking brake is not a wear compensation. Adjust the parking brake only when the following are replaced:

- shoes,
- the cables,
- the parking brake lever.

Note:

Any other adjustment except in the above cases is not permitted.



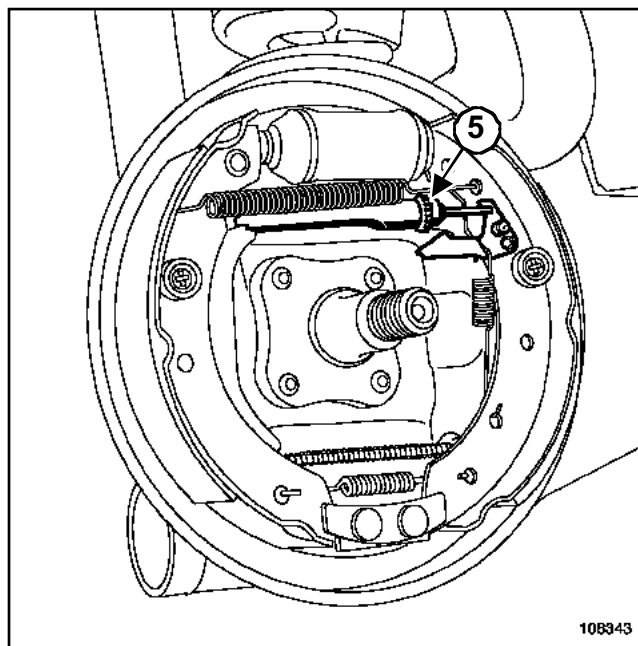
109448
109448

Lower the parking brake lever.

Undo the adjusting nut as far as it will go (4).

Remove:

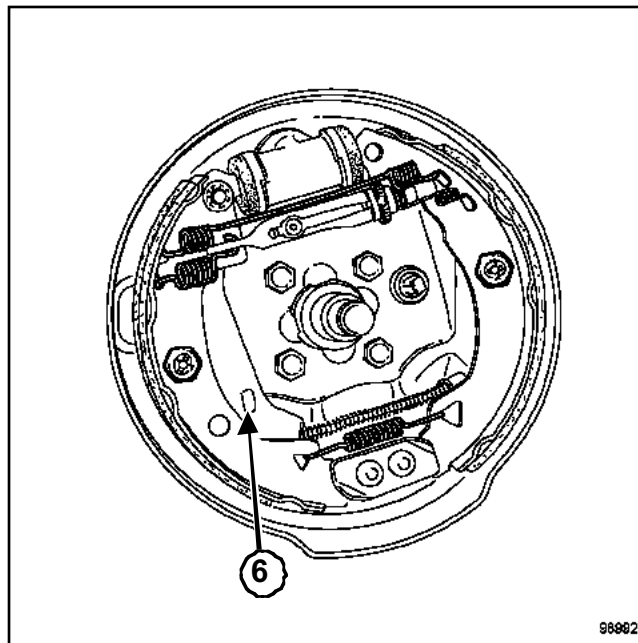
- the two rear wheels,
- the two drums.



108343

108343

Check the operation of the compensation system by rotating the notched sector (5) (ensure it turns in both directions), then turn it back by 5 to 6 teeth.



98982

98992

Make sure:

- that the cables slide freely,
- that the lever position against is correct.

Progressively tighten the cables at the level of the central adjusting nut (4) in such a way as the levers (6) release the parking brake between the first and second notches of the lever movement and remain released in the second notch.

Fit the drums.

Parking brake cables

Torque tighten:

- the **drum nuts (175 Nm)**,
- the **wheel mounting bolts (105 Nm)**.

With the vehicle on its wheels, adjust the brake linings by pressing the brake pedal firmly and progressively for a number of times while listening for the automatic compensation system clicking.

Check the lever movement (seven positions).

Release the parking brake.

Check that the wheels turn freely.

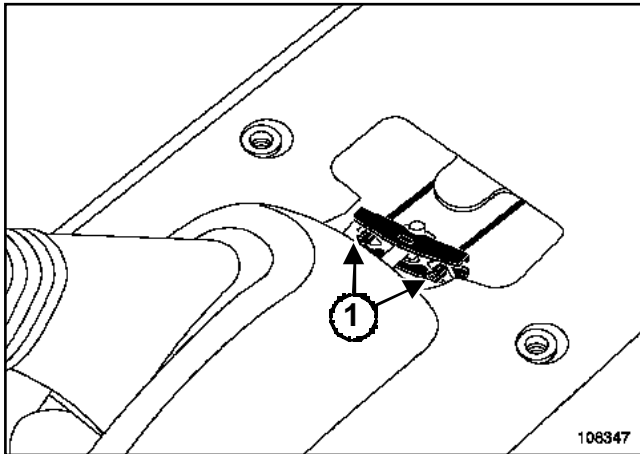
Parking brake lever

Tightening torques 

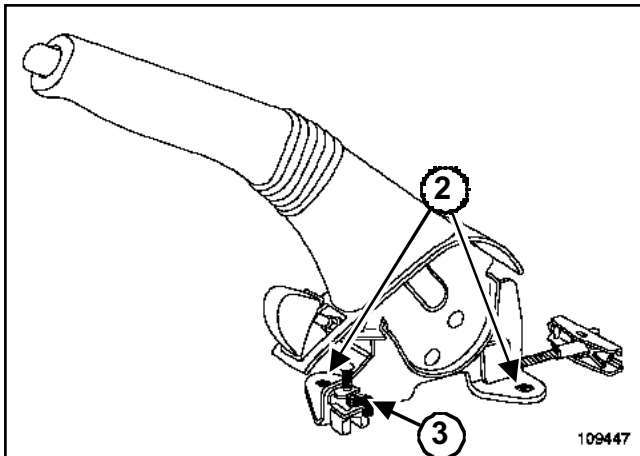
parking brake lever mounting bolts	21 Nm
------------------------------------	-------

REMOVAL

Remove the centre console (see **57A, Mechanisms and accessories, interior equipment**) or the cover (depending on the equipment).

108347
108347

Unclip the two cables (1).

109447
109447

Remove the nuts (2).

Lift the lever slightly to be able to disconnect the parking brake switch connector (3).

Remove the parking brake lever.

REFITTING

Proceed in the reverse order to removal.

Torque tighten the **parking brake lever mounting bolts (21 Nm)**.

Adjust the parking brake if the lever remains between the first and second handbrake lever movement positions (see **37A, Control of mechanical components, parking brake cable**).

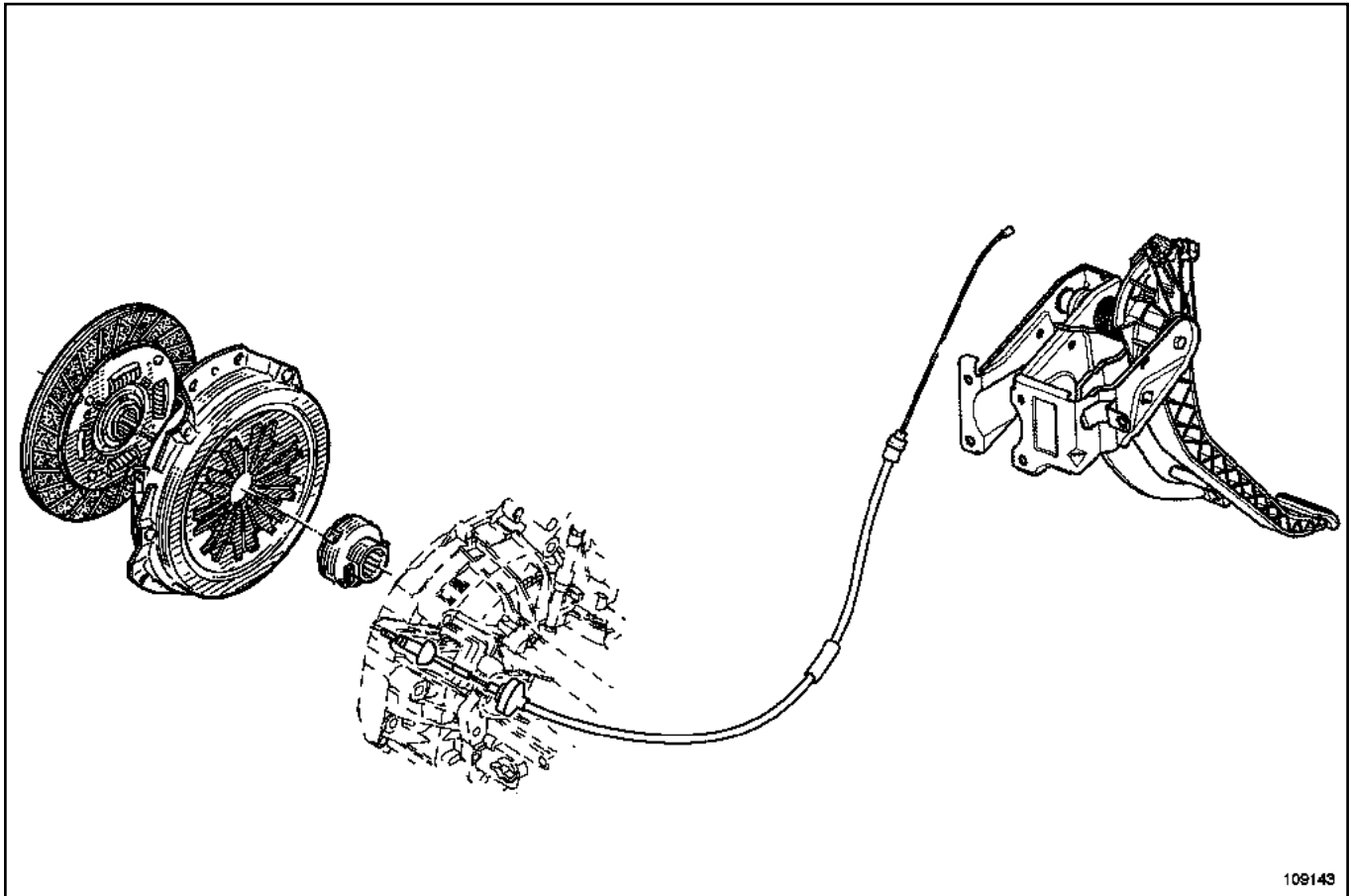
MECHANICAL ELEMENT CONTROLS

Exploded view of clutch control components

37A

L90, and K7J or K7M, and JH1 or JH3

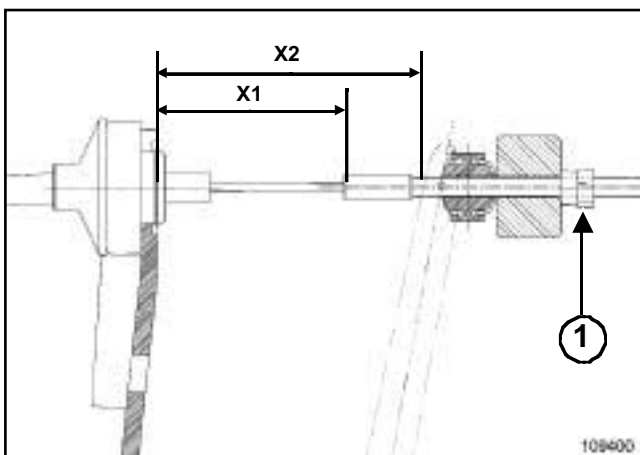
Exploded view



109143

109143

This control has no automatic take-up.



109400

The adjustment of the clutch control cable guard is by the gearbox side end, by turning the nut (1).

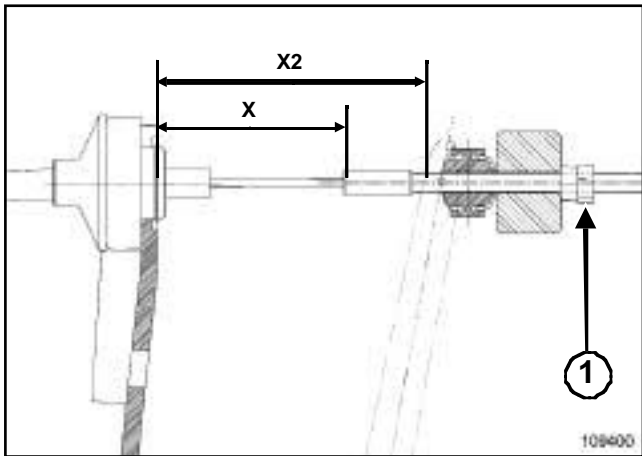
Clutch pedal released.

Measurement of the guard can be done in two places:

- Between the sleeve stop and the end of the clutch control cable (X1) = **60 mm ± 5**.
- Between the sleeve stop and the end of the clutch fork (X2) = **86 mm ± 5**.

Clutch control: Adjusting

L90, and K7J or K7M, and JH1 or JH3



109400

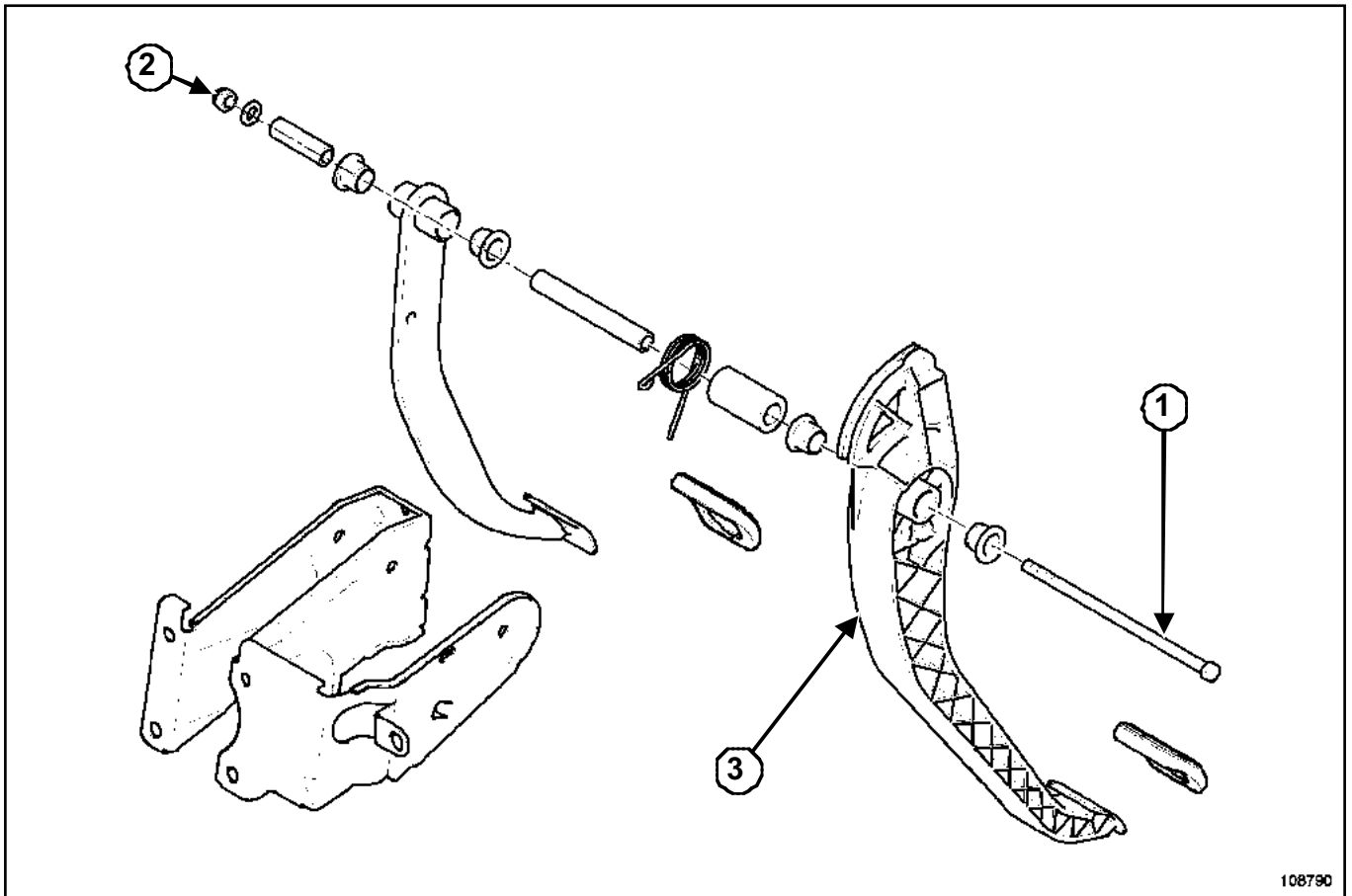
The adjustment of the clutch control cable guard is by the gearbox side end, by turning the nut (1).

Clutch pedal released.

Measurement of the guard can be done in two places:

- Between the sleeve stop and the end of the clutch control cable (**X**) = **60 mm ± 5**.
- Between the sleeve stop and the end of the clutch fork (**X2**) = **86 mm ± 5**.

L90, and K7J, and JH1 – L90, and K7M, and JH3

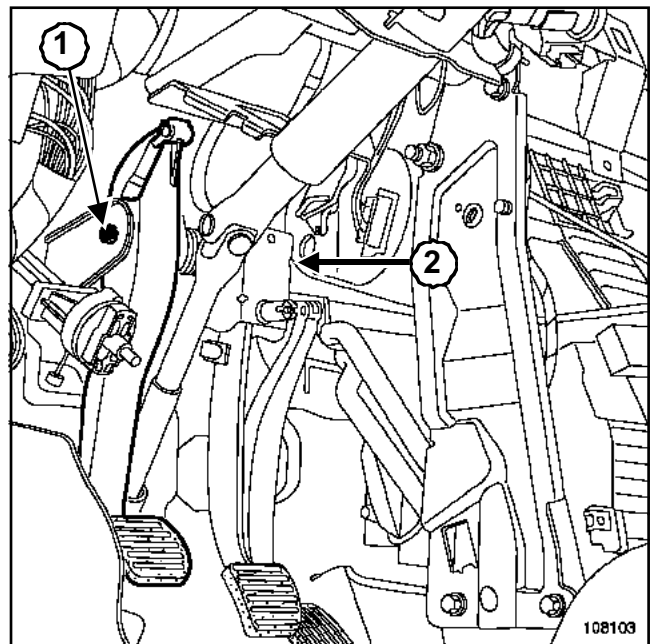


108790

108790

REMOVAL

Disengage the cable from its slot, lifting the pedal and bringing the cable up at right-angles to the pedal.



108103

108103

Remove the nut (2) from the pedal assembly shaft(1).

Withdraw the shaft (1) to release the clutch pedal.

L90, and K7J, and JH1 – L90, and K7M, and JH3

Remove the clutch pedal (3).

REFITTING

Coat the shaft with grease.

Place the clutch pedal in position with its spring.

Fit the pedal shaft.

Note:

Do not hit the shaft with a hammer to get it to go back into place.

Refit and tighten the pedal assembly shaft nut.

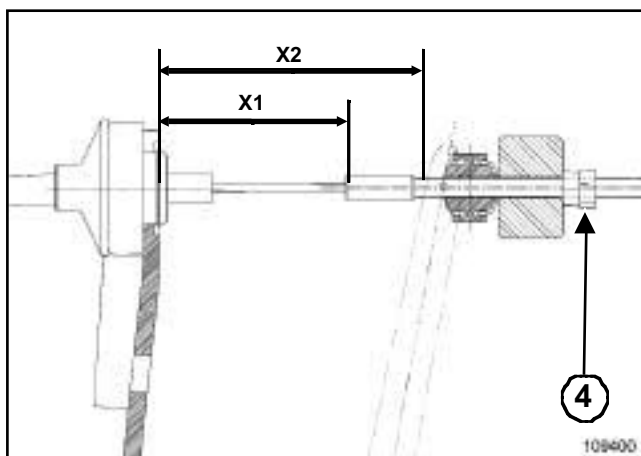
Fit the cable in place in its notch on the pedal (see method of removal).

Check that the cable fits perfectly in the groove provided for it on the pedal.

Check that the whole clutch system operates correctly.

With the pedal at rest, clutch engaged position, pull on the cable at the clutch fork on the gearbox.

The cable must have at least **2 cm** of « slack ».



109400

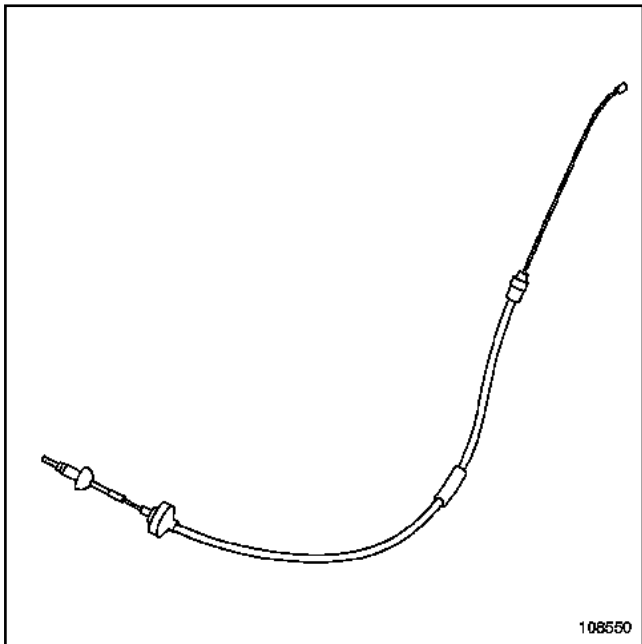
The adjustment of the slack in the clutch control cable is carried out at the gearbox end, using the nut (4).

Clutch pedal at rest.

The slack can be measured in two places:

- Between the sleeve stop and the end of the clutch control cable (X1) = **60 mm ± 5**.
- Between the sleeve stop and the end of the clutch fork (X2) = **86 mm ± 5**.

L90, and K7J or K7M, and JH1 or JH3

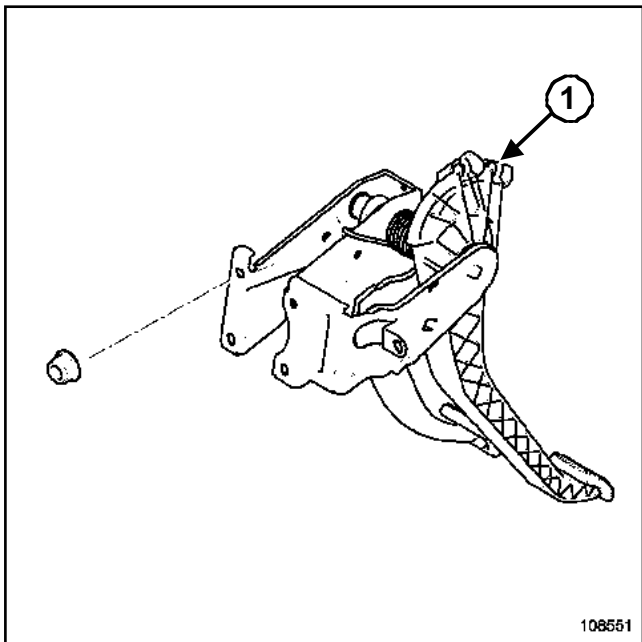


108550
108550

REMOVAL

In the engine compartment, disconnect the cable from the clutch fork.

Press on the pedal to bring the cable back into the passenger compartment.



108551
108551

Remove the cable from the pedal (1) housing, by lifting the pedal and holding the cable up perpendicular to the pedal.

Push the cable sleeve stop into the engine compartment.

Remove the complete cable via the engine compartment.

REFITTING

Thread the cable into the passenger compartment via the engine compartment.

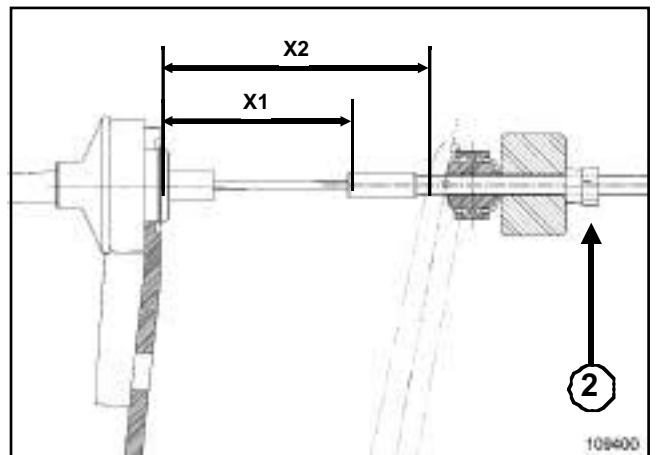
Fit the cable into the notch (1) of the pedal.

Note:

Check that the cable is perfectly set into the specially designed pedal throat.

Fit the cable onto the clutch fork.

Press the clutch pedal to clip the cable sleeve stop into position on the bulkhead.



109400
109400

The adjustment of the clutch control cable guard is by the gearbox side end, by turning the nut (2).

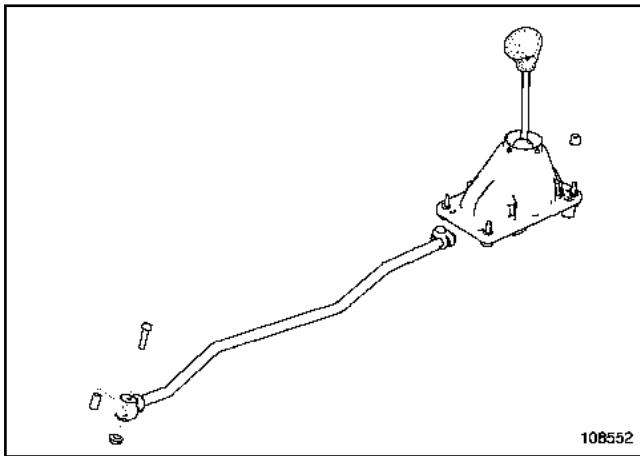
Clutch pedal released.

Measurement of the guard can be done in two places:

- Between the sleeve stop and the end of the clutch control cable (X1) = **60 mm ± 5**.
- Between the sleeve stop and the end of the clutch fork (X2) = **86 mm ± 5**.

External gear control: Description

L90, and K7J or K7M, and JH1 or JH3

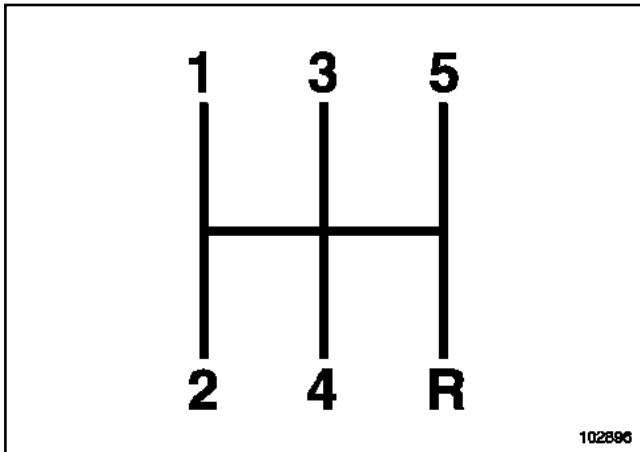


108552

L90 vehicles are fitted with a gearbox control linkage.

WARNING

It is important not to untighten the control linkage adjustment flange nut.



102896

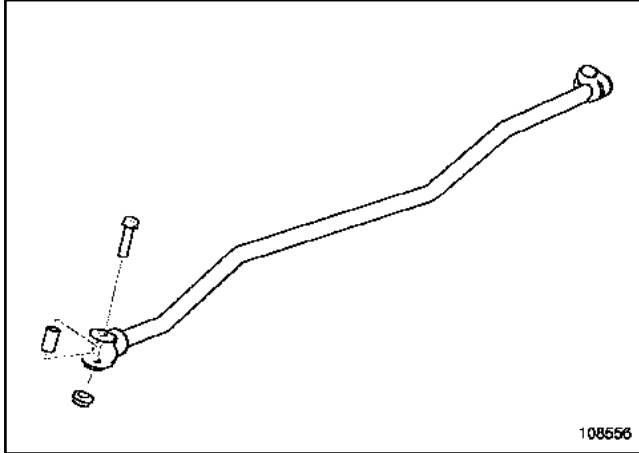
To select reverse gear, return to neutral and select reverse like any other gear.

L90, and K7J or K7M, and JH1 or JH3

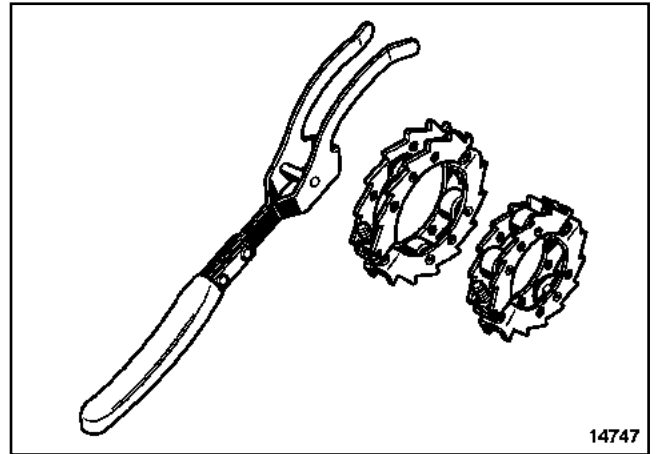
Essential special tooling

Mot. 1199-01

Exhaust pipe cutter



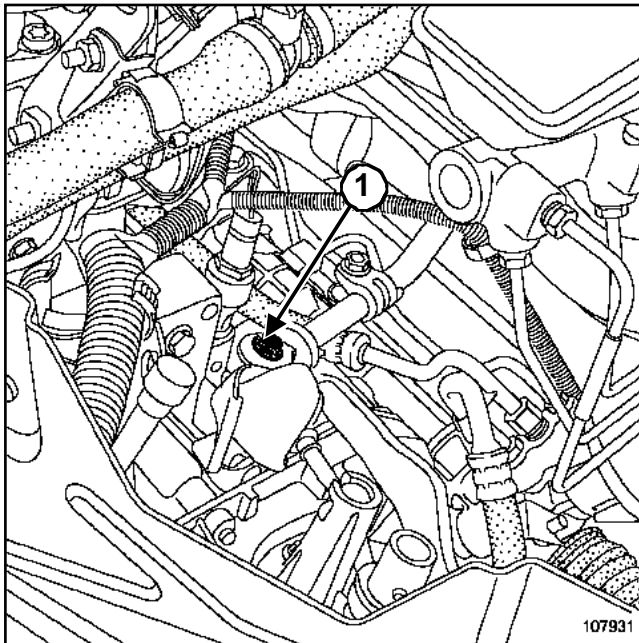
108556
108556



14747
14747

REMOVAL

Put the vehicle on a two-post lift.



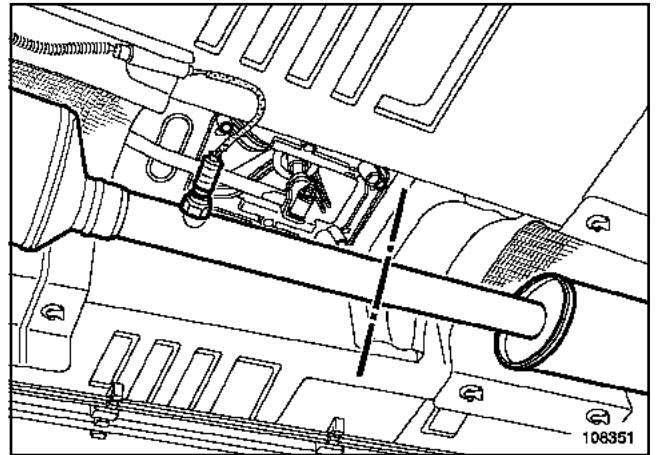
107931
107931

Remove the gearbox control gaiter.

Remove nut (1) from the gearbox control linkage.

WARNING

It is important not to untighten the control linkage adjustment flange nut.



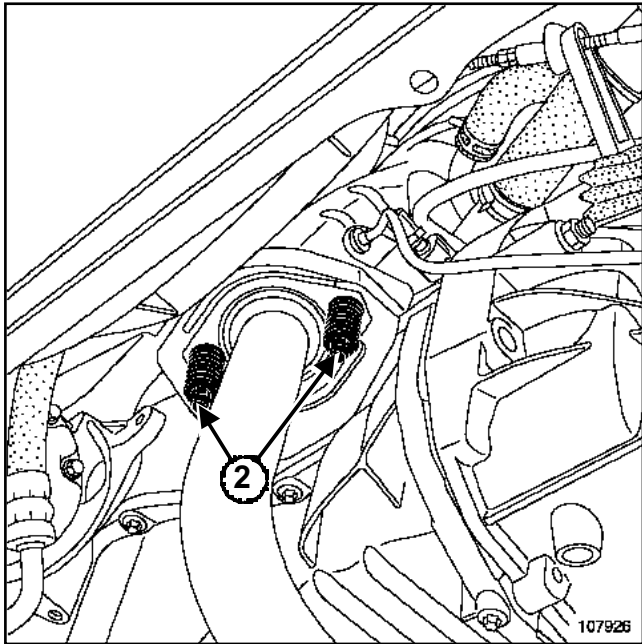
108351

Cut off the exhaust line using tool (Mot. 1199-01) between the two cutting points located about **130 cm** from the exhaust manifold.

Disconnect the connectors of the oxygen sensor downstream from the catalytic converter.

Remove the clips from the oxygen sensor connector downstream from the catalytic converter.

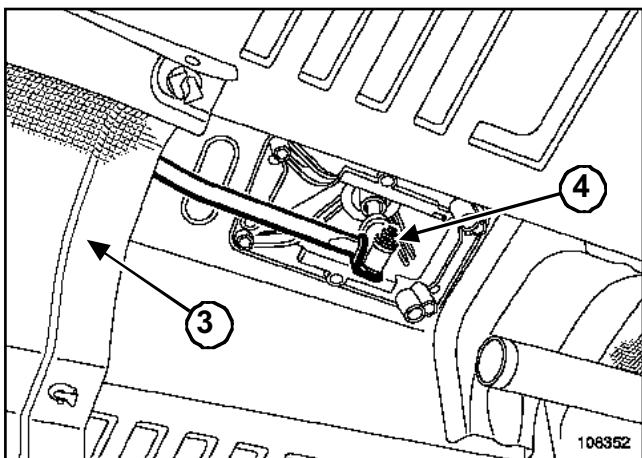
L90, and K7J or K7M, and JH1 or JH3



107926

Remove:

- the catalytic converter mountings (2) on the exhaust manifold,
- the catalytic converter by unclipping the rubber mountings.



108352

Remove:

- the heat shield (3),
- the nut (4) from the gearbox control linkage,
- the gearbox control linkage.

REFITTING

Smear grease over the fixing bearings of the control linkage.

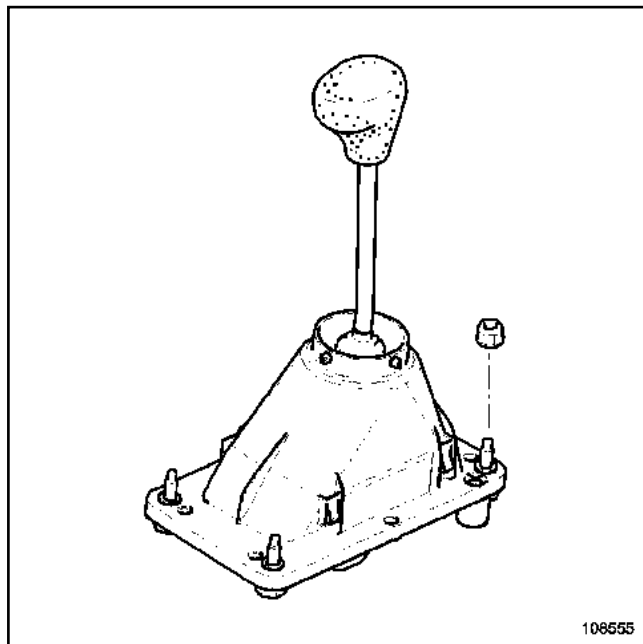
Proceed in the reverse order to removal.

L90, and K7J or K7M, and JH1 or JH3

Essential special tooling

Mot. 1199-01

Exhaust pipe cutter



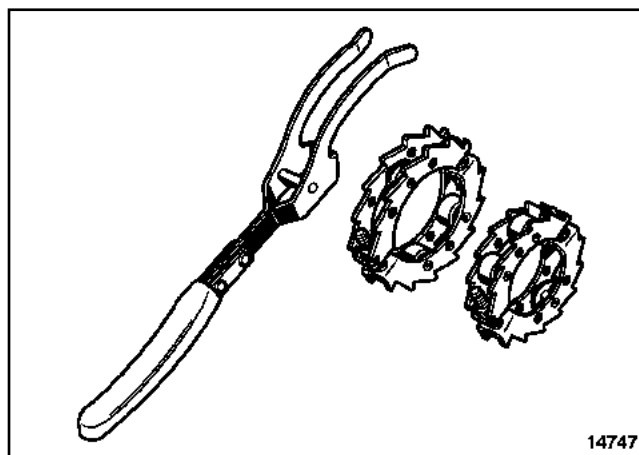
108555

108555

REMOVAL

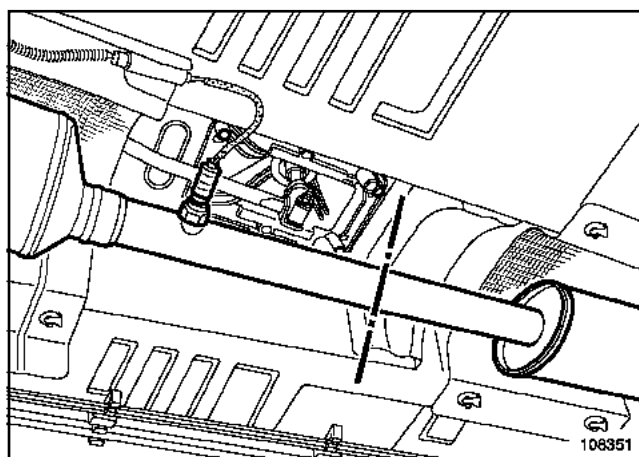
Put the vehicle on a two-post lift.

This operation is carried out after having removed the centre console (see **57A, Interior equipment, Centre console**).



14747

14747



108351

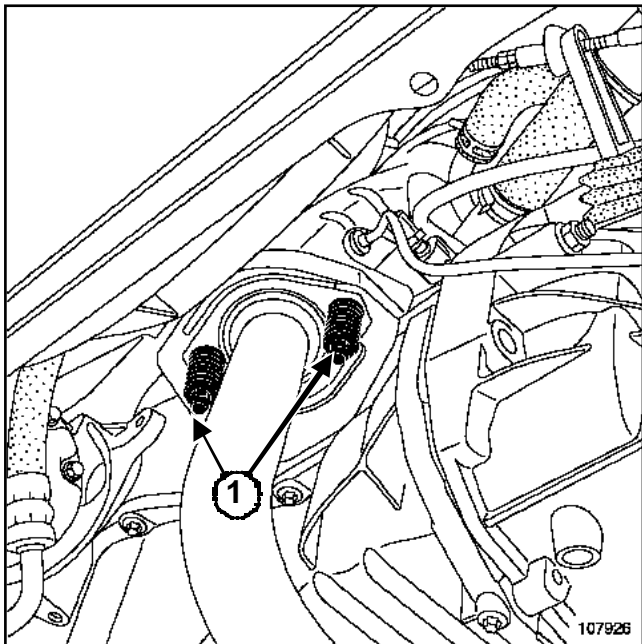
108351

Cut off the exhaust line using tool (Mot. 1199-01) between the two cutting points located about **130 cm** from the exhaust manifold.

Disconnect the downstream oxygen sensor from the catalytic converter.

Remove the clips from the oxygen sensor connector downstream from the catalytic converter.

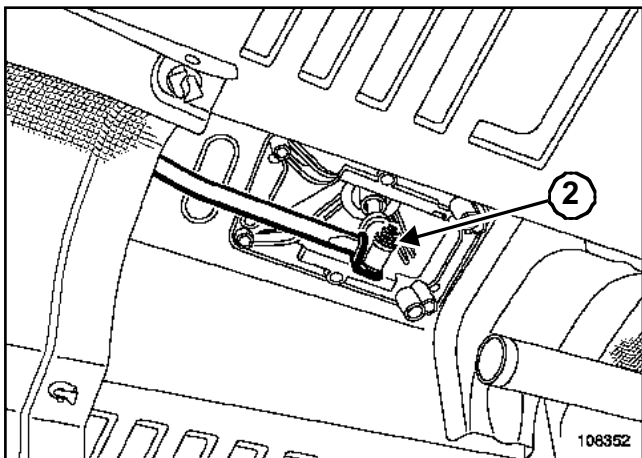
L90, and K7J or K7M, and JH1 or JH3



107926

Remove:

- the catalytic converter mountings (1) on the exhaust manifold,
- the catalytic converter by unclipping the rubber mountings.



106352

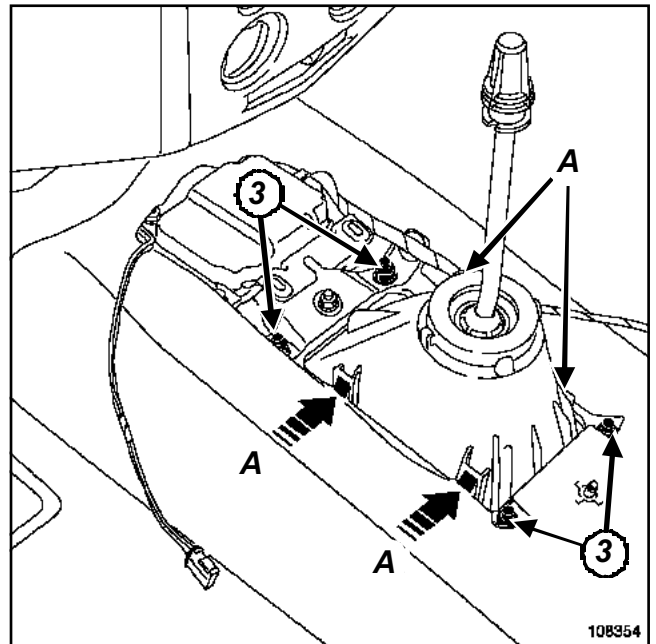
Remove nut (2) from the gearbox control linkage.

Turn the control lever gaiter inside out.

Cut the collar clip tightening the gaiter at the level of the knob.

Remove:

- the control lever gaiter,
- the gear lever knob by twisting and pulling it.



108354

Remove the mounting (3) nuts of the control unit.

Press the notches (A) of the control unit to unclip the control unit from the body.

Remove the control unit from underneath the vehicle.

REFITTING

Proceed in the reverse order to removal.

Introduction

The vehicle is fitted with a BOSCH 8.0. ABS system.

The BOSCH 8.0 system comprises the anti-lock braking system uniquely associated with an Electronic Braking Distribution.

IMPORTANT

After any operations on the ABS, the vehicle must be road tested to confirm the repair

ABS SYSTEM DESCRIPTION

The ABS system comprises:

- four wheel speed sensors,
- a brake servo assembly,
- a pump assembly consisting of:
 - a hydraulic pump,
 - a pressure modulation unit (eight solenoid valves),
 - a computer,
 - a pressure sensor.

ANTI-LOCK BRAKING SYSTEM

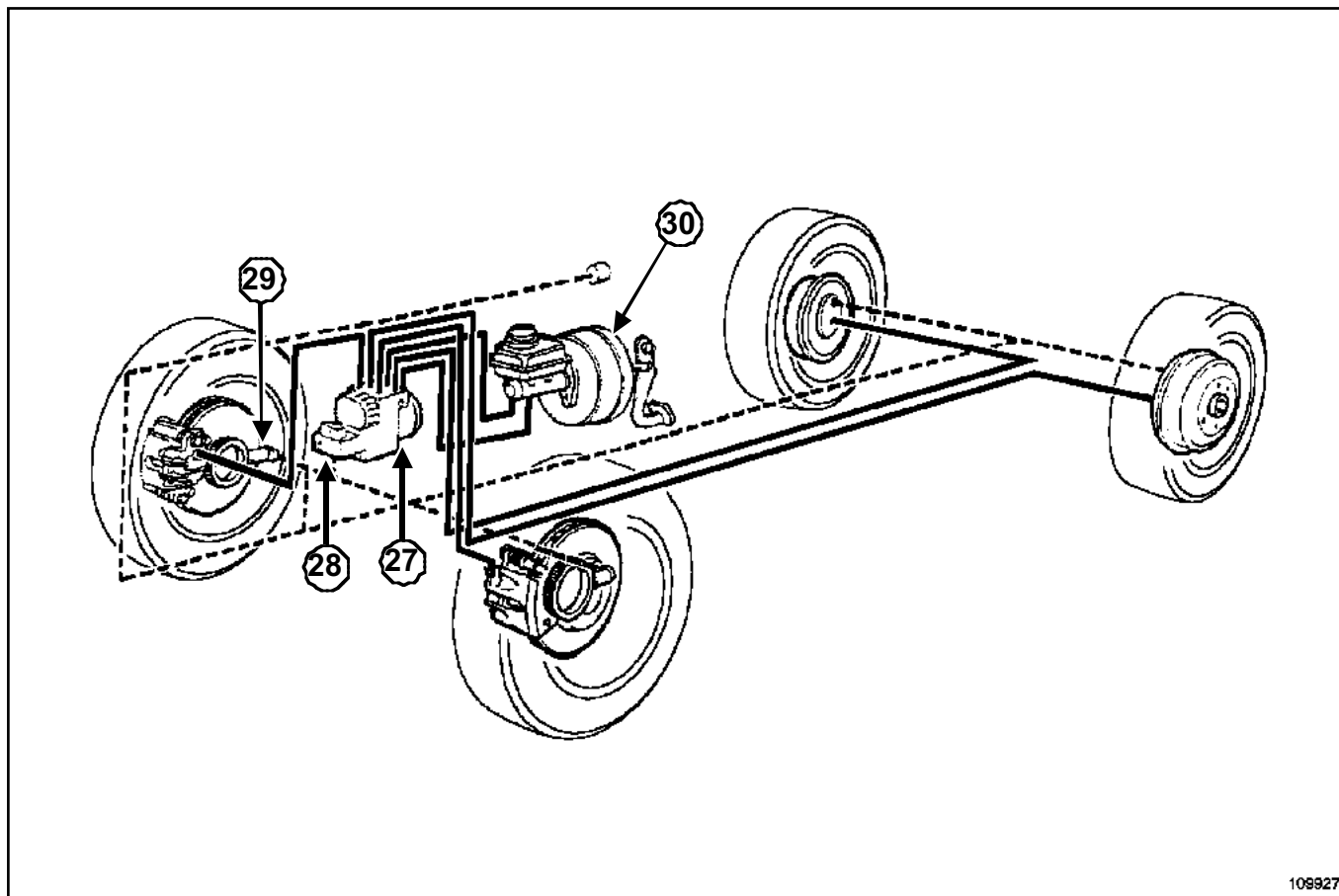
ABS system without ESP: Description

38C

The vehicle is equipped with the BOSCH 8.0 system which consists of the anti-lock braking system only.

IMPORTANT

After any work on the ABS system, the vehicle must be road tested to confirm the repair.

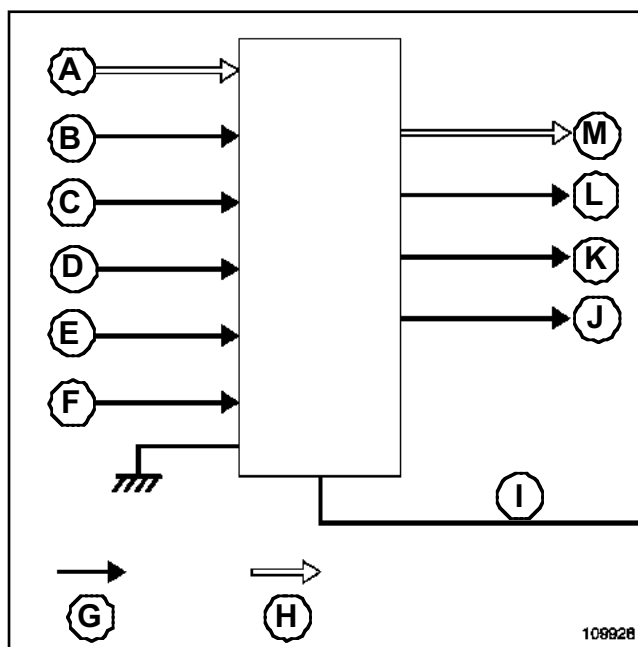


109927

109927

The ABS system consists of:

- a brake servo assembly (30),
- a pump assembly comprising:
 - a hydraulic pump (27),
 - a pressure modulation unit (eight solenoid valves),
 - a computer, (28),
- four wheel sensors (29).



109928

109928

ANTI-LOCK BRAKING SYSTEM

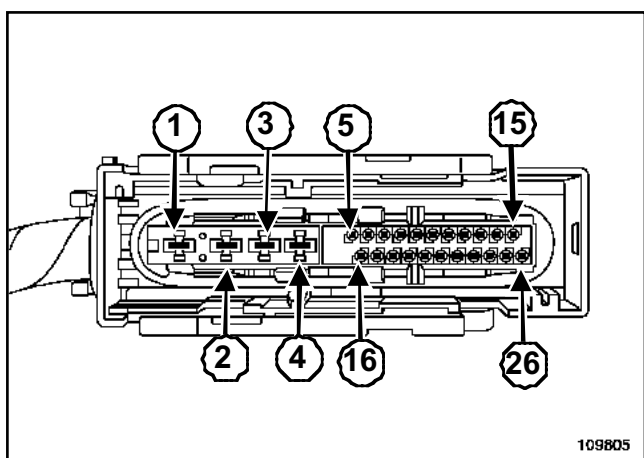
ABS system without ESP: Description

38C

- (A) Braking pressure from master cylinder
- (B) wheel sensor signal
- (C) Diagnostic socket
- (D) Supply (+ before ignition feed)
- (E) Supply (+ after ignition feed)
- (F) Brake lights sensor signal
- (G) Wire connection
- (H) Hydraulic connection
- (I) Pump assembly (hydraulic unit, computer)
- (J) Diagnostic socket
- (K) Brake fault warning light
- (L) ABS system fault warning light
- (M) Regulated braking pressure on wheel(s) concerned

Note:

The computer is a single unit with the pump assembly.



109805

Track	Description
(1)	Pump motor earth
(2)	Pump motor supply (+ before ignition feed)

Track	Description
(3)	Solenoid valve supply (+ before ignition feed)
(4)	Solenoid valve earths and computer
(5)	Front-left speed sensor supply
(6)	Rear-left speed sensor supply
(7)	Not used
(8)	Rear-right speed sensor supply
(9)	Front-right speed sensor supply
(10)	Front-right speed sensor signal
(11)	line K (diagnostic)
(12)	Brake fault warning light
(13)	Not used
(14)	Not used
(15)	Not used
(16)	Front-left speed sensor supply
(17)	Rear-left speed sensor signal
(18)	12V + after ignition feed (fuse protector)
(19)	Rear-right speed sensor signal
(20)	Brake light switch
(21)	Not used
(22)	ABS system fault warning light
(23)	Not used
(24)	Not used
(25)	Not used
(26)	Not used

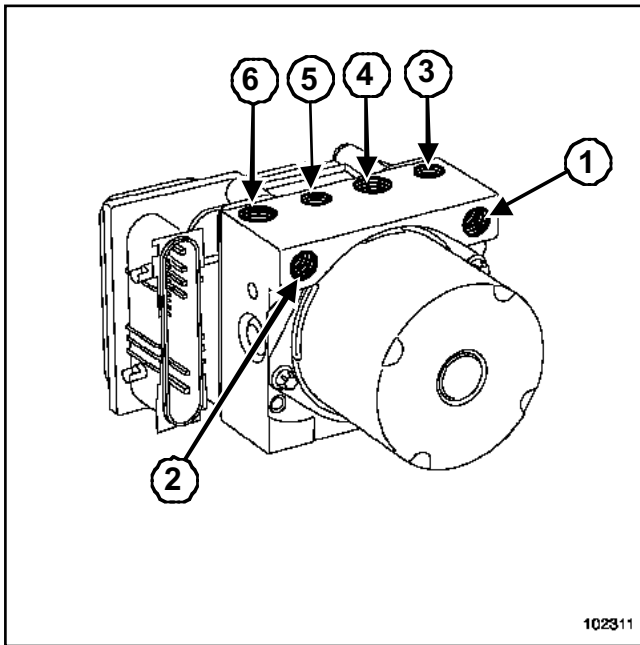
ABOUT THE BOSCH 8.0 ABS SYSTEM

The ABS system pump assembly is equipped with a **26-track** computer.

Note:

The computer is a single unit with the pump assembly.

The hydraulic unit consists of eight solenoid valves. It is located in the engine compartment, on the side member, near the front-right suspension and the bulkhead.



- (1) Master cylinder primary circuit
- (2) Master cylinder secondary circuit
- (3) Output to the left hand front wheel
- (4) Output to the offside rear wheel
- (5) Output to the nearside rear wheel
- (6) Output to the front right hand wheel

ANTI-LOCK BRAKING SYSTEM

Hydraulic assembly without ESP

38C

Essential equipment

pedal press

Tightening torques

hydraulic unit mounting bolts on its support	8 Nm
--	------

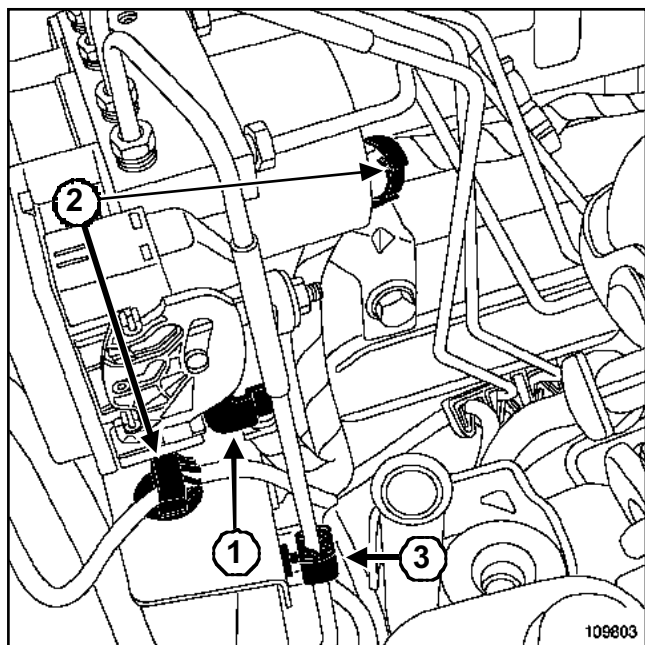
hydraulic unit support mounting bolts	22 Nm
---------------------------------------	-------

rigid pipe unions on the hydraulic unit	14 Nm
---	-------

REMOVAL

Disconnect the battery, starting with the negative terminal.

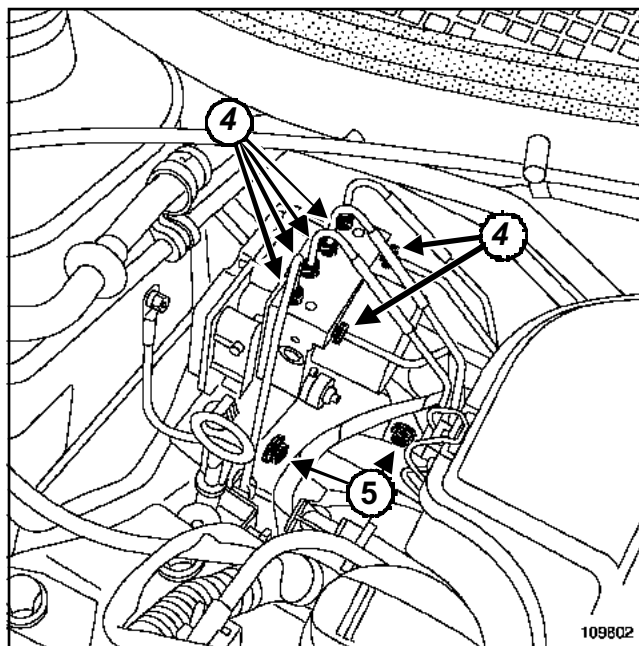
Fit a **pedal press** to the brake pedal to restrict the outflow of brake fluid.



Disconnect the hydraulic unit connector by lifting the mounting bracket (1).

Unclip:

- the hydraulic unit connector cable (2),
- the rigid brake pipe (3).



109802

109802

Unscrew:

- the rigid pipe unions on the hydraulic unit (4),
- the hydraulic unit mounting bolts (5).

Remove the two hydraulic unit support mounting bolts.

REFITTING

Proceed in the reverse order to removal

WARNING

Position the earth terminal wire facing downwards to optimise the hydraulic unit computer connector sealing.

ANTI-LOCK BRAKING SYSTEM

Hydraulic assembly without ESP

38C

Torque tighten:

- the hydraulic unit mounting bolts on its support (**8 Nm**),
- the hydraulic unit support mounting bolts (**22 Nm**),
- the rigid pipe unions on the hydraulic unit (**14 Nm**).

WARNING

Connect the battery starting with the positive terminal; carry out the necessary programming (see **80A, Electrical equipment, Battery**).

Note:

Following the replacement of the hydraulic unit computer: Carry out the necessary programming (see **38C, ABS system, configuration**).

Bleeding the circuit (see **30A, General Vehicle Information, Braking circuit bleed**).